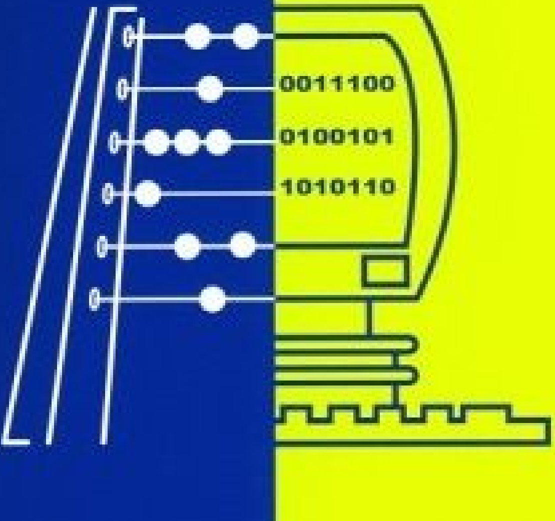
André Vanoli

A History of National Accounting



IOS Press

A HISTORY OF NATIONAL ACCOUNTING

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André Vanoli

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To the memory of Claude Gruson

A History of National Accounting
A. Vanoli
IOS Press, 2005

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Foreword

At the time when this book is being written, at the end of the century, national accounting is no longer at its most glorious age. Nevertheless many of its principal results circulate in the media, are the object of comments by economists and political decision makers, appear in the information that influences the financial markets, are used for characterizing the comparative levels of the economies and their evolution, etc.

Gross or net domestic (or national) product per capita, national income, household or global saving rate, observed or expected change of annual or quarterly GDP in volume (at constant prices), movements in gross fixed capital formation, surplus or deficit of general government, rate of compulsory levies, balance of external transactions, for example, are all becoming familiar concepts (if not for all, at least for many), even when their exact content and meaning are most often poorly known.

Distant are the times when the sovereign's treasury, the size of the crops and the surplus left over for trade beyond the predominant self-consumption or the dearth they brought about, the main commercial flows, at certain periods the contribution of precious metals, the conditions and maintenance of the roads and the fleet, represented the principal characteristics of economies with populations few in number and rather stationary for long periods of time. Public officers and merchants made efforts to gather some crucial data on these phenomena, essential for public or private business management, without transforming them into information of general interest.

With the increase in agricultural surplus, the birth of the manufacturing industry, the development of trade, the demographic revolution, the extension of market economic transactions induces an increase in the number and diversity of quantitative data in the more advanced economies. The need for synthesizing this information in such a way that one single figure would characterize the strength of a nation's economy appears belatedly and for a long time intermittently. Remarkably, when the first attempts in this direction see the light of day in England at the end of the 17th century, it is not the political or economic necessity that the analysts invoke to explain this emergence but intellectual factors (see Box 3). A century later, at the time of the Napoleonic wars, political reasons lead to a revival. Then, progressively, these estimates of national income extend, though with a slow and unsteady rhythm, during the 19th century.

The 30s and 40s of the 20th century witness the combination of extreme economic and political events (World Wars, Great Depression), development of governmental intervention, and intellectual investments (cycle analyses, macroeconomics) that lead to the emergence of national accounting. Although it has its roots in the long history of national income estimates, its characteristics essentially differentiate it from the latter, with the exception of those made by King – precursor without followers – in England at the end of the 17th century (see Box 2). These characteristics are found in the project of building accounts for the nation similarly to business accounts, but in a more ambitious manner and not to simply compile one or two significant aggregates. This implies that it is necessary to establish, for the economic transactors grouped in categories, accounts both of their transactions and their wealth, to describe the main interrelations among them and to aggregate all this at the level of the national economy. The approach is here defined in its principle, but in fact, it can mix the methods of compilation and not necessarily go from the most elementary level to the global one.

From a certain point of view, national accounting does less than the accounting of a firm or a public institution. It is evidently impossible to have the economic accounts of a nation directly kept by a squad of accountants that would have at hand all the supporting documents of the elementary transactions made by transactors as well as the statement of all their claims and liabilities. National accountants are accountants only to the second degree. They depend in practice on the accounts of transactors, when they exist and may be available, and on a vast amount of statistical information, which is never complete.

On the other hand, national accounting does more than the accounting of an economic transactor. First, it covers them all. That is why it is said that it is a quadruple entry system and not only a double entry one. This is true only conceptually though because, as was said in the preceding paragraph, it is not directly established that way. From this potential quadruple entry system proceed simultaneously the benefits of being able to complete the information concerning one transactor by using that of others, to estimate missing data, and the heavy constraint of looking for and respecting an overall consistency.

National accounting also does more than business or public accounting because, although it takes account of the institutional reality, it is above all concerned with the economic nature of the flows and stocks that it measures. Thus, for assets, it does not keep their heterogeneous original values when they have been accumulated at different dates, but it revaluates them. It also goes beyond the transactions as perceived by the transactors themselves. For instance, it estimates values for exclusively physical flows (self-consumption), or unbundles complex transactions into elementary flows (the case of insurance premiums and interest). It even reconstitutes certain economically important flows, which are observed with difficulty in physical quantities and not at all in terms of purchase/sale transactions (the case of the estimate of a part of banking services using the banks' interest margin). In so doing, national accounting intends, beyond appearances, to measure flows whose economic meaning is more important.

Being more economically oriented than the accounts of economic transactors themselves, national accounting is closer to the notions that economic theories develop. Hence the references it can derive to found its own concepts. Hence also, however, the source of potential conflicts, notably on the estimate and interpretation of the aggregates, as theoretical models are often quite far from the conditions of actual economies that statistics and national accounting have the charge to observe.

The risk exists, thus, of a doubly imperfect correspondence, both with microeconomic accounting data, because they are not sufficiently economically significant, and with economic theories, in this case because they do not view national accounting as being sufficiently economically significant either.

Because of the growing complexity of economies, it will be difficult for national accounting to completely fulfill its original project. In the 20th century, success and discomfort will mark the history that this book tries to describe from a general and worldwide standpoint, dedicating though some developments to the original aspects of the French experience.

A first part (chapter 1) deals with the emergence of national accounting from the 1930s until 1945, recalling only briefly the preceding two and a half centuries of national income estimates. The second part (chapters 2 to 4) presents the accounting systems and their international harmonization, with a chapter presenting the beginning and development of French national accounting. The third part (chapter 5) presents national accounting as a statistical synthesis, without entering into the details of the evolution of the compilation methods. Parts II and III refer to the internal history of the discipline. On the other hand, the fourth part (chapters 6 to 9), dedicated to concepts and their relationship with economic theory, presents the problematics and debates that unite or sometimes divide economists and national accountants, on issues referring to the relationships between production, value and welfare, between production, income and wealth, and between value, volume and prices. The fifth part (chapter 10) deals with the uses and the status of national accounting and essentially refers, as does the first part, to the external history of national accounting.

Each chapter ends with an "outlook", combining conclusions and the establishment of links with other issues. It might be helpful to read these "outlooks" in a row, before or after reading the book. Boxes are many. By definition, their reading is separable from the main text of the chapters. Nevertheless, the synthetic nature of the main texts may make it necessary to read some boxes. They are intended to facilitate access for readers having only some general idea about national accounting or, reciprocally, to allow them to avoid more technical developments. It was not possible, without making the book longer and heavier, to present in more detail the contents of national accounting. For this it is possible to refer to the available handbooks that do this or to the synthesis of Jean-Paul Piriou in *La Comptabilité nationale* [National Accounting] (La Découverte, coll. "Repères", 13th edition, 2004; with a basic bibliography).

National accounting is a language. By definition, words do not have always the meaning that they have in everyday life, or in business accounting, or in the language of economists, which is far from being unified. Some boxes dedicated to “vocabulary” illustrate this situation. The one that concerns the term “real” should be particularly mentioned to the reader. Perhaps they are not enough. However, other passages of the book refer also to the meaning of words, for instance the appendix of chapter 8 devoted to Hick’s concept of income.

The book does not have a general bibliography with the long traditional list of authors in alphabetical order, however, despite its potential value. The system of an “annotated bibliography” at the end of each chapter has been preferred. It has a selective nature and usually follows the order of the topics of each chapter. In some cases, it could seem annoying to have to shift from the annotated bibliography of one chapter to that of another or to go through the annotated bibliography of a chapter to find a reference. The disadvantage of the system followed may be compensated for by the existence of short comments on the cited references. The index of proper names somewhat mitigates the problem as the page numbers referring to the books or articles of an author are in bold type.

Quotes from English references are taken directly from the original.

A postface tries to situate the book, by giving some indication of its genesis, on what it does not intend to be as well as what its purpose is, and also on the series of circumstances that made a septuagenarian to publish here, nowadays, for the first time, a book on this topic.

As he has not the intention to withdraw from society, the author would be grateful to any reader who would indicate mistakes, defects, omissions, or who would like to make suggestions or provide complementary information.

Acknowledgments

This book is the result of successive changes in a more limited project (see the Postface). It might never have appeared without the initial request by Jean-Paul Piriou for his series “Repères” and the flexibility that he showed in adapting to the author’s approach.

This long work would not have been made possible without the support from the Institut National de la Statistique et des Etudes Economiques and its professional environment. The technical and secretarial backing provided by the Institute, thanks to the understanding of Paul Champsaur, its Director General, and Georges Consolo, its Secretary General, has been the necessary base for the implementation of this endeavor.

Marie-Thérèse Pedersoli assured with her competence, professional conscience and dedication, and with a very constant sense of good humor as well, the typing and correction of the numerous drafts of this text and provided different and precious secretarial services that an executive of the old school particularly appreciates. Line Clavenad kindly accepted to replace her during vacation times. The data-processing support and the library services of the INSEE have also actively contributed to the task.

Edith Archambault, Jacques Magniez, Pierre Muller and Jean-Paul Piriou read the whole manuscript, sometimes several drafts, and provided comments, criticisms, suggestions, and proposals for boxes. Pierre Muller also made a critical review of all boxes. Alain Desrosières read several chapters. Besides the relevance of his remarks, based on his unique experience as a statistician and historian of statistics, he continuously encouraged the project and provided moral support, so much required for someone engaged in a long-term personal work. He also provided many valuable documents.

By the end of the journey, Jacques Mayer, under whose friendly orders I made my first steps as a generalist national accountant, after “getting out there and shoveling coal” (in French, “aller au charbon”) with André Hamaide, has also accepted to read all the chapters.

Alain Benedetti and Jacques Bournay read some chapters and boxes and provided valuable observations.

Interviews with Michel Hébert, Guy Laroque, François Lequiller, Pascal Mazodier and Guy de Monchy helped me to better perceive the evolution of the users and of the status of national accounting in the last decade of the century.

Many statisticians and national accountants helped by providing documents and information and by answering some of my questions:

- in international organizations: Alessandra Alfieri (UN), Kirk Hamilton (World Bank), Derek Blades, Anne Harrison, Paul McCarthy, David Roberts, Paul Schreyer (OECD), Brian Newson and Anton Steurer (Eurostat);
- at IARIW: Jane Forman;
- abroad: Erling Fløttum and Einar Lie (Norway), Kishori Lal (Canada), Steve Landefeld and Brent Moulton (USA), Luisa Picozzi and Giovanni Savio (Italy), Tetsuro Sakamaki (Japan);
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- Marc Bentolila, former director of the Bureau Agricole Commun (BAC) [Agricultural Common Bureau] provided his testimony on the Commission for Agricultural Accounts.

I sincerely thank them all for their help. Evidently, following the hallowed expression, the responsibility for remaining errors, inadequacies and the expressed opinions is exclusively mine.

I have also to express, though anonymously, my thanks to all those who contributed, over almost forty-five years of activity in this field, in my day-to-day work, national and international meetings and conferences, activities of professional societies or technical assistance missions, through exchanges of views, and sometimes confrontations, to the accumulation of the experience on which this book is based.

This publication in English is identical, except for a very small number of corrections and marginal changes, to the original book published in French in 2002. The translation was not an easy task and I should like to warmly thank my translators Marion Libreros and Gayle Partman for both their intense work and the outcome of their efforts. Thanks also to Eduardo Libreros who generously provided many advices.

The translation was made possible thanks to the support of Le Centre National du Livre/French Ministry of Culture, INSEE, the Banque de France and the Association de Comptabilité Nationale (ACN). I am very grateful to these institutions for their invaluable help.

Thanks also to Delphine Ribouchon, Rights Manager at Editions La Découverte, who did not save her efforts for making this publication in English possible.

I wish to extend also my sincere thanks to my publisher in English, IOS Press, to its director Einar Fredriksson and his staff.

Jean-Paul Piriou, the publisher at the origin of this book, died before his time in February 2004. His contribution to the teaching and dissemination of national accounting, and more generally to the spread of economic knowledge has been outstanding.

PART I

Emergence

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Chapter 1

From Estimates of National Income to Construction of Accounts for the Nation

Contents

For over two and a half centuries, measured from the first works of William Petty in 1665 to the end of the nineteen twenties, considerable efforts were made to estimate national income as a meaningful concept in itself. In the fifteen years that followed, as a combined result of the Great Depression, the works of Keynes and World War II, the elaboration of a system of national accounts was made possible, leading among other things to the derivation of a number of aggregates.

1. 1665–1929: Two hundred and sixty years of intermittent estimates of national income

1.1. General overview of the works

Over such a long period, no state is known to have placed any specific order for this type of product. Only two political initiatives are to be mentioned: Lavoisier who made, or better completed, an estimate for the French National Assembly, and Pitt, who, as England's Prime Minister, provided the Chamber of Commons with an estimate of taxable income, excluding labor income, as a justification

Box 1
The first estimate of national income, by William Petty[1]

William Petty's original estimates, 1664

Income		Expence	
From Land	8	Food, Housing, Clothes and all other necessaries	40
From other Personal Estates	7		
From the labour of the People	25		
Total	40	**Total**	40

[1] Shown in an accounting form by Richard Stone (*Nobel Memorial Lecture, 1984*, p. 7); England, in million pounds.

for his proposed introduction of an income tax. Initiative came from individuals; among them no professional statisticians can be mentioned until the middle and mostly the end of the nineteenth century, only honest minds concerned about public matters. In the seventeenth century, the first to launch an estimate is, among other occupations, a physician (William Petty 1623–1687, see Box 1) and the second is a herald by profession, a cartographer, a registrar at the College of the Army and finally a secretary to the Comptrollers Accounts (Gregory King 1648–1712). A Governor-Lieutenant of Rouen (Boisguillebert, 1646–1714) and a retired army engineer (Vauban, 1633–1707) are among the first French that come to mind. In England, a century later, we find a clergyman (Henry Beeke, born in 1751, little is known about him) and a surgeon (Benjamin Bell, 1749–1806).

For a very long period of time these estimates are not intended to provide information of general interest (this objective will only appear during the second half of the nineteenth century). They are mostly the result of the social and political concerns of their authors, generally associated with some projects of reform. The title of the book written by Petty is very significant in this respect: *Political Arithmetick*. This expression will describe the new discipline of quantitative observation of topics concerning society, until it will be replaced by "statistics" at the end of the eighteenth century under the influence of the German school of cameralist statistics.

At this early stage, taxation is the main concern. William Petty wants to show that it is possible to impose taxes based on less painful and more equitable methods. Boisguillebert and Vauban strongly criticize the French tax system and propose a radical reform. In England at the end of the eighteenth century, Pitt, Beeke and Bell try to estimate the result of a tax on income. In 1791, Lavoisier with his estimation makes an attempt to evaluate the outcome to be expected from the new taxes proposed by the National Assembly. In England, fiscal concerns still inspire Joseph Lowe (1822–1823) and W.E. Smee (1846).

The other main purpose behind these early works is the assessment of the economic strength of a nation in comparative terms. Petty wants to fight the prevailing pessimistic ideas about the economic situation in England. His reasoning, essentially qualitative in nature, leads him to conclude that his country is not so bad off when compared to France. King (see Box 2) wants to compare England to France and Holland. With this purpose in mind, he compiles what can be viewed as the first estimation of their income. He values the French income in 1668 as double the English one, which means, on a per capita basis, that the former represents three quarters of the latter. To see the impact of the "six-year war" against France, he even compiles a series from 1688 to 1695 (the first one ever; no other series will be established in the next one and a half centuries), and he projects it for the next three-year period. Regarding England, he includes estimates of its stocks and total net worth. Assessment of wealth, frequently limited to private wealth, will develop later, during the nineteenth century. (For the particularities of the English innovation see Box 3.)

The Napoleonic Wars revive the interest in measuring the economic strength of a nation, on both sides of the English Channel. In France the effort to collect data is remarkable; in 1814 in England, Patrick Colquhoun may seem to echo well in advance François Fourquet's book *Les comptes de la puissance* [The Accounts of Power] (1980) by publishing his estimate of income in a book called: *A Treatise on the Wealth, Power and Resources of the British Empire in every Quarter of the World including the East Indies.* Later, C.B. Spahr (1896) and W.I. King's (1915) evaluation of income distribution and its change over time will be the driving force for the elaboration of estimates in the USA. Incidentally, they arrive at contradictory conclusions.

The estimations of national income were a source of immediate difficulties for their authors rather than a reason for success, not only due to the crucial nature of the topic but mainly because of the conclusions that they supported. Petty faced minor inconveniences as most of his works were posthumous. Once informed, the King of France would have been offended by an unfavorable conclusion toward his country, while the English authorities preferred to keep these essays secret. When Vauban publishes *La Dîme Royale* (The Royal Tithe) in 1707, he is banished from the court, his book is forbidden and the copies destroyed. Already sick, he only survives a few months in his estrangement. The scandal reaches Boisguillebert: *Le Détail de la France* (France in Detail) had been published anonymously abroad, had passed unnoticed (as had its summary published in the same way under the revealing title *La France ruinée sous le règne de Louis XIV!* [France Ruined Under the Ruling of King Louis XIV]). His books, including the latest, *Factum de la France* [Facts of France] (1707), are also forbidden. He is removed from office, exiled to the provinces, but ... he immediately republishes his works secretly abroad, along with those of Vauban. Almost a century later, under another autocracy, A.N. Radishchev (1749–1802) commits suicide after being threatened with a second exile to Siberia because of his ambitious plan to gather statistics from the provincial administrations. [Formerly, while in Siberia, he had finished an estimate of Russia's national income.]

For a long time, interest in the estimation of national income was not only limited to a reduced number of nations but was also mostly intermittent. By

Box 2
Gregory King, an outstanding pioneer

An account by social category[1]

A scheme of the income & expense of the several families of England calculated for the year 1688

Ranks, Degrees, Titles and Qualifications	Number of families	Heads per family[3]	Number of persons	Income per family £	Income per head £	Expence per head £	Increase per head £	Total income £'000	Total expence[2] £'000	Total increase £'000
Temporall Lords	160	40	6,400	2,800	70	60	10	448	384	64
Spiritual Lords	26	20	520	1,300	65	55	10	33.8	28.6	5.2
Baronets	800	16	12,800	880	55	51	4	704	652.8	51.2
Knights	600	13	7,800	650	50	46	4	390	358.8	31.2
Esquires	3,000	10	30,000	400	40	37	3	1,200	1,110	90
Gentlemen	12,000	8	96,000	240	30	27.5	2.5	2,880	2,640	240
Persons in greater Offices and Places	5,000	8	40,000	240	30	27	3	1,200	1,080	120
Persons in lesser Offices and Places	5,000	6	30,000	120	20	18	2	600	540	60
Eminent Merchants & Traders by Sea	2,000	8	16,000	400	50	40	10	800	640	160
Lesser Merchants & Traders by Sea	8,000	6	48,000	200	33.3	28.3	5	1,600	1,360	240
Persons in the Law	10,000	7	70,000	140	20	17	3	1,400	1,190	210
Eminent Clergy-men	2,000	6	12,000	60	10	9	1	120	108	12
Lesser Clergy-men	8,000	5	40,000	45	9	8	1	360	320	40
Freeholders of the better sort	40,000	7	280,000	84	12	11	1	3,360	3,080	280
Freeholders of the lesser sort	140,000	5	700,000	50	10	9.5	0.5	7,000	6,650	350
Farmers	150,000	5	750,000	44	8.8	8.55	0.25	6,600	6,412.5	187.5
Persons in Liberal Arts and Sciences	16,000	5	80,000	60	12	11.5	0.5	960	920	40
Shopkeepers and Tradesmen	40,000	$4\frac{1}{2}$	180,000	45	10	9.5	0.5	1,800	1,710	90
Artisans and Handicrafts	60,000	4	240,000	40	10	9.5	0.5	2,400	2,280	120
Naval Officers	5,000	4	20,000	80	20	18	2	400	360	40
Military Officers	4,000	4	16,000	60	15	14	1	240	224	16
	511,586	$5\frac{1}{4}$	2,675,520	67	12.9	12	0.9	34,495.8	32,048.7	2,447.1
Common Seamen	50,000	3	150,000	21	7	7.5	–0.5	1,050	1,125	–75
Labouring People & outservants	364,000	$3\frac{1}{2}$	1,275,000	15	4.3	4.4	–0.1	5,460	5,587	–127
Cottagers & Paupers	400,000	$3\frac{1}{4}$	1,300,000	5	1.5	1.75	–0.25	1,950	2,275	–325
Common Soldiers	35,000	2	70,000	14	7	7.5	–0.5	490	525	–35
	849,000	$3\frac{1}{4}$	2,795,000	10.5	3.25	3.45	–0.2	8,950	9,512	–562
Vagrants	–	–	30,000	–	2	4	–2	60	120	–60
	849,000	$3\frac{1}{4}$	2,825,000	10.5	3.19	3.41	–0.22	9,010	9,632	–622
So the General Account is										
Increasing the Wealth of the Kingdom[4]	511,586	$5\frac{1}{4}$	2,675,520	67	12.9	12	0.9	34,495.8	32,048.7	2,447.1
Decreasing the Wealth of the Kingdom[4]	849,000	$3\frac{1}{4}$	2,825,000	10.5	3.19	3.41	–0.22	9,010	9,632	–622
Neat Totalls [and averages]	1,360,586	$4\frac{1}{20}$	5,500,520	32	7.9	7.55	0.33	43,505.8	41,680.7	1,825.1

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[1] Source: G.E. Barnett (ed.), Two tracts by Gregory King, Johns Hopkins University Press, Baltimore, 1936, p. 31 (amended). Presentation slightly modified by Richard Stone (Nobel Memorial Lecture, 1984, p. 8).

[2] This column does not appear in King's original.

[3] "Family" is equivalent to present-days "household" (it includes in-house domestic servants, which explains the high number of persons per family in the higher classes of society). The rows reflect the social stratification of those times.

[4] The last two rows above the Neat Totalls show the wealth gains or losses in the kingdom. The lowest classes decrease their wealth because they spend more than their income.

cont'd

Box 2 (cont'd)

An annual series 1688–1695 projected until 1698 (thousand pounds)[1]

Year	Annuall Income of the Nation	Annuall Expence of the Nation	Ordinary Revenue of the Crown	Extraord.^{ry} Taxes actually raised	Annuall Expence In all	Increase or Decrease of the Nation	
1688	43,500	41,700	2,000		41,700	Incr.	1,800
1689	43,600	41,500	1,800	3,000	44,500	Decr.	900
1690	43,700	41,500	1,800	4,000	45,500	Decr.	1,800
1691	43,800	41,400	1,700	4,000	45,400	Decr.	1,600
1692	43,800	41,200	1,700	4,000	45,200	Decr.	1,400
1693	43,600	41,000	1,600	4,000	45,000	Decr.	1,400
1694	43,100	40,800	1,600	5,000	45,800	Decr.	2,700
1695	42,500	40,500	1,500	5,000	45,500	Decr.	3,000
1696	41,600	40,100	1,500	4,500	44,600	Decr.	3,000
1697	40,200	39,300	1,400	4,500	43,800	Decr.	3,600
1698	38,500	38,500	1,400	4,000	42,500	Decr.	4,000

[1] Taken from Studenski, *The Income of Nations*, 1958, p. 35; *Two Tracts by Gregory King*, 1936, pp. 46–49).

[2] Col. 5 = Col. 2 + Col. 4. Ordinary revenue of the Crown and extraordinary taxes actually raised are presented separately.

Link between flows and stocks (thousand pounds) ***(ibid, p. 36)***

	The Stock of the Kingdom 1688	Decrease by the year 1695	Remain.^{g} Stock an.^{o} 1695	Decrease by the year 1698	Remaining Stock anno 1698
Coyn'd Silver	8,500	4,000	4,500	1,500	3,000
Coyn'd Gold	3,000		3,000	1,500	1,500
Uncoynd Silver & gold	500	400	100	100	
Wrought Plate Rings &c.[a]	4,000	1,600	2,400	1,200	1,200
Jewells	1,500	500	1,000	200	800
Furniture Apparell &c.[a]	10,500	2,500	8,000	1,500	6,500
	28,000	9,000	19,000	6,000	13,000
Stock for Trade Consumption &c.[a]	33,000	3,000	30,000	3,500	26,500
The Live Stock in Cattle &c.[a]	25,000	1,000	24,000	1,000	23,000
	86,000	13,000	73,000	10,500	62,500

The stocks consist of all gold and silver in coins (monetized or not), gold and silver works, jewellery, furniture, clothing, commercial stock and livestock.

cont'd

the middle of the 19th century, such estimations seem to be found in only five countries. Moreover, in three of them – Russia, Germany and The Netherlands – estimates made at the end of the 18th century and the beginning of the 19th century will not be repeated for many years. Russia's three estimates will fall

Box 2 (cont'd)

An international comparison (England, France, Holland)[1]

The general account of England, France & Holland for the years 1688–1695

	Totals (£ million)						**Per head (£'s)**					
	1688			**1695**			**1688**			**1695**		
	England	France	Holland	England	France	Holland	England	France	Holland	England	France	Holland
Bread . . . & all things made of Meal or Flower				4.3	10.1	1.40				0.79	0.75	0.63
Beef, Mutton, Veal . . . Venison, Conies				3.3	5.3	0.80				0.61	0.39	0.36
Butter, Cheese & Milk				2.3	4.0	0.60				0.42	0.30	0.27
Fish, Fowle & Eggs				1.7	3.7	1.10				0.31	0.27	0.49
Fruit, Roots & Garden Stuff				1.2	3.4	0.40				0.22	0.25	0.18
Salt, Oyl, Pickles . . . & confectionary Ware				1.1	2.8	0.30				0.20	0.21	0.13
Beer & Ale				5.8	0.1	1.20				1.06	0.01	0.54
Wine, Brandy Spirits . . . & made Wines				1.3	8.6	0.40				0.24	0.64	0.18
Dyet [food and drink]	21.3	41.0	6.40	21.0	38.0	6.20	3.87	2.93	2.91	3.85	2.82	2.78
Apparell [clothing]	10.4	18.5	3.00	10.2	16.0	2.80	1.89	1.32	1.36	1.87	1.19	1.25
Incident Charges [expenditure n.e.s.]	10.0	21.0	6.35	14.3	26.0	8.40	1.82	1.50	2.89	2.62	1.93	3.75
Increase [saving]	1.8	3.5	2.00	−3.0	−6.0	0.85	0.33	0.25	0.91	−0.55	−0.44	0.38
General Expence	43.5	84.0	17.75	42.5	74.0	18.25	7.91	6.00	8.07	7.80	5.49	8.15
Rent of Land, Buildings & other Hereditaments	13.0	32.0	4.00									
Produce of Trade, Arts & Labour	30.5	52.0	13.75									
General Income	43.5	84.0	17.75	42.5	74.0	18.25	7.91	6.00	8.07	7.80	5.49	8.15
Consumption besides Taxes	39.7	70.0	11.00	39.0	62.5	10.50	7.22	5.00	5.00	7.16	4.63	4.69
Publick Revenue & Taxes	2.0	10.5	4.75	6.5	17.5	6.90	0.36	0.75	2.16	1.19	1.30	3.08
Increase	1.8	3.5	2.00	−3.0	−6.0	0.85	0.33	0.25	0.91	−0.55	−0.44	0.38
General Expence[2]	43.5	84.0	17.75	42.5	74.0	18.25	7.91	6.00	8.07	7.80	5.49	8.15
Population (millions)	5.5	14.0	2.20	5.45	13.5	2.24						

Source: G.E. Barnett (ed.), *Two tracts by Gregory King*, Johns Hopkins University Press, Baltimore, 1936, p. 55 (amended).

[1] Presentation slightly amended by Richard Stone, *Nobel Memorial Lecture 1984*, p. 10. King's original tables and comments are reproduced in Studenski, *The Income of Nations*, 1958, pp. 31–36.

[2] King calls total consumption *total expence*. Stone gives this expression its contemporary sense of total uses (uses of income, including savings).

cont'd

into oblivion until the mid-20th century. One only finds a relatively large number of estimates in England and in France. Even there, curiosity alternates with long periods of lack of interest. The American scholar Studenski, in his historical

Box 2 (cont'd)

The English economic historian and national accounts compiler Phyllis Deane presented King's accounts in a modern format. ("The implications of early national income estimates for the measurement of long term economic growth in the United Kingdom", *Economic Development and Cultural Change*, November 1955, pp. 3–38, table p. 8). Her table, with the original note on its sources, is presented here.

Social Accounts of England and Wales in 1688 (£ Million)

I. National Product and Expenditure

Indirect Taxes			4. Consumer's expenditure on goods and services	(10)	46.0
1. (a) Central Government	(20)	2.1			
(b) Local Government	(21)	0.7	5. Government expenditure on current goods and services	(17)	2.4
2. Income payments	(14)	48.0	6. Domestic asset formation	(24)	1.7
			7. Exports	(29)	5.1
			8. Less imports	(31)	–4.4
		——+			——+
3. National product at market prices		50.8	9. Expenditure on national product		50.8

II. Personal Income and Expenditure

10. Consumer expenditure	(4)		14. Income payment	(2)	
Cereals		4.3	Rents		13.0
Meat, poultry, game		3.9	Wages and salaries		17.7
Fish, eggs, dairy products		3.4	Profits, interest and mixed income		17.3
Vegetables		1.2			
Groceries and confectionery		1.1			——+
		——+			48.0
Total food in 1695		13.9	15. Transfers	(18)	0.6
Beer and ale		5.8			
Wines and spirits		1.3			
		——+			
Total food and drink in 1695		21.0			
Adjustment for 1688		0.3			
		——+			
Total food and drink in 1688		21.3			
Rent of houses and homesteads		2.5			
Clothing		10.4			
Services of resident domestics and children under 16		4.5			
Other goods and services		7.3			
11. Direct taxes	(22)	0.2			
12. Saving	(27)	2.4			
		——+			——+
13. Total personal expenditure		48.6	16. Total incomes of persons		48.6

cont'd

Box 2 (cont'd)

III. Government Income and Expenditure

17. Expenditure on goods and services	(5)		20. Customs and excise duties	(1a)	2.1
			21. Poor rate	(1b)	0.7
(a) Central Government		2.3	22. Hearth money	(11)	0.2
(b) Local Government		0.1			
18. Poor relief	(15)	0.6			
		+			+
19. Total government expenditures		3.0	23. Total government income		3.0

IV. Capital Transactions Account

24. Domestic asset formation	(6)	1.7	27. Private saving	(12)	2.4
25. Foreign lending	(32)	0.7			
		+			+
26. Disbursements on capital account		2.4	28. Receipts on capital account		2.4

V. External Account

29. Exports	(7)		31. Imports	(8)	
(a) Merchandise f.o.b.		4.3	(a) Merchandise f.o.b.		4.0
(b) Shipping services		0.8	(b) Shipping services		0.4
			32. Foreign lending	(25)	0.7
		+			+
30. Total value exports		5.1	33. Expenditure abroad		5.1

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[1] Note on sources of this table. Most of the items are directly derivable from King's *Natural and Political Observations*. See pp. 30–31 for items 2, 4, 14 and 15, and pp. 54–55 for item 10. For items 20, 21, and 22 the source was Davenant: see his *Discourses on the Public Revenue*, Part I, p. 233, and his *Essay upon Ways and Means*, p. 20 and p. 72. For the items in the External account the source was King's *Of the Naval Trade of England*: for items 25 and 27 see p. 64, for items 29–31, see pp. 74–76. See also text below for commentary on selection and use of these figures.

Stone may rightly regret that "after this brilliant start, all thoughts of balanced accounts seem to have evaporated" (*Nobel Memorial Lecture 1984*, p. 9), and this will be so until the eve of World War II.

opus magnus, *The Income of Nations* (1958), registers only a dozen works in each country before the end of the 18th century, while during the first two thirds of that century no notable work is to be found. At the end of the century and the beginning of the following one, the revolutionary period, the Napoleonic Wars, and the projects of income tax in England stir a renewed interest. The French Restoration witnesses a new decline, since for Louis XVIII and Charles X, statistics have a flavor of heresy.

Progressively, after the mid-19th century, the estimates of national income lose their original close link with projects of reform or the assessment of economic power, though their frequency remains low and increases only in the last two decades of the century. Estimates also appear progressively in other countries.

Box 3
Why this English innovation at the end of the 17th century?

Phyllis Deane and Richard Stone provide their answers to this question:

Phyllis Deane writes: ("The implications of early national income estimates for the measurement of long-term economic growth in the United Kingdom", *op. cit.* p. 3): "Apart from the early attempts to estimate the balance of trade of England and to use foreign trade records as indicators of national prosperity, there are no contemporary assessments of national economic strength of a specifically quantitative nature, until the end of the seventeenth century.* Then an unusual combination of circumstances yielded a stock of economic and statistical data which was more complete than any which had preceded it and more systematically and informatively analysed than any which was produced for the next century.

An important factor in this new combination of circumstances was the spirit of the age. The end of the seventeenth century was a period of eager interest in experimental science of all kinds and in the systematic pursuit of scientific knowledge for its own sake. It was characteristic of the age that writers on political and economic matters should begin to comprehend the economic system as a whole and should try to describe it in quantitative terms."

* Phyllis Deane elaborates in a note: "The habit of supporting political argument by statistical data on incomes or wealth was common, however, by the beginning of the sixteenth century. As early as 1600, Thomas Wilson expressed the importance of different groups in the nobility in terms of estimates of their aggregate yearly incomes. See *The State of England, Anno Dom. 1600.*"

As for Richard Stone (*Nobel Memorial Lecture 1984*", *op. cit.*, p. 6), he writes: "To trace the origins of national economic accounting we must go back to seventeenth century England, an age of great intellectual vigour, scientific curiosity and inventiveness. William Petty, physician, chemist, land surveyor, cartographer, naval engineer, co-founder of the Royal Society, adviser both to the Cromwell government and after the Restoration to Charles II and, above all, political arithmetician, was one of the more remarkable products of that remarkable century."

By the end of the century, Studenski finds some elements that can be qualified as first attempts of estimation in merely ten countries, some twenty before the 1929 crisis. After that the pace accelerates.

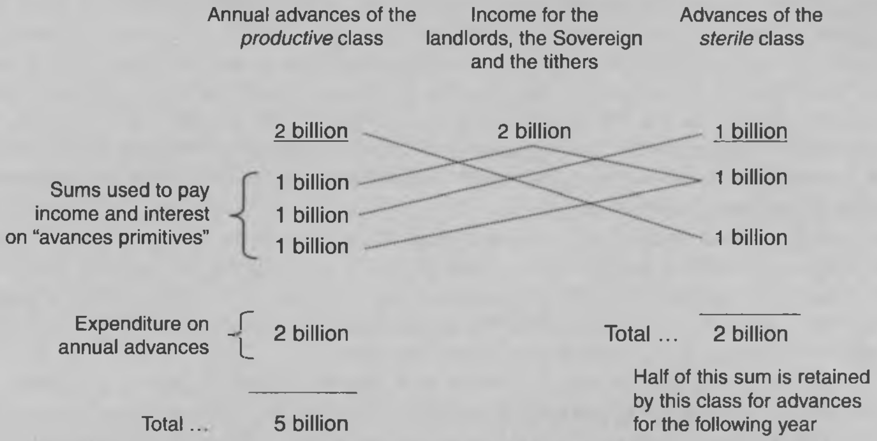
During these two and a half centuries, recognized economists did not pay much interest to the quantitative estimation of national income. Several among them, such as Jean Baptiste Say and Mc Culloch, openly showed their scepticism. The case of Charles Davenant (1656–1714) can be considered the exception confirming the rule, since he is not a theoretician. He admires Petty and King and, in 1698, publishes large extracts of the latter's work. King, probably out of modesty, did not publish his own research, which only became public in 1802.

1.2. The concept of productive activity

However, for better or for worse, theoreticians intensively discussed national income and its definition. Although many notions will be clarified, Adam Smith's (1723–1790) restricted conception of productive activity will impinge strongly upon the estimations for the next hundred years following the publication of *The Wealth of Nations* (1776). Much later, this conception will be imposed for seventy years on the countries of the Soviet sphere via that of Marx, correctly or perhaps incorrectly understood.

Box 4
François Quesnay: Formula of the "Tableau Economique"

Total reproduction: 5 billion


Annual advances of the *productive* class
Income for the landlords, the Sovereign and the tithers
Advances of the *sterile* class
2 billion
2 billion
1 billion
Sums used to pay income and interest on "avances primitives"
1 billion
1 billion
1 billion
1 billion
1 billion
Expenditure on annual advances
2 billion
Total ... 2 billion
Half of this sum is retained by this class for advances for the following year
Total ...
5 billion

From: François Quesnay, "Analyse de la formule arithmétique du Tableau Economique de la distribution des dépenses annuelles d'une nation agricole (1766)", in: François Quesnay, *Tableau Economique des physiocrates*, Calmann-Levy, 1969, p. 58 (Explanatory introduction by Michel Lutfalla, pp. 7–41). See Paul Studenski, *The Income of Nations*: table, p. 64; comments, pp. 62–65.

Note: The economy under study is in a stationary state (no net accumulation of capital). See the main text of the chapter.

Initially, the first scholars to estimate national income have a broad view of the concept. The problems start with the involvement of the physiocrats. In his *Tableau Economique* (1758), the physician François Quesnay (1694–1774) limits the productive class to cultivators (see Box 4). In his view, only this class is capable of creating a net product. According to the classical version of 1776, out of a total output of 5 billion, the cultivators use 2 billion for themselves and 1 billion for supporting the *sterile* class (craftsmen, manufacturers, merchants, etc., who are not employees of the Church, of the State or of other landlords). In return, the sterile class supplies 1 billion of non-agricultural goods to attend the needs of the productive class. The sterile class is so called because it reproduces only the equivalent of its labor (1 billion) and of the materials it uses (1 billion). The net product (2 billion) goes to the class of proprietors, i.e. the landowners, the Church, the State and their employees so they can pay their purchases from the productive class (1 billion) and from the sterile class (1 billion). This net product is the difference between total agricultural output (5 billion) and the advances made (2 billion of annual advances and 1 billion of interest or replacements of "avances primitives": the working capital).

This scheme, briefly summarized here, shows the first analysis of the economic circuit in terms of both flows of value and flows of goods among large groups of the society, an anticipation of what will be done in the 20th century. At the same time, the notion of productive activity as the activity capable of creating a surplus (once the value of subsistence, which is the reproduction of the productive and sterile classes, has been taken care of) and thus the notion of income as the exclusive net product of agriculture, generates considerable confusion in the definition of national income.

The approach by the physiocrats left its mark on certain estimates, mainly in France (Turgot, Du Pont de Nemours – estimates of 1785 and 1789 – Lavoisier or Ganilh who in 1815 reviews the latter's work). Nevertheless, it is Adam Smith, himself under the physiocrats influence, who will have a lasting impact on the quantitative studies and the conceptual discussions. National income comprises the value created in the production of goods (material goods) and in the trade and transport activities associated to this production. Services are excluded. Smith associates to this analysis the distinction between productive and non-productive labor, an idea that will achieve great success. In practice, most of the estimates made until late into the 19th century will apply the concept of material production.

Meanwhile, although Smith's view is initially widely followed by the classical economists (Ricardo, Malthus, etc.), it will be progressively undermined by most (Say, Walras, Marshall). It is Marx who revitalizes it, with different developments depending on the particular book. Discussion is possible about the definition of productive labor as either labor associated with the production of goods or labor that can generate a profit for the capitalist. It is the former one that will have strong consequences during the 20th century.

Notwithstanding, taking an analysis of Quesnay's contribution as a starting point, Marx will also present his schemes of simple and extended reproduction (with capital accumulation) in *Capital* Book II (published in 1885 after his death). These schemes are based on the differentiation between a group of industries producing means of production and another one producing consumer goods. These ideas will contribute in the 1900s to the development of socialist planning, and somewhat later, after the 1929 crash, to the theories of equilibrium and balanced growth, of Keynesian inspiration, and to the inter-industry analysis by Wassili Leontief, following the first Soviet works at the beginning of the 1920s.

1.3. Methods of estimation

In practice, estimating the national income of a country consisted in gathering the largest possible amount of data, and processing it ingeniously and with as much rigor as possible because of the considerable gaps in the availability of data. Those were the days of enlightened amateurs. Studenski distributes, or mentions, praises and blames. This is a frequent problem even nowadays; most results presented by authors lack the required documentation. Petty, the real father of the idea, does not vacillate in drawing conclusions beyond the reach that the quality of his statistics allows. King is more careful, and according to Studenski (*ibid.* p. 30) is the "prototype of the modern statistician". In contrast, Boisguillebert seems to

Box 5

A retrospective comparison of two estimates of British national income around 1800

Phyllis Deane analysed in depth the estimates of the British national income made in the first half of the 19th century ("Contemporary Estimates of National Income in the First Half of the Nineteenth Century", *The Economic History Review*, Cambridge, April 1956, pp. 339–354).

The table below (ibid, p. 340) shows, as an example, her comparison between Bell's and Beeke's estimates for 1800, and the derived estimate that she obtains. (For details on sources and discussions, see her text).

TABLE I – The national income of Great Britain c. 1800 (in millions of pounds)

	Beeke's estimate of "clear" national income	Bell's estimate for incomes over £ 15	Derived estimate
(1) Landlords' rents	20.0	40.0	35.0
(2) Tenants' profits	15.0	35.0	26.0
(3) Tithes	2.5	4.0	4.0
(4) Mines, inland navigation and timber	4.5	5.0	5.0
(5) Houses	10.0	4.0	10.0
(6) Professions	2.0	3.0	3.0
(7) Proportion for Scotland	8.5	Allocated	Allocated
(8) Property abroad	4.0	5.0	5.0
(9) Foreign trade and shipping	10.0	12.0	12.0
(10) Home trade	16.2	33.0	28.0
(11) Labour incomes	97.0	75.0	100.0
(12) Interest other than National Debt.	Not separately estimated		Not separately estimated
(13) Total national income	204.2	243.0	228.0

act thoughtlessly. Vauban did not have much data but demonstrated the rigor of an engineer, as Lavoisier demonstrated the rigor of a chemist. Puzzling situations occur; the reverend Henry Beeke (see Box 5) shows a surprising capability for handling statistics.

Obviously, it depends mostly on the scope and quality of the available information. From this point of view, England is much more advanced than France. However, the estimate made for the USA in 1843 by George Tucker (1775–1861), scholar, economist and former member of Congress, reveals the considerable level of the statistical development in this country and is considered better than those made in England in previous decades.

Methods are diverse. Compilers usually combine elements of what will later be called the three approaches for the compilation of national income: output, income and expenditure. Petty (see Box 1) bases his work on consumption expenditure by groups of products (he disregards saving). Next, he estimates property income, and obtains labor income as a difference. He tries to check these results with a plausible yearly average applied to half of the total population, and then distributes them among sextiles using an assumption of an average income per group. King (see Box 2) starts from social and professional groups (25 approx.), for which he estimates their income, their expenditure, and the excess (or sometimes the deficit) of the first over the second. He uses a large amount of tax data and complements them with other information, particularly agricultural output.

Lavoisier, within a physiocratic perspective, only considers agriculture, but estimates the rest of activities separately. He approaches the estimate of the value of agricultural output by products, using the consumption of total population and some daily wages. For instance, to estimate the net product of agriculture he must deduct consumption by the rural population. He calculates it indirectly, based on an average by family, imputing to the husband the income and the maintenance cost of a soldier, two thirds of that to the wife, and a similar two thirds of this value to three children under the age of ten.

During the first half of the 19th century, the output (material) approach dominates. In the second half, the income approach dominates. This is particularly the case in England where data derived from income tax are used. Afterwards, countries employ either method, depending on their particular situation.

Repeated estimates for several years are scarce. Gregory King's early attempts were extraordinary in this respect. Timothy A. Coghlan (1856–1926), a government statistician of New South Wales, develops such an exercise at the end of the 19th century, covering the eight Australasian colonies, applying, in turn, the three approaches. He publishes this series on a yearly basis from 1890 on, and for the first time, in an official statistical yearbook. But this still remains a personal initiative; in 1904, when he leaves, these estimates cease. Finally, Canada seems to be the first country where, in 1925, the regular elaboration and publication of the estimates of national income become the official responsibility of a government agency, bringing symbolically to an end the heroic period, although it will still persist for several decades in other countries.

2. 1930–1945: The fifteen-year transition towards a system of national accounts

In summary, the first centuries left a twofold legacy: first, a concept, that of national income according to payments to factors (labor income, several forms of property and entrepreneurial income), without considering depreciation, that is net of what will later be called consumption of fixed capital; and second, multiple attempts at its estimation. Depending on the nature of the available information, direct estimates of incomes by types or indirect estimates based on the calculation of the net value of output for different economic activities were used; even, mainly in the early works, the measure was approximated via consumption and expenditures; a combination of these approaches was also possible, mainly of the first two. The transactors of the economy appear only as attributes of the information used, or of the estimation method followed, but they are not as such the focus of the study. Therefore, at the very beginning, they are extremely specific, as in the case of King (cf. Box 2), where these transactors are the social or professional categories of everyday life. They become more abstract with time, with theoreticians like Quesnay, or even more with Marx, or with practitioners oriented towards the presentation of the income structure according to factors (labor, property, etc.) or, in a less frequent case, according to the income level of individuals or families.

The emphasis given here to national income should not hide the fact that the concern for estimating national or private wealth could already be found in the pre-historical times of National Accounting and has inspired much research (see chapter 8). However, in the period between the two World Wars, attention is mainly focussed on flows as a clear reflection of the emergence of Keynesianism. Studies on wealth will have no bearing on the origin of national accounting. The only link is with the estimates of income.

2.1. Towards the accounting approach

In two and a half centuries, many issues have been addressed, many paths have been explored, many solutions (even opposite ones) have been adopted. Due to the nature of these initiatives, harmonization was not a matter of concern. Surprisingly, however, the issue was never thought of in terms of accounting, by analogy to business accounting. Nevertheless, this idea will make its way in the 1930s. It is true that Irving Fisher in his theoretical works (1906, 1928), had formerly evoked the extension of the accounting treatment of individuals and businesses to society as a whole and the possibility, in principle, of obtaining the capital and income of society as a combination of balances of businesses and income accounts of individuals. Morris A. Copeland, an American economist with institutional inspiration, shows (1932, 1935, 1937) the benefits to be expected in the formulation of the problems related to the estimation of national income, if a double-entry bookkeeping system is used. By 1936, another American, Robert F. Martin from the Department of Commerce, presented the idea of an accounting system for the national economy. This idea was clearly manifesting itself. In France in 1939, André Vincent published his first ideas regarding the application of accounting principles to the national economy considered as an entity. In the Netherlands, Ed van Cleeff made his estimates for 1938 (published in 1941) within a format of a national accounting system.

By this time, in Scandinavia, the vision of Ragnar Frisch (1895–1973, Nobel Prize 1969), one of the founders of econometrics, regarding a system of national accounts proceeds from a different source of inspiration. His perspective stems neither from analogies with business accounting nor from the purpose of improving the definition of national income and its measurement. Interest focusses on economic circulation as a whole and the micro/macro relationships

(Frisch already used those terms in 1928–29), inscribing itself in a rigorous conceptual framework called "system of economic circulation" and developed directly from an economic perspective. Rigorousness is found through an axiomatic process beginning with a series of postulates – for instance, sector, real object, financial object – and establishes the logical relationships among the elementary variables. This process is completely the opposite of the approach through aggregates.

In Germany, Ferdinand Grüning, within a different perspective and independently from the measurement of aggregates, dedicates himself to the analysis of economic interdependences, developed at a level later called "meso-economic". His work *Der Wirtschaftskreislauf* [The Economic Circuit] (1933) (French translation: *Le circuit économique*, Payot 1937) is oriented toward the construction of an economic model seen as a small-scale representation of the real German economy. Grüning is a hydraulics engineer, who becomes interested in macroeconomics after observing the Great Depression and its devastating consequences. The title of the first part of his book is "Principles of Economic Mechanics". The solutions he advocates for Germany rely on an autarkic orientation. Paul Reynaud, former Minister of Finance and later Prime Minister of France, wrote the foreword to the French translation, to which the subtitle "Liberalism or Autarky" was added, as this issue was then at the center of the debates regarding the ways out of the crisis.

However, in practice, in the sphere of the studies on national income, the 1930s will mainly witness improvements in methods, the beginning of a trend toward official status, regularity in publication of series, and the emergence of expenditure, representing the use of national income for consumption and capital formation, as a full-scale aggregate.

2.2. The 1929 crisis and the trend towards official status

World War I had not been characterized by significant attention to the estimation of national income, with some exceptions, particularly in the USA where the NBER (National Bureau of Economic Research), founded shortly after the war, was soon to launch an important project. The 1929 crisis and the Great Depression mark a first turning point. It is in the USA that the most significant developments are to be observed. This time the impulse comes from the top. In June 1932, the Senate requests estimates for 1929, 1930 and 1931 from an official agency. As is the case in other countries, collective private efforts come in support of individual researchers. As early as 1921–1922 the NBER published a series for 1909–1919 at current and constant dollars. Simon Kuznets (1901–1985, Nobel Prize 1971), commissioned by the NBER to the Department of Commerce, prepared a report with the help of a reduced number of assistants, which was presented to the Senate in early January 1934 (*National income 1929–1932*). The estimates made only at current prices were well documented. They were based on the estimation of the income created by the different activities and according to the different types of distributed income. The same framework will be used throughout the 1930s, with the addition of monthly series (1938) of income distributed to individuals, including transfers (which increase significantly during the Depression) and, in 1939, of incomes by states.

At the same time, estimates of expenditure are developing (the term *product* is used in this approach by the Americans, instead of the term *expenditure* which will be used by the English). It is first Clark Warburton (Brookings Institution) who, between 1932 and 1934, estimates consumption (consumption goods and services) and capital formation (capital goods). For the first time the term "gross national product" or "gross social product" is associated with the sum of these two final products (about Warburton, see Carson, 1975, pp. 161–163), whereas Kuznets, beginning in 1933, prepares a long series on capital formation published in his 1937 *National Income and Capital Formation 1919–1935* and in his 1938 *Commodity Flow and Capital Formation.* He also uses the expression "gross national product".

Other countries undertake the expansion of their work. The Netherlands publishes official estimates in 1933, beginning with the income for 1929 and for some previous years. They constitute the basis for a project of improvement, under Jan Tinbergen's (1903–1994, Nobel Prize 1969) leadership, in order to provide a better statistical base for the econometric model of the Dutch economy that he presented in 1936. The method based on output by activity is associated, on a supplementary basis, with the preferred one based on income, although an assumption of an evasion rate of 10% on taxable income has been accepted. As is the case in the USA, great importance is attached to long series. The 1939 publication (J.B.D. Derksen) covers the period 1921–1936, and is soon extended to 1900–1920.

In 1937 in Sweden, the University Institute headed by Erik Lindhal published the results of a monumental study conducted over ten years (Erik Lindahl, Einar Dahlgreen and Karin Kock, *The National Income in Sweden 1861–1930*, University of Stockholm, Institute for Social Sciences, 1937). It covers the period 1861–1930, and is based on the net value of output by industries; consumption and net investment are also compiled. To estimate the inputs corresponding to the industries, a kind of commodity flow method is used, in which supply within the domestic market is distributed among the different uses based on the characteristics of the commodities. Viggo Kampmann, an economist who will become Prime Minister at the beginning of the 1960s, develops this method in a Danish project launched towards 1935 with the objective of covering the current decade. He applies the commodity flow method, starting from an estimate of total supply and analysing this supply according to its use. At the end of the war, the project will successfully publish a series of annual input–output tables covering the period 1930–39 (the table for 1935 is reproduced by Aukrust, 1994, p. 65).

By the eve of World War II, Great Britain, where no official initiative had been taken and where research, therefore, had remained in the individual sphere, seems to have lost to the USA the role of leader in the elaboration of national income estimates, which it had retained for two and a half centuries, and this in spite of the research undertaken by Arthur L. Bowley and Josiah Stamp, and mainly that of Colin Clark. The latter published *The National Income 1924–1931* in 1932, and in his *National Income and Outlay* (1937) expanded his research to estimates for consumer expenditure, saving and investment, and included income and expenditure of the general government as well as the transactions with the rest of the world. He deserves Stone's recognition as "having recovered the synthetic view of political arithmeticians", although he had not presented his results in accounting form. "Clark was my teacher at Cambridge, adds Stone, and his work has been the main source of inspiration for mine" (*Nobel Memorial Lecture 1984*, pp. 10–11). Clark compiles estimates of income for the whole world in his 1941 book *The Conditions of Economic Progress*, where he complains bitterly about the lack of support for this type of work. In the introduction to his 1937 book, he mentions that he had to do everything by himself and had to pay for the clerical work out of his own pocket.

At the same time, John Maynard Keynes (1883–1946), with his *General Theory of Employment, Interest and Money* (1936), presents a macroeconomic theoretical construct that will be at the root of the needs for rigorous measurements of concepts such as income, consumption, investment and saving, and formulates the equations which describe their mutual relationship, which will become classical and form the skeleton of National Accounting. "In summary:

Income = Value of output = Consumption + Investment,

Saving = Income – Consumption,

Therefore, Saving = Investment." (Book II, Chapter VI).

In so doing, he provides a theoretical base for the measurement of these concepts, which in previous works on national income proceeded from a completely empirical approach. He therefore paved the road for the national accounts aggregates to enter into the debates of economic policy, generating an impressive public requirement for national accounts.

The situation of which Colin Clark complains will soon change in Great Britain. That is not the case for France, which will be lagging behind with poor statistics and a lack of official interest. Léopold Dugé de Bernonville, a statistician from France's General Statistics, carries on Clément Colson's works for 1913, and publishes annually and privately an estimate of private incomes from 1933 to the war, in the *Revue d'Economie Politique*. He will also cover the period 1920–1939 but with a weak statistical basis. In 1939, in the same publication (January–February), Alfred Sauvy and Raymond Rivet analyse these assessments, but they adjust the 1936 total estimate by a mere 6%, while noting that the levels of the industry and trade profits are, even after update, at the lower limit, as no correction had been made to take tax evasion into account.

In two countries with authoritarian regimes, the situation for statistics on national income becomes confused. In the USSR, an important work had been realised under the leadership of Pavel Ilitch Popov – in particular a detailed balance for 1923–1924 made of tables giving balances of goods both in physical quantity and in value at a very detailed level (1926). Nevertheless, from the mid-1930s on, the resulting official series will linger for at least 20 years within a limited scope, and refer to some aggregates of output valued at 1926–1927 constant prices.

In Germany, in spite of the strong criticism from the mainstream of theoretical economists, the official publication of series had begun in 1932 (referring to 1929). These estimates were only made public until 1938 inclusive. Continued under the Nazi regime, but on a confidential basis, it is not clear whether they were actually used by the regime, although Grünig several years later (1950) said that this was the case. In a way, Grünig dedicated his book to the Nazis: "I am happy to be able to submit this book to a period and to men who had the required energy to transform into reality the solutions accepted as appropriate" (*Der Wirtschaftskreislauf*, Author's foreword). He welcomed the fact that "the victory of the economic and political concepts of national socialism has recalled the German people to their collective duties" (p. 260). Head of the Division of Central Economic Observation of the Imperial Economic Chamber from 1936 to 1944, he was well placed to see how things were evolving, but he made no additional comment. In the post-war period, the history of the German national accounting will ignore the Nazi period and skip over the 1932–1949 period (see Utz-Peter Reich, German National Accounts between Politics and Academics, *The Accounts of Nations*, 1994, pp. 158–159).

2.3. World War II and the take-off

World War II marks a new turning point. It witnesses the real birth of national accounting and the extension of its use. Great Britain is in the foreground. Keynes gives the impulse, worried about *How to pay for the war?* (published in 1940) and the problem of inflation. He works on it during November–December 1939, using former estimates made by Colin Clark. Shortly afterwards, an official effort is undertaken, its main technical protagonists being James Meade (1907–1995, Nobel Prize 1977) and Richard Stone (1913–1991, Nobel Prize 1984), at this time, both civil servants in the War Cabinet. After intensive conversations among authorities, the Chancellor of the Exchequer is finally convinced; this leads to the first official publication in The White Book on April 7, 1941, as a support for the presentation of the budget, *An Analysis of the Sources of War Finance and Estimate of the National Income and Expenditure in 1938 and 1940.*

Following Keynes' suggestion, a technical article is published in *The Economic Journal*. In "The Construction of Tables of National Income, Expenditure, Saving and Investment", June–September 1941, Meade and Stone present the accounting framework that they have worked out. Still without any explicit formulation of sector accounts, their set of tables brings into play businesses, persons,

Box 6
The three approaches to national income according to Meade and Stone

Meade and Stone present in their Table A three approaches to national income ("The construction of Tables of National Income, Expenditure, Savings and Investment", *The Economic Journal*, June–September 1941, pp. 216–233, table A, p. 231).

Table A

I. Net National Income at Factor Cost	II. Net National Output at Factor Cost	III. Net National Expenditure at Factor Cost
1. Rents	6. Net output of agriculture	15. Personal Consumption at Market Prices
2. Profits and interest	7. Net output of mining	16. Current Government Expenditure on Goods and Services
3. Salaries	8. Net output of industry	17. Government subsidies
4. Wages	9. Net output of transport	18. *Less* indirect taxes
	10. Net output of distribution	19. Home Investment:
	11. Net value of personal services	a) Gross Home Investment in Fixed Capital
	12. Net value of government services	b) *Less* Depreciation, Renewals, Repairs, etc.
	13. Net income from abroad	c) Home Investment in stocks
		d) Costs involved in transfer of property
		20. Foreign Investment
+	+	+
5. Total Net National Income at Factor Cost	14. Total Net National Output at Factor Cost	21. Total Net National Expenditure at Factor Cost

government and the rest of the world. Main emphasis is placed on net aggregates at factor cost (on the concept of factor cost see chapter 6, section 4 and Box 45), but the net aggregates for income and expenditure are also presented at market prices. The tables at factor cost analyse net national output by main branches of economic activity, the distribution of national income by types of income and net national expenditure by types of uses (see Box 6); they then present the formation and uses of personal income, the sources and uses of saving – including the deficit of the general government – and international transactions. Some of the tables appear in The White Book. This system is still incomplete. The accounts of the sectors remain implicit. Neither the structure of the productive system nor the financing transactions appear. However, the set of tables published in 1941 represents indeed a system of national accounts, in the form of a linkage among a coherent set of macroeconomic totals.

Meade and Stone's intensive effort made it possible to innovate on previous presentations and to crystallize a set of elements which were a legacy of former times. As they were not previously specialists in the estimation of national income, and benefitted from the exceptional circumstances that surrounded their effort, they moved more freely and consequently could be more audacious.

It must be acknowledged that Americans were the first, during the 1930s, to convey the positive interest of government towards compilations of national income, and that they did the most to carry these issues to maturity. As a result of the struggle against the Great Depression, the pre-Keynesian ideas had developed mainly with Lauchlin Currie at the Federal Reserve System. He had prepared a series of *pump priming deficit*, a calculation of the net contribution of the federal government to national buying power. It measured the net demand resulting from transactions of receipts and outlays by the federal government.

During the later 1940s, the recently created Industrial Economics Division prepared a memorandum *Effects of the Defense Program on the Economy*. (Currie had by then become one of Roosevelt's advisors.) The study, based on a revised series of Gross National Product using the expenditure approach, includes a tentative projection of GNP and its components for fiscal year 1942, built on quarterly estimates for 1939 (corrected for seasonality as the fiscal years start in April). In 1941, estimates of national income are used in the framework of resource programming. A feasibility study made within the framework of the "Victory Program" that consolidates all military expenses requested by the governmental agencies for 1942 and 1943, and chaired by Kuznets, leads to the conclusion that the goals cannot all be achieved, even after accepting the realistic assumption of a shrinkage of consumption expenditure. The estimates are also used in the analysis of the inflationary gap, a notion created during the war that will experience considerable success during this period and after, in which estimates for potential real output are compared to those for estimated demand.

Until mid-1940, the official series for national income essentially follow the same methods as in their first publication in 1934. During the two-year period from 1941 to 1943, they will be profoundly restructured, with renewed resources and a new head of the Division of National Income, Milton Gilbert, who is looking for a system that explains the current economic situation in Keynesian terms. The main effort concentrates on expenditure, clearly the main concern at the time: what part of total output will be left over for civilian consumption? For this purpose, comparing war expenses to net national income at factor cost is not the most effective procedure. Thus, in March 1942, Gilbert advocated for GNP or total gross expenditure at market prices to be viewed as the main aggregate. As a matter of fact, values expressed at factor cost do not correspond to any idea of expenditure as perceived by the basic economic transactors. They are not used in budgetary practices or in statistical surveys. The new series are launched in the May 1942 issue of *Survey of Current Business*, in the form of four tables (relationship between GNP and national income, distribution of GNP by uses and by types of income, and use of income by individuals). In the following months, GNP is also presented at constant prices (with an attempt to deflate differentially according to some groupings of products) and on a quarterly basis as is the case for national income; then the use of national gross saving by the federal government is estimated. Thus, the main elements of the future US system are in place.

In the meantime, divergences appeared – and would later deepen – between the Department of Commerce and Simon Kuznets. He had acknowledged a broad concept, but the inclusion of indirect taxes and the treatment of all the output of general government as final introduced a significant difference as compared to the concept of GNP which he himself had used before the war. Kuznets was deeply influenced by the traditional estimation of national income by factor share and by a concern about approaching a measure of welfare, although he had underlined in his 1934 report the theoretical obstacles to such an interpretation of national income.

2.4. A digression on Leontief's work

Unconnected to the ongoing research on national income, Wassili Leontief (1906–1999, Nobel Prize 1973) who left Leningrad in 1925 to continue his studies in Berlin (where he wrote a dissertation on the economy as a circuit), and moved to the USA in 1931, introduces the input–output analysis (inter-industry relationships) in which, with a view much broader than Popov's (1926), he intends to implement empirically a model inspired by the theory of general equilibrium (this formulation is presented in a more nuanced form in chapter 10).

Initially based on the description of the technical relationship between the output of homogeneous branches and the inputs required for this output (technical coefficients), expressed in physical terms, in practice the table has to use money values, due to the unavoidable heterogeneity of output resulting from a given activity. Based on data from the years 1919 and 1929, the research started at Harvard in 1932 leads to the publication of an article in 1936 as well as of a book, *The Structure of the American Economy 1919–1929, An Empirical Application of Equilibrium Analysis* (Harvard University Press) published in 1941. Although the 1936 publication passed unnoticed, the input–output analysis attracts attention in 1941, as its appearance coincides with the entrance of the USA into the war. From then on, the input–output technique is envisaged, not so much to analyse the war economy, as to study the effects of demobilization, initially mainly on employment. The Bureau of Labor Statistics (BLS) creates a team, under Leontief's direction, to put together an input–output table (IOT) for 1939 (preliminary publication in February 1945) to be used for several purposes.

In the USA, the input–output analysis will then experience varying fates. In 1945–1946, the BLS prepares a programming document for 1950. In 1947, budget cuts cancel all work, which will resume in 1948, this time under the aegis of the Air Force. An outstanding effort is made on the 1947 table, with the participation of a very strong working team from the BLS. Nevertheless, the BLS activities in this field will not survive the Korean War. The input–output technique is then suspected to be an instrument of governmental planning. The dominant position of the USA observed during the 1950 First International Conference on Input–Output Economic Analysis will be lost forever. However, setting-up input–output tables will start again in 1959 at the Office of Business Economics, later the Bureau of Economic Analysis (BEA), in very close connexion with the US national accounts: compilation of input–output tables every five years, starting in 1958, with a failed attempt in the mid-1970s to complement them with yearly tables utilizing very simplified techniques.

2.5. The early stages of international normalization: the Stone memorandum (1945)

The period of World War II, which on the one hand had witnessed the intensification of work, associated with the growing influence of Keynesian ideas, was, on the other hand, a period in which the process towards international normalization was nipped in the bud. In effect, the Committee of Statistical Experts of the League of Nations had agreed in April 1939 upon this normalization, which encompassed three specific areas (statistics on national income, on banking and on balance of payments). Nevertheless, the process would resume immediately after the war. Even before the end of the war, in a September 1944 meeting, the British, Americans and Canadians had agreed to make their estimates more comparable (about these discussions and the decision-making process regarding international harmonization see the appendix to chapter 3). As early as December 1945 a meeting of a subcommittee of statisticians of national income from the League of Nations was held at Princeton. The subcommittee adopted recommendations based on a memorandum presented by Stone. The text was revised after the meeting and published as an appendix to the subcommittee's report, under the title "Definition and Measurement of the National Income and Related Totals". Prepared in 1945, it can be viewed as the most elaborate proposal for a system of accounts in the early post-war times.

The system is presented in a dense text almost a hundred pages long, and is well in advance of its time, mainly in the perspective of international normalization, although the report resists this view. It insists on the fact that the approach presented is not radically innovative but a logical development of recent research in the field of national income.

In the presentation of the proposed accounting system (see the appendix to this chapter), sectors are the result of aggregation of accounting entities according to their function; these accounting entities are the basic economic units that perform the transactions. For each category of accounting entity it might be necessary to establish more than one account. Transactions are classified according to the nature of the counterpart to the money flows. Five main sectors are identified: productive enterprises; financial intermediaries, insurance and social security agencies, final consumers (including the general government) and the rest of the world. The first four are subdivided: business enterprises and persons (home-ownership); banking system and other financial institutions; insurance companies and societies, private pension funds and social security funds; persons and public collective providers. The list of the five sub-accounts is unique, but their size depends on the sub-sectors, and two of them might in some cases be combined. The main accounts used are the following: an operating account, an appropriation account, a revenue account (for current income and expenses of persons and public collective providers), a capital account, and a reserve account.

Each transaction is entered twice in the system, following the double-entry principle, but there is no systematic description of the bilateral relationship between sectors (dummy accounts are therefore implicit). The link between the accounts of each sub-sector is sometimes a complex issue. For instance, for productive enterprises, the surplus of the appropriation account enters the reserve account and then, once combined with the net financial transactions, passes on to the capital account. Another case is that of realised net capital gains, recorded only for business enterprises, which appear in the reserve account, and are transferred to the appropriation account, from where they return to their point of origin as part of the net result of this account, finally to be sent to the capital account with the other financing means.

Besides the definition of all the elements of this accounting framework, Stone's document discusses numerous problematic issues, which will remain as such for a long time; for instance, the treatment of insurance, of financial intermediaries, of provisions for depreciation, of interest on public debt, of indirect taxes.

The aggregates that Stone describes are completely coherent with the system of accounts, but they are not directly readable in the accounting scheme itself; they are derived from it. In fact, Stone does not present an account for the national economy, by addition of sector accounts. Although he presents GNP and gross national expenditure at market prices, he maintains national income at factor costs as the main aggregate from which the others are derived (the chapter dedicated to aggregates is called *National Income and Other Aggregates from Transactions*). Output, intermediate consumption and value added are not transaction categories of the system that presents sales, purchases and movements of inventories. It is possible to derive value added, though gross of insurance services, but not output or intermediate consumption because the details in the movements of inventories are not adequate for these purposes.

The duality system of accounts/aggregates is bothersome. It will be a source of ambiguities. One might think that the aggregates are secondary – that is not Stone's position, which is made explicit by the title of the appendix, *Definitions and Measurement of the National Income and Related Totals* – or regard the accounting system as subordinate, underlying, merely instrumental. This is not Stone's position either. He clearly shows the change in perspective between the original effort at measuring some aggregates and the attention paid now to the structure of elementary transactions and to their interdependence.

The subcommittee of experts, chaired by Stone, follows a middle way, not free from ambiguity. It indicates a "total agreement" with Stone's approach in his memorandum, but, as it is impossible to implement a system as detailed as the one presented in the appendix, the Subcommittee "recommends" certain accounts for the economy as a whole and for some broad sectors. These recommendations take the form of nine tables that cover both the transactions of the aggregated sectors (one account for income and outlay of persons, only one operating account combined for all enterprises, financial and non-financial, one consolidated account for the social security funds and public collective providers, one account for savings and capital formation) and the aggregates of income, product and expenditure and their mutual relationship.

The state of statistics in the world at the end of the war probably made it unavoidable to define more achievable objectives. Nevertheless, in these recommendations, the structure of the system proposed by Stone as one of accounts of sectors and transactions is lost while the functional nature of his sectors is even more accentuated.

It is not possible to consider Stone's 1945 text or the report of the subcommittee as international recommendations, contrary to Fritz Bos's opinion (*The Accounts of Nations, 1994*, pp. 198–217) who sees them as the first generation of such recommendations. The UN published the report and its annex in 1947 but the Statistical Commission, in its report of February 18, 1947, "wishes it to be understood that these reports are published [the others refer to banking statistics and balance of payments] as valuable technical documents. They do not carry the Commission's endorsement in detail." (Report's editorial note, UN, p. 4). The Subcommittee's recommendations are more in line with Meade and Stone's work in 1941 than with that of Stone in 1945. They are closer to what the USA, in a condensed format, will introduce in 1947, under the name of *National Income and Product Accounts*. They open a perspective on development in which the first generation of the normalized system of national accounts (between 1950 and 1953) will be inscribed. In the meantime, the expression "social accounts", formerly used, will be replaced by "national accounts" or "national economic accounts".

Obviously, France, not having national accounts at the end of the war (André Vincent had continued his lonely analysis, and René Froment's first estimates at the Institut de conjoncture [Short-term Forecast Institute] remained confidential), did not attend the Princeton meeting. After a transition period, it would refuse the perspective proposed in the standardized system.

Outlook

The emergence of national accounting accompanies that of macroeconomics. They are both offspring of the 1929 Great Depression and World War II against a background of increase in populations and economies (in 1688, the year of Gregory King's estimate of national income, population was estimated as 5.5 million for the United Kingdom, 14 million for France and 2.2 million for the Netherlands). The cyclical economic crises of the 19th century did not foster the development of policies of global regulation. Estimates of national income were produced sporadically over two and a half centuries, starting with William Petty's attempt in 1665. Those estimates resulted from individual initiatives and were aimed at the evaluation of the economic strength of a country, either for comparative purposes or to back up projects of tax reform, but they were not part of the art of government.

For the influential circles as well as for the schools of economic theories prevailing in those times, readjustment stemmed from the reactions of microeconomic entities, without any external intervention of government. Although it stressed the existence of general interdependences, the theory of general equilibrium could not by itself and within the prevailing context, foster the compilation of macroeconomic magnitudes linked through economic-accounting relationships. And this, notwithstanding the fact that Leon Walras (*Elements of Pure Political Economy*, 1874, Lecture 37, *Economica*, 1988, p. 601), in his critical review of the theory of the physiocrats, had established the link between "the table that we have outlined in Lecture 35, with specific figures about people's life, called economic table" and "a similar *Economic Table*, famous in the history of Political economy, the one developed by Dr. Quesnay . . . ."

World War I shakes the world and brings about the total mobilisation of the resources of the belligerents. The war economy, the arms production and its financing, force, no doubt *de facto*, the elaboration of empirical exercises in order to achieve an approximate verification of feasibility. But war does not immediately unseat previous convictions. In the countries not directly affected by revolutionary convulsions, there is the belief in a return back to the *status quo ante*, once the conflict is over.

The 1929 crisis is decisive; it brings instability and mass unemployment to the foreground and generates doubts about the possibilities of automatic readjustment through market forces. Macroeconomics is really born with Keynes' *General Theory* that brings to an end, for a long period of time, the pre-eminence of the "laissez-faire" doctrine. It constitutes the theoretical base that states as a requisite the estimation of interdependent economic aggregates, and not just the traditional national income. The role of the state expands beyond its classical functions (general administration, defense, police, justice). Public income and expenditure which by then were growing at a rapid pace become essential elements for the determination of the level of economic activity.

As a consequence, the dawn of national accounting is historically closely related to the crisis, to the Keynesian macroeconomics and to the expansion of the role of the state; the latter being reinforced during and after the war by policies of reconstruction, growth and social protection. National accounting is not, so to speak, an endogenous development in the long history of estimations of national income, and even less in those of wealth. In the period between the two World Wars, the methodological progress made in the first of these fields is due in the first place to Colin Clark and Simon Kuznets, but also to others. Don Patinkin sees in this a statistical revolution preceding the Keynesian one. These improvements are related to the need to find answers to the new questions raised by the depression and "to quantify those macroeconomic variables to which the pre-*General Theory* theories of the business cycle had already attached crucial significance" (Patinkin, 1976, p. 1107).

In other words, there is only a partial methodological link between national accounting and the previous assessments of national income. The legacy, on one side very positive, will become cumbersome on the other, due in part to the ambiguities originating in the Keynesian reference itself. It increases the number of fundamental aggregates and establishes the general equations of their relationship. Closely followed, it favors a top-down conception of national accounts and their system as a very condensed accounting scheme, describing mainly the relationship among large aggregates with limited subdivision. Taking the assessments of national income as a starting point goes in the same direction, as it leads progressively to consider the compilation of output, of value added in general, frequently called net output, and of expenditure, within the perspective of the three approaches to the estimation of national income (by income, by output and by expenditure) and subordinated to it. They are, following the expression used in the 1940s, "related totals".

On the other hand, Fisher and Copeland had considered applying to society as a whole an approach similar to business accounting, within a perspective of bottom-up aggregation. Within a different perspective, Frisch also proposed to start from the bottom, using elementary variables. The accounting system proposed by Stone, in his 1945 memorandum, also takes an ascending path, but his scheme of aggregates is in a parallel situation, mainly because of the pre-eminence given to the notion of income at factor cost. The aggregates, formally derived from an underlying accounting system, will have, for quite a long period of time, a greater visibility than the accounts themselves. The nascent international normalization will give priority to the legacy concerning the assessment of aggregates. The position of Stone himself will not lack ambiguity.

Annotated bibliography

Paul Studenski's *The Income of Nations* (New York University Press, 1958), is the fundamental book, very dense and encyclopaedic. Its preparation took more than twenty years. It has a worldwide coverage. Nothing equals the first part, "History" (pp. 9–160). Summary tables cover England in the 17th and 18th centuries (p. 51), France during the same period (p. 77), then during the following century, England (p. 118), France (p. 128) and extensions to a few other countries (p. 141) and finally (pp. 156–157) the time of the first estimates during the first half of the 20th century elsewhere. The second part, "Theory and Methodologies" (pp. 161–297) is also invaluable; it takes stock of the state of the art by the middle of the 20th century in a historical perspective. The rest of the book (pp. 299–511) provides information by country that one would wish to be available also for the second part of the 20th century. The book has many references. A great number of them can also be found in *Comptabilité nationale* [National Accounting] (Dalloz, 1965) by Jean Marczewski, as footnotes to chapter II. "Historique de la Comptabilité Nationale" [A historical perspective on national accounting], by Alfred Sauvy, in relation with short term forecasting, appears in *Economie et Statistique* (no. 14, July–August 1970, pp. 19–32). See also an article by Gérard Klotz, "Les statistiques du revenu national en France (1848–1939): une approche thématique" [National income statistics in France (1848–1939), a thematic approach] in Pierre Dockès et al., *Les traditions économiques françaises 1848–1939* [The French Economic Traditions 1848–1939] (CNRS Editions, 2000, pp. 355–368).

Marx reproduction schemes are presented and set in the development of his works in the item "Reproduction", in Gérard Bensussan and Georges Labica (eds.), *Dictionnaire critique du marxisme* [A Critical Dictionary of Marxism] (PUF, coll. "Quadrige", 1999; first edition, 1982).

On the other hand, *The Accounts of Nations* (IOS Press, 1994), a collective book edited by Zoltan Kenessey, is partial and its quality is uneven. It is valuable because it complements Studenski on several countries: Scandinavian countries (Odd Aukrust's text "The Scandinavian contribution to national accounting" [pp. 16–65] is outstanding), the Netherlands (Gert P. den Bakker), Germany (a very interesting article by Utz-Peter Reich on "German national accounts between politics and academics", and India (Tiwari). France is not covered as Vanoli – the author approached – was involved full-time in the preparation of the 1993 SNA. On the USA, Zoltan Kenessey (pp. 109–123) complements (particularly on Fischer and Copeland) the article by Carol S. Carson (a summary of her dissertation) "The history of the United States national income and product accounts: the development of an analytical tool" (*The Review of Income and Wealth,* June 1975, pp. 153–181; focussing on the 1932–1947 period, on which the present chapter is strongly based). Curiously there is nothing similar for the United Kingdom. Carson's work does not cover the input–output tables. On this particular subject see Joseph W. Duncan and William C. Shelton, *Revolution in the United States Government Statistics* 1926–1976 (US Department of Commerce, 1978, Chapter III, pp. 105–115; this paper completes Carson's analysis on which it relies heavily).

On the axiomatic approach initiated by the Norwegians, see Odd Aukrust, "An axiomatic approach to national accounting. An outline" (*The Review of Income and Wealth*, September 1966, pp. 179–190) with critical comments by G. Stuvel (pp. 190–193). Few researchers follow this path except Jean Bénard, in *Comptabilité Nationale et modèles de politique économique* [National Accounting and Models of Economic Policy] (PUF, coll. "Thémis", 1972. The first part, "Logique de la Comptabilité Nationale" [The Logic of National Accounting] includes a first chapter "Axiomatique de l'enregistrement au niveau social" [Axiomatic of social recording], pp. 23–59, inspired by Aukrust's paper).

Don Patinkin's paper "Keynes and econometrics: on the interaction between the macroeconomic revolutions of the Interwar period” (*Econometrica*, November 1976, pp. 1091–1123), provides a vivid and subtle description of the complex interaction between the Keynesian revolution and the one that had already started in the estimates of national income with Colin Clark and Simon Kuznets.

Stone’s basic text for the League of Nations, “Definition and Measurement of the National Income and Related Totals” (an appendix to *Measurement of National Income and the Construction of Social Accounts*, United Nations, 1947) is rather difficult to read. However, Chapters I, “Introduction”, and II, “The social accounts” (pp. 26–37) give a general view that can be completed with the listing of the sectors (p. 44), the sequence of accounts and their components (pp. 45–53, see the appendix to this chapter).

Stone’s Nobel Lecture, *Nobel Memorial Lecture 1984*. The Accounts of Society, was published in the *Journal of Applied Econometrics* (1986, vol. 1, pp. 5–28). Neither Copeland nor Leontief are mentioned. A presentation and discussion of the first British accounts of 1941, making use of reactions collected at that time, is found in Oleg Arkhipoff’s *Introduction à la comptabilité nationale. Qu’est-ce que l’économie nationale?* [Introduction to National Accounting. What is the National Economy?] (Ellipses, coll. “Marketing”, 1995, pp. 44–48).

In addition to Studenski, many references are to be found in Carson and Patinkin. In the Zoltan Kenessey book already mentioned, *The Accounts of Nations*, there are numerous references to Fisher, Copeland, Martin and other American authors. Irving Fisher’s *The Nature of Capital and Income* (Macmillan, 1906), “The income concept in the light of experience” (1928, reprinted in English from the German original published in the *Wieser Festschrift*, *Die Wirtschaftstheorie der Gegenwart*, vol. III, 1927). Morris A. Copeland’s “Some problems in the theory of national income” (*Journal of Political Economy* XL, February 1932), “National wealth and income – an interpretation” (*Journal of the American Statistical Association* XXX(190), 1935), and *Concepts of National Income*, vol. I of Studies in Income and Wealth (NBER, 1937). Robert F. Martin’s *National Income and its Elements* (National Industrial Conference Board, 1936).

Dutch references appear in den Bakker’s contribution to *The Accounts of Nations*; in particular, p. 88 quotes two articles by Ed van Cleeff published in *De Economist* (1941, no. 7/8, pp. 415–424; no. 11, pp. 608–623), where he presents a system of “*nationale boekhouding*” [national bookkeeping]; many references to Derksen. The series published in 1939 can be found in *Speciale Onderzoekingen van de Nederlandsche Conjunctuur* (Centraal Bureau voor de Statistiek, Den Haag, no. 2). In 1946, *A System of National Bookkeeping, illustrated by the experience of the Netherlands Economy* (Occasional Paper X, National Institute of Economic and Social Research, Cambridge University Press). Aukrust, in *The Accounts of Nations*, has a large number of references to Scandinavians. The reference to the Russian publication of 1926 under P.I. Popov’s direction, is found in Janos Arvay (*ibid.*, p. 236).

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Appendix. The accounting system proposed by Richard Stone in 1945

Source: "Definition and Measurement of National Income and Related Totals", appendix to *Measurement of National Income and the Construction of Social Accounts*, United Nations, 1947) pp. 45–53.

Sector I. Productive Enterprises

Business Enterprises

(1) Operating Account

1. Sales proceeds	50,000	5. Payments for factors of production:	
2. Subsidies	130	(a) Wages, salaries, etc.	3,975
3. Transfer from capital account in respect of unsold goods, work in progress and unused materials	70	(b) Interest	500
		6. Purchases of goods and services including bank and similar charges, actual and imputed	43,025
		7. Insurance premiums and imputed charges to policy-holders	80
		8. Indirect taxes	270
		9. Contribution to social security funds	30
		10. Transfer to capital account in respect of inventories taken over	55
		11. Transfer to capital account in respect of depreciation and obsolescence	440
		12. Transfer to revenue account of persons in respect of bad debts	25
		13. Transfer to appropriation account of surplus	1,800
	——+		——+
4. Total receipts	50,200	14. Total payments	50,200

(2) Appropriation Account

15. Transfer from operating account of surplus	1,800	24. Dividends and withdrawals	1,600
16. Interest	10	25. Direct taxes	300
17. Receipts in respect of deposits actual and imputed	95	26. Payments of contingency claims to employees and third parties (assumed to be handled by insurance rather than reserves)	15
18. Imputed receipts as policy-holders	5		
19. Dividends	120	27. Transfer to capital account in respect of property insurance claims	35
20. Insurance claims	55		
21. Transfers from reserve account in respect of excess provision for taxation	5	28. Transfer to reserve account in respect of unpaid accruing tax liability	45
		29. Transfer to reserve account of surplus	110
22. Transfer from reserve account in respect of realized capital gains	15		
	——+		——+
23. Total receipts	2,105	30. Total payments	2,105

(3) Capital Account

31. Transfer from operating account in respect of inventories taken over	55	36. Payments for factors of production:	
		(a) Wages, salaries, etc.	135
32. Transfer from operating account in respect of depreciation and obsolescence	440	37. Purchases of goods and services	800
		38. Net purchases of existing equipment and other assets	15
33. Transfer from appropriation account in respect of property insurance claims	35	39. Transfer to operating account in respect of unsold goods, work in progress and unused materials	70
34. Transfer from reserve account	490		
35. Total receipts	1,020	40. Total payments	1,020

(4) Reserve Account

41. Transfer from appropriation account in respect of unpaid accruing tax liability	45	47. Transfer to appropriation account in respect of excess provision for taxation	5
42. Transfer from appropriation account of surplus	110	48. Transfer to appropriation account in respect of realised capital gains	15
43. Receipts from subscriptions to new issues, etc.	345	49. Transfer to capital account	490
44. Other new borrowing from:		50. Net sums deposited with banks and given in return for notes and coin	40
(a) Banks	25	51. Subscriptions to new issues, etc.	5
(b) Other financial intermediaries	40	52. Net purchases of existing securities	5
45. Receipts from redemption and repayments	15	53. Redemption and repayment of obligations	20
46. Total receipts	580	54. Total payments	580

Persons (House-Ownership)

(5) Operating Account

55. Gross rental received or imputed	500	57. Payments to factors of production:	
		(a) Wages, salaries, etc.	70
		(b) Interest	20
		58. Purchases of goods and services	45
		59. Insurance premiums	30
		60. Indirect taxes	120
		61. Transfer to personal capital and reserve account in respect of depreciation and obsolescence	50
		62. Transfer to personal revenue account of surplus	165
56. Total receipts	500	63. Total payments	500

Sector II. Financial Intermediaries

Banking System

(6) Operating Account

64. Charges to customers, actual and imputed:		66. Payments to factors of production:	
(a) Actual:		(a) Wages, salaries, etc.	95
(i) Business enterprises	5	67. Purchases of goods and services	45
(ii) Persons	20	68. Insurance premiums	5
(b) Imputed:		69. Indirect taxes	5
(i) Business enterprises	25	70. Transfer to appropriation account of surplus	50
(ii) Persons	150		
	——+		——+
65. Total receipts	200	71. Total payments	200

(7) Appropriation Account

72. Transfer from operating account of surplus	50	77. Payments to depositors actual and imputed:	
73. Interest	200	(a) Actual:	
74. Dividends	50	(i) Business enterprises	45
75. Insurance claims	–	(ii) Persons	30
		(b) Imputed:	
		(i) Business enterprises	25
		(ii) Persons	150
		78. Dividends and withdrawals	35
		79. Direct taxes	10
		80. Transfer to capital and reserve of surplus	5
	——+		——+
76. Total receipts	300	81. Total payments	300

(8) Capital and Reserve Account

82. Transfer from appropriation account of surplus	5	87. Net purchases of gold and silver bullion and coin	15
83. Net sums deposited and received in return for notes and coin	65	88. Net sums deposited and given in return for notes and coin	–
84. Receipts from subscriptions to new issues	5	89. Discounts and advances to:	
85. Receipts from redemptions and repayments	10	(a) Business enterprises	25
		(b) Persons	5
		90. Subscriptions to new issues, etc.	35
		91. Net purchase of existing securities	5
		92. Redemptions and repayments of obligations	–
	——+		——+
86. Total receipts	85	93. Total payments	85

Other Financial Intermediaries

(9) Operating Account

94. Charges to customers actual and imputed:		96. Payments to factors of production	
(a) Actual:		(a) Wages, salaries, etc.	120
(i) Business enterprises	15	97. Purchases of goods and services	30
(ii) Persons	135	98. Insurance premiums	10
(b) Imputed:		99. Indirect taxes	5
(i) Business enterprises	5	100. Transfer to appropriation account of surplus	40
(ii) Persons	50		
	+		+
95. Total receipts	205	101. Total payments	205

(10) Appropriation Account

102. Transfer from operating account of surplus	40	107. Payments to depositors actual and imputed	
103. Interest	80	(a) Actual:	
104. Dividends	20	(i) Business enterprises	20
105. Insurance claims	5	(ii) Persons	25
		(b) Imputed:	
		(i) Business enterprises	5
		(ii) Persons	50
		108. Dividends and withdrawals	25
		109. Direct taxes	10
		110. Transfer to capital and reserve of surplus	10
	+		+
106. Total receipts	145	111. Total payments	145

(11) Capital and Reserve Account

112. Transfer from appropriation account of surplus	10	117. Mortgage and similar advances to:	
113. Mortgage and similar debts repaid by:		(a) Business enterprises	40
(a) Business enterprises	–	(b) Persons	45
(b) Persons	90	118. Net sums deposited with banks and given to banks in return for notes and coin	5
114. Net sums deposited	5	119. Net purchase of existing securities	15
115. Receipts from redemptions and repayments	5	120. Subscriptions to new issues	5
	+		+
116. Total receipts	110	121. Total payments	110

Section III. Insurance and Social Security Agencies

Insurance Companies and Societies

(12) Revenue Account

[a] Business Enterprises

122. Premiums less commissions to policy holders	115	125. Claims and surrenders	60
123. Imputed charges	5	126. Transfer to reserve account in respect of increase in accruing liability	–
		127. Transfer to operating account of surplus	60
	——+		——+
124. Total receipts	120	128. Total payments	120

[b] Persons

129. Premiums less commissions to policy holders	130	133. Claims and surrenders	90
130. Considerations for annuities	45	134. Annuities	30
131. Imputed charges	65	135. Transfer to reserve account in respect of increase in accruing liability	35
		136. Transfer to operating account in respect of surplus	85
	——+		——+
132. Total receipts	240	137. Total payments	240

[c] Rest of the World

138. Premiums less commissions to policy-holders	10	141. Claims and surrenders	5
139. Imputed charges	–	142. Transfer to reserve account in respect of increase in accruing liability	–
		143. Transfer to operating account of surplus	5
	——+		——+
140. Total receipts	10	144. Total payments	10

(13) Operating Account

145. Transfer from revenue accounts:		147. Payments to factors of production:	
(a) Business enterprises	60	(a) Wages, salaries, etc.	70
(b) Persons	85	(b) Interest	10
(c) Rest of the world	5	148. Purchases of goods and services	20
		149. Indirect taxes	5
		150. Transfer to appropriation account of surplus	45
	——+		——+
146. Total receipts	150	151. Total payments	150

(14) Appropriation Account

152. Transfer from operating account of surplus	45	156. Imputed payments to policy-holders:	
		(a) Business enterprises	5
153. Interest	55	(b) Persons	65
154. Dividends	15	157. Dividends and withdrawals	20
		158. Direct taxes	15
		159. Transfer to capital and reserve of surplus	10
	——+		——+
155. Total receipts	115	160. Total payments	115

(15) Capital and Reserve Account

161. Transfer from revenue account in respect of excess accruing liability	35	165. Net sums deposited with banks and given to banks in return for notes and coin	5
162. Transfer from appropriation account of surplus	10	166. Net purchase of existing securities	20
163. Receipts from redemptions and repayments	5	167. Subscriptions to new issues	25
	——+		——+
164. Total receipts	50	168. Total payments	50

Private Pension Funds

(16) Revenue Account

169. Contributions from employees	20	173. Pension payments	10
170. Interest	5	174. Payments to factors of production:	
171. Dividends	–	(a) Wages, salaries, etc.	5
		175. Purchases of goods and services	–
		176. Transfer to reserve account of surplus	10
	——+		——+
172. Total receipts	25	177. Total payments	25

(17) Reserve Account

178. Transfer from revenue of surplus	10	180. Net purchase of existing securities	10
	——+		——+
179. Total receipts	10	181. Total payments	10

Social Security Funds

(18) Revenue Account

182. Contributions	90	187. Claims and benefits	85
183. Transfer from public collective providers	15	188. Payments to factors of production:	
184. Interest	5	(a) Wages, salaries, etc.	10
185. Dividends	–	189. Purchases of goods and services	5
		190. Transfer to reserve account of surplus	10
	——+		——+
186. Total receipts	110	191. Total payments	110

(19) Reserve Account

192. Transfer from revenue account of surplus	10	195. Net purchase of existing securities	5
193. Transfer from public collective providers	–	196. Redemption and repayment of obligations	5
	——+		——+
194. Total receipts	10	197. Total payments	10

Sector IV. Final Consumers

Persons

(20) Revenue Account

198. Wages, salaries, etc.	5,460	212. Payments to factors of production:	
199. Interest	495	(a) Wages, salaries, etc.	105
200. Receipts, actual and imputed, as depositors	255	213. Purchases of goods and services, including bank, etc., charges, actual and imputed, rentals and fees to public collective providers	6,705
201. Imputed receipts as policy-holders	65	214. *less* Transfers from operating account of business enterprises in respect of bad debts	–25
202. Net return from house ownership	165	215. Insurance premiums	130
203. Dividends and withdrawals	1,505	216. Considerations for annuities	45
204. Transfers from public collective providers	170	217. Imputed charges to policy-holders	65
205. Contingency claims	15	218. Gifts and fines to:	
206. Insurance claims, surrenders and annuities	120	(a) Persons	70
207. Pensions from private funds	10	(b) Public collective providers	5
208. Social security benefits	85	(c) Rest of the world	20
209. Gifts from:		219. Direct taxes	745
(a) Persons	70	220. Contributions to social security funds	45
(b) Rest of the world	45	221. Contributions to private pension funds	20
210. Capital transfers from abroad	15	222. Transfer to capital and reserve account of surplus	545
	——+		——+
211. Total receipts	8,475	223. Total payments	8,475

(21) Capital and Revenue Account

224. Transfer from revenue account of surplus	545	229. Payments for factors of production:	
		(a) Wages, salaries, etc.	50
225. Bank, mortgage and similar advances	50	230. Purchases of goods and services	210
226. Transfer from house-ownership account in respect of depreciation and obsolescence	50	231. Net purchase of existing assets	–
		232. Repayments of advances, mortgages, etc.	90
227. Receipts from redemptions and repayments	5	233. Net sums deposited with banks and given to banks in return for notes and coin	5
		234. Net sums deposited with other financial intermediaries	5
		235. Net purchase of existing securities	–20
		236. Subscription to new issues	310
	+		+
228. Total receipts	650	237. Total payments	650

Public Collective Providers

(22) Revenue Account

238. Direct taxes	1,080	246. Payment to factors of production:	
239. Indirect taxes	405	(a) Wages, salaries, etc.	800
240. Transfer of surplus from appropriation account of publicly controlled enterprises	10	(b) Interest	25
		247. Purchases of goods and services	180
241. Interest	20	248. Contributions to social security funds	15
242. Dividends	–	249. Transfer to social security funds	15
243. Gifts and fines	5	250. Transfers to capital and reserve account in respect of depreciation and obsolescence	45
244. Fees	10		
		251. Transfer payments (national debt interest):	
		(a) Enterprises	175
		(b) Persons	170
		252. Subsidies	130
		253. Transfer to capital and reserve account of surplus	–25
	+		+
245. Total receipts	1,530	254. Total payments	1,530

(23) Capital and Reserve Account

255. Transfer from revenue account of surplus	–25
256. Transfer from revenue account of depreciation and obsolescence allowances	45
257. Receipts from subscriptions to new securities	10
258. Receipts from redemptions and repayments	–
	——+
259. Total receipts	30

260. Payments to factors of production:	
(a) Wages, salaries, etc.	20
261. Purchases of goods and services	35
262. Net purchase of existing assets	–20
263. Transfer to social security funds	–
264. Net purchase of existing securities	–15
265. Repayment and redemption of obligations	10
	——+
266. Total payments	30

Sector V. Rest of the World

All Economic Entities

(24) Consolidated Account

267. Proceeds from sale of factors of production:	
(a) Wages, salaries, etc.	10
(b) Interest	25
268. Dividends and withdrawals	20
269. Proceeds from sale of goods and services including existing equipment, gold, etc.	700
270. Insurance premiums	5
271. Insurance claims	5
272. Remittances	20
273. Receipts from subscriptions to new issues	25
274. Other new lending	–
275. Repayments and redemptions	10
	——+
276. Total receipts	820

277. Payments to factors of production:	
(a) Wages, salaries, etc.	15
(b) Interest	165
278. Dividends and withdrawals	60
279. Purchase of goods and services including existing equipment, gold, etc.	505
280. Insurance premiums	10
281. Insurance claims	–
282. Remittances	45
283. Capital transfers accompanying persons	15
284. Net sums deposited with banks and given in return for notes and coin	10
285. Net purchases of existing securities	–25
286. Subscriptions to new issues	5
287. Repayment and redemption of obligations	15
	——+
288. Total payments	820

PART II

Systems and International Harmonization

Chapter 2

French National Accounting Follows its own Path

Contents

During the second half of the 20th century, the world witnesses a fantastic development of national accounts and their uses. Almost every country implements them, and their scope increases considerably. Concerns about international harmonization are persistent at the time, up to the point where it becomes an essential feature of the studies in this field. However, this is a rather complex process; during a long period of time diversity remains within a framework of soft standardization as international recommendations are not compulsory. Deep divergences develop between the main systems before convergence prevails by the end of the 1960s and even more in the last decade of the century.

1. The SEEF's choice for autonomy

Around 1950, two main systems seem to emerge as international references, although differences between countries – mainly in the West – are apparent both in approach and in the national solutions reached: the Soviet system on one side and the Anglo-Saxon on the other. In the western group however, the French will very rapidly assume a position diverging from the mainstream, and apply its main concepts only on a supplementary basis. For twenty years they will develop a system significantly apart from the predominant trends.

The political context in which this particular experience is born and the uses to which it is intimately related (short-term forecasting, medium and long-term projections within the framework of indicative planning) are presented in chapter 10. Since the present chapter focuses on technical issues, a quick reading of chapter 10 up to the transfer to the INSEE is recommended.

In 1950, at the Treasury Directorate of the Ministry of Finance (headed by François Bloch-Lainé), a brilliant team gathered around Claude Gruson (see chapter 10, Box 73, p. 432) within the Service des Etudes Economiques et Financières (SEEF [Service for Economic and Financial Studies]). This group immediately started a debate on the doctrine, qualified by the Treasury Directorate as "classical", that dominated, under Stone's influence, the preparation of the first generation of standardized international systems (The 1950 and 1951 OEEC *Simplified System*, the OEEC 1952 *Standardised System* and the 1953 *System of National Accounts* of the United Nations which will usually be referred to by the acronym SNA). At the time, the need for and urgency of normalization are mostly coming from the US administration in the framework of the Marshall plan.

Curiously, the concepts of production and of national economy, which will introduce the largest quantitative differences in the accounts, are not part of the controversy carried on by the French. The concept of production – as it appeared in the published accounts starting at the end of 1955 – is limited to goods and services for sale or assimilated. Consequently, services provided by the government to the community free of charge or almost free of charge are excluded. No theoretical justification for this exclusion is provided except the intention to refrain from entering into the theoretical debate about the valuation of these types of services. François Perroux, who played an important role in the 1940s in the dissemination of foreign research on social accounting and in carrying out thorough studies of the relevant concepts, stressed that measurements at market prices and those obtained by addition of costs were not consubstantial from the point of view of the theory of value. The Marxist orientation of part of the SEEF group may also have played some role, though not a decisive one (see Box 73).

The considerations that guided the choices seem to have been mostly empirical in nature. The SEEF originally saw national accounting mainly as an instrument for the preparation of "economic budgets" (global short-term economic forecasts with a one- or two-year perspective). In the short term, general government services are determined by budgetary decisions; and in the analysis of equilibrium they are merely exogenous elements of demand for enterprises or employment. Empiricism is even more decisive in the exclusion of insurance and banking services from production. Although they are involved in market relations, the indirect estimation of these services is complex and deemed inaccurate.

Similar considerations underlie the concept of national economy that is adopted: the accounts cover the transactions of entities present in the territory, even when their presence is only occasional (tourists are therefore part of the households). This decision seems to clarify the balances of goods and services.

Such choices reflect the fact that the French are not mainly concerned with defining or compiling aggregates which are beyond theoretical suspicion. Certainly their aggregates are rigorously defined and calculated, but they are not the main objective of the accounting system; the system is not subordinated to them. It can be said with some exaggeration that they are considered as extra results. From this point of view, the SEEF does not follow the historical trend that in the two previous decades had characterized the emergence of the accounting approach viewed mainly as an instrument to improve the determination of the aggregates, mostly national income, and their complements (though Kuznets, in a discussion in 1948, questioned the utility of an accounting system in this perspective).

2. A critical review of the first standardised system

The SEEF finds the first Standardised System, outlined at the beginning of the 1950s, too aggregated, too function-oriented, too confused in its architecture and too lacking in its extent. It is true that the system has some advantages and plays a positive international role that the SEEF experts would probably not have criticized afterwards. The 1952–1953 version presents a reference framework that will be used profitably as a guideline by numerous countries in the early stages, and that will encourage the preparation of aggregates that are relatively homogeneously defined and internationally comparable in broad terms. Its contents are by no means trivial, mainly when compared to what existed, or, as was frequently the case, did not exist at all, at the eve of the war. Nevertheless it has many weaknesses.

The main deficiencies of the first Standardised System and of its aggregated nature are obvious. Although the contribution of the main activities to GNP appears (in a standard table), there is no analysis of the production process. The balance between GNP and its uses is shown in an aggregated form without a supply-and-use table by product. GNP or GDP, current outlays by consumers and general government, gross capital formation, are broken down following specific classifications. Finally, financial transactions are not considered at all. Saving appears classified by sectors, but net lending or net borrowing is only presented for the nation as a whole, and for government in a supplementary table. Besides, at that time, the system deals only with current prices.

Other deficiencies are perhaps more difficult to grasp. The sectors (three are distinguished: business enterprises, general government and private households, and private non-profit institutions) are built on a functional basis because all market producers are grouped in business enterprises, including all unincorporated private enterprises and non-autonomous public enterprises (later called units of market production of general government). As a consequence, these sectors do not always include complete economic units, that are autonomous centers of decision where economic behaviors are apparent. Notwithstanding the importance of their difference in roles, financial and non-financial enterprises are not separated. In fact, three poles are created, corresponding to major basic economic functions (market production, private consumption, redistribution and organization of collective services) but not of sectors grouping economic entities in the full meaning of the word.

The background sequence of accounts – presented in a debit/credit form – is simple, close to what is to be found in other places at the time. Net value added balances a production account (with sales and purchases). An appropriation account leads to net saving, and a capital-transactions account records pro forma net lending and borrowing. Finally and somewhat artificially because it does not follow the sequence of the three previous accounts, an account for the external transactions of the sector is presented, recording all that is not internal to it.

Even with the deficiencies associated with the functional conception of the sectors, a systematic use of this sequence of accounts and of a classification of flows could have led to a cross-classified table summarizing the system in a rather satisfactory way. But this is not what has been done. It will take a long time for the SNA to get to this point.

For the time being, the Standardised System provides for six national accounts:

- A consolidated production account of the given economy that shows, on one side, national income (at factor cost) and the other components of GNP at market prices, and, on the other, the main headings of final expenditure which constitute gross national expenditure.
- An account showing the breakdown of national income by the main categories of income.
- A (consolidated) appropriation account for general government.
- A (consolidated) allocation account for households and private non-profit institutions.
- A consolidated capital-transactions account, balanced by net lending to the rest of the world.
- Finally, a consolidated account for the rest of the world.

The priority given to aggregates is still evident. The Standardised System is very close to the recommendations of the 1945 Subcommittee of the League of Nations, somewhat behind even. It is extremely close to the system of six accounts introduced in the USA when the *National Income and Product Accounts* were formalized in 1947; they were reduced to five in 1958 (see the comparative table in Box 7).

As all this is rather limited, and its final purpose is mainly to show the links among the aggregates and their main components, the Standardised System also presents ten standard tables which give details and complete the contents of the six accounts (for a Scandinavian critical review of the Standardised System approach, see Box 8).

Box 7
First schemes of national accounts (1941–1952)

The synoptic table below shows the list of accounts or tables of different accounting frameworks following the order used in the 1952 Standardised System. Only the names of the accounts are shown. In order to describe their content more precisely without making the presentation too burdensome, only the six accounts of the 1952 OEEC Standardised System and those of the US 1947 NIPA (National Income and Product Accounts) are detailed below.

National Accounting Schemes according to various sources

Meade and Stone, 1941	League of Nation's Experts Subcommittee, 1945	National Income and Product Accounts (NIPA), USA, 1947	National Income and Expenditure United Kingdom, 1952	OEEC's Standardised System, 1952
A. Net Nat. Income, Net Nat. Output, Net Nat. Expenditure at Factor Cost **E.** Curr. Expend. and Investment at home (with NI at market prices)	**3.** National Income, Net Product and Expenditure (factor cost) **5.** Relation between National Income and GNP (market prices) **6.** Expenditure classification of the Gross National Product (market prices)	**I.** National Income and Product Account (NI: factor cost; GNP: market prices)	**1.** Gross National Product (factor cost)	**1.** National product and expenditure account (market prices)
	8. Combined operating account of enterprises of all kinds	**II.** Consolidated Business Income and Product Account		
			3. Corporate income appropriation account	
Parts of **A, B, C**	**2.** Relation between personal income and national income **4.** Income payments	Part of I		**2.** National Income account (factor cost)
Parts of **A, B, C, D**	**9.** Consolidated account of social security funds and public collective providers	**III.** Consolidated government receipts and expenditures Account	**4.** Revenue account Central Govt. and National Insurance Funds **5.** Curr. account Local authorities	**3.** Consolidated appropriation account for General Government
B/B' Personal Incomes Personal Cons. and Savings	**1.** Personal income and outlay	**V.** Personal Income and Expenditure Account	**2.** Personal Income and Outlay	**4.** Consolidated appropriation account of households and NPISH
C. Sources of Savings. Uses of savings **B.** (part) Personal Savings (cash, securities, other)	7. Saving, capital formation and net lending to the rest of the world	**VI.** Gross Savings and Investment Account	**6.** Combined capital account	**5.** Consolidated capital transactions account
D. Receipts from abroad Current Expenditure and Investment Abroad	Parts (incomplete) in tables 1, 3, 7 and 8.	**IV.** Rest of the World Account	**7.** Transactions with the rest of the world	**6.** Consolidated account for the rest of the world

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Box 7 (cont'd)

Account No. 1 of the Standardised System is presented as being mainly (OEEC, 1952, p. 35) "the consolidated production account of the given economy". However, after this abstract consolidation, nothing remains of an actual production account. There is, instead, a balance between GNP via the income approach and via the expenditure approach.

"Accounts No. 2, 3 and 4", continues the text (*ibid*, p. 36) "would, if consolidated, provide the consolidated appropriation account for the given country". Although Account No. 2 shows the saving of corporations, it is the balancing item of an appropriation account, which is not shown. Besides, corporations are not a sector of the system but only a part of the business sector.

On this accounting scheme as a whole, see the text of the present section, and Ingvar Ohlsson's 1953 comment in Box 8. The standardised tables give details and additional information on GNP (actually GDP) at factor cost by activity, the composition of national income and its relations with the other aggregates, the receipts and expenditures (with their functional breakdown) for government and individuals, the domestic gross capital formation (by product, by activity, by sector) and finally the balance of payments.

The 1952 Standardised System is very close to the US 1947 NIPA. However, the contents of OEEC Account No. 2 (National Income Account) appear in the left column of the NIPA Table I. If Stone did not include it in his 1952 Account No. 1, it was to maintain the fiction of the relationship between its four basic accounts and the six national accounts. NIPA does not make use of this trick. NIPA's Table I is a summary account of GNP via the income approach and via the final expenditure approach and is by no means a consolidated production account. NIPA's six accounts constitute the actual accounting structure of the US accounts, conceived both to show the relationship among the different aggregates and to present the main results. About fifty very rich statistical tables complete them, with some series covering back to 1929.

The 1947 NIPA had an account (Table II) for the business sector, a mix of a production account and of an appropriation account in the sense of Stone. It will disappear in 1958; as a consequence, the net consolidated sales will also disappear, placing the NIPA closer to the first Standardised System. The accounting structure consists then only of the five remaining accounts, always within the same concept. Account I may then be given the same formal meaning as Account No. 1 of the Standardised System, that is, that of a consolidated production account for the whole economy.

On the eve of the first 1952 Standardised System, the British summary tables have a format very close to this system and to the NIPA. However, they have a corporate income appropriation account showing the transition from the corporations' trading profits to their saving. The income part of the British Table 1 (GNP), including the trading profits, reflects more justly than does OEEC Account No. 1 the components of a consolidated production account for the whole nation. Contrasting with NIPA, the British summary tables, although forming a balanced set, are not taken as a formalization of a general accounting structure itself.

Also, starting from *National Income and Expenditure* (August 1952, pp. 20–21) and in a more elegant manner in the next issue (1953, pp. 12–13), the British summary tables are presented as a table of sector accounts, called *social accounts*, "in a form designed to show at a glance how the various sectors and types of activity recorded [that is, production, consumption and wealth increase] in this system of statistics are related to one another" (August 1952, p. 1). This table cross-classified in columns the sectors (persons, corporations, public authorities) and their sub-accounts of production (only one, consolidated), of income and expenditure, of capital, and finally the rest of the world, and in rows the flows of receipts and payments encompassing at the same time transactions (income payments to factors of production, transfers, current expenditures on goods and services, etc) and balancing items (saving, net change in financial assets). The idea behind this table, unfortunately missing from the Standardised System and the NIPA, is close to that of René Froment (1945) and to what the SEEF, of which Froment was then a member, is going to develop shortly after, in a more rigorous manner, under the name of "Tableau économique

cont'd

Box 7 (cont'd)

d'ensemble" [Overall Economic Table], and close even to what Aukrust had proposed shortly before (1949–1950) (see Box 21). This table tries to give a true representation of the accounting structure, but the aggregates do not appear explicitly (the main aggregate of the British accounts at the time is GNP at factor cost). In 1956, however, the table disappears from the British publications.

The ambiguity of the five accounting schemes presented above results from the intention to provide simultaneously an easy summary of the main statistical information for practical purposes. This objective is particularly obvious in Meade and Stone's 1941 scheme, presented in the form of five tables, and also in the tabular framework made of nine tables of the recommendations of the 1945 League of Nations Group of Experts headed by Stone ("which we recommend should be adopted as a framework in the presentation of national income statistics", p. 9). Meade and Stone's Table A (see Box 6), and the Expert Group's Table 3 present three columns showing the breakdown of national income, national product and national expenditure, all three net at factor cost, by income type, branches of economic activity and categories of final expenditure respectively. The net product (value added) by type of economic activity does not appear anymore in the general schemes that follow but in supplementary tables.

The purpose of presenting in a simple way the main results of the accounts and their relationship obviously deserves praise. This is not the point of discussion here. Nevertheless, the confusion between a framework for summary presentation and an accounting structure – that characterizes in particular the 1947 NIPA, the 1952 Standardised System as well as the 1945 Recommendations of the Subcommittee of Experts of the League of Nations – constitutes an obstacle for the proper conceptual understanding of the nature of a national accounting system. This is far from the accounting system presented by Stone in his 1945 memorandum, even though he himself chairs the Subcommittee and guides the preparation of the Standardised System.

Getting deeper insight.

Main entries of the six accounts of the 1952 Standardised System (pp. 40–46):

Account 1. National product and expenditure account

1.1	National income (2.7)	1.5	Consumers' expenditure on goods and services (4.1)
1.2	Depreciation and other operating provisions (5.3)	1.6	Government current expenditure on goods and services (3.1)
1.3	Indirect taxes (3.8)	1.7	Gross domestic asset formation (5.1)
1.4	Less: Subsidies (3.2)	1.8	Sales of goods and services to the rest of the world and factor income payments from the rest of the world (6.1)
		1.9	Less: Purchases of goods and services from the rest of the world and factor income payments to the rest of the world (6.5)
	Gross national product at market prices		Gross national expenditure at market prices

cont'd

Box 7 (cont'd)

Account 2. National income account

2.1	Compensation of employees (4.5)	2.7	National income (1.1)
2.2	Income from property and entrepreneurship accruing to households, etc. (4.6)		
2.3	Savings of corporations (5.5)		
2.4	Direct taxes on corporations (3.10)		
2.5	Government income from property and entrepreneurship (3.7)		
2.6	Less: Interest on the public debt (3.3)		
	National income		National income

Account 3. Consolidated appropriation account for general government

3.1	Government current expenditure on goods and services (1.6)	3.7	Government income from property and entrepreneurship (2.5)
3.2	Subsidies (1.4)	3.8	Indirect taxes (1.3)
3.3	Interest on the public debt (2.6)	3.9	Direct taxes on households, etc. (4.2)
3.4	Current transfers to households, etc. (net) (4.7)	3.10	Direct taxes on corporations (2.4)
3.5	Current transfers to the rest of the world (6.6)	3.11	Current transfers from the rest of the world (6.2)
3.6	Saving of government (5.4)		
	Current expenditure and saving of general government		Current revenue of general government

Account 4. Consolidated appropriation account for households and private non-profit institutions

4.1	Consumers' expenditure on goods and services (1.5)	4.5	Compensation of employees (2.1)
4.2	Direct taxes on households, etc. (3.9)	4.6	Income from property and entrepreneurship accruing to households, etc. (2.2)
4.3	Current transfers to the rest of the world (6.7)	4.7	Current transfers from government (net) (3.4)
4.4	Saving of households, etc. (5.6)	4.8	Current transfers from the rest of the world (6.3)
	Expenditure and saving of households and private non-profit institutions		Income of households and private non-profit institutions

Account 5. Consolidated capital transactions accounts

5.1	Gross domestic asset formation (1.7)	5.3	Depreciation and other operating provisions (1.2)
5.2	Net lending to the rest of the world (6.8)	5.4	Saving of government (3.6)
		5.5	Saving of corporations (2.3)
		5.6	Saving of households, etc. (4.4)
		5.7	Net capital transfers from the rest of the world (6.4)
	Gross addition to national wealth		Gross addition to national wealth

cont'd

Box 7 (cont'd)

Account 6. Consolidated account for the rest of the world

6.1	Purchases of goods and services from the nation and factor income payments to the nation (1.8)	6.5	Sales of good and services to the nation and factor income payments from the nation (1.9)
6.2	Current transfers to government (3.11)	6.6	Current transfers from government (3.5)
6.3	Current transfers to households, etc. (4.8)	6.7	Current transfers from households (4.3)
6.4	Net capital transfers to the nation (5.7)	6.8	Net borrowing from the nation (5.2)
	+		+
	Total		Total

The 1947 NIPA and the corresponding data
(*Survey of Current Business*, July 1948, pp. 14–15)

Table I. National Income and Product Account, 1947 (millions of dollars)

Compensation of employees		Personal consumption expenditures	164,755
Wages and salaries	122,159	Gross private domestic investment	30,031
Supplements	5,342	Net foreign investment	8,898
Income of unincorporated enterprises and inventory valuation adjustment	38,866	Government purchases of goods and services	27,952
Rental income of persons	7,131		
Corporate profits and inventory valuation adjustment:			
Corporate profits before tax:			
Corporate profits tax liability	11,709		
Corporate profits after tax:			
Dividends	6,880		
Undistributed profits	11,195		
Inventory valuation adjustment	–5,075		
Net interest	4,293		
	+		
National income	*202,500*		
Indirect business tax and non tax liability	18,488		
Business transfer payments	612		
Statistical discrepancy	–3,389		
Less: Subsidies minus current surplus of Government enterprises	–126		
	+		
Charges against net national product	*218,337*		
Capital consumption allowances	13,299		
	+		+
Charges against gross national product	231,636	Gross national product	231,636

cont'd

Box 7 (cont'd)

Table II. Consolidated Business Income and Product Account, 1947 (millions of dollars)

Compensation of employees:		Consolidated net sales:	
Wages and salaries		To consumers	158,008
Disbursements	102,014	To government	11,339
Excess of accruals over disbursements	0	To business on capital account	29,413
Supplements:		To abroad	8,896
Employer contributions for social insurance	2,483	Change in inventories	618
Other labor income	1,629		
Income of unincorporated enterprises and inventory valuation adjustment	38,866		
Rental income of persons	7,131		
Corporate profits before tax and inventory valuation adjustment:			
Corporate profits before tax:			
Corporate profits tax liability	11,709		
Corporate profits after tax:			
Dividends	6,643		
Undistributed profits	10,793		
Inventory valuation adjustment	–5,075		
Net interest	3,154		
	+		
Income originating	*179,347*		
Indirect business tax and non-tax liability	18,488		
Business transfer payments	612		
Statistical discrepancy	–3,389		
Less: Subsidies minus current surplus of government enterprises	–126		
	+		
Charges against net product	*195,184*		
Capital consumption allowances	13,090		
	+		+
Charges against business gross product	208,274	Business gross product	208,274

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An accounting structure with four accounts and three sectors is in the background, but finally it is a system of six national accounts and ten standard tables. Starting with a rather simple logic, but ending with a very dense presentation, the Standardised System will weigh heavily on the history of SNA, and its influence will not disappear completely until the 1993 SNA version.

The secondary place given to the basic accounting structure, the functional conception of the sectors, and the pre-eminence of the aggregates thus combined, blur, almost to invisibility, the founding idea which conceived the construction of the accounts of the nation as starting from elementary phenomena, and then aggregating actual (or virtual) elementary economic accounts. In principle,

Box 7 (cont'd)

Table III. Consolidated Government Receipts and Expenditures Account, 1947 (millions of dollars)

Purchases of goods and services:		Personal tax and non-tax receipts	21,621
Purchases of direct services:		Corporate profits tax accruals	11,709
Compensation of employees:		Indirect business tax and non-tax accruals	18,488
Wages and salaries	15,571		
Supplements		Contributions for social insurance:	
Employer contributions for social insurance	1,020	Employee contributions	2,068
		Employer contributions:	
Other labor income	172	Business	2,483
		Government	1,020
Income originating in and net and gross product	*16,763*	Households and institutions	17
Net purchases from business	11,339	Deficit (+) or surplus (–) on income and product transactions	–14,077
Net purchases from abroad	–150		
Transfer payments	11,064		
Net interest paid	4,439		
Subsidies minus current surplus of government enterprises	–126		
Government expenditures	43,329	Government receipts and deficit	43,329

Table IV. Rest of the World Account, 1947 (millions of dollars)

Net payments of factor income to the United States:		Net disinvestment in the United States	8,898
Wages and salaries	6		
Interest	208		
Dividends	237		
Branch profits	408		
Income originating in and net and gross product	*853*		
Net purchases from the United States:			
From business	8,896		
From government	150		
From persons	–1,001		
Net current payments to the United States	8,898	Net disinvestment in the United States	8,898

cont'd

this idea was present in Stone's 1945 work, though within a somehow virtual accounting system, as a support to the aggregates. At least part of this idea was also in the mind of the Norwegians Frisch and Aukrust, but more in terms of aggregation of economic flows distributed among the sectors than in the sense of a potential aggregation of microeconomic accounts themselves. This idea had, in more direct terms, oriented Vincent's research in France.

Box 7 (cont'd)

Table V. Personal Income and Expenditure Account, 1947 (millions of dollars)

Personal consumption expenditures:		Wages and salary receipts:	
Purchases of direct services:		Disbursements by:	
Compensation of employees:		Business	102,014
Wages and salaries paid	4,568	Government	15,571
Supplements paid:		Households and institutions	4,568
Employer contributions for social insurance	17	Rest of the World	6
Other labor income	21	Less: Employee contributions for social insurance	2,068
Interest paid	931	Other labor income:	
	———+	Business	1,629
Income originating in and net product of households and institutions	*5,537*	Government	172
		Households and institutions	21
Institutional depreciation	209	Income of unincorporated enterprises and inventory valuation adjustment	38,866
Gross product of households and institutions	*5,746*	Rental income of persons	7,131
Net purchases from business	158,008	Dividends	6,880
Net purchases from abroad	1,001	Personal interest income	8,732
Personal tax and non-tax payments	21,621	Government transfer payments	11,064
Personal saving	8,822	Business transfer payments	612
	———+		———+
Personal outlay and saving	195,198	Personal income	195,198

Table VI. Gross Savings and Investment Account, 1947 (millions of dollars)

Business purchases on capital account	29,413	Excess of wage accruals over disbursements	0
Change in business inventories	618		
Net disinvestments in the United States by rest of world	8,898	Undistributed corporate profits (domestic)	10,793
Government deficit (+) or surplus (–) on income and product transactions	–14,077	Corporate inventory valuation adjustment	–5,075
		Statistical discrepancy	–3,389
		Capital consumption allowances by private business	13,090
		Foreign branch profits (net)	402
		Institutional depreciation	209
		Personal saving	8,822
	———+		———+
Gross investment and government deficit	24,852	Gross private saving	24,852

Without entering into a detailed comment on the US accounts, some observations can be made.

A *statistical discrepancy* appears (Table I) when comparing GNP (via expenditures) (231,636) and GNP (via income) (235,025). The latter is then adjusted to the former (235,025 – 3,389 = 231,636). [On the problem of statistical discrepancy, see chapter 5].

An *inventory valuation adjustment* of –5,075 for corporations (Tables I, II, VI) is introduced in order to transform changes in inventory according to business accounting to changes in inventory as understood, with more economic significance, by national accounting. This adjustment is implicit

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Box 7 (cont'd)

for unincorporated enterprises and part of the item *income of unincorporated enterprises and inventory valuation adjustment*, Tables II and V).

Interest on public debt (4,439, Table III) is treated as transfers whereas the interest paid by business (Table II), non-profit institutions (Table V) and the rest of the world (Table IV) is considered part of national income (4,293) in Table I. In the transition, which will become classic, from GDP to GNP, only the interest paid by the rest of the world will be taken into consideration (208, Table IV). Nevertheless, other things being equal, GNP is the same in the two presentations. In Table I, national income (via income) appears after primary distribution (first eight rows of Table I). It is then necessary to take into account all interest paid in order to obtain value added again (rows *"Income originating in and net and gross product"* in Tables II, III and V). The treatment of interest on public debt has been the topic of many frequently confused discussions (see chapter 6). Anticipating chapters 3 and 6, it should be pointed out that all interest constitutes primary income (as understood by the 1993 SNA). As a consequence, net interest received (*personal interest income*: 8,732, Table V), less interest paid by business (3,154, Table II), government (4,439, Table III) and non-profit institutions (931, Table V) = interest paid by the rest of the world (208, Table IV), the same that appears in the transformation of GDP into GNP. The analysis of interest on public debt as transfers was a mistake, but this mistake led to a better calculation of national income, within the context of those times (see chapter 6).

Box 8

Ingvar Ohlsson's comments on the 1952 Standardised System

In his book *On National Accounting* (1953) the Swede Ingvar Ohlsson presents (pp. 61–70) Stone's systems of national accounts as they could be found in the 1945 League of Nations memorandum, in a 1949 paper ("Functions and criteria of a system of social accounting", *Income and Wealth* Series I) and in the OEEC 1952 Standardised System. Ohlsson underlines Stone's vacillation between a functional and an institutional conception of sectors and, more widely, of the whole national accounts system. His final comment draws very close to the one of this book:

> "Compared to the two previous works, the 1952 accounting design [. . .] is very modest. The interest has been largely transferred to certain standard tables of the type included in national income statistics. The National Accounts [. . .] therefore become mainly a system for showing the definitional connection between the transactions included in the standard tables. The basis is an accounting design of three sectors [. . .] with four accounts in each sector [. . .]. The institutional and functional divisions are in this way kept separate. Through a variety of consolidations of sectors and accounts, the result is, however, an NA-system with only six accounts and a mainly functional appearance [. . .]. Through this system of consolidating, the reflection of the institutional characteristics in the accounts disappears. It has little advantage, as regards usefulness, over the national income statistics, which are presented at the same time in standard tables". *(pp. 64–65)*

Clearly, Ohlsson, although he expresses the view that any judgment should take into consideration the purpose of simplification when proposing a standardized scheme for all OEEC member countries, does not agree with the direction followed.

When the SEEF sharply rejected the Standardised System (even though Jean Marczewski had participated in the Cambridge group that formulated it), it did not break with the essential direction of the first French developments, although the 1945 to 1949 estimates of the pioneers (René Froment, Pierre Gavanier, Jacques Dumontier) had generally followed the Anglo-Saxon schemes, as those were the only ones available at the time. It is curious, however, that the SEEF made no reference to Stone's 1945 proposition with which it had more relationship; it seems to have been ignored (see chapter 1, pp. 24–26 and appendix). It is true that Gruson willingly kept himself away from foreign research that he considered too inadequate for the analysis he wanted to perform. Such an attitude, not to be recommended as a general rule, is consistent within the dynamics of his venture, which consisted in strongly stimulating creativity and in pushing national accounting and its culture farther than anywhere else.

3. The SEEF's conceptual framework

On the eve of the organization of the SEEF, a personal note of Claude Gruson, "Note sur les conditions d'établissement d'une comptabilité nationale et d'un budget économique national" [Note on the conditions for building national accounting and the nation's economic budget], published in July 1950 (*Statistiques et Etudes Financières*, July 1950, No. 19; annexes in No. 20–21), gives continuity to these first developments within an extended functional approach (one pole, "bank", a related account for "capital market") but supported by developed accounting frameworks. Among these, there is a proposal – which will never appear again – to establish for producers simultaneously an operating account (purchases and sales), a cash account, and an accounting for commitments (orders received, orders passed, decisions to engage in manufacturing and marketing expenses before getting orders, etc.). The memory of the 1929 crisis was clearly on his mind. In 1949, Gruson publishes his *Esquisse d'une théorie générale de l'équilibre économique. Réflexions sur la théorie générale de Lord Keynes* [Outline of a General Theory of Economic Equilibrium. Reflections on the General Theory of Lord Keynes] (PUF) dedicated to the problem of market availability and economic stability (A third of the book is entitled: "La loi des débouchés" [The Laws of Markets]). His 1950 note has the same purpose and intends "to place the budgetary exercise inside a framework of precise assumptions regarding the evolution of the economy". The note focuses on economic budgets and tries to define, by means of a system of equations, the relationships among the different elements of the economic circuit without considering the possibility of limiting himself to a few relationships between a small number of aggregates. Gruson is a visionary, and he writes in the note: "We are going to propose a very realistic solution, that is, we shall take into account all the complexities of the real economy by all possible means" (p. 520). He ends up with a system of equations, very complex for the time (88 equations with only three production poles, when several tens would be required), but he shows confidence in the new machines already used by physicists. The concerns about short-term equilibrium are translated into the synthetic representation given to the economic circuit. It is a graph of monetary flows called "Tableau des mouvements monétaires et des variations de positions créancières et débitrices" [Tableau of monetary flows and changes in the net lending/net borrowing positions] (see box 9). Graphical representations of the economic circuit were "in fashion" in the 1940s and 1950s (See the appendix to this chapter).

A note from the SEEF in May 1953, “Méthodes d’établissement des comptes provisoires de la nation et des budgets économiques” [Methods for implementing provisional accounts of the nation and economic budgets] (*Statistiques et études financières*, May 1953, No. 53), written by Jean Sérisé, typifies the nature and the limitations of analysis at this stage. The assessment of prospective accounts was described as “of a very particular nature. It is focused mainly on the monetary aspects of equilibrium or disequilibria in the short run”.

On technical grounds, the manifesto of the French National Accounting is a note of the SEEF team, published in September 1952 and written by Louis Blanc, René Mercier and Charles Prou, “Principes d’établissement d’une comptabilité économique et d’un tableau économique” [Principles for implementing national accounts and an economic table] (*Statistiques et études financières*, September 1952, No. 45). This note presents the shortfalls of the classical frameworks (see above). It proposes the design of a new framework “that would provide the instrument for a more concrete analysis of economic phenomena”. The purpose is to build “a coherent system on which to base the national accounts, the inter-industrial exchanges analysis, and the study of the economic behavior of the various social groups”.

The “Principles” presents a construction going rigorously from bottom to top. *Microeconomic accounting,* following the accrual principle of recording, shows the registration of elementary economic “opérations” (the French word “transactions” is restricted to monetary operations) and their aggregation in classes of “opérations” that have the same economic meaning (transactions on goods and services, exchanges in kind, disposals of second-hand goods, movements in stocks; transfers; financial “opérations”).

The economic agents have three accounts: an operating account (with purchases and sales) leading to a gross operating surplus, a far-reaching appropriation account (covering net borrowing and net lending; its balancing item is the financing of equipment and stocks) and a capital account, whose balance is gross investment (equal to the previous one).

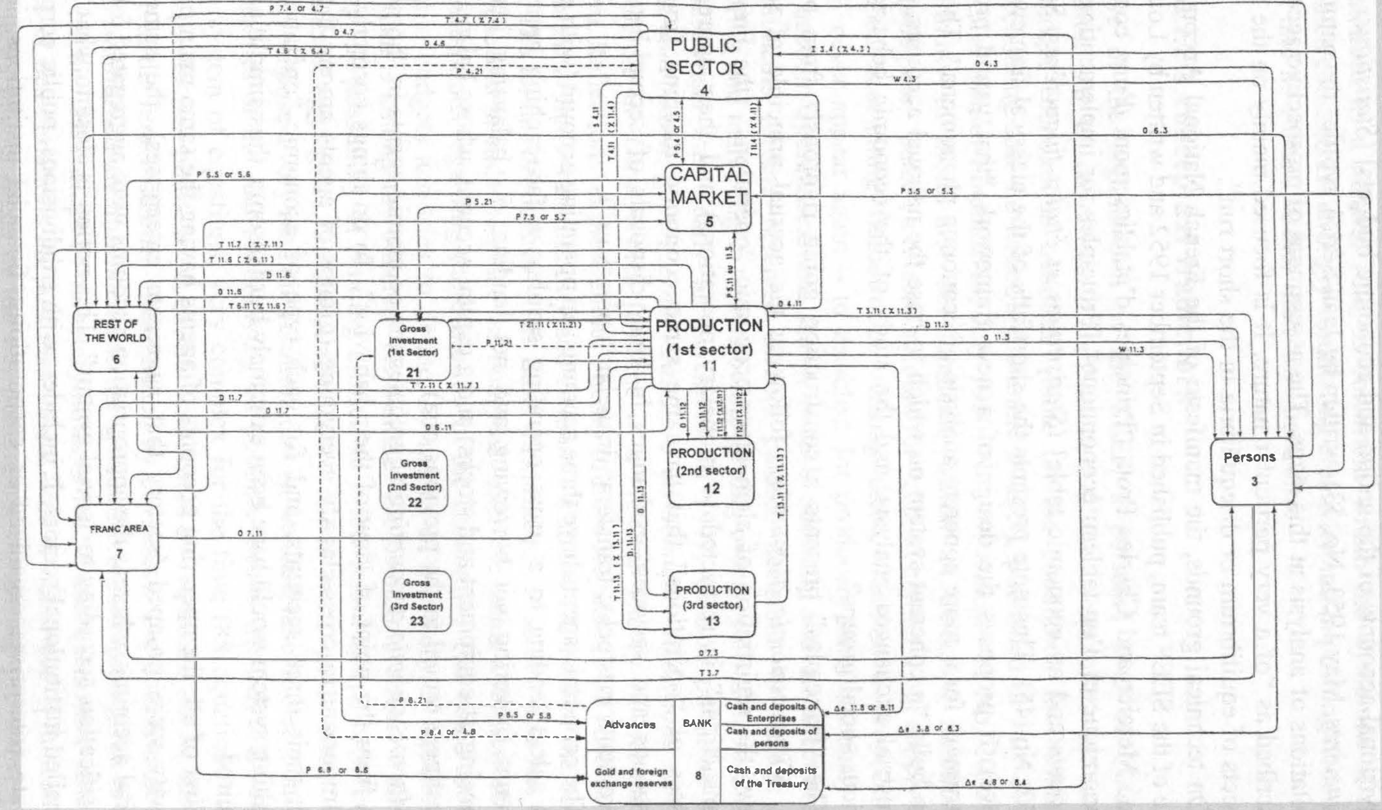
Macroeconomic accounting aggregates the economic agents in “homogeneous sets from the point of view of their behavior”. To do things correctly it would be important to cross-classify everything (groups of agents among themselves, with their three accounts, and for each type of economic “opération”). The resulting system would have been extremely burdensome, thus simplification was required.

First of all, the operating accounts of agents having the same main productive activity were grouped (sectors that aggregate enterprises), the same for the capital accounts, whereas the appropriation accounts were aggregated following a classification according to “social groups”. This notion is close to what will later be called institutional sectors. It includes, with subdivisions, public corporations, private enterprises organized as corporations, financial institutions, individual entrepreneurs (their enterprises and their households taken together) in five categories, and the other persons in six categories (see Box 10).

Box 9

Flowchart presented by Claude Gruson in his July 1950 Note

Tableau of monetary flows and of changes in the net lending/net borrowing positions



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Box 9 (cont'd)

The directions of the arrows represent that of the payments. For instance, T3.11 = Payments of goods and services by individuals to the production sector 11. Terms in parentheses (x11.3) show the variation of the credit position of sector 11 to that of individuals, originating in sales of goods and services. The physical flows, if they exist, go in the opposite direction to that of payments.

Notations are as follows: W (wages), O (interest and payments of bonds), D (distributed profits), I (taxes), P (liquid capital investments and loans), De (Change in cash), S (Subsidies), T (Transactions on goods and services).

The ambition to cover all aspects of economic life (production, distributive transactions, financing) is clear. Description is made from a payments point of view. Transactions in kind are not included. Contrasting with a similar approach that Copeland is developing (See Box 12), Gruson has in mind in principle the analysis of the changes in the borrowing and lending position by type of payments. In the end, that would give an accrual system of recording (claims and obligations).

Box 10
Classification of social groups in the “Principles”, September 1952 (p. 818)

0. Public corporations
   Budget dependencies: Dockyards, Postal Services, others
   Public establishments, industrial and commercial
   Mixed economy enterprises: Electricité de France (electricity), Charbonnages (coal mining), SNCF (railroad), maritime transportation, mechanical, other
1. Corporate Enterprises
   Limited liability companies/partnership, corporations, civil societies, limited-shares partnerships, concessionary companies, cooperative societies
   11. Food and beverage
   12. Mining and energy
   13. Basic metals and metal products
   14. Textile
   15. Chemical
   16. Construction
   17. Transportation
   18. Trade
   19. Others
2. Financial institutions
3. Individual entrepreneurs
   30. Farmers: tenants, sharecroppers, owners
   31. Craftsmen
   32. Manufacturers
   33. Traders (trade and services)
   34. Liberal professions
4. Persons
   41. Directors of corporations, managers of other companies
   42. Top executive employees, engineers
   43. Executives, assistants, supervisors, assistant technicians, assistant intellectual workers, Army, Police, representatives, sellers
   44. Unskilled workers, apprentices, miners, farm laborers, service personnel
   45. Others: non-actives (persons of private means, pensioners, draftees, population in institutions, clergy)
   46. Private non-profit institutions
5. General Government (central and local) [details are omitted as they are too specific to the French situation]
6. Social security
7. French Overseas Union
   71. North Africa
   72. Indochina
   73. Others
8. Rest of the word
   81. Dollar zone
   82. Sterling zone
   83. Other zones

The idea of describing the total network of bilateral relationship between the groups of economic agents is then omitted. For each type of “opérations”, *dummy accounts* are introduced: they hide the direct agent-to-agent relationship and show for each group of agents its debit and credit corresponding to the given “opération”. For instance, on one side there are dividends paid by corporations, or by the rest of the world, etc.; on the other, the total dividends received by persons, but not the individual amount of dividends paid by corporations to persons. The main dummy accounts are the “opérations” account (on goods and services with payment), the transfer accounts and the financial “opérations” accounts. The “Principles” point out that by merging the “opérations” accounts and the “operations in kind” accounts (exchanges in kind, disposals of second-hand goods and movements in inventories), for the same category of products, it is possible to obtain an account for supply and use.

The whole system is synthesized in one "*Tableau économique élémentaire*" [Elementary Economic Table] (shown as an example in Box 11). This one does appear in the format that will later be adopted in the "Tableau économique d'ensemble" (TEE) [Overall Economic Account]. It is a square table where a row (credit) and a column (debit) are assigned to the account or sub-account of each transactor or of each "opération". A flow appears only once, in the intersection of a row and of a column. This matrix or table representation of an accounting structure has also been mentioned in general terms by Stone in 1948; as he does not introduce dummy accounts, he needs a table or matrix in three dimensions, in which each layer or floor would represent a different type of transaction. The 1952 presentation of the square table has the particular advantage of showing clearly how the whole system is linked and of allowing the use of different aggregation criteria depending on the type of accounts.

The flows of goods and services, including the inter-industrial exchanges, are included. The operating accounts of sectors aggregate enterprises with their sales and their purchases. The SEEF chooses an option different from Leontief's (branches of homogeneous production). The financial "opérations" are also presented. The elementary square table (annexed to the "Principles") shows them only through their balancing items, but the text analyses their recording rules and their linkages with the table. The SEEF does not ignore the developments made by the American Morris A. Copeland (1947, 1949) nor the considerable study he is preparing at the time (1952), but keeps a broader view, less concentrated on payments; it is closer to the future *flow-of-funds accounts* that, at the Federal Reserve Board, will soon transform Copeland's original *moneyflows accounts* (see Box 12).

4. Growth and extension of French national accounting (CNF)

Based on this autonomous conceptual analysis, the SEEF will place the *Comptabilité Nationale Française* – CNF [French National Accounting] on an advanced level of development (see Box 13 for a chronological table of the main steps followed by the former CNF 1950–1975). In 1952 the INSEE (The National Statistical Office) took over from SEEF with the participation of the *Banque de France* (the Central Bank) and the Public Accounting Directorate (see chapter 10, p. 436). Some of the initial options will be substantially modified in the process. New national accounts are published at the end of 1955 (1952 benchmark). Major changes are introduced in 1960 (1956 benchmark), and in 1969 (1962 benchmark). By then, the way to convergence has been opened.

As the history of these developments is becoming distant in time and has been mainly ignored abroad, it is important to trace it in detail, although the reporting might seem rather technical.

Box 11

The elementary economic table or square table of the September 1952 "Principles" (Annexe 4, insert between pages 818 and 819)

DEBIT

CREDIT		OPERATING									TRANSACTIONS													APPROPRIATION									TRANSFERS								CAPITAL							
		Agriculture 10	Food industries 11	Mining and energy 12	Manufacturing 13	Construction and Public Works 14	Services 15	Employees 16	Non active and others 17	Government 18	Agricultural products 20	Food products 21	Ores, minerals and electricity 22	Manufacturing products 23	Construction, Public Works 24	Services 25	Credit 26	Insurance 27	Rentals 28	Labor 29	Operations in kind 3	Disposals 4	Inventories 5	Public enterprises 60	Corporations 61	Financial institutions 62	Individual entrepreneurs 63	Persons 64	General Government 65	Social security 66	French Overseas Union 67	Rest of the world 68	Taxes 70	Subsidies 71	Social contributions 72	Social benefits 73	Insurance claims 77	Dividends 78	Other transfers 79	Financial transactions 8	Agriculture 90	Food industries 91	Mining and energy 92	Manufacturing 93	Construction, Public Works 94	Others 99	Adjustment 00	TOTAL
OPERATING	10 Agriculture										V_{20-10}	V_{21-10}	V_{22-10}	V_{23-10}	V_{24-10}	V_{25-10}	V_{26-10}		V_{28-10}	V_{29-10}	V'_{3-10}	V'_{4-10}	V^n_{5-10}																									Z_{10}
	11 Food industries										V_{20-11}	V_{21-11}	V_{22-11}	V_{23-11}	V_{24-11}	V_{25-11}	V_{26-11}		V_{28-11}	V_{29-11}		V'_{4-11}	V^n_{5-11}																									Z_{11}
	12 Mining and energy										V_{20-12}	V_{21-12}	V_{22-12}	V_{23-12}	V_{24-12}	V_{25-12}	V_{26-12}		V_{28-12}	V_{29-12}		V'_{4-12}	V^n_{5-12}																									Z_{12}
	13 Manufacturing										V_{20-13}	V_{21-13}	V_{22-13}	V_{23-13}	V_{24-13}	V_{25-13}	V_{26-13}		V_{28-13}	V_{29-13}		V'_{4-13}	V^n_{5-13}																									Z_{13}
	14 Construction, Public Works										V_{20-14}	V_{21-14}	V_{22-14}	V_{23-14}	V_{24-14}	V_{25-14}	V_{26-14}		V_{28-14}	V_{29-14}		V'_{4-14}	V^n_{5-14}																									Z_{14}
	15 Services										V_{20-15}	V_{21-15}	V_{22-15}	V_{23-15}	V_{24-15}	V_{25-15}	V_{26-15}	V_{27-15}	V_{28-15}	V_{29-15}		V'_{4-15}	V^n_{5-15}																									Z_{15}
	16 Employees										V_{20-16}	V_{21-16}	V_{22-16}	V_{23-16}	$V_{2\ 16}$	V_{25-16}	V_{26-16}		V_{28-16}	V_{28-16}	V'_{3-16}	V'_{4-16}	V^n_{5-16}																									Z_{16}
	17 Non active and others										V_{20-17}	V_{21-17}	V_{22-17}	V_{23-17}	V_{24-17}	V_{25-17}	V_{26-17}		V_{28-17}	V_{29-17}		V'_{4-17}	V^n_{5-17}																									Z_{17}
	18 Government										V_{20-18}	V_{21-18}	V_{22-18}	V_{23-18}	V_{24-18}	V_{25-18}	V_{26-18}		V_{28-18}	V_{29-18}		V'_{4-18}	V^n_{5-18}																									Z_{18}
TRANSACTIONS	20 Agricultural products	A_{10-20}	A_{11-20}	A_{12-20}	A_{13-20}	A_{14-20}	A_{15-20}	A_{16-20}	A_{17-20}	A_{18-20}													V^n_{5-20}				C_{63-20}	C_{64-20}	C_{65-20}	C_{66-20}	T_{67-20}	T_{68-20}																Z_{20}
	21 Food products	A_{10-21}	A_{11-21}	A_{12-21}	A_{13-21}	A_{14-21}	A_{15-21}	A_{16-21}	A_{17-21}	A_{18-21}													V^n_{5-21}				C_{63-21}	C_{64-21}	C_{65-21}	C_{66-21}	T_{67-21}	T_{68-21}																Z_{21}
	22 Ores, minerals, and electricity	A_{10-22}	A_{16-22}	A_{16-22}	A_{16-22}	A_{16-22}	A_{16-22}	A_{16-22}	A_{16-22}	A_{16-22}													V^n_{5-22}				C_{63-22}	C_{64-22}	C_{65-22}	C_{66-22}	T_{67-22}	T_{68-22}																Z_{22}
	23 Manufacturing products	A_{10-23}	A_{11-23}	A_{16-23}	A_{16-23}	A_{16-23}	A_{16-23}	A_{16-23}	A_{17-23}	A_{16-23}													V^n_{5-23}				C_{63-23}	C_{64-23}	C_{65-23}	C_{66-23}	T_{67-23}	T_{68-23}									E_{90-23}	E_{91-23}	E_{92-23}	E_{93-23}	E_{94-23}	E_{99-23}		Z_{23}
	24 Construction, Public Works	A_{10-24}	A_{11-24}	A_{12-24}	A_{13-24}	A_{14-24}	A_{15-24}	A_{16-24}	A_{17-24}	A_{18-24}													V^n_{5-24}				C_{63-24}	C_{64-24}	C_{65-24}	C_{66-24}	T_{67-24}	T_{68-24}									E_{90-24}	E_{91-24}	E_{92-24}	E_{93-24}	E_{94-24}	E_{99-24}		Z_{24}
	25 Services	A_{10-25}	A_{11-25}	A_{12-25}	A_{13-25}	A_{14-25}	A_{15-25}	A_{16-25}	A_{17-25}	A_{18-25}																	C_{63-25}	C_{64-25}	C_{65-25}	C_{66-25}	T_{67-25}	T_{68-25}																Z_{25}
	26 Credit	A_{10-26}	A_{11-26}	A_{12-26}	A_{13-26}	A_{14-26}	A_{15-26}	A_{16-26}	A_{17-26}	A_{18-26}																	C_{63-26}	C_{64-26}	C_{65-26}	C_{66-26}	T_{67-26}	T_{68-26}																Z_{26}
	27 Insurance	A_{10-27}	A_{11-27}	A_{12-27}	A_{13-27}	A_{14-27}	A_{15-27}	A_{16-27}	A_{17-27}	A_{18-27}																	C_{63-27}	C_{64-27}	C_{65-27}	C_{66-27}	T_{67-27}	T_{68-27}																Z_{27}
	28 Rentals	A_{10-28}	A_{11-28}	A_{12-28}	A_{13-28}	A_{14-28}	A_{15-28}	A_{16-28}	A_{17-28}	A_{18-28}																	C_{63-28}	C_{64-28}	C_{65-28}	C_{66-28}	T_{67-28}	T_{68-28}																Z_{28}
	29 Labor	A_{10-29}	A_{11-29}	A_{12-29}	A_{13-29}	A_{14-29}	A_{15-29}	A_{15-29}	A_{17-29}	A_{18-29}																	C_{63-29}	C_{64-29}	C_{65-29}	C_{66-29}	T_{67-29}	T_{68-29}																Z_{29}
	3 Operations in kind	A'_{10-3}																										C'_{64-3}	C'_{65-3}																			Z_{3}
	4 Disposals	A^Y_{10-4}	A^Y_{11-4}	A^Y_{12-4}	A^Y_{13-4}	A^Y_{14-4}	A^Y_{15-4}	A^Y_{16-4}	A^Y_{17-4}	A^Y_{18-4}																	C^Y_{63-4}	C^Y_{64-4}													E^V_{90-4}	E^V_{91-4}	E^V_{92-4}	E^V_{93-4}	E^V_{94-4}	E^V_{99-4}		Z_{4}
	5 Inventories	A^n_{10-5}	A^n_{11-5}	A^n_{12-5}	A^n_{13-5}	A^n_{14-5}	A^n_{15-5}	A^n_{16-5}	A^n_{17-5}	A^n_{18-5}	A^n_{20-5}	A^n_{21-5}	A^n_{22-5}	A^n_{23-5}	A^n_{24-5}																										N_{90-5}	N_{91-5}	N_{92-5}	N_{93-5}	N_{94-5}	N_{99-5}		Z_{5}
APPROPRIATION	60 Public corporations	R_{10-60}	R_{11-60}	R_{12-60}	R_{13-60}	R_{14-60}	R_{15-60}																											J_{71-60}			L_{77-60}	D_{78-60}	H_{79-60}									Z_{60}
	61 Corporate enterprises	R_{10-61}	R_{11-61}	R_{12-61}	R_{13-61}	R_{14-61}	R_{15-61}																											J_{71-61}			L_{77-61}	D_{78-61}	H_{79-61}									Z_{61}
	62 Financial institutions						R_{15-62}																											J_{71-62}			L_{77-62}	D_{78-62}	H_{79-62}									Z_{62}
	63 Individual entrepreneurs	R_{10-63}	R_{11-63}	R_{12-63}	R_{13-63}	R_{14-63}	R_{15-63}							W_{23-63}																				J_{71-63}		L_{73-63}	L_{77-63}	D_{78-63}	H_{79-63}									Z_{63}
	64 Persons							R_{16-64}	R_{17-64}					W_{23-64}																				J_{71-64}		L_{73-64}	L_{77-64}	D_{78-64}	H_{79-64}									Z_{64}
	65 General Government									R_{18-65}				W_{23-65}							W'_{3-65}												I_{70-65}	J_{71-65}			L_{77-65}	D_{78-65}	H_{79-65}									Z_{65}
	66 Social security																																	J_{71-66}	K_{72-66}		L_{77-66}	D_{78-66}	H_{79-66}									Z_{66}
	67 French Overseas Union										T_{20-67}	T_{21-67}	T_{22-67}	T_{23-67}	T_{24-67}	T_{25-67}	T_{26-67}	T_{27-67}	T_{28-67}	T_{29-67}														J_{71-67}		L_{73-67}	L_{77-67}	D_{78-67}	H_{79-67}									Z_{67}
	68 Rest of the world										T_{20-68}	T_{21-68}	T_{22-68}	T_{23-68}	T_{24-68}	T_{25-68}	T_{26-68}	T_{27-68}	T_{28-68}	T_{29-68}														J_{71-68}		L_{73-68}	L_{77-68}	D_{78-68}	H_{79-68}									Z_{68}
TRANSFERS	70 Taxes	I_{10-70}	I_{11-70}	I_{12-70}	I_{13-70}	I_{14-70}	I_{15-70}	I_{16-70}	I_{17-70}	I_{18-70}														I_{60-70}	I_{61-70}	I_{62-70}	I_{63-70}	I_{64-70}	I_{65-70}	I_{66-70}	I_{67-70}	I_{68-70}																Z_{70}
	71 Subsidies																												J_{65-71}																			Z_{71}
	72 Social contributions	K_{10-72}	K_{11-72}	K_{12-72}	K_{13-72}	K_{14-72}	K_{15-72}	K_{16-72}	K_{17-72}	K_{18-72}																	K_{63-72}	K_{64-72}	K_{65-72}	K_{66-72}	K_{67-72}	K_{68-72}																Z_{72}
	73 Social benefits																													L_{66-73}																		Z_{73}
	77 Insurance claims						L_{15-77}																	L_{60-77}	L_{61-77}	L_{62-77}	L_{63-77}	L_{64-77}	L_{65-77}	L_{66-77}	L_{67-77}	L_{68-77}																Z_{77}
	78 Dividends																							D_{60-78}	D_{61-78}	D_{62-78}	D_{63-78}				D_{67-78}	D_{68-78}																Z_{78}
	79 Other transfers	K_{10-72}	K_{11-72}	K_{12-72}	K_{13-72}	K_{14-72}	K_{15-72}	K_{16-72}	K_{17-72}	K_{18-72}														H_{60-79}	H_{61-79}	H_{62-79}	H_{63-79}	H_{64-79}	H_{65-79}	H_{66-79}	H_{67-79}	H_{68-79}																Z_{79}
	8 Financial transactions																							O_{60-8}	O_{61-8}	O_{62-8}	O_{63-8}	O_{64-8}	O_{65-8}	O_{66-8}	O_{67-8}	O_{68-8}																Z_{8}
CAPITAL	90 Agriculture													U_{23-90}	U_{24-90}									F_{60-90}	F_{61-90}		F_{63-90}																					Z_{90}
	91 Food industries													U_{23-91}	U_{24-91}									F_{60-91}	F_{61-91}		F_{63-91}																					Z_{91}
	92 Mining and energy													U_{23-92}	U_{24-92}									F_{60-92}	F_{61-92}		F_{63-92}																					Z_{92}
	93 Manufacturing													U_{23-93}	U_{24-93}									F_{60-93}	F_{61-93}		F_{63-93}																					Z_{93}
	94 Construction, Public Works													U_{23-94}	U_{24-94}									F_{60-94}	F_{61-94}		F_{63-94}																					Z_{94}
	99 Others													U_{23-99}	U_{24-99}									F_{60-99}	F_{61-99}	F_{62-99}	F_{63-99}	F_{64-99}																				Z_{99}
	00 Adjustment																																															Z_{00}
	TOTAL	Z_{10}	Z_{11}	Z_{12}	Z_{13}	Z_{14}	Z_{15}	Z_{16}	Z_{17}	Z_{18}	Z_{20}	Z_{21}	Z_{22}	Z_{23}	Z_{24}	Z_{25}	Z_{26}	Z_{27}	Z_{28}	Z_{29}	Z_{3}	Z_{4}	Z_{5}	Z_{60}	Z_{61}	Z_{62}	Z_{63}	Z_{64}	Z_{65}	Z_{66}	Z_{67}	Z_{68}	Z_{70}	Z_{71}	Z_{72}	Z_{73}	Z_{77}	Z_{78}	Z_{79}	Z_{8}	Z_{90}	Z_{91}	Z_{92}	Z_{93}	Z_{94}	Z_{99}	Z_{00}	Z

cont'd

Box 11 (cont'd)

Short reading guide. Annex No. 5 of the "Principles" analyses the entries in the table (p. 819).

For groups of products (20 to 29), the "operations" accounts represent in columns the sales of the producer sectors (intersection [×] with rows 10 to 18), inventories at the beginning of the period (× with row 5), imports (× with rows 67 and 68), disposals of second-hand consumption goods (× with rows 63 to 65), and disposals of equipment (× with rows 90 to 99). On the corresponding rows (20 to 29) one finds: the current operating purchases by the producer sectors (× with columns 10 to 18), inventories at the end of the period (× with column 5), consumption purchases by the social groups (× with columns 63 to 66), exports (× with columns 67 and 68), and purchases of equipment (× with columns 90 to 99). It should be noticed that here employees are considered as a producer sector and the public administrative sector as a final consumer.

"Operations" in kind are presented separately, on rows and columns 3 to 5. Inventories at the beginning and the end of the period are on row 5 (× with columns 10 to 18) and in column 5 (× with rows 10 to 18). The entry "Disposals" corresponds to own account output (column 4 × rows 10 to 18), which is broken down into its intermediary uses (× with columns 10 to 18), own account final consumption (× with columns 63 and 64) and output of own-account equipment (× with columns 90 to 99).

Other accounts can also be read then. The operating accounts of the producer sectors are balanced by their respective gross operating surplus R that enters into the appropriation account of the different social groups (columns 10 to 18 × rows 60 to 65). As the net balance of financial "operations" performed by the social groups is shown in their appropriation account (row 8 × columns 60 to 68), at the same time, the balance of this account gives for each group the financing of equipment and inventories of the various producer sectors (transaction F, columns 60 to 64 × rows 90 to 99). The capital accounts of the latter (columns and rows 90 to 99) are thus simultaneously balanced.

Box 12

From Copeland's *moneyflows accounts* to the *flow-of-funds accounts* of the Federal Reserve Board

In 1944, following Wesley C. Mitchell's suggestion, Copeland was invited by the NBER to begin an exploratory study of moneyflows in the USA. He presented the direction of his work in a 1949 paper, "Social Accounting for Moneyflows" [after a first paper two years earlier, "Tracing money flows through the United States economy" (*American Economic Review*, May 1947).

In this text (reprinted also in *Flow-of-Funds Analysis*, pp. 7–18), Copeland is interested in moneyflows, in principle on a strict cash basis. Some exceptions are nevertheless needed for expediency – in the households case that he analyses in the text – regarding credit sales and installments to contractors that are entered at the time the customer is charged in the books of the seller or construction contractor. The idea is to describe the flows that will later be called "non financial" (wages, dividends, taxes, etc.) using the corresponding payments/receipts during a given period. They are therefore entered at the time of settlement. In addition to gross money flows, the financial statement of a sector includes the situation of its assets and liabilities. The difference between the advanced funds and the funds obtained during a certain period of time, in principle, equates to the difference between ordinary receipts of money and ordinary expenditures of money.

On this basis, national accounting (Copeland uses "social accounting") rests on a quadruple-entry system because all payments or credit flows go from one transactor to another and for the same amount. Copeland contrasts this approach to the national income one that could be summarized by only one balanced account.

Copeland's initiative was strongly supported by the Federal Reserve Board (the Fed). When the project was near its publication (*A Study of the Moneyflows in the United States*, NBER, 1952), there was a "passing of the torch", as the Fed decided to absorb the Copeland staff and to continue the studies on moneyflows as an ongoing activity. Dan Brill, formerly Copeland's principal assistant, headed the group.

Stephen P. Taylor, for many years director of the Flow-of-Funds Section of the Federal Reserve Board, described the process that followed in "From money-flows accounts to flow-of-funds accounts" (1991), reprinted in *Flow-of-Funds Analysis* (1996, pp. 101–108).

During the 1950s, the system was gradually transformed from Copeland's moneyflows structure to something that connects differently to other statistical systems and differs in analytic approach. "It was not clear what Copeland thought of these transformations, but I cannot believe that he approved them all." writes Taylor (*ibid*, p. 102).

In the first half of the aforementioned decade, although they experiment with certain changes, the Fed moneyflows stay close to Copeland's main idea. "[...] particularly in including only actual, arm's-length transaction between separate parties, both non financial and financial. This requirement meant consolidated statements for governments, banking, and business, and it meant excluding from the system all the imputed items that are created in income-and-product accounting to gather into the total forms of production and income that are not reflected in transactions. It also meant excluding claims on life insurance reserves and pension reserves and a variety of accruals that accountants write into company books" (*ibid*, p. 102).

This meant that in the short-term financial projections initiated by the Fed in 1952, a very sizeable amount of preliminary work went into expunging all the imputations not explicitly identified from income and output projections.

This phase of the work at the Fed leads to the publication in 1955 of a full set of accounts, by sector and transaction type, covering the 1939–1953 period. This book "inaugurated the change of name from 'moneyflows' to 'flow-of-funds' to get away from the confusion with money stock movements that bothered many readers of Copeland and to use instead a term common in business accounting." (*ibid*, p. 103).

cont'd

Box 12 (cont'd)

In the second half of the 1950s the Fed efforts are mainly concentrated on the development of quarterly accounts, published in 1959. The flow-of-funds drifts progressively away from Copeland's conception because of practical reasons (difficulty to expunge quarterly series of amounts imputed on an annual basis) as well as conceptual reasons (focus of the analysis on the relationship between saving and investment). NIPA imputations are no longer eliminated. Non-financial transactions based on payments disappear (wages paid and received, interest paid and received, etc.) and are replaced by concepts (consumer income and consumption, business profits and investment, etc.) based directly on NIPA aggregates (*ibid*, pp. 104–105).

Thus Copeland's idea of an alternative accounting system based exclusively on actual payments/receipts flows disappear. The Fed's flow-of-funds tend to become financial accounts of a classical type. However, their integration with the NIPA will not be achieved without difficulties. Even after 1965, when they are considered as almost integrated, some differences remain with the NIPA (for instance, the treatment given to the purchase of durable goods as capital formation by households).

4.1. Tables of financial transactions

At first, the SEEF gives priority to the financial part of its project with Jean Denizet, and later Serge Barthélemy. As early as 1954, summary tables of financial transactions for 1951 to 1954 (with estimated data for the latter) are published. The tables are very detailed for transactions and financial intermediary transactors (including the Treasury). However, enterprises and persons are grouped, as well as all the agencies of general government (different from the Treasury). The tables are presented in resource-and-use form and not as changes in assets or liabilities. For instance, the incurrence of a loan is recorded as a resource (of financial means), and its repayment is registered as a use (of financial means). In terms of assets and liabilities, both transactions will be recorded on the liabilities side (first as an increase and then as a reduction in liabilities). The idea is to keep the presentation homogeneous for all the sequence of accounts, financial and non-financial. Transactions between non-financial transactors and financial intermediaries, between non-financial transactors themselves, and between intermediaries are carefully distinguished. A table of investment financing, for each sector activity and each large public enterprise, is included for the years 1952 and 1954. Enterprises and households are not separated until the following publication (1955).

The structure of the tables of financial transactions is profoundly transformed in 1960. They are not shown as resource and use anymore, but as changes in liabilities and assets (differential balance sheets). The classification of financial transactions is completely modified: it is less detailed but more homogeneous; it classifies financial assets by decreasing liquidity and then by debtor type. Collections and redemptions of bonds and long-term loans are distinguished from issuances and new loans. The technical detail of the relations among financial intermediaries, considered as non-essential for economic accounting, disappears and is replaced by a single item "deposits, bills and advances among intermediaries" distinguishing only the Treasury and the banking system.

Box 13

Main steps followed by the former French National Accounting (1950–1975)

Year	Organization	Accounting Framework	Production of Goods and Services	Enterprises Account	Household Account	Financial Transactions Table	"Tableau économique d'ensemble"
1950	Creation of the SEEF (de facto)	Gruson's note					
1952	Creation of the Accounts and Economic Budgets Commission	"Principles" – micro accounting – macro accounting – "Tableau économique élémentaire"					Square table of the "Principles"
1953		Note on "Methods for Economic Budgets"					
1954			Start of work on the preparation of the 1951 "Tableau économique"			Summary tables of financial transactions (TROF) 1951 to 1954	
1955		Accounts 1949–1955 Volume II Méthodes "semi-global framework" (1952 benchmark, prices years n and n_0 1952)	10 categories for goods and services, without interindustrial exchanges table	Presented in several legal categories	Global	Financial Transactions Table (TOF) Separation enterprises/households	"Tableau économique d'ensemble" (TEE) (First Version)
1957		1951 "Tableau économique" ("butcher's operation")	Purchases and sales (112 sectors × 157 products)	37 sectors × 3 legal categories (internally 60 sectors)	Complete appropriation accounts for 12 socio-professional categories		
1960		Accounts 1956–1959 (series 1949–1959) Volume II, "Les méthodes" (base 1956)	Interindustrial exchanges table (TEI) (1956) Leontief type (65 branches and in fact balances for 421 products) Yearly compilation of TEI but published only in base years Goods and services prices n and n_0 (1956) but also $n-1$ prices for internal uses		Complete appropriation accounts 1956 for 6 socio-professional categories		

cont'd

Box 13 (cont'd)

Year	Organization	Accounting Framework	Production of Goods and Services	Enterprises Account	Household Account	Financial Transactions Table	"Tableau économique d'ensemble"
1961	Transfer of Tables of Financial Transactions to Banque de France						
1962	Transfer of National Accounting to INSEE with collaboration from SEEF/DP, Banque de France, Public Accounting Directorate						
1965							TEE (Final version)
1966		Methods for Base 1959 (many secondary modifications)	Publication of Interindustrial Exchanges Table 1959 Publication of goods and services at *n* and 1959 prices		Household resources by socio-professional category for 1962		
1969		Base 1962 (some slight modifications)	Yearly publication of Interindustrial Exchanges Tables at *n*, *n* – 1 and 1962 prices Substantial transformation of methods	First publication of yearly series 29 sectors 1959–1966, then yearly publication (except 1970)			
1971					Household resources by socio-professional category for 1965	Relinquishment of the breakdown of changes in assets between individual entrepreneurs and households	
1975					Household resources by socio-professional category for 1970		

The *Banque de France* takes responsibility for the non-provisional tables of financial transactions (TOF) in 1962. The provisory ones remain the responsibility of the SEEF and later pass to the *Direction de la Prévision* (Directorate of Economic Forecasting).

4.2. Production and goods and services

The SEEF enters into a long-term investment concerning the "opérations" on goods and services. In 1954, activities are launched to prepare a "Tableau économique" [Economic Table] for 1951 (Pierre Echard, André Hamaide), an enormous task, designated in common parlance at the SEEF as "the butcher's operation", that brings together a good number of government units and organizations of employees. The *Tableau économique de l'année 1951* [1951 Economic Table] published by SEEF–INSEE in 1957 has the characteristics of a prototype and goes (on purpose) into details far beyond the possibilities offered by the quality of the data sources used. It is a direct result of the accounting theory described in the "Principles" of 1952. The enterprise is the statistical unit used to study production and inter-industrial relations.

Operating accounts are constructed for enterprises classified in 112 sectors, detailing their current sales and purchases for 157 groups of goods and services. Transactions accounts (dummy accounts) show for each of these groups the sales and purchases of the different economic entities. Operating accounts and transactions accounts are grouped so as to give a provisional form, which would remain unique, to the tables of inter-industrial exchanges built according to the "Principles" of 1952. Instead of only one table of Leontief's type, with a close correspondence between units of homogeneous production and products, there are two. The first one, for purchases of sectors by product (and purchases of other economic entities and the rest of the world), also shows the other elements of the sectors operating accounts. The other presents mainly the sales of sectors by product (including the secondary output of its activity) and imports.

The "Tableau économique" for 1951 had a rather institutional conception, close to business accounting. It was a good descriptive device, but its use in projections based on the technical relationship between output and the corresponding intermediate consumption was unsatisfactory. The SEEF, under the pressure of the preparation of National Plans, was led to return to a classical Leontief point of view, and established operating accounts by branches that are technically homogeneous with a tight relationship between branches and products. After an internal exercise for 1954, based on a projection/first transformation of the 1951 table, using heroic assumptions, the table of inter-industrial exchanges (in French TEI) for 1956, published in 1960, was of Leontief's type.

Established on a yearly basis since then, but first disseminated only for the benchmark years 1956 and 1959, TEI's are published every year, after the benchmark 1962 (publication in 1969), at the three price systems used since the 1956 table, that is current prices, previous-year prices and fixed base-year prices. The 1959 table, which did not show major differences with that for 1956, has several appendices (tables showing for each item its contents in imports and indirect taxes). A substantial change of methodology characterizes the 1962 table: intensive use of enterprises data derived from tax sources and industrial censuses, cross-classification between sectors, and homogeneous branches for sales of products and derivation of output. However, it is only in the tables corresponding to the benchmark year 1980 that the operating accounts by homogeneous branches are introduced (first publication in 1987).

In fact, the French statistical system does not use the establishment as a statistical unit for the description of the production system (with the exception of employment), and will never provide the statistical base which is required for a completely satisfactory compilation of intermediate consumption tables that could have been built from the observation of groupings of establishments (or proxy units). The duality existing between data sources on enterprises and sources on products, already backing the 1951 table (a theoretical choice of those days), has remained. Luckily, radical improvements in statistics have been made, although a poor assessment of intermediate purchases remains. Questions concerning input purchases within the yearly enterprise survey have only an intermittent life.

In the French experience, the TEI (later called "Tableau Entrée–Sortie", TES, or input–output table) is totally integrated into the national accounts. However the prevailing concern of input–output specialists for the study of technical relationships has left the forefront. Emphasis is put on very detailed balances between supply and use for several hundreds of goods and services. In this context, the intermediate consumption table for homogeneous branches is more a device useful for checking the general consistency of the goods and services accounts than a way to precisely observe the evolution of technical coefficients. This doctrine tries to get the best out of an uncomfortable situation and provides a set of weights useful for different purposes.

4.3. "Tableau économique d'ensemble" [Overall Economic Account]

The representation of production very rapidly becomes functional (homogeneous branches replacing sectors of enterprises). However, the importance attached by the "Principles" to the analysis of the behavior of economic agents, understood as decision centers, remains. Even before the formal conception of the new system, it has a strong influence on the SEEF's early work, which is characterized by the detailed study of general government and of the transactions of financial intermediaries (1949 accounts presented, with 82 annexes, to the recently created "Commission des comptes et des budgets économiques de la Nation" [Commission for accounts and economic budgets of the nation], in February 1952). On the "Commision des comptes", see chapter 10.

With the publication of a new series of accounts at the end of 1955 based on a new benchmark year (1952) (Volume I, *Rapport et comptes 1949–1955*; Volume II, *Méthodes*), the presentation becomes more homogeneous. The "Tableau économique d'ensemble" [Overall Economic Account] (TEE) makes its appearance.

The dense style of earlier presentations becomes clearer. SEEF gives up its intention to present the synthesis of the accounts in the square table of the 1952 "Principles", as that format is not well adapted for publication. The TEE, presented as a summary of the square table, systematically cross-classifies, in rows, "opérations" and balancing items with, in columns, economic agents and their sub-accounts; in practice, however, the operating accounts start with value added and not with output. The TEE has two parts, with uses (replacing the term debit) on the left, and resources (the term credit is not used anymore) on the right. Instead of one square matrix of order m (m covering at the same time accounts of sectors of economic activity, products, social groups, transfers, financial transactions) as in the 1952 theoretical scheme, there are two juxtaposed matrices of order $m \times (n \times c)$ (m transactions categories and balancing items, n types of transactors, c classes of accounts, although not all of them exist for all transactors).

The presentation in the Tableau économique d'ensemble format, whose name obviously evokes Quesnay, has its roots in earlier French studies (*Point Economique*, No. 5 of 1945 on year 1945, 1938 accounts in the March–April 1947 issue, 1949 accounts in a 1952 issue). Froment's influence is noteworthy. Its simplicity and elegance are the result of the systematization efforts undertaken following the "Principles" of 1952 and of the idea of dummy accounts that they introduced (Blanc). In 1949, Aukrust proposes the idea of a similar cross-classified presentation – without the dummy account notion; a similar idea is later adopted in the British accounts but is abandoned in 1957. Stone will introduce the idea of dummy accounts, though never adopting an integrated presentation of the TEE type. Moreover, he will search for a more general approach including a unique matrix, with only one row and one column for each account (the same principle as in the 1952 square table).

For twenty years the TEE will undergo only minor modifications. From the 1965 publication on, financial transactions are included using an aggregated classification. Concerning other transactions, the most significant change is the adoption, in 1960, of the expression "opérations de répartition" [distributive transactions] instead of the ambiguous term "transfers" (see chapter 6). The 1960 publication distinguishes a financial account from a capital account, and the non-financial accounts of enterprises separate non-financial enterprises from financial institutions. Previously, this distinction had only been made in the table of financial transactions.

Box 14 presents a numerical example of the TEE, taken from the former CNF, in the format used until the introduction of the SECN (see chapter 3).

4.4. Enterprise accounts

An essential target of the 1952 "Principles" was to deepen the analysis of non-financial enterprises and households. Originally, a similar importance was attached to the study of these two groupings of entities, but in practice they experienced uneven development. The 1951 "Tableau économique" is very ambitious. Appropriation and capital accounts (the latter including financial transactions), for sectors of enterprises classified according to their main activity, were published in thirty-seven sectors (almost sixty for internal work purposes) and three legal categories (private corporations, nationalized companies, unincorporated enterprises). Appropriation accounts for households were presented for twelve socio-professional categories and their consumption expenditures analyzed in great detail (by function, by product, by consumption unit, with numerous cross-classifications).

Back to the non-financial enterprises: there is a new publication in 1956, from operating accounts to financial accounts, detailed in twenty-seven sectors and three legal categories. From then on, the sectors accounts are compiled almost every year but still experimental in character. Lags in the schedules for their elaboration prevent narrowing the differences in evolution for the global elements taken from sectors and those taken from branches. The series remain unofficial and for internal use. 1969 (1962 benchmark) sees the first publication of a yearly series of accounts (1959–1966) for twenty-nine sectors, and its consistency with the goods and services accounts is verified for the main elements. The enterprises accounts by sector of activity are henceforth regularly integrated in the French national accounts (with the exception of 1970). Nevertheless, no intent to establish financial accounts by sector has been kept: the available information is not sufficient to systematize former heroic attempts, and the occasional intents to produce "financing tables" remain for internal use only.

4.5. Household accounts

The detailed analysis of household accounts by socio-professional category (CSP) will be more difficult and will remain more limited. The ambitious experimental table of 1951 is based essentially on the establishment of a cross-classified demographic table consisting of twelve socio-professional categories in which the population is classified according to the CSP of the head of the household and the individual CSP of its members. The 1956 work is also based on a sample survey of incomes as declared to the internal revenue service, which studies the combination of types of income within a household, and on a survey of family budgets. It leads in 1960 to the publication of a complete appropriation account

Box 14

The "Tableau économique d'ensemble" [Overall Economic Account] for 1959

Million Francs

USES

		1. Non financial enterprises			2. Households			3.General Government		4.Financial Institutions		51. Rest of the world	52. O.T.	Total
		Operating	Appropriation	Capital *and Financial*	Operating	Appropriation	Capital *and Financial*	Appropriation	Capital *and Financial*	Appropriation	Capital *and Financial*			
	Transactions in Goods and Services													
6a.	Gross domestic product	//	//	//	//	//	//	//	//	//	//	//	//	//
6b.	Consumption	//	//	//	//	167,627	//	11,093	//	1,150	//	//	//	**179,870**
6c.	Gross fixed capital formation	//	//	35,001	//	//	9,640	//	5,981	//	210	//	//	**50,832**
6d.	Changes in inventoriesand other transact.	//	//	1,811	//	//	–193	//	193	//	//	//	//	**1,811**
6e.	Exports	//	//	//	//	//	//	//	//	//	//	20,101	8,930	**29,031**
6f.	External balance of services	//	//	//	//	//	//	//	//	//	//	2,245	1,459	**3,704**
6g.	Imports	//	//	//	//	//	//	//	//	//	//	//	//	//
	Total 6 – Transactions in goods and services	//	//	**36,812**	//	**167,627**	**9,447**	**11,093**	**6,174**	**1,150**	**210**	**22,346**	**10,389**	**265,248**
	Distributive transactions													
70.	Compensation of employees	88,106	//	//	//	4,209	//	17,375	//	3,066	//	//	//	**112,756**
71.	Social benefits	1,450	//	//	//	//	//	30,310	//	20	//	//	//	**31,780**
72.	Interest, dividends andland rent	7,052	5,730	//	930	200	//	3,125	//	2,215	//	827	330	**20,409**
73.	Taxes	42,122	5,796	//	1,054	10,720	//	417	//	2,046	//	//	//	**62,155**
74.	Transfers	393	//	//	//	//	//	20,547	//	//	//	308	//	**21,248**
75.	Insurance	2,025	//	//	70	1.526	680	34	//	20	//	240	190	**4,785**
76.	External expenses and receipts	//	//	//	//	1.682	//	10,351	//	290	//	3,035	2,264	**17,622**
77.	Other distributive transactions	1,285	//	//	//	3,390	//	253	//	19	//	622	137	**5,706**
78.	Individual entrepreneurs gross income	//	65,018	//	//	//	//	//	//	//	//	//	//	**65,018**
79.	Capital formation financing by individual entrepreneurs	//	//	//	//	//	4,870	//	//	//	//	//	//	**4,870**
	Total 7 – Distributive transactions	**142,433**	**76,544**	//	**2,054**	**21,727**	**5,550**	**82,412**	//	**7,676**	//	**5,032**	**2,921**	**346,349**
	Financial Transactions													
9a.	Money	//	//	*2,890*	//	//	*5,519*	//	*380*	//	*370*	//	//	*9,159*
9b.	Other investments and emissions	//	//	*5.570*	//	//	*7,412*	//	*688*	//	*3.007*	*660*	*1,018*	*18,355*
9c.	Short term credits	//	//	*23*	//	//	*–60*	//	*854*	//	*3,895*	*10*	*90*	*4,812*
9d.	Other loans	//	//	*80*	//	//	//	//	*8,423*	//	*9,240*	*1,488*	//	*19,231*
9e.	Gold and foreign currency	//	//	//	//	//	*–320*	//	*–38*	//	*2,302*	*–1,069*	*150*	*1,025*
9f.	Deposits, bonds and advances among financial intermediaries	//	//	//	//	//	//	//	*189*	//	*1.987*	//	//	*2,176*
	Total 9 – Financial transactions	//	//	***8,563***	//	//	***12,551***	//	***10,496***	//	***20,801***	***1,089***	***1,258***	***54,758***
	Balancing items													
8e.	Gross operating surplus	92,277	//	//	6,966	//	//	//	//	//	//	//	//	**99,243**
8a.	Gross saving	//	21,749	//	//	21,037	//	7,083	//	2,567	//	//	//	**52,436**
8c.	Net lending	//	//	//	//	//	6,040	//	909	//	3,037	//	2,920	12,906
8c'.	Net borrowing	//	//	*10.193*	//	//	//	//	//	//	//	*2.713*	//	*12,906*
0.	Adjustment	//	//	*98*	//	//	//	//	*323*	//	*20*	*556*	*3,039*	*4,036*
	Overall total	**234,710**	**98,293**	**55,666**	**9,020**	**210,391**	**33,588**	**100,588**	**17,902**	**11,393**	**24,068**	**31,736**	**20,527**	**847,882**

SUPPLY

	1. Non financial enterprises			2. Households			3.General Government		4.Financial Institutions		51. Rest of the world	52. O.T.	Total	Line no.
	Operating	Appropriation	Capital *and Financial*	Operating	Appropriation	Capital *and Financial*	Appropriation	Capital *and Financial*	Appropriation	Capital *and Financial*				
Transactions in Goods and Services														
Gross domestic product	229,939	//	//	9,020	//	//	//	//	//	//	//	//	**238,959**	6a
Consumption	//	//	//	//	//	//	//	//	//	//	//	//	//	6b
Gross fixed capital formation	//	//	//	//	//	//	//	//	//	//	//	//	//	6c
Changes in inventoriesand other transact.	//	//	//	//	//	//	//	//	//	//	//	//	//	6d
Exports	//	//	//	//	//	//	//	//	//	//	//	//	//	6e
External balance of services	//	//	//	//	//	//	//	//	//	//	//	//	//	6f
Imports	//	//	//	//	//	//	//	//	//	//	20,337	5,952	**26,289**	6g
Total 6 – Transactions in goods and services	**229,939**	//	//	**9,020**	//	//	//	//	//	//	**20,337**	**5,952**	**265,248**	
Distributive transactions														
Compensation of employees	//	//	//	//	85,835	//	26,921	//	//	//	//	//	112,756	70
Social benefits	//	//	//	//	31,780	//	//	//	//	//	//	//	31,780	71
Interest, dividends andland rent	//	3,005	//	//	7,959	//	1,597	//	7,368		430	50	20,409	72
Taxes	234	//	//	//	//	//	61,921	//	//	//	//	//	62,155	73
Transfers	4,164	3,011	//	//	7,657	//	5,933	//	20	//	418	45	21,248	74
Insurance	//	//	//	//	//	//	//	//	4,005	680	100		4,785	75
External expenses and receipts	//	//	//	//	4,549	//	750	//	//	//	2,507	9,816	17,622	76
Other distributive transactions	373	//	//	//	627	//	3,466	//	//	//	873	367	5,706	77
Individual entrepreneurs gross income	//	//	//	//	65,018	//	//	//	//	//	//	//	65,018	78
Capital formation financing by individual entrepreneurs	//	//	4,870	//	//	//	//	//	//	//	//	//	4,870	79
Total 7 – Distributive transactions	**4,771**	**6,016**	**4,870**	//	**203,425**	//	**100,588**	//	**11,393**	**680**	**4,328**	**10,278**	**346,349**	
Financial Transactions														
Money	//	//	//	//	//	//	//	*1,703*	//	*7,456*	//	//	*9,159*	9a
Other investments and emissions	//	//	*5,284*	//	//	//	//	*4.529*	//	*8,712*	*–760*	*590*	*18,355*	9b
Short term credits	//	//	*4,486*	//	//	*357*	//	*–149*	//	//	*118*	//	*4,812*	9c
Other loans	//	//	*9.084*	//	//	*2.118*	//	*1,840*	//	*4,192*	*1,210*	*787*	*19,231*	9d
Gold and foreign currency	//	//	//	//	//	//	//	//	//	*–2,765*	*3,790*	//	*1,025*	9e
Deposits, bonds and advances among financial intermediaries	//	//	//	//	//	//	//	*1.987*	//	*189*	//	//	*2,176*	9f
Total 9 – Financial transactions	//	//	***18,854***	//	//	***2,475***	//	***9,910***	//	***17,784***	***4,358***	***1,377***	***54,758***	
Balancing items														
Gross operating surplus	//	92,277	//	//	6,966	//	//	//	//	//	//	//	**99,243**	8e
Gross saving	//	//	21,749	//	//	21,037	//	7,083	//	2,567	//	//	**52,436**	8a
Net lending	//	//	//	//	//	*6.040*	//	*909*	//	*3,037*	//	*2,920*	***12,906***	8c
Net borrowing	//	//	10,193	//	//	//	//	//	//	//	2,713	//	**12,906**	8c'
Adjustment	//	//	//	//	//	*4.036*	//	//	//	//	//	//	***4,036***	0
Overall total	**234,710**	**98,293**	**55,666**	**9,020**	**210,391**	**33,588**	**100,588**	**17,902**	**11,393**	**24,068**	**31,736**	**20,527**	**847,882**	

Note: Because of technical reasons the capital account and the financial account are shown in the same column. The latter are identified by the use of italics. O.T. Overseas territories.

cont'd

Box 14 (cont'd)

The evolution of the "Tableau économique d'ensemble" (TEE) [Overall Economic Account] is presented in the main text of this chapter, pp. 70ff. For related ideas, mainly about the United Kingdom, see Box 7. The antecedents of the TEE and its influence on the presentation of the Integrated Economic Accounts adopted in the 1993 SNA/1995 ESA, are elaborated in chapter 3, Box 21.

The structure of the TEE of the former CNF is simple; it is presented here in its final version before the changeover to SECN in the middle of the 1970s. Economic agents are presented in columns with their sub-accounts, with their uses on the left-hand side of the table and their resources on the right. Rows represent "operations", grouped in three main categories, as well as the balancing items. It can be read in the following manner: the operating account of non-financial enterprises consists mostly of: resources, gross domestic output (229,939), transfers (subsidies, 4,164) and some other items; in uses, compensation of employees (wages and social contributions, 88,106), direct social benefits (1,450), etc. Its balancing item, gross operating surplus (92,777), is shown again on the right-hand side in the next sub-account, the appropriation account. The goods and services account is balanced against their total amount (Total 6). The account of each type of distributive or financial operation is balanced in the corresponding row. For instance, for interest, dividends and farm rents (total 20,409), the left-hand side shows which entities pay such items in their accounts, and the right-hand side shows the entities that receive them.

Source: "Les comptes de la nation de 1964" [The accounts of the nation 1964], *Etudes et Conjoncture*, no. 7, July 1965, pp. 200–201.

for six CSPs, showing *in fine* their gross saving (see Box 15). The survey on income tax returns is repeated in 1962, in 1965 and then every five years.

However, from the 1962 account onward, only the resource part of the household account is shown by CSP. Biases in the answers of some CSPs to the family budget survey that strongly underestimate their consumption lead to unrealistic levels of saving. Therefore, even limited to the breakdown according to CSP of household accounts first compiled in global terms, the CNF ambition of social analysis is only partly successful on the income side of the accounts. Even so, they are very useful and their results will be widely discussed. (In anticipation, note that these studies will continue until the mid-1980s [1979 incomes] and are then interrupted. Their resumption, envisaged at the beginning of 1995 ESA, will not occur before the end of the century.)

On the treatment of unincorporated enterprises, the CNF will stray. Based on a critical review of the functional approach that splits them between the "productive" pole (enterprises) and the "consumption" pole (persons/households), the 1952 "Principles" anticipates that they will constitute a social group on their own, simultaneously producer and consumer, separated both from corporate enterprises and from persons.

As early as the 1955 publication, this point of view is abandoned because of the lack of adequate information, and because it is an obstacle to the adoption of a simplified framework. The unincorporated enterprises will be integrated with the other enterprises in all accounts. The households of entrepreneurs will be grouped with the others. The 1951 table (published in 1957) follows this principle. The gross operating surplus of unincorporated enterprises is completely assigned to households (as a consequence, and differently from Stone 1945, no undistributed income corresponds to them). A certain amount of investment financing by the individual entrepreneurs flows from the households' appropriation account to the enterprises' capital account (non-symmetrical recording, open to criticism). In this account, the unincorporated enterprises have all types of financial transactions, except investments in shares and other securities, because their allocation is deemed unfeasible. The approach is then globally functional, more for instance than in the British accounts. In 1960 (1956 benchmark), the investment financing by individual entrepreneurs remains part of the households' saving and becomes a use in their capital account. In 1969 (1962 benchmark), as the allocation of the changes in financial assets between unincorporated enterprises and households seems difficult in practical terms and hardly conceptually justified, it is suspended and everything remains in the households accounts. Only the changes in liabilities are kept with those of the enterprises. But, before that, it is Stone who will propose a more institutional solution!

Box 15

Household appropriation accounts according to their socio-economic category (France 1956)

The household appropriation account (France) for 1956 distributed among six socio-professional categories (CSP) is reproduced below. It is a curiosity, because the experience attempted by French National Accounting (see this chapter's text, at the end of section 4) seems to have been particular if not unique in national accounts offices. A similar approach, although within a somewhat different framework, will be later proposed in the context of "social accounting matrices". (See chapter 4).

Source: "Les comptes de la nation" (*Les comptes*, vol. I, *Statistiques et études financières*, supplément No. 140, August 1960, p. 1354). NF = New Francs (introduced at the beginning of 1960)

Household appropriation account by socio-professional category (million NF)

Classification number		0 Farmers	1 Agricultural employees	2 Owners of non-agricultural businesses	3 Managerial staff and professionals	4–8 Other employees	9 Not in labor force	Others[1]	**Total**
Uses									
6	*Transactions on goods and services*	*14,320*	*2,850*	*16,570*	*8,840*	*56,840*	*17,460*	*3,510*	*120,390*
6b	Consumption	14,320	2,850	16,570	8,840	56,840	17,460	3,510	120,390
7	*Distributive transactions*	*950*	*80*	*3,950*	*2,750*	*3,900*	*1,450*	*370*	*13,450*
70	Wages and social contributions	330	...	1,390	570	440	330	...	3,060
721	Interest	...	...	...	30	30	80	...	140
73d	Direct taxes	270	...	2,030	1,590	1,360	570	...	5,820
751	Non-life insurance	60	10	120	50	170	50	...	460
762	External receipts and expenses	20	...	230	450	1,170	150	370	2,390
77	Other distributive transactions	270	70	180	60	730	270	...	1,580
8a	*Gross saving*	*2,800*	*120*	*10,050*	*1,900*	*1,750*	*860*	...	*17,480*
Total uses		**18,070**	**3,050**	**30,570**	**13,490**	**62,490**	**19,770**	**3,880**	**151,320**
Resources									
7	*Distributive transactions*	*17,780*	*2,810*	*29,130*	*13,250*	*61,780*	*17,090*	*3,880*	*145,720*
701	Wages	1,540	1,650	1,910	7,700	43,630	4,430	1,130	61,990
71	Social security benefits	940	890	670	770	11,190	7,880	80	22,420
72	Interest and dividends	350	...	1,190	1,420	590	1,730	...	5,280
741	Social assistance benefits	420	210	300	80	2,150	1,010	530	4,700
744-5	Equipment grants and war damages	110	...	300	100	620	430	...	1,560
762	External receipts and expenses	...	...	...	50	560	...	2,140	2,750
77	Other distributive transactions	...	...	...	...	390	...	...	390
78	Individual entrepreneurs' gross income	14,420	60	24,760	3,130	2,650	1,610	...	46,630
8e	Gross operating surplus	*290*	*240*	*1,440*	*240*	*710*	*2,680*	...	*5,600*
Total resources		**18,070**	**3,050**	**30,570**	**13,490**	**62,490**	**19,770**	**3,880**	**151,320**
	Disposable income	17,120	2,970	26,620	10,740	58,590	18,320	3,510	137,870
	Disposable income per consumption unit (in NF)	3,337	2,346	7,520	9,056	4,086	3,159	...	4,298
	Disposable income per household (in NF)	9,672	5,812	17,866	22,271	9,454	5,406	...	9,969

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[1] Others: Non-residents and persons living in institutions.

5. Among the most advanced countries

In the mid-1960s, the CNF reaches an outstanding level of development, which places it among the most advanced countries. Nevertheless, it has been compelled to limit to a certain extent its initial ambition, concerning mainly the purity of the institutional approach, recognizing *de facto* that the opposition institutional/ functional had been initially slightly exaggerated. Although some weak points remain, in particular concerning the observation of intermediate consumption, it covers within a unique system all aspects of economic activity, still with the exception of holdings of capital. Abroad, input–output tables are frequently compiled, given the case, by particular institutions according to frameworks that are not totally integrated. In other cases the compilation only occurs every five or ten years and on these occasions the consistency with the national accounts is assured (for instance in the USA and in the United Kingdom). In a limited number of countries integrated Input–Output Tables (IOT), both at current and constant prices, are prepared annually (Denmark, Norway, the Netherlands). Undoubtedly, France is the only one at that time to begin the work with the elaboration of these data at previous year's prices.

A similar situation prevails on the financial side. The tables of financial transactions (flow-of-funds in the US terminology) are even less frequently produced than IOT's; in most central banks they correspond mainly to short-lived experiments. They are well developed and prepared annually by the Federal Reserve Board in the USA but are not consistent with BEA accounts before 1965, with certain gaps remaining, and differing estimates for the saving of sectors puzzling the analysts. In the United Kingdom they appear later (1961), and are less complete than in France. The financial accounts are disregarded in most of the countries where emphasis is made on IOT (Norway being partly the exception, as it published in 1956 the financial balances of the sectors without compiling financial transactions accounts; it will only compile the income accounts for institutional sectors by the mid-1980s.)

Economic agents accounts, that will very soon be called "institutional sectors", have received a stronger impetus here than anywhere else, in particular the accounts for enterprises, due to the existence of accounting standards and the access to income tax returns (and soon the existence of an "annual enterprises survey") which gradually permit an advanced micro/macro linkage using somewhat complex methods. The USA and the United Kingdom also use tax statistics but only aggregated ones. It is not possible to find anywhere else an equivalent of the "Tableau économique d'ensemble" [Overall Economic Account) (the United Kingdom gets close, but only temporarily), reflecting the rigorous conception of the accounting framework chosen.

However, France, apart from some experiments, does not compile quarterly accounts. These had been launched in the USA in the 1940s, in Norway in 1953 – those will be interrupted from 1970 to the mid-1980s – and in the United Kingdom in the 1950s (1957). France does not have long series either, as opposed to the case in the USA where they go back to 1929, in Norway (back to 1865) and in the Netherlands. In France, after some first attempts made by scholars, there are no regular assessments of stocks of fixed capital.

The development of national accounts is closely related to the intensity of their use. It is very strong in France, as well as in Norway and the Netherlands or, from a different perspective, in the USA and the United Kingdom. It also depends on the richness of the statistical information system, which at the same time it stimulates. In the 1960s this system really takes off in France, first at the INSEE and then elsewhere, making up for France's huge lost time and, among other things, bringing most of the statistical sources to the level of the CNF ambition.

In the mid-1960s, in the wake of the great wave of development and harmonization of the international framework, Norway, Sweden, Denmark, the Netherlands, the United Kingdom, France, the USA, Canada and India seem to have the most advanced systems of National Accounts (such an enumeration obviously involves the risk of unfairness).

Outlook

The fact that France developed an autonomous system should not give the idea, that, by comparison, other countries' accounts are necessarily homogeneous and comply strictly with the standardized system. With the exception of those countries that start from scratch and tend to follow the standards fairly closely, most of the countries that have accumulated their own experience apply evolving schemes presenting many particular features. Whether discussing accounting frameworks, classification of economic entities by sectors, or treatment of transactions, the particularities are numerous, and they can be quantitatively significant.

Great diversity in practice. Thus certain countries stress mainly GDP (sometimes called geographical product, as for instance in Norway), others stress GNP (the USA and the United Kingdom) that includes net income from factors (wages, interest, dividends, etc.) coming from abroad. The NIPA favor aggregates at market prices, and provide only national income at factor cost, while British accounts insist on aggregates at factor cost including GNP. The NIPA are singular, and will remain so for a long time (see chapter 3), as they classify all government expenditures in goods and services as current transactions, without any provision for fixed capital formation. Investment in housing constitutes both for the British system and for the French one a capital formation corresponding to the household sector; for the US system (and for the Standardised System) it constitutes a capital formation of the enterprise sector. The Americans – as do the Canadians or Indians, for instance – estimate complete production for banks using indirect methods (see chapter 4), while British national accounts only take into consideration the sale of services explicitly invoiced, which leads then to a negative value added.

So long as estimates for stocks of fixed capital do not exist, countries must use the depreciation charges which appear in business accounts, with (USA) or without (United Kingdom) adjustments, as it is not possible to use the replacement values (instead of original values) recommended by the Standardised System. This led the British national accounts, at the beginning of the 1950s, to present an aggregate called "National Income and Depreciation" and to refuse for a long time to compile estimates of net national income as requested in principle, which they considered unreliable until the introduction, in 1957, of a method of perpetual inventory type to calculate the consumption of fixed capital.

In addition to very noticeable differences such as those mentioned above, there are many others. They frequently concern marginal economic entities or flows, for which the criteria used in the definition of main categories apply only imperfectly. These gray areas see the proliferation of a diversity of solutions, for instance in the classification of certain receipts (taxes or provision of services? direct or indirect taxes?) or certain expenditures (current transfers or capital transfers?) of general government, or in the establishment of the borderline between intermediate outlays and capital outlays for enterprises (*what to do* with major repairs, for instance), or in the classification of certain non-autonomous public market units (in the enterprise sector? in the general government sector?) etc.

Furthermore, differences in the institutional settings of the countries contribute to the lack of direct comparability of the results of national accounts. The expenditures of the British national health system are included in the outlays of the general government; this differs from the situation in other countries where equivalent outlays are generally to be found in the household expenditures, be they under their direct responsibility or reimbursed by the social security system. Another example concerns the delimitation between market and non-market activities, mainly in the case of education; it is extremely variable and influences the measurement of public and private consumption expenditures.

Heterogeneity originating from the statistical sources and from the methods designed for their use, diverse in nature and with dissimilar levels of development also contributes to this situation.

Weak actual standardization. The great expansion of national accounts from the 1940s to the 1960s results in the production of a considerable amount of information, still used essentially within a national framework. At this stage, it is supported by the dissemination of the rather precise knowledge of its contents to its main users. The concepts of national accounting are widely popularized (see chapter 10). Nevertheless, it is difficult to use the national accounts of different countries together, an exercise that does not go beyond some aggregates, and even then is not free from pitfalls.

The standardization, launched at a very early stage, aims mainly at facilitating international utilizations of national accounts. As this has only an incentive value, it certainly reduces dispersion but does not bring in great homogeneity. It is not certain that the questionnaires of international agencies permit in general the gathering of national answers that fully comply with the recommendations of the 1952 System. It may seem paradoxical that France, by calculating the standardized aggregates on a supplementary basis and by publishing them annually together with the results of its own system, feels freer than many to assume a well-disciplined attitude! The OEEC secretariat and the IMF missions by direct contacts with the countries try, with varying success, to understand the real contents of the national accounts and to make them evolve.

Various explanatory reasons. The great diversity in national accounting in this period is the result of several important factors the effects of which are difficult to disentangle. The inherited tradition of calculating national income and the nature of the main statistical sources are combined, in the USA, in the United Kingdom, in Canada, etc., to favor the income approach; later and progressively the final expenditure approach has been added. In this context, the main interest is oriented towards the origin of factors' income by industry rather than to the analysis of the productive system itself.

On the other hand, this analysis is fundamental for the Scandinavian countries (to a lesser degree for Sweden), for the Netherlands and for France. The income information there is poor and/or its reliability considered low, whereas production information is relatively abundant, a recent phenomenon in France as a consequence of the war and of the mechanisms that were set up for the allocation of raw materials. In these countries, the need for reconstruction and growth confer an important role on incentive policies and indicative planning for specific productive sectors (see chapter 10). In this context, estimates of income will be based on detailed measurement of production and of transactions on goods and services. The income approach will occupy a subordinated position.

Financial accounts are developed very early in the USA and in France. In both cases, concerns for anti-inflationist monetary equilibrium are present; additionally in France, great attention is given to the analysis of investment financing, mainly for the recently expanding public market sector. Institutional considerations have an influence, as in both cases the idea of setting up these accounts does not come from central statistical agencies but from key economic policy centers (this is not the case for preliminary research in the USA where the NBER has on several occasions played the role of pioneer). Traditionally, statistical offices look at financial matters with caution, whereas central banks perceive these offices' involvement with suspicion. On the other hand, there is an important difference between France and the USA: the concern for integrating financial accounts and non-financial accounts appeared very early in France in the system elaborated at the beginning of the 1950s, while at the same time this is a secondary priority for the Fed (which does not have the responsibility of NIPA). This trend will be reversed in the following decade (see Box 12).

As time passes, experience spreads and approaches get mixed, although convergence remains partial. Countries that favored the income and expenditure approach experience the need to reinforce it by the analysis of production and supply and use of goods and services. The British accounts do it already by the end of the 1940s, the US accounts ten years later, but limited to the base years.

Norwegians develop accounts of financial assets and liabilities from 1956 on. At the beginning of the 1960s British accounts introduce a financial analysis, still incomplete, and focused on the public sector as a whole. Frequently these accounts bring about short-lived experiments in central banks, the benchmark being the Fed *flow-of-funds* rather than financial accounts integrated to a general system of national accounts.

Influences of economic theories also play a role in the explanation of certain choices. This is in particular the case for the USSR and her satellites in a context of political and ideological pressure (see chapter 3). In other countries things happen more subtly; for instance, Keynesian and classical – soon called neoclassical – influences got combined, in some cases with surprising results. Meade and Stone's declared preference for aggregates at factor cost should be related, without any doubt, to Keynes' vivid 1940 criticism of Clark for his conversion to measurement at market prices (see chapter 6). British accounts and Stone will for a long time stick to this uncomfortable position that Pigou did not assume. US national accounts compilers were attached then, as the English, to the pre-eminence of GNP, a measure of output associated with national factors of production – regardless of the place where they are employed –, over GDP, a measure of the value added by production units resident in the economy (see Box 19), but did not share their preference for aggregates at factor cost. They only accepted this method for national income after a British–Canadian–American meeting in 1940. For them, the use of market prices is the very heart of economic life. The 1952 Standardised System followed them and included GNP but only compiled at market prices. However, the treatment of the services provided by general government is going to trouble everyone (see chapters 3 and 6).

Annotated bibliography

The techno-political history of the emergence and development of French national accounting has been related to the history of planning and economic budgets and presented through interviews with twenty-six of their participants, in a non-academic book that is unclassifiable, partial, questionable and fascinating, and should frequently be taken *cum grano salis*, by François Fourquet, *Les comptes de la puissance, Histoire de la comptabilité nationale et du Plan* [The Accounts of Power, a History of National Accounting and of the Plan] (Ed. Recherches, coll. "Encres", 1980). Book I, *Des origines au bilan national* [From the Origins to the National Balance] and Book II, *Histoire intérieure du SEEF 1948–1961* [Internal History of SEEF 1948–1961] are those that refer most to national accounting (pp. 3 to 179). The transfer to INSEE is related in chapter 15 (pp. 259–274). Annexes 2 to 35 (pp. 388–423) give numerous references and some excerpts. Biographical notes of the twenty-six participants are also included.

The SEEF approach is presented, on-the-spot, in Charles Prou's book, *Méthodes de la Comptabilité Nationale Française* [Methods of French National

Accounting] (Armand Colin, 1956). But before comes the analysis of the French National Accounting precursors – Colson, Dugé de Bernonville, and in particular Vincent, Froment and the other statisticians of the Planning Office – and the role of Perroux and the Institut de Science Economique Appliquée (ISEA).

Subsequent developments are presented in the volume edited by Joëlle Affichard, *Pour une histoire de la statistique* [For a History of Statistics], volume 2: *Matériaux* [Materials] (Economica/INSEE, 1987) with articles by Georges Consolo, André Hamaide, Antoine Jeantet, Jacques Garagnon, Henri Le Port and Jean Bégué. For the latter, see his paper on surveys of income tax returns of households regarding household accounts by socio-professional category. The basic materials appear in the *Rapports sur les comptes de la Nation* [Reports on the Accounts of the Nation] (SEEF, Ministry of Finance; from 1963 onwards in INSEE's publications).

The 1948 Stone paper is *Social Accounting, Aggregation and Invariance*, University of Cambridge, Department of Applied Economics, Reprint Series No. 11, 1948.

The 1949 paper by Aukrust "On the theory of social accounting" (*The Review of Economic Studies*, vol. XVI(3), No. 41, 1949–1950), is a very interesting theoretical reflection. On the eve of the preparation of the Standardised System, he formulates a proposal of a national accounting system with a more general character than those of Stone (1945), Leontief or Frisch. Aukrust participated in the Cambridge research team that elaborated, under Stone's direction, the simplified system (1950); in 1994, he indicates with regret "None of us had the slightest influence on the outcome" (*The Accounts of Nations*, p. 59, note 43).

The first international standardized system has been analyzed using the OEEC publication: *A Standardised System of National Accounts* (1952).

The volume edited by John C. Dawson, *Flow-of-Funds Analysis, A Handbook for Practitioners* (M.E. Sharpe, 1996), can be consulted about Copeland, references for whom appear at the end of Dawson's article "Copeland as social accountant" (pp. 93–100). Copeland's 1949 text "Social accounting for money flows" is also reprinted (pp. 7–18). See also Stephen P. Taylor's "From Moneyflows accounts to flow-of-funds accounts" (pp. 101–108). See the main references to Copeland in Box 12 of this chapter and in the annotated bibliography of chapter 1, p. 28.

Appendix. Diagrammatic representations of National Accounts

The scheme of monetary flows presented by Claude Gruson in his July 1950 "Note" helps to visualize the economic interrelations. (see Box 9). Diagrammatic representations of the economic circuit, which have a long history dating back to Quesnay and his Tableau Economique, experience an important vogue in the 1940s and 1950s. They usually have a pedagogical function within the framework of an initiation to national accounts and the working of economic flows. They are also sometimes part of some research.

The presentation of the flows in the British economy in 1948 by Stone in *The Role of Measurement in Economics* (Cambridge University Press, 1951, p. 44) complies with a pedagogical role. In this representation, the state is part of the "consumption" pole (fig. 2A1).

As soon as they try to be less function-oriented, in particular when they try to distinguish the public authority and persons, and diversify the classification of the flows, these schemes grow more complex. Usually, they are similar in spirit to the basic Keynesian scheme, and represent mostly the flows of payments corresponding to the transactions. This is how in fig. 2A1 the arrow representing imports indicates the direction of the payments to the rest of the world (see also Gruson's scheme).

In order to complete them, some economists have also tried to represent the real movements associated to the monetary flows. Usually limited to goods and

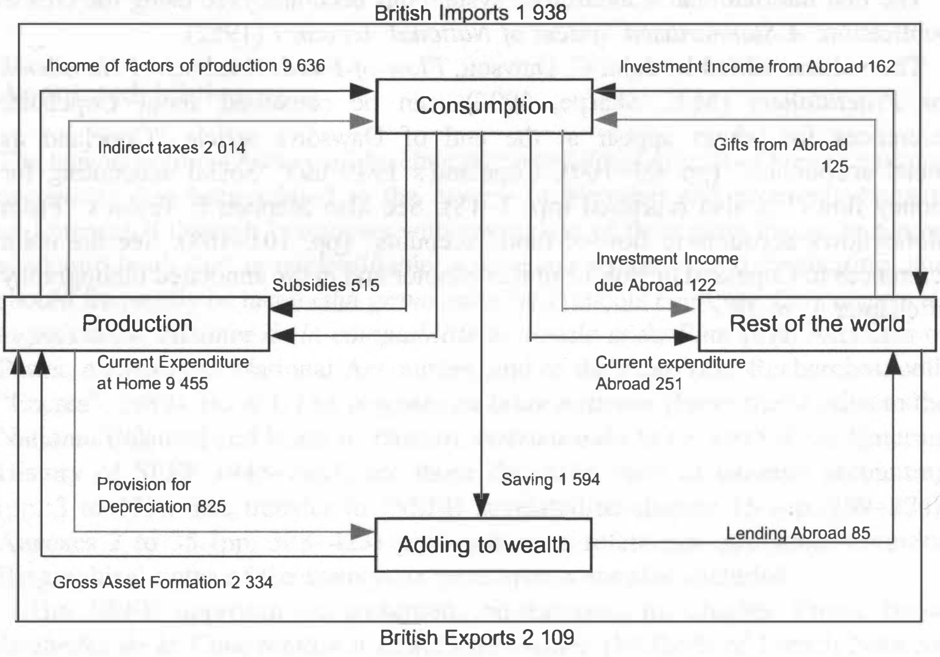
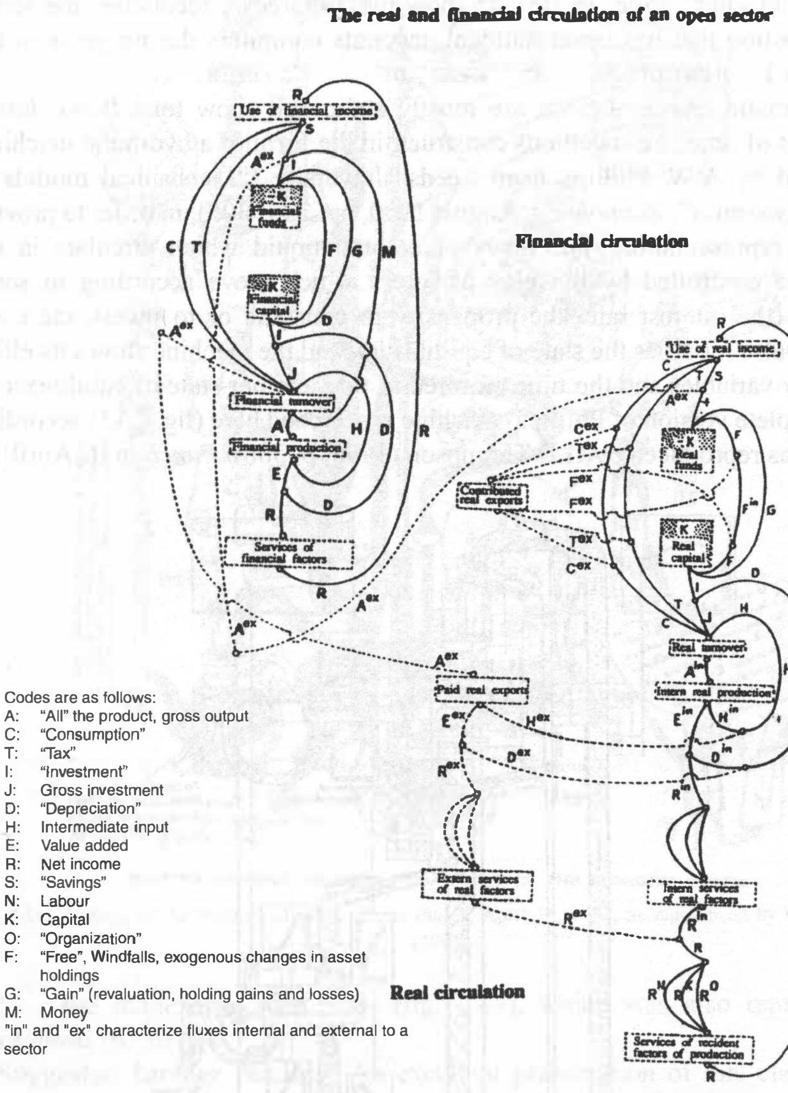

British Imports 1 938
Income of factors of production 9 636
Investment Income from Abroad 162
Consumption
Indirect taxes 2 014
Gifts from Abroad 125
Investment Income due Abroad 122
Subsidies 515
Production
Rest of the world
Current Expenditure at Home 9 455
Current expenditure Abroad 251
Provision for Depreciation 825
Saving 1 594
Adding to wealth
Lending Abroad 85
Gross Asset Formation 2 334
British Exports 2 109

Fig. 2A1. Transactions in the British economy in 1948 (million £ sterling) according to Richard Stone.



Codes are as follows:
A: "All" the product, gross output
C: "Consumption"
T: "Tax"
I: "Investment"
J: Gross investment
D: "Depreciation"
H: Intermediate input
E: Value added
R: Net income
S: "Savings"
N: Labour
K: Capital
O: "Organization"
F: "Free", Windfalls, exogenous changes in asset holdings
G: "Gain" (revaluation, holding gains and losses)
M: Money
"in" and "ex" characterize fluxes internal and external to a sector

Fig. 2A2. Frisch's 1942 graph.

services, this type of representation leads then to the adjunction – or to an additional presentation – of flows going in the opposite direction (for instance, the arrow attached to imports would go from the rest of the world to the economy of reference, following the movement of merchandises). See in particular Jean Marczewski's model (1947) in *Les Comptabilités Nationales dans le monde* [National Accounts Worldwide] (INSEE, 1952).

Within his search for rigorous conceptual bases to represent the economy, Frisch systematizes the distinction between real flows and financial flows, as can be seen in his 1942 scheme extracted from Aukrust, *The Accounts of Nations* (op. cit., p. 64) (fig. 2A2). Note that "real" does not mean "at constant prices" but rather "in kind". (See, in Box 25, how the 1993 SNA reconciles the terms of an opposition that has upset national accounts compilers during years in the mid century.)

Diagrammatic representations are mostly static and show total flows during some period of time. An ingenious construct, in the form of a hydraulic machine, was devised by A.W. Phillips from Leeds University ("Mechanical models in economic dynamics", *Economica*, August 1950, pp. 283–305), in order to provide a dynamic representation. The flows of colored liquid which circulate in the machine are controlled by the play of levers which move according to some parameters (the interest rate, the propensity to consume or to invest, etc.). An outside impulse modifies the state of equilibrium, and the machine shows its effect on the other variables and the time required to find another state of equilibrium.

The complete version of Phillips' machine is sketched here (fig. 2A3) according to N. Barr, as reproduced by G.F. Thompson (1998, p. 306). *Punch* in its April 15,

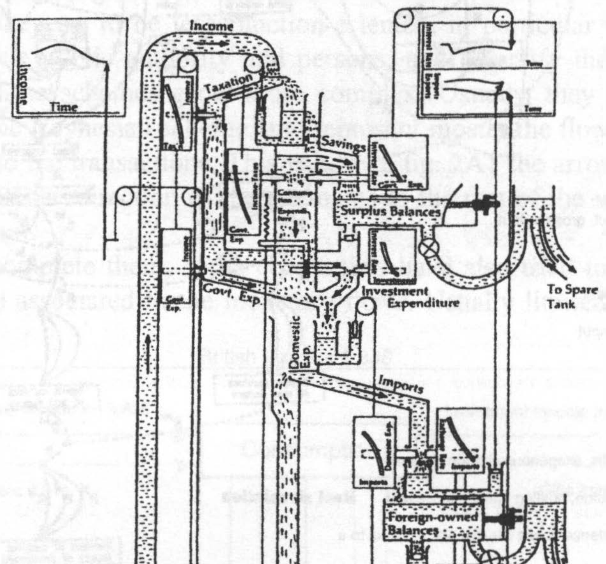
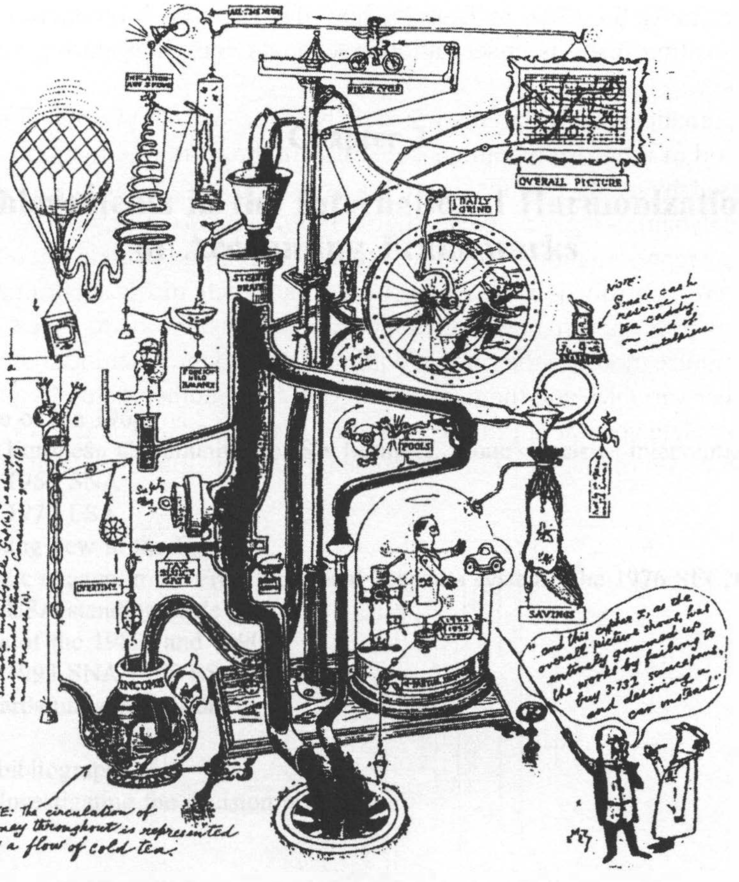


Fig. 2A3. The Phillips Machine. From N. Barr, "The Phillips machine" (1988, *LSE Quarterly*, vol. 2, no. 2, p. 324, fig. 2) as reproduced by G.F. Thompson (1998).


OVERALL PICTURE
DAILY GRIND
NOTE: Small cash reserve — tea caddy — end of mantelpiece
POOLS
SAVINGS
NOTE: Whatever fluctuation of income, suitable unbridgeable gap (a) is always maintained between Consumer goods (b) and Income (c).
OVERTIME
TAX SLUICE GATE
INCOME
"and this cypher x, as the overall picture shows, has entirely gummed up the works by failing to buy 3·732 saucepans, and desiring a car instead."
NOTE: The circulation of Money throughout is represented by a flow of cold tea.

MACHINE DESIGNED TO SHOW THE WORKING OF THE ECONOMIC SYSTEM

Fig. 2A4. Cartoon of the Phillips Machine. From *Punch*, April 15, 1953, as reproduced by G.F. Thompson (1998).

1953 issue made a cartoon of it (fig. 2A4), which was also reproduced by Thompson (p. 307).

Suggested further reading: An excellent presentation of this class of work can be found in "Les représentations graphiques en matière de revenu national et de comptabilité nationale" [Graphical representation in national income and national accounting], a section of "Les comptabilités nationales dans le monde. Comparaison des méthodes" [National accounts worldwide. A comparison of their methods] (*Etudes et Conjoncture*, INSEE, 1952, pp. 197–238). The Phillips machine is described on pages 227–230. The visualization techniques are described in an interesting and unusual paper by G.F. Thomson, "Encountering economics and accounting: some skirmishes and engagements" (*Accounting, Organizations and Society*, vol. 23, no. 3, 1998, pp. 283–323).

Chapter 3

Achievements in the International Harmonization of Accounting Frameworks

Contents

1. The wave of the 1960s

The shortcomings of the first generation of the OEEC/UN Standardised System would soon become striking. The 1952 system was not adapted to the development of accounts, the compilation of which was expanding in other countries. It was necessary to gather scattered pieces and to take advantage of the accumulation of experience. On the other hand, the development of the activities of international organizations, and particularly that of the European Communities, required more homogeneity in the content of the accounts. Nevertheless, a real homogeneity of the statistical contents of national accounts could not be achieved right away. First and foremost, it was necessary to prevent the differences in accounting systems and classifications from becoming obstacles to understanding, right from the beginning. In this context, the international harmonization of accounting frameworks was given high priority. Obviously, the process was going to be complex by nature given the number of actors involved, their unequal roles and the frequent subtle differences between the formal rules of decision and the real influence of institutions, countries and individuals. This chapter focuses on the technical evolution of the international systems. Some insight in the decision

Box 16
General schedule of international harmonization

Years		Refer to
1944	United Kingdom, USA, Canada, tripartite meeting in Washington	appendix chapter 3, pp. 130–131
1945	League of Nations Princeton meeting and Stone memorandum (published in 1947)	chapter 1, pp. 24–26, and appendix chapter 3, pp. 131–132
1949–1950	OEEC simplified system	chapter 3, p. 132
1952	OEEC standardized system, United Nations SNA (First generation)	chapter 2, pp. 45–51, pp. 45–56
1963	Proposal of the concept of total consumption of the population, linking SNA/MPS.	chapter 3, p. 102
1968	United Nations SNA (Second generation) (preparation 1964–1968)	chapter 3, pp. 90–96 and appendix pp. 135–137
1970	European System of Accounts (ESA) (preparation 1964–1970)	chapter 3, p. 96, and appendix, pp. 133–135, p. 137
1971	Basic principles of the System of Balances (MPS), UN publication	chapter 3, pp. 101–102
1976	Publication of the French SECN (beginning, 1967, preparation 1970–1975). French NA gives up its autonomous system created at the beginning of the 1950s	chapter 3, pp. 102–103
1977	Comparisons of the SNA and the System of Balances MPS–UN (outcome of a process initiated 20 years earlier)	chapter 3, pp. 101–102
1989	Revised version of the basic principles of the System of Balances (MPS), UN publication	chapter 3, pp. 124–125
1990	End of MPS as an alternative international system, although it survives in a few cases	chapter 3, pp. 124–125
1993	SNA (Third generation) jointly published by UN, IMF, World Bank, OECD, European Community – Eurostat (preparation 1986–1993)	chapter 3, pp. 104–124, and appendix, pp. 137–145
1995	ESA (European System of Accounts) corresponding to the 1993 SNA	chapter 3, pp. 104–124, and appendix, pp. 137, 145

process is provided in the appendix; as it follows a chronological order, it can be read in parallel to the main text. Box 16 shows the general chronology of international harmonization.

1.1. The European Communities of Six hesitates. Stone's decisive intervention

In the early 1960s, the European Economic Communities, comprising at the time six countries, make an early effort to compare views and practices and to move towards harmonization, in the form of a "sectors' accounts scheme" that is based on the OEEC Standardised System and completes it. Very soon it seems preferable to elaborate a more convenient system, an initiative that some years later will lead to the ESA. In 1964, the "Propositions pour un cadre communautaire de comptabilité nationale" [Propositions for a national accounting framework for the European Communities] (*Informations Statistiques*, SOEC, No. 4, 1964), are prepared by a French expert (André Vanoli). Inspired by the spirit but not the letter of the French system of accounts, the paper discusses various topics, suggests orientations, and presents a set of accounts rather than a wholly formalized system, looking less for innovation – although sometimes it does – than for the integration of "integrated economic accounts, input–output tables and financial accounts" into a scheme that would be acceptable to all. This objective is less than evident at that time because input–output tables have been officially banned in the Federal Republic of Germany, as chancellor Erhard associates them with the contemptible idea of planning.

Support will come from … Stone himself, with whom French national accountants had crossed swords in the past (see chapter 2). Following a UN request, he presents a report at the end of 1964 proposing drastic changes to the first SNA. This report is based on research done at Cambridge in the early 1960s by Stone and his colleagues, after a short-lived revival of the idea of planning in the United Kingdom. "A program for growth" (1962 and following) comprises a growth model, a social accounting matrix for the year 1960, and input–output relationships for the period 1954–1966. Cambridge's Social Accounting Matrix (SAM) links the input–output analysis and institutional sectors' accounts (including financial accounts as a memorandum item). When the SEEF experts learn of this, they are surprised by the substantial convergence of Stone's accounting matrix and French national accounts, beyond differences in their form and obviously in the concepts of production and economic territory. Nevertheless, the French do not intend to convert the latter into international norms. The 1964 "Propositions" to the EEC suggest, for example, the elaboration of two input–output tables, a market one and a non-market one.

Discussions within the European Communities and at the UN (Jacques Mayer is part of the worldwide group of experts chaired by Stone) continue in parallel with some mutual conjunction. They end successfully, with the 1968 SNA and the European System of Integrated Economic Accounts, or 1970 ESA. Except for the classifications of economic activities and products, differences are in general minor, and the ESA can be presented – the condition of its acceptability for some countries – as the European Communities' version of the SNA, which is both true and not true. It is globally true in terms of content: both systems are very close although the SNA has the widest geographical coverage (excepting obviously the East). It is not true in terms of approach: the ESA is not some kind of later adapted version of a previously adopted 1968 SNA. Later, however, the 1995 ESA will rightly be the almost identical European version of the 1993 SNA. Anyway, the 1970 ESA and the 1968 SNA are not as close as the 1952 OEEC system and the 1952 SNA. However, in the West, the coexistence of three international systems is avoided, as in 1965 the OEEC decides not to review its own system that will then be abandoned.

1.2. The 1968 SNA

The 1968 SNA provides abundant information. It now covers, at the same time, input–output tables, sector accounts and financial tables. The accounting system is at the core of the analysis, and the presentation of transactors and transactions (this English term is ambiguous, the translation in French of the 1968 SNA uses the word "opérations") is developed within this framework.

A production account has net operating surplus as its balancing item. An income-and-outlay account has net saving as its balancing item. A capital-finance account covers the other transactions. In fact, it is subdivided into two parts, thus giving way to net lending, another essential balancing item. Two categories of statistical units are used: one for the production accounts (establishment-type unit), the other for the rest of the system (institutional unit). The former are grouped in industries following the main economic activity of the establishment, the latter in institutional sectors. The terminology used underlines the institutional option taken for all accounts except that of production. This criterion is rigorously applied to unincorporated enterprises: these are strictly analyzed simultaneously with households beginning from the operating surplus. There is no more splitting of individual entrepreneurs in two parts. The criterion of unicity of assets ownership and decision center prevails. Furthermore, non-financial corporations and financial institutions are systematically differentiated. There is no more ambiguous and functionally oriented enterprise sector. There is, however, a second-degree infringement on the institutional principle: the unincorporated market production units of general government are classified with corporations when they are large and sell mainly to the public.

One of the great achievements of the 1968 SNA is to differentiate *industries* (producers which produce goods and services for sale at a price which is normally intended to cover their cost of production) from *producers of government services* (producers of services provided by general government or by non-profit institutions serving households), and the corresponding types of output: *commodities* on one hand, and *other goods and services* on the other. The English terminology is rather awkward and unsatisfactory. The French translation of the 1968 SNA is much better (Jean-Pierre Januard, member of the French national accounting group, participated in New York in its adjustment); it uses a vocabulary proposed by the French, based on the 1964 "Propositions", that will have a great success: *branches d'activité marchande* (market branches), *branches non marchandes* (non-market branches), *biens et services marchands* (market goods and services), *biens et services non marchands* (non-market goods and services).

The general structure of the 1968 SNA is presented in a matrix format, a square table inspired by the 1962 SAM, but also very close to the 1952 "Principles" of French national accounting (see Box 17). Each account is assigned one column and one row. The term "account" is used in a very broad sense. An account is a row and a column that balance. They can refer to a transactor or to a transaction, to a type of product (goods and services), to a financial asset, or, more generally, to a category that describes what transactors are doing – for instance a function or a subdivision of a consumption function. In this way accounts are given "a significance which is not ordinarily associated with them: they are a means of representing categories and their intersection shows the interaction of one set of categories with another" (1968 SNA, § 1.27). The notion of *dummy account* is adopted in this perspective. Stone was increasingly oriented towards a matrix presentation of an accounting system. He found it as clear as, and more concise than, most of the usual presentations. With each transaction is associated a unique entry instead of two. It is possible to subdivide the categories employed without modifying the rest. It is only a matter of adding rows and columns. Each cell can be considered as a sub-matrix. It is also possible to introduce other categories, and this is what Stone does for assets, liabilities and their revaluations.

At the time, this matrix presentation troubled many national accounts compilers, less sensitive perhaps to its pedagogical virtue "as a means of communicating the structure of the system to someone who wants to understand it in detail" (1968 SNA, § 1.14) than to its limited contribution to the presentation of the global results of the accounts. It is not conceived for such a use, since the system is not a very simplified one; table 2.1, "An illustration of the complete system", consists of 7,744 cells, where less than 6% are filled. Stone, who showed in the comparison of different presentation methods, at the beginning of the 1968 SNA, an overall table of the four consolidated accounts of the nation crossing accounts and transactions (table 1.2, p. 4) does not proceed any further in this direction. As for the French, they abstain from proposing to the UN a table similar to their "Tableau économique d'ensemble" [Overall Economic Account], which would be covering only part of the system because it does not include a production account for the institutional sectors.

Finally, in the *Blue Book* for 1968 a very elegant matrix presentation at the beginning coexists with a dense presentation of a set of standard accounts and twenty-six standard and supplementary tables at the end. Altogether this gives the impression of a daunting system, more complex than what it really is, but that does not give fair recognition to the enormous work of Abraham Aidenof (UN) on three quarters of the book.

In the first part, Stone also dedicates two detailed chapters to input–output analysis and to accounts at constant prices. The basic tables of the system, generally rectangular, where industries (groups of establishments) may have a secondary production, can be transformed into square input–output tables, mainly

Box 17
The 1968 SNA presentation in matrix form

The presentation of the 1968 SNA is described in the first two chapters. Stone starts from the presentation of the four consolidated accounts of the nation (1968 SNA, Table 1.3, p. 5).

Table 1.3. The four accounts of the nation in matrix form

	1	2	3	4	Total	
1.	Production		210	47	52	309
2.	Consumption	255		−19	5	241
3.	Accumulation		27			27
4.	Rest of the world	54	4	−1		57
	Total	309	241	27	57	

The rows show the credit elements of an account; the corresponding columns show its debit elements. The nature of a transaction is determined by its position in the table. In row 1 we find the final uses of the economy (consumption, 210, capital goods, 47, exports, 52); in column 1, we have GDP, 255, and imports, 54. Row 2 shows GDP, 255, provisions for the consumption of fixed capital, −19 (negative value) and the balance of factor incomes from the rest of the world, 5. Column 2 shows the corresponding uses, consumption, 210, net saving, 27 and net current transfers abroad, 4. Net lending of the nation, negative here, −1, balances row 3 and column 3. By including additional rows and columns it is possible to extend the accounts. Thus Table 1.6 (*ibid.* p. 9) shows a first breakdown of accounts and the addition of balance sheets. Rows 3 to 12 correspond to rows 1 to 4 of Table 1.3.

Table 1.6 is described in detail in the 1968 SNA (pp. 9–12). For instance, rows and columns 3 and 4 present a breakdown of row and column 1 of the previous table. Row 3 shows the uses of commodities: value of commodity input, 245, final consumption, 166, increase in stocks, 6, fixed capital formation, 41, and exports, 50. The resources appear in column 3: production of commodities, 443, imports, 51, and import duties, 14. Row 4 presents the output of activities (443 production of commodities and 44 production of unmarketed services) and column 4 the value of commodity input, 245, incomes to the factors of production, provisions for the consumption of fixed capital and indirect taxes less subsidies, 241, and finally the direct expenditures abroad in the provision of government services, 1.

It is relatively easy to find the elements of Table 1.3. GDP is to be found at the intersection of columns 3 and 4 with row 6, 14 + 241 = 255. Saving, 27, is a use of the income and outlay account (column 6) and a resource of the capital finance account (row 10). The nation's net lending, −1, is the difference between the acquisition of financial claims, 58, and new issues of financial claims as liabilities, net, 59, to be found at the intersection of rows and columns 9 and 10; it is symmetrically the difference between the corresponding transactions with the rest of the world (18 and 17).

Rows and columns 1 and 2 are associated with the opening balance sheet, rows and columns 15 and 16 with the closing balance sheet, whereas rows and columns 13 and 14 present the revaluations of assets and liabilities. It is possible to read the net worth accounts of the national economy and its changes in row and column 10. The opening net worth, 693 (row 10, column 2) is the difference between opening assets (1,249 + 661) and opening liabilities (1,217). It increases by the changes in tangible assets (consumption of fixed capital, −19; capital formation, + 6 + 41; revaluations, + 42), and the changes in claims (+ 58 − 21 revaluations), and decreases by the changes in debt (+ 59 − 23 revaluations) which leads to a net increase of +71. Therefore, the closing net worth is 764 (row 10, column 16), the difference between the closing assets (1,286 + 731) and the

cont'd

Box 17 (cont'd)

closing liabilities (1,253). Small reading detail for the rest of the world: –2 (row 12, col. 14) does not correspond to a change in net tangible assets (the rest of the world does not have any here), but to the difference between the revaluation of claims (–2) and liabilities (0) of the rest of the world. The combination of this net revaluation (–2) and the current surplus (1) transforms the financial net worth of the rest of the world in the economy under analysis from –32 (row 12, col. 2) to –33 (row 12, col. 16).

Up to this point, no details have been given for industries, institutional sectors, forms of income, etc. Finally, a matrix illustration of the overall system is given (*ibid*, Table 2.1 "An illustration of the complete system", inserted after p. 18), whose data are coherent with the two previous tables. Rows and columns are broken down to show the classifications of the institutional sectors and of the transactions of the system or – in the case of industries, goods and services, consumption purposes and financial assets – aggregated classifications presented under three or four headings for the sake of illustration. For instance, row and column 6 (Income and outlay) of the previous table are transformed into 27 rows and columns: 4 for value added (compensation of employees, net operating surplus etc.), 5 for institutional sectors of origin, 13 for forms of income (wages and salaries, property income, direct taxes on income, social security benefits, for instance), and again 5 for institutional sectors of receipt. The table on page 94 in the present box lists the eighty-eight rows and columns of the big 1968 SNA matrix, which is not reproduced itself here.

Table 1.6. First disaggregation of national accounts, including balance sheets

			1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**
Opening assets	1	Financial assets										1,249		165				
	2	Net tangible assets										661						
Production	3	Commodities				245	166		6	41			50					
	4	Activities			443		44											
Consumption	5	Expenditure by purpose						210					2					
	6	Income and outlay			14	241						–19	13					
Accumulation	7	Increase in stocks										6						
	8	Fixed capital formation										41						
	9	Financial assets										58		18				
	10	Capital and finance	1,217	693				27			59				–23	44	1,253	764
Rest of the world	11	Current transactions			51	1	2	12										
	12	Capital transactions	197	–32							17		1		0	–2	214	–33
Revaluations	13	Financial assets										–21		–2				
	14	Net tangible assets										42						
Closing Assets	15	Financial assets										1,286		181				
	16	Net tangible assets										731						

Note: To opening and closing assets correspond, in column, opening and closing liabilities; and to net tangible assets corresponds the net worth.

As stated before, each row/column pair represents an account. Therefore the totals by row and by column are equal (they are not shown in the matrix because they are, as such, meaningless). The pair may correspond, in usual terms, either to the account of an economic entity (production account of an industry, income and outlay account or capital finance account of an institutional sector), or a transaction account (goods and services supply and use account, property income account, etc.). It can also be a device to show a value or aggregate broken down following alternative classifications using dummy accounts. Along this line, increase in the stocks of industries is shown by industry and by product. It is also shown by institutional sector along with the other components of capital formation – in which case it is not presented by institutional sector and by product. In the case of net operating surplus, it is shown by industry and by institutional sector, but without

cont'd

Box 17 (cont'd)

cross-classifying industries and sectors (which could be done easily with some additional rows and columns).

The balancing items and the aggregates do not appear as headings of a row or column, except for operating surplus. They can be inferred from their position in the intersection of certain rows and certain columns (or groups of rows and columns). Thus, GDP, read directly in the first table, and derived from the sum of two cells in the second, is now obtained by adding an increasing number of cells following the details of the industry classification introduced in the matrix (close to thirty cells in table 2.1, with nine industries).

Summarizing, the matrix presentation makes possible the presentation of all the components of the 1968 SNA and their relationships: the input–output table by industry corresponds to the first groups of rows and columns (excluding balance sheets), institutional sector accounts, with distributive and financial transactions occupying the following rows and columns. The initial and final groups of rows and columns are reserved *pro forma* for balance sheets. In Stone's view, and this from the beginning of the 1950s, such a formalization made it possible to unify three approaches that had been developed separately: input–output tables, national accounts narrowly understood as the extensions of national income estimates, and finally financial accounts. Though historically understandable, this situation presented the risk of perpetuating a truncated view of national accounts. Evolution has finally led to the right understanding of the notion of a system of national accounts, as encompassing the three aspects mentioned above as well as balance sheets.

The ease with which the contents of the system can be located and presented as a whole has its drawbacks. The matrix representation of an elaborated system requires a table with a large number of rows and columns (eighty-eight for table 2.1, still on an illustrative level), in which only a relatively small number of cells (less than 6% in this case) are used. It is pedagogically useful but poor for the actual presentation of results. Moreover, by generalizing the notion of account, it tends to blur the initial vision, which was to apply to the economy as a whole an approach analogous to business accounting. Beyond the structural umbrella of the three main functions (production, consumption, accumulation), everything remains at the same level, and the sequence of accounts that constitutes the backbone of national accounts is obscured (see Box 20).

List of rows/columns of the 1968 SNA matrix

Opening assets		Financial assets	Currency and deposits	1
			Securities	2
			Other financial claims	3
		Net tangible assets	All categories	4
Production	Commodities	Commodities, basic value	Products of agriculture and mining	5
			Products of manufacturing and construction	6
			Services of transport, communication and distribution	7
			Other commodities	8
		Commodities taxes, net	Products of agriculture and mining	9
			Products of manufacturing and construction	10
			Services of transport, communication and distribution	11
			Other commodities	12
	Activities	Industries	Agriculture and mining	13
			Manufacturing and construction	14
			Transport, communication, distribution	15
			Other industries	16
		Producers of government services	Public administration and defence	17
			Health, education, other social services	18
			Other government services	19
		Private services	Domestic services of households	20
			Production of private n-g services to households	21

cont'd

Box 17 (cont'd)

List of rows/columns of the 1968 SNA matrix (cont'd)

Consumption	Expenditure	Household goods and services	Food, beverages, tobacco	22
			Clothing and household goods and services	23
			Other goods and services	24
		Government purposes	Public administration and defence	25
			Health, education and social purposes	26
			Other government purposes	27
		Purposes of private n-p bodies	All purposes	28
	Income and outlay	Value added	Compensation of employees	29
			Operating surplus	30
			Consumption of fixed capital	31
			Indirect taxes, net	32
		Institutional sector of origin	Non-financial entities, corporations, quasi-corporations	33
			Financial institutions	34
			General government	35
			Households	36
			Private non-profit institutions	37
		Form of income	Wages and salaries	38
			Employers' contributions	39
			Entrepreneurial income	40
			Operating surplus	41
			Property income	42
			Direct taxes on income	43
			Social security contribution	44
			Current transfers by enterprises	45
			Social security benefits	46
			Social assistance grants	47
			Other current transfers by government	48
			Current transfers by households	49
			Current transfers by the rest of the world	50
		Institutional sector of receipt	Non-financial entities, corporations, quasi-corporations	51
			Financial institutions	52
			General government	53
			Households	54
			Private non-profit institutions	55
Accumulation	Increase in stocks	Industries	Agriculture and mining	56
			Manufacturing and construction	57
			Transport, communication, distribution	58
			Other industries	59
		Producers of government services	Public administration and defence	60
	Fixed capital formation	Industries	Agriculture and mining	61
			Manufacturing and construction	62
			Transport, communication, distribution	63
			Other industries	64
		Producers of government services	Public administration and defence	65
			Health, education, other social services	66
			Other services	67
		Producers of private n-p services	All services	68
	Capital finance	Industrial capital formation, land, etc.	Industrial capital formation	69
			Land, mineral rights, etc.	70
		Capital transfers	All categories	71
		Financial assets	Currency and deposits	72
			Securities	73
			Other financial claims	74
		Institutional sectors	Non-financial entities, corporations, quasi-corporations	75
			Financial institutions	76
			General government	77
			Households	78
			Private non-profit institutions	79
Rest of the world		Current transactions	All categories	80
		Capital transactions	All categories	81
Revaluations		Financial assets	Securities	82
			Other financial claims	83
		Net tangible assets	All categories	84
Closing assets		Financial assets	Currency and deposits	85
			Securities	86
			Other financial claims	87
		Net tangible assets	All categories	88

of the commodity-by-commodity type. They are derived by using, often broadly, particular assumptions: that of an industry technology (where the secondary products are assumed to have the same input structure as the industry they come from), or that of a commodity technology (where the secondary products are assumed to have the same input structure as the industry for which these types of products constitute the main output), or any combination of both.

Stone notably develops alternative forms of valuation for market goods and services (true factor value; approximate factor value; true basic value; approximate basic value; producers' value; purchasers' value) and the ways in which they interact with taxes and subsidies on products and other taxes and subsidies, payable or receivable by the producers or included, in a net form, in the purchasers' value of intermediate inputs (see Box 18).

Among these notions, there is one that will have a great future in national accounts: the approximate basic value. As compared to producers' price, it excludes taxes on products, net of subsidies. Its use allows the exclusion of most of the distortions produced in the measurement of output and value added by indirect taxation (only the other types of indirect taxes remain) without the use of the controversial value at factor cost. Although the latter expression is still found in the first chapters of the 1968 SNA, under Stone's pen, it will never appear again, neither in the text, nor in the tables, nor in the accounts. Following the idea advocated long ago by Aukrust, the 1968 SNA prefers the notion of "factor incomes" (§ 6.9). On this controversial issue see section 4 of chapter 6, "Measuring at factor cost?".

At the same time, the clear delimitation between transactions on goods and services (that exclude services from factors of production) and other categories of transactions (income and financing) eliminates from the system the concept of gross national product (GNP), which no longer fits as an output concept. As a matter of fact, production is associated with resident production units, not with resident production factors, and the corresponding aggregate is gross domestic product (GDP). (See Box 19.)

1.3. The 1970 ESA

The European System of Accounts appears shortly afterwards. Its drafting has been given a great deal of attention by a high quality team (Vittorio Paretti, Jean Petre, Piero Erba, Hugo Krijnse Locker, etc.). Detailed discussions among the six member countries have given rise to wordings and treatments which are often more precise than in the SNA and are better adapted to the EEC situation. The ESA is a model of clarity. It has adopted the division of transactions in three categories, following the French way, with, in the middle, the distributive transactions, a general category that the SNA has not yet considered. The ESA is also better balanced than the SNA, particularly regarding financial accounts.

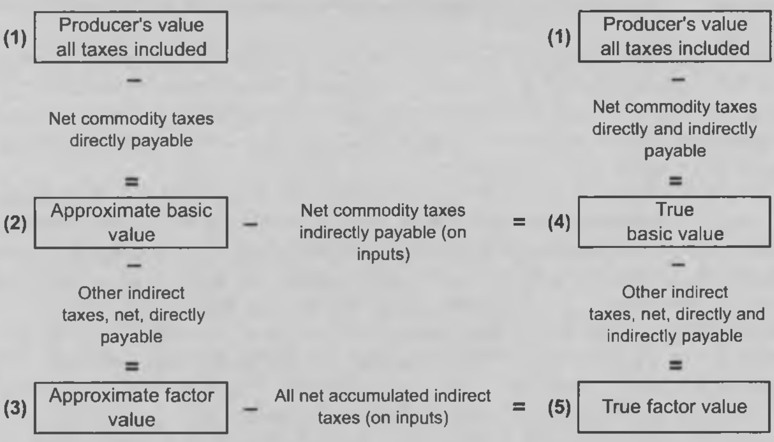
Box 18

Valuation of transactions on commodities (market goods and services) in the 1968 SNA

The notions proposed by Stone in Chapters III and IV of the 1968 SNA reflect the concern of input–output analysis to evaluate products as homogeneously as possible to get closer to physical measures.

In order to do this, first of all, producers' values are to be preferred to purchasers' values, so as to neutralize the effect of variability in trade and transport charges. Then, an effort is made to eliminate indirect taxes and subsidies, the variability of which could be large, depending on the commodity groups and types of buyers.

Beginning with producers' values (a similar analysis could be made beginning with purchasers' values), the following scheme shows the five possible notions that might be derived depending on the relative proportion of indirect taxes and subsidies that has been removed.


(1) Producer's value all taxes included
–
Net commodity taxes directly payable
=
(2) Approximate basic value
–
Other indirect taxes, net, directly payable
=
(3) Approximate factor value
(1) Producer's value all taxes included
–
Net commodity taxes directly and indirectly payable
=
(4) True basic value
–
Other indirect taxes, net, directly and indirectly payable
=
(5) True factor value
– Net commodity taxes indirectly payable (on inputs) =
– All net accumulated indirect taxes (on inputs) =

To understand this process, it should be noted that the 1968 SNA differentiates taxes and subsidies on products ("Indirect taxes and subsidies which are proportioned to the quantity or the value, of commodities, produced or sold", § 6.15) from other indirect taxes and subsidies. "Net" in the table means "less subsidies". These two categories of taxes may, for a specific unit of production, affect the value of its outputs, of its production or of its sales, but they can also be incorporated in the prices of its intermediate inputs.

The values on the left-hand side may be calculated without using input–output analysis. They only bring into play indirect taxes and subsidies affecting directly the valuation of output by production units. Value (3) corresponds to what has been traditionally called "at factor cost" without any additional specification.

Values (4) and (5), on the right-hand side, do need the use of input–output analysis because it is necessary to calculate net taxes on products accumulated on intermediate inputs – value (4) – and in addition to those, other indirect taxes, net, accumulated on intermediate inputs – value (5).

The 1968 SNA recommends the use of value (2), the approximate basic value, much simpler to calculate than the true basic value, "because it seems likely to remove most major sources of price heterogeneity" (§ 3.30).

(On these concepts see 1968 SNA, §§ 3.28–3.31, 4.10–4.17 and 4.95–4.106, with a mathematical discussion in the Annex to Chapter IV).

The 1993 SNA and the 1995 ESA choose to retain value (2). By convention, it has been considered simpler to call it "basic value" or, more precisely "basic price", neglecting the adjective "approximate". The basic price of the 1993 SNA/1995 ESA corresponds, therefore, to the approximate basic price of the 1968 SNA. Value added at basic prices is defined as the difference between output valued at basic prices and intermediate consumption valued at purchasers' prices (see 1993 SNA, § 6.225, 1995 ESA, § 9.23).

Box 19

GDP and GNP. Resident production units and resident production factors

"Resident producers (resident production units) are defined so that all, and solely, production taking place in the domestic territory of the given territory is encompassed" (1968 SNA, § 5.96). The economic territory differs from the geographical territory as it includes the extraterritorial enclaves (that is, embassies, consulates and military establishments) owned abroad and, reciprocally, excludes the extraterritorial enclaves owned by foreign countries and international organizations within its territory. The gross value added of an economy (which leads to GDP) is the sum of the value added by resident producers of this particular economy.

A resident producer (a corporation, for instance) may employ as workers (border, seasonal, for instance) residents of another economy, or may use financial capital owned by the rest of the world. This gives rise to payments abroad for wages (and other elements of compensation of employees), interest, and/or dividends. Reciprocally, wages, interest and dividends are paid to the economy of reference because of the use of labor or capital of its own residents on the economic territories of other countries.

In the transition from GDP to the traditional concept of GNP it is necessary to subtract from the former the compensation of employees and property income paid abroad and to add the compensation of employees and property income received from abroad. The gross value added of an economy, from a GNP perspective, is the sum of the value-added components attributable to production factors resident in this economy.

Historically, net national product (NNP) has been conceived as identical to the national income measured using the production approach. The analysis of production and of value added (output – intermediate consumption) which takes place concretely in the production units, mainly enterprises, and not abstractly in the production factors, then leads to the general pre-eminence given to GDP (aggregate preferred to NDP because of particular difficulties in the measurement of the consumption of fixed capital). For various reasons, notably the force of habit and the concern for keeping product and income equal (there could be more profound justifications), the concept of national product has been maintained (gross also for the same reason as above). Whence originates the GDP/GNP dualism, for instance, in the 1952 Standardised System.

The 1968 SNA does not include GNP as a concept of production, because of an operational reason: there is no place in the integrated system for two simultaneous and alternative concepts of value added, one related to production units and the other to production factors. The analysis of the productive process is done within the production units and the industries that group them. Although the 1968 SNA excludes GNP from its conceptual and accounting systems, it does not mention what happens to it. However, it defines incidentally, via the list of its components, a national income (net) at market prices (§ 7.4), which passed almost unnoticed.

The 1970 ESA, under the obligation of continuing to present GNP because of its use in some of the EEC regulations, merely says (§ 129): "The ESA does not show gross (net) national product at market prices as an actual aggregate of the system. However, this can always be calculated [. . .]." GNP is therefore outside the 1970 ESA's accounting system, but it still floats at the side, surviving on a purely empirical basis (a calculation procedure derived from GDP).

The 1964 "Propositions" suggested, more explicitly, ". . . associating the notion of production exclusively to producer entities while using exclusively for factors of production a concept of income" (Vanoli, § 33). Next, discussing terminology, it was suggested, among other things, to replace the terms GNP/NNP by gross/net national income, defined as the sum of gross/net primary incomes of the resident sectors, national income becoming therefore a concept at market prices.

Given the non-existence of a concept of primary income integrated as such in the system, the 1968 SNA and the 1970 ESA could not follow such a proposal; probably, minds were not yet ready to accept it.

Thirty years later, however, the same author's renewed propositions led to the explicit replacement in the 1993 SNA/1995 ESA of GNP/NNP by GNI/NNI at market prices, defined as indicated above, on a conceptual basis that has been clarified (about the problems of interpretation

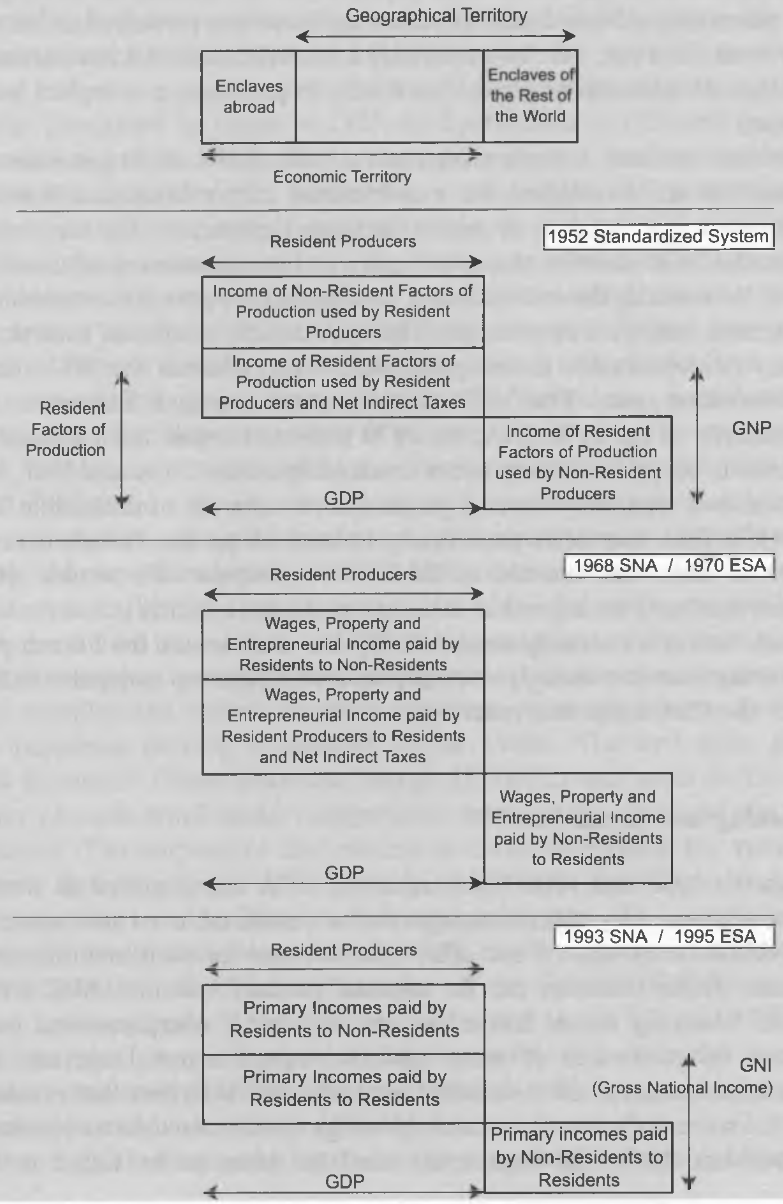
cont'd

Box 19 (cont'd)

of the nature of interest and the difference between the concept of primary income and that of income derived from production, see chapter 6).

Although the conceptual clarification and the simplification in accounting achieved by the 1993 SNA/1995 ESA are important, some countries or economists may still consider GNP as a concept of production and national income as a concept at factor cost (or factor incomes), out of tradition, legislation or analytical considerations.

The scheme below illustrates the relationships explained above. Primary incomes include indirect taxes net of subsidies. For conciseness, "wages" is used instead of "compensation of employees". It is obviously possible to replace the gross aggregates by the net ones, by subtracting consumption of fixed capital from incomes.


Geographical Territory
Enclaves abroad
Enclaves of the Rest of the World
Economic Territory
1952 Standardized System
Resident Producers
Income of Non-Resident Factors of Production used by Resident Producers
Income of Resident Factors of Production used by Resident Producers and Net Indirect Taxes
Resident Factors of Production
Income of Resident Factors of Production used by Non-Resident Producers
GNP
GDP
1968 SNA / 1970 ESA
Resident Producers
Wages, Property and Entrepreneurial Income paid by Residents to Non-Residents
Wages, Property and Entrepreneurial Income paid by Resident Producers to Residents and Net Indirect Taxes
Wages, Property and Entrepreneurial Income paid by Non-Residents to Residents
GDP
1993 SNA / 1995 ESA
Resident Producers
Primary Incomes paid by Residents to Non-Residents
Primary Incomes paid by Residents to Residents
GNI
(Gross National Income)
Primary incomes paid by Non-Residents to Residents
GDP

The sequence of accounts consists of six accounts, explicitly splitting in two each of the three accounts of the 1968 SNA. A production account (balancing item: value added) and a generation of income account (balancing item: operating surplus) replace the production account of the 1968 SNA. The income and outlay account is replaced by a distribution of income account (balancing item: disposable income) and a use of income account (balancing item: saving). The capital finance account, split *de facto* in two, is divided explicitly into a capital account (balancing item: net borrowing or net lending) and a financial account (balancing item: net changes in financial assets). For a realistic comparison (the measurement of consumption of fixed capital is neither reliable nor homogeneous among countries), all non-financial balancing items are presented in both gross and net terms (as a rule the SNA uses only a net valuation). An innovation of the ESA is that all institutional sectors have now, in principle, a complete sequence of accounts.

In practice, however, a single production account and a single generation of income account are established for non-financial corporations and households. This important step is taken in spite of a factual constraint. For the production accounts, the ESA directly adopts the units of homogeneous production, while the SNA, in choosing the establishment first, makes a better choice, closer to the most common statistical observation. The ESA directly adopts an analytical unit, frequently non-observable in straightforward ways, whereas the SNA derives it from observation units. The VAT, which is generalizing in Europe, is treated unsatisfactorily in the 1970 ESA; the 1979 ESA will depart from a treatment in gross terms to adopt a treatment in net terms (output net of invoiced VAT, VAT on products shown separately, uses of goods and services net of deductible VAT).

The 1970 ESA has been particularly influenced by the French experience. However it does not include a Tableau économique d'ensemble [Overall Economic Account] but a *general table of transactions*, which is less meaningful and which was never actually compiled. By the same token, the French practice of estimating accounts using previous-year prices remains isolated. Neither the SNA nor the ESA adopt this practice.

1.4. Nothing new in the East?

Although the 1953 and 1968 UN versions of SNA are proposed as worldwide recommendations, they are not recognized as standards, even indicative, either by the USSR or by any of the other fifteen countries with centrally planned economies. These countries use the material product system (MPS) according to which, following Adam Smith and one of Marx's interpretations, only the production of goods and of some services, called material services (goods transportation mainly), are considered as productive activities that create value and are the source of national income. Although in their discussions (for instance, T. Ryabushkin, 1950) the economists used the ideas to be found in Marx's

Theories on surplus value (manuscript dated 1861–1863), in which productive labor is defined as that which creates a surplus value for the capitalist, regardless of the character, material or not, of the output of the activity, this reference did not lead to any questioning of the restrictive concept, even though the former theory of Marx had no longer any significant application in a socialist regime. From this narrow conceptual point of view, only the limits of the material services could be a topic of discussion and modification, such as the inclusion of trade, of part of postal services and telecommunications, of passenger transportation. Ideology is overwhelming, based mainly on the role assigned to the working class.

Under the constraint of a narrow concept of production and of a correspondingly larger redistribution concept of national income, the Soviet statisticians developed a "System of balances of the national economy", a statistical tool consisting of an articulated and consistent set of balances, accounts and tables (described by Popov in 1926, by Ryabushkin in 1950 and by Valerian Antonovitch Sobol in 1960). The system presents two fundamental balances. The first one describes the production, consumption, and accumulation of social product (table of supply and use of goods and material services). The other shows the production, primary distribution, redistribution and final use of national income. This balance of national income, later called "financial balance", shows, first of all, the distribution of primary incomes derived from material production. Then, it describes the redistribution which comprises a large group of transactions: redistribution in the traditional sense (for instance, contributions and social benefits), but also the income of persons employed in the non-productive spheres, interest, or all kinds of financial transactions. Lastly, the final uses of material products are shown, after taking into account the net result of foreign trade: consumption, net capital formation and compensation of losses. In a closed economy, the net balancing item of the redistribution is zero for the economy taken as a whole. In that way, the central part of this balance corresponds to the total of distributive transactions and financial transactions of the western system, without showing any intermediate balancing item. Balances of material assets and of labor complete the system, to which numerous tables are structurally linked.

Two processes develop in parallel in the 1960s. The first takes place in the UN Economic Commission for Europe (UNECE) and starts in 1958. Four countries of each block make comparisons between the SNA and the System of Balances. The purpose of this process is not to harmonize the systems but to identify their conceptual differences, to characterize their importance and to establish conversion tables between their main aggregates. An essential technical document is finally issued very late in 1977, based on two earlier documents: the 1968 SNA and the "Basic Principles of the System of Balances of the National Economy" which had also been published by the UN in 1971. In fact, these "Principles" were elaborated in the framework of the Council for Mutual Economic Assistance (CMEA) between 1965 and 1969, because of the need for harmonization and improvement of the system.

Concurrently, the Eastern national accounts compilers participate in discussions in Geneva on the preparation of the 1968 SNA and on the SNA/MPS links. Political events influence the process within the CMEA. With the exception of the Russians and their closest supporters, there is great dissatisfaction regarding the MPS (Material Product System). The Poles and Hungarians plead for a more developed system, more adapted to the orientation of the managerial reform of enterprises, and to the development of market conditions and financial instruments that are underway. After a decentralized phase, the Soviets recapture control of the process; the 1968 Prague spring had failed (its effects were observed during the following meetings at Geneva), and a non-innovative Standardized System of Balances is adopted by the CMEA at the end of 1968 and sent to the UN that decides to publish it (1971).

Notwithstanding this lack of change within the MPS, ideas are at work. Thus, a comparative study of Hungarian and British consumption leads to the proposal of the concept of "total consumption of the population" (Margaret Mód and Reginald Beales, "The consumption of the population in the United Kingdom and Hungary", *Statistical Standards and Studies*, No. 1, UN, Geneva, 1963), covering both material goods and non-material services. This concept is even introduced in the 1971 document, but as a foreign insert, unrelated to the theoretical framework.

1.5. Drastic change in the French national accounts system: The 1976 SECN

International recommendations have been considerably enriched in the west by the end of the 1960s. Nevertheless, they do not have a compulsory character for the countries, which transmit adjusted data when requested. In fact, more or less important differences remain among national practices. Setting up the 1968 SNA and the 1970 ESA will contribute to their reduction, although unevenly. France, for instance, decides to implement the 1970 ESA completely (1971 benchmark, published in 1976), and adopts the international concept of production. But she goes further than these recommendations. On the one hand, balance sheets are introduced as an integral part of what is to become the central framework of National Accounts. On the other hand, satellite accounts, intermediate systems [their general idea having been presented in 1967 (Vanoli)], additional accounts and analyses (for households for instance) complete the new French "Système Elargi de Comptabilité Nationale" [Enlarged System of National Accounts] (1976 SECN).

The purpose of satellite accounts is to present information on a particular domain (housing, health, etc.) within a specific framework with links to the central framework. Intermediate systems constitute a conceptual and accounting framework in between the microeconomic accounting system of units – in particular enterprises which have a standardized accounting system – and the macroeconomic accounts of the corresponding institutional sector of national accounting. The 1976 SECN does not disregard any of the experiences of French national accounting in the preceding 25 years, but integrates them within a standardized international system while opening new perspectives for national accounting. It is supported by considerable practical experience, although it had been slow in encompassing regular quarterly accounts (see chapter 2) at the beginning of the 1970s – Philippe Nasse, Paul Champsaur – following the attempts of the 1950s – Paul Dubois, Jacques Vacher – and of the mid-1960s – Philippe Masson, Philippe Templé. Regional accounts had been developed on an experimental basis (1966 on 1962, Pierre Soubie et al.) but will have no systematic follow-up. On the contrary, compilation of balance sheets is imminent (see chapter 8). At this point, it seems that the SECN has no equivalent in the world. Well inserted now in the main international trend, it will be in the position to develop a great influence within this sphere.

1.6. The USA standing aside

The Americans assume a completely opposite position and do not apply the 1968 SNA. George Jaszi, BEA's director, although a member of the expert group, prefers to stay at the margin. He is convinced that the US system is the best. The Americans, scarcely active in the Geneva discussions, do not have any influence on the 1968 SNA. Their position is thus paradoxical. Their statistical system is very powerful, their research on national accounting is widely extended, their conceptual and quantitative studies are strongly developed in universities and research institutions. Gradually, better consistency between largely independent parts of economic accounts is achieved (with BOP towards 1965, with IOT compiled every five years since 1964, with the Fed's Flow-of-Funds current non-financial transactions – see Box 12). Balance sheets are compiled.

On the other hand, the framework of their system of central accounts, the NIPA (National Income and Product Accounts), has scarcely evolved since 1947 (on the NIPA, see Box 7). The NIPA remains closely linked to the philosophy of the first Standardised System, with a reduced number of accounts showing the main links between the aggregates and the main (functional) sectors, and a large number of tables with abundant statistical information, but only partially integrated. It maintains some odd aspects such as the lack of gross fixed capital formation (GFCF) for general government, for which all purchases of goods and services, including wages paid, are considered as a current consumption expenditure. There is thus a broad concept of production, but no production of general government itself (The former French National Accounts system showed a reciprocal oddity: general government did not have a productive activity but did have a GFCF …).

Most countries follow intermediate paths that will evolve over time towards a stronger harmonization.

In Europe, the EEC, with an increasing number of Member States, pushes for increased consistency, not only formal but also substantial, among the accounts of Member States. This tendency gains ground even beyond the circle of member states. Worldwide, under UN requests, and pressure from the World Bank and the IMF, countries review and extend their accounts, based on the 1968 SNA. Technical assistance, in particular from France in Latin America (Colombia, Ecuador, Peru, and later Brazil), will efficiently help a large number of countries to evolve from the stage of aggregates to effective national accounts. After 10 years or so, these developments, and the consequent enhancement of experiences, will necessitate new progress in the international system.

2. The wave of the 1980s and 1990s

Preliminary talks on the revision of the SNA start in 1982; the revision process itself begins in 1986 and ends in 1993–1995. The duration of the process shows the complexity of the operation, its ambitious targets and the intensity of the discussions. Five international organizations are closely associated (UN, EEC, IMF, WB and OECD) compensating for the weakening of the UN that loses its exclusive control on the SNA. The resulting 1993 SNA is common to the five organizations and this reinforces its status. In particular, the IMF enters fully into the harmonization process among the SNA and the Fund's manuals on Balance of Payments (complete harmonization, with the exception of some details, with the 1993 Manual of BOP), on Government Finance Statistics and on Monetary and Financial Statistics. The close involvement of Europe will mean that SNA and ESA will be almost identical from now on.

More than previous versions of the system (although the 1970 ESA already had this characteristic), the 1993 SNA is the fruit of collective work, as the preface's long list of acknowledgments shows it. The Expert Group, the secretariats of international organisations and consultants bear most of the burden (see the appendix to the present chapter, "Investigating the decision process"). The new system's conception carries mainly the seal of Vanoli (member of the core group), whereas the drafting is strongly influenced by Peter Hill (OECD) who writes a substantial number of chapters and gives a more explicative orientation to the solutions adopted, with references to economic theory, whereas former presentations of the SNA (1952 and 1968 versions) and the 1970 ESA had been essentially descriptive.

2.1. The 1993 SNA/1995 ESA

The new system covers, within an enlarged perspective, an integrated central framework and partially integrated elements (satellite accounts in particular). The document focuses on the presentation and analysis of the conceptual framework. It has neither numerous cumbersome standard tables, nor guidance on the priorities for elaboration. Those have been left for the international questionnaires, for the application manuals and to the decision of the countries.

For the first time a complete accounting sequence is presented (see Box 20) (balance sheets had only been mentioned *pro forma* in Stone's large matrix at the beginning of the 1968 SNA, without any follow-up in the rest of the manual). This sequence is presented in three parts. The *current accounts* are more differentiated than before, in order to show a larger number of significant balancing items concerning incomes (the 1968 SNA had been criticized for neglecting their analysis). In the sequence, between operating surplus and saving, we now find the entrepreneurial income (when relevant), the balance of primary incomes, the disposable income and the adjusted disposable income (for social transfers in kind, such as certain social security benefits, health and education services, etc.).

The *accumulation accounts* are now complete. They record all the changes in assets, liabilities and net worth that appear between two successive balance sheets, the opening one and the closing one. In chapter 8, box 55 presents a summary of the links between the four accumulation accounts and the opening and closing stocks of assets and liabilities. They include two traditional accounts (a capital account and a financial account) and two new accounts. The content of the first new account is to some extent complex. It includes, at the same time, the economic appearance and disappearance of non-produced assets (subsoil resources for instance), the destruction of assets resulting from catastrophes (natural, political, technological), and, finally, uncompensated seizures (as in the case of nationalizations), etc. It also registers the effects of changes in classifications and structure that result in a transfer of net worth from one sector to another (as the case of an unincorporated enterprise becoming a corporation) or of an asset or liability from one category to another (as for instance the transformation of agricultural land into building land). The second of these new accounts is the revaluation account. It shows the nominal holding gains or losses resulting from a change in the specific values of assets and liabilities. It is then broken down into neutral holding gains or losses that would result from applying to both assets and liabilities an index of the change of the general price level and real holding gains or losses due to changes in relative prices.

Balance sheets contain, in a classical manner, assets, liabilities and net worth. In the case of corporations, net worth is the net value corresponding to the entity itself, while shares and other equity, valued at current market prices, are treated as liabilities.

As a consequence of the further analysis of accumulation, a category "other accumulation entries" is added to transactions on goods and services (products), to distributive transactions (finally the expression appears in the SNA), and to transactions in financial instruments, in order essentially to designate the flows registered in the two new accumulation accounts previously described.

There is a major innovation in the SNA/ESA: a TEE (*Tableau économique d'ensemble* [Overall Economic Table]) is finally introduced, but without its name ("it sounds too French", argues an Anglophone expert) which will be transformed into "Integrated Economic Accounts" – IEA (poor Quesnay!). Its introduction

Box 20
Sector accounts sequence and balancing items, from 1952 SNA to 1993 SNA/1995 ESA

1952 SNA	1968 SNA	1970 ESA	1993 SNA/1995 ESA[a]
			Current accounts
Production account	*Production account*	*Production account*	• *Production account*
Net value added		Value added gross/net	Value added gross/net
(Factor cost)		(Market prices)	(Basic prices)
Appropriation account			
			• *Primary distribution of income account*
		Generation of income account	*Generation of income account*
	Net operating surplus	Operating surplus gross/net	Operating surplus/mixed income gross/net
	Income and outlay account	*Distribution of income account*	*Allocation of primary income account*
			Entrepreneurial income account
			Entrepreneurial income
			Allocation of other primary income account
			Balance of primary incomes
			• *Secondary distribution of income account*
		Disposable income gross/net	Disposable income gross/net
			• *Redistribution of income in kind account*
			Adjusted disposable income gross/net
		Use of income account	• *Use of income account*
			[disposable/adjusted disposable]
Saving (net)	Saving (net)	Saving (gross/net)	Saving (gross/net)

cont'd

Box 20 (cont'd)

Sector accounts sequence and balancing items, from 1952 SNA to 1993 SNA/1995 ESA (cont'd)

1952 SNA	1968 SNA	1970 ESA	1993 SNA/1995 ESA
			Accumulation accounts
Capital transactions account	*Capital finance account*		
	First part	*Capital account*	*Capital account*
	Net lending	Net lending/net borrowing	Net lending/net borrowing
	Second part	*Financial account*	*Financial account*
	Net lending	Net changes in financial assets and liabilities	Net lending/net borrowing
			Other changes in volume of assets account
			Changes in net worth due to other changes in volume of assets
			Revaluation account
			Changes in net worth due to nominal holding gains/losses
			Balance sheets
	Pro forma		*Opening balance sheet*
			Net worth
			Changes in balance sheet
			Changes in net worth
			Closing balance sheet
			Net worth

[a] Roman type: balancing items; italics: name of the account.

Comments

The "Propositions pour un cadre communautaire de comptabilité nationale" [Propositions for an accounting framework for the European Communities] (Vanoli 1964) suggest a sequence of accounts which would give a great importance to income distribution. A primary distribution account is balanced by a primary income gross/net. A secondary distribution account reveals the disposable income gross/net. A use of disposable income account shows its allocation between consumption and saving. [Ohlsson (see Ohlsson, pp. 129ff) and before him Lindhal (see Ohlsson, p. 255) had already made such a proposal of a use of income account].

Additionally, the "Propositions" suggest splitting the primary distribution account for non-financial enterprises into two parts, to show the operating surplus and – as a variant – an account leading to total profits before taxes and distribution of income to the owners.

The 1970 ESA, although inspired on these propositions, does not retain the difference between the primary and the secondary distribution of income.

The sequence of accounts of the 1968 SNA remains less elaborated. Its dense drafting, and even more the whole presentation, with its abundance of accounts and tables, contains many items, for

cont'd

Box 20 (cont'd)

instance the concepts of value added (§§ 2.40, 7.10), of disposable income (§ 7.5) and even of the entrepreneurial income, defined in the same way as the total profit before taxes and distribution to owners of the "Propositions" (§§ 7.40–7.42). These notions do not appear directly, however, in the sequence of accounts.

The 1968 SNA sequence remains very close to that of the 1952 Standardised System. The introduction of input–output analysis, with a high emphasis on it, leads only to balance the production account by net operating surplus, instead of value added, because the account conceived in this way may be compiled by industry. In the first chapters of the *Blue Book*, even in the matrix presentation of the system, emphasis is on the four main economic functions (production, consumption, accumulation and relations with the rest of the world). To each of the first three correspond not only a part of the sequence of accounts (of sectors or of industries), but also a part of the transactions accounts, in the sense of the French system, and also part of the functional breakdown, if relevant. Nevertheless, the sequence of accounts undoubtedly plays a more important role in the presentation of the system than in 1952 (Chapters V–VII).

This sequence becomes truly crucial in the 1993 SNA/1995 ESA. Chapters VI through XIV of the SNA analyse the accounts and sub-accounts one by one. The structure of current accounts has the same source of inspiration as the "Propositions" after a detour over the 1970 ESA. Thirty years and strong perseverance were required to reach this result. The presence of a redistribution of income in kind account enriches the scheme. It is completed by the development of accumulation accounts and the introduction of balance sheets. The logic of the system appears more clearly and in all its complexity.

In the 1993 SNA/1995 ESA, the changes in balance sheets (next-to-last account on the right) represent only the total content of the four accumulation accounts (for a better view, see Box 55 in chapter 8). But, as the uses of net saving (last balancing item of the sub-sequence corresponding to current accounts) are all registered in the capital account or the financial account, it follows that the changes in balance sheets reflect the incidence on net worth of the total content of current accounts and of accumulation accounts. The implicit sequence in the accounting structure of the 1993 SNA/1995 ESA is the following:

- Opening balance sheet
- Current accounts
- Accumulation accounts
- Closing balance sheet

In some cases this advanced differentiation within the sequence of accounts has been received with criticism, when the deliberate option of the 1993 SNA/1995 ESA to concentrate exclusively on the conceptual presentation of the system in all its extent had not been correctly understood. The forest of standard tables that made the 1968 SNA so forbidding (the 1970 ESA escaped this shortcoming), is sent back to the design of international questionnaires and to national publications.

At the beginning of the following century, a proposal inspired by a purely theoretical approach suggests a change of orientation for the starting point of the sequence of accounts. The balancing item of the production account would be the assumed pure profit of the microeconomic theory, and value added, as a balancing item, would be demoted to a secondary place (see chapter 8, Box 56, for a proposal from the Research Agenda of *Measuring Capital*, OECD, 2001, and its critical review).

has been facilitated by the inclusion of a complete sequence of accounts for all institutional sectors. It is more complete than the French TEE, as it includes the new accumulation accounts and the balance sheets. It also contains one column for the overall economy (total economy in the SNA jargon), which makes it possible to directly show aggregates corresponding either to transactions, or to balancing items. For instance, GDP or Gross Domestic Income (the former GNP which now appears clearly as an aggregate of primary incomes) can now readily be found there. All the balancing items are shown gross and net (on the evolution from TEE to IEA, see Box 21).

Input–output tables still present the detailed analysis of production (see Box 22). The central table of supply and use of goods and services is based on establishment-type units ("establishment" in SNA terminology, "local unit of economic activity" in ESA terminology), grouped in industries. More sophisticated derived analytical variants lead to symmetric tables denominated "product-by-product" where the establishment unit has been replaced by the unit of homogeneous production. The central table, closer to basic observation, is conceived mainly as an instrument of statistical synthesis and of accounting consistency. It provides a large number of data to analysts, but it is not intended for use in projections based on technical-economic coefficients (relations between final demand of products and the required output, taking into account the industries' interrelations). Symmetric product (homogeneous production branches)-by-product tables support this form of basic input–output analysis.

The consistency and integration of the system are reinforced by the recommendation of a three-dimensional table crossing output, intermediate consumption and the components of value added, of on the one side industries, and on the other institutional sectors. The linkage industries/sectors becomes, then, an international recommendation.

The integrated economic accounts may be expanded into more detailed tables and accounts, by subdividing rows and columns. In particular, they can be linked to detailed tables of financial transactions or of stocks of financial assets and liabilities (including tables showing the relationship between debtors and creditors by type of instrument). The flexibility of the system makes it possible to include a detailed analysis of household accounts (beyond the principal categories based on the main sources of income), or to emphasize the distinction between the public sector, the private sector and the foreign-controlled sector. It is even possible to specifically analyze key activities or sectors for a given country, for instance oil or coffee, or other sectors of particular importance, as is frequently the case with agriculture (see Box 23). And, of course, the general framework may be adjusted to elaborate quarterly or regional analysis.

All in all, after half a century of evolution in accounting techniques, the central framework of the 1993 SNA/1995 ESA is at the same time complete and well balanced in its way of grasping the major phenomena of economic life within its scope. The elaboration of its accounting structure has probably reached a plateau, but secondary adjustments could well be necessary. Nevertheless, despite the enrichment of the concepts of consumption and income in the system, and the enlargement of the concept of GFCF to some elements of intangible assets, some essential problems remain without a good solution. These refer mainly to the treatment of market exploitation of natural resources and to other environmental issues, or to more classical topics such as the analysis of the R&D expenditures,

Box 21

From the "Tableau économique d'ensemble" (TEE) of French National Accounts to the Integrated Economic Accounts of the 1993 SNA/1995 ESA

The first overall presentation of a nation's economic accounts, in the format of a table crossing sectors (persons, productive economy, central and local government, rest of the world) in columns, with transactions (domestic purchases and sales, several categories of income, external transactions, financial and monetary movements) in rows, was devised by René Froment, a statistician at the Institut de Conjoncture (Short-Term Forecast Institute), in *Point Economique* "Rapport sur la situation économique fin décembre 1945" [Report on the Economic Situation at the end of December 1945] (Service national de statistique, No. 5, confidential; the 1945 table is reproduced by François Fourquet, *Les Comptes de la Puissance* [The Accounts of Power], *op. cit.*, p. 397). To each sector are associated one column for debit and one column for credit. There are no balancing items or aggregates.

Shortly after, Froment improved this presentation in a research study on "La comptabilité nationale de la France en 1938. Une méthode de comptabilité économique" [French national accounts in 1938, A method of economic accounting] (*Etudes et conjoncture, Union Française*, No. 8&9, March–April 1947, pp. 75–101). For each sector (a monetary and banking sector has been added) he distinguishes an operating account (in fact a current transactions account), and a capital account, each with one column for Receipts and another for Payments. The row presentation is systematized with three categories: Purchases and sales of goods and services, Income and taxes, and Capital movements. A last row shows the balancing item resulting from the introduction of the two above-mentioned accounts: operating surplus (saving).

The new French system of national accounts set up by the SEEF, where Froment works, develops these lines in the Tableau économique d'ensemble [Overall Economic Account] that summarizes the results of the new accounts (see *Rapport sur les comptes de la nation, Vol. I, Rapport et Comptes 1949–1955* [Report on the Accounts of the Nation, Vol. I, Report and Accounts 1949–1955], SEEF, INSEE 1955). Supplementary sub-accounts are identified in columns; the three categories of "operations" are to be found in rows, as well as the balancing items. Columns are distributed in two groups, in order to record resources on the right and uses on the left (see Box 14 for the final version of the Tableau économique d'ensemble of the former French national accounts, published from 1965 on, and the text of chapter 2, pp. 70–94, describing its evolution since 1955).

The idea of a table cross-classifying sectors in columns and transactions in rows is also used elsewhere at the end of the 1940s and during the 1950s.

Odd Aukrust does this when he presents his considerations "On the theory of social accounting" (*The Review of Economic Studies*, No. 41, 1949–1950). He places in columns the sectors (private enterprises, public enterprises, public authorities, households and rest of the world) and their sub-accounts (real current account, real capital account, financial current account, financial capital account, income account). In rows, he includes purchases of goods and services, wages and other transactions, and balancing items [income generated by enterprises (i.e. net value added at market prices), saving, and net increase in claims]. He will not continue with this type of presentation.

In the United Kingdom, in 1952, the yearly publication *National Income and Expenditure* introduces a table of "Social Accounts of the United Kingdom" (Aukrust also uses the expression "social accounts" for national accounts). In columns are placed the production account (consolidated for the whole economy), the income and outlay account and the capital account for each sector (persons, corporations, public authorities), and a rest of the world account. In rows appear the elements of the income and outlay account, then those of the capital account, and finally the international transactions, as well as saving and net change in financial assets. Aggregates are not shown explicitly. The publication of this table ends in 1956.

The 1970 ESA, which is significantly inspired by French national accounting, includes a general table of transactions (Table T2), that presents the institutional sectors in columns, with resources on the right-hand side and uses on the left, and in rows three general categories for transactions (on goods and services, distributive, financial) and the balancing items. This is very close to the TEE of the former French national accounts, but it excludes the presentation in columns of the sequence of accounts for each sector. This is probably due to the need to avoid increasing the number of rows (there are six accounts for each of the six institutional sectors), but it impoverishes the table. Reading it becomes difficult, even though the account to which it belongs is indicated in the row for each transaction. Apparently, no country will compile this table.

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Box 21 (cont'd)

The SECN innovates with a renewed presentation of the TEE that makes it possible to take into account the lengthening of the sequence of accounts in the ESA without multiplying the number of columns. For that purpose, transactions are now grouped, not according to the three main categories followed by the list of balancing items, but following the sequence of accounts. To improve readability, the names of the transactions and balancing items now appear in the centre of the table and no longer at the beginning of the row. The balancing item of the account of a sector appears in the uses of this account (on the left) and also, in the same row, in the resources of the following account of that same sector (on the right).

This new TEE structure is shown here first of all in a schematic form. The 1975 TEE is also presented in all its details (*Rapport sur les comptes de la nation de l'annèe 1976* [Report on the Accounts of the Nation 1976] pp. 50–51, see also the series of reports up to the end of the 1990s). As the transactions in goods and services appear in different accounts (mainly production, use of income and capital), their balance appears now in columns (each column is in fact divided into market and non-market goods and services).

Tableau économique d'ensemble of the SECN

Accounts	Uses		Goods and Services	Total	Transactions or balancing items	Accounts	Resources		Goods and Services	Total
	Sectors 1......................n	Rest of the world					Sectors 1......................n	Rest of the world		
Production					Exports/Imports	Production				
					Production					
					⋮					
					Value added	Generation of income				
Generation of income					Compensation of employees	Income				
					⋮					
					Operating surplus					
					⋮					
Income					Current transfers					
					Disposable income	Use of income				
Use of income					Final consumption					
					Saving	Capital				
Capital					Net lending / Net borrowing					
Financial					International means of payment	Financial				
					Claims and liabilities balance					
					Adjustment					

cont'd

Box 21 (cont'd)

Tableau économique d'ensemble for 1975

Million Francs

Account	USES							Goods and services		Total	Transactions		Account	RESOURCES							Goods and services		Total
	Sector accounts						S 90	Market	Non-Market					Sector accounts						S 90	Market	Non-Market	
	S 10	S 80	S 40	S 50	S 60	S 70								S 10	S 80	S 40	S 50	S 60	S 70				
PRODUCTION C1	/	/	/	/	/	/	269,854	/	/	269,854	P50	Exports of goods and services	PRODUCTION C1	/	/	/	/	/	/		269,854	/	269,854
	/	/	/	/	/	/	/	259,240	/	259,240	P60	Imports of goods and services		/	/	/	/	/	/	259,240	/	/	259,240
	/	/	/	/	/	/	/	2,193,153	223,963	2,417,116	P10	Output of goods and services		1,489,136	586,013	63,146	17,872	251,468	9,481	/	/	/	2,417,116
	/	/	/	/	/	/	/	2,175,376	/	2,175,376	P1A	Output of market industries		1,489,136	577,301	63,146	17,872	23,684	4,237	/	/	/	2,175,376
	/	/	/	/	/	/	/	17,777	223,963	241,740	P1B	Output of non-market industries		/	8,712	/	/	227,784	5,244	/	/	/	241,740
	752,773	196,124	13,156	10,607	81,849	5,515	/	/	/	1,060,024	P21/22	Distributed Intermediate Consumption		/	/	/	/	/	/	/	1,060,024	/	1,060,024
	752,773	196,124	13,156	10,607	15,738	2,762	/	/	/	991,160	P2A	Distributed Intermediate Consumption of market industries		/	/	/	/	/	/	/	991,160	/	991,160
	/	/	/	/	66,111	2,753	/	/	/	68,864	P2B	Distributed Intermediate Consumption of non-market industries		/	/	/	/	/	/	/	68,864	/	68,864
	736,363	389,889	49,990	7,265	169,619	3,966	/	/	/	1,357,092	N1	"Gross value added"	GENERATION OF INCOME C2	736,363	389,889	49,990	7,265	169,619	3,966	/	/	/	1,357,092
	736,363	381,177	49,990	7,265	7,946	1,475	/	/	/	1,184,216	N1A	"Market gross value added"		736,363	381,177	49,990	7,265	7,946	1,475	/	/	/	1,184,216
	/	8,712	/	/	161,673	2,491	/	/	/	172,876	N1B	"Non-market gross value added"		/	8,712	/	/	161,673	2,491	/	/	/	172,876
	/	/	/	/	/	/	/	/	/	/	R30	Production subsidies received		21,457	6,345	4,022	1,635	1,794	/	/	/	/	35,253
GENERATION OF INCOME C2	514,035	72,839	24,185	5,766	154,095	3,776	1,661	/	/	776,357	R10	Compensation of employees	INCOME C3	/	773,330	/	/	/	/	3,027	/	/	776,357
	62,350	9,720	2,710	5,045	3,581	27	/	127,130	/	210,563	R20	Taxes linked to production and imports		/	/	/	/	202,770	/	7,793	/	/	210,563
	/	/	/	/	/	/	/	123,804	/	123,804	R21	VAT on products		/	/	/	/	123,804	/	/	/	/	123,804
	62,350	9,720	2,710	5,045	3,581	27	/	/	/	83,433	R22	Other taxes linked to production		/	/	/	/	83,212	/	221	/	/	83,433
	/	/	/	/	/	/	/	/	/	0	R23	Levies for the EEC		/	/	/	/	–4,458	/	4,458	/	/	0
	/	/	/	/	/	/	/	3,326	/	3,326	R29	Customs duties and similar		/	/	/	/	212	/	3,114	/	/	3,326
	/	/	47,073	/	/	/	/	/	/	47,073	P23	Adjustment for imputed bank services		/	/	/	/	/	/	/	47,073	/	47,073
	181,435	313,675	–19,956	–1,911	13,737	163	/	/	/	487,143	N2	"Gross operating surplus"		181,435	313,675	–19,956	–1,911	13,737	163	/	/	/	487,143
INCOME C3	/	/	/	/	28,485	/	6,768	/	/	35,253	R30	Production subsidies paid		/	/	/	/	/	/	/	/	/	/
	98,685	34,000	108,551	3,061	18,667	34	27,001	/	/	289,999	R40	Property and entrepreneurial income		24,730	71,009	148,699	8,289	15,180	439	21,653	/	/	289,999
	59,349	30,023	101,316	/	18,659	34	16,435	/	/	225,816	R41	Actual interest		11,260	37,696	146,351	7,035	8,906	235	14,333	/	/	225,816
	/	/	/	2,068	/	/	/	/	/	2,068	R42	Imputed interest accruing to insurance policy holders		/	2,068	/	/	/	/	/	/	/	2,068
	2,207	3,977	/	/	8	/	1,040	/	/	7,232	R43	Income from land and intangible assets		1,086	2,959	2	/	833	/	2,352	/	/	7,232
	33,273	/	7,072	986	/	/	5,665	/	/	46,996	R44	Dividends and other income distributed by corporations		8,523	25,561	2,346	1,254	5,441	204	3,667	/	/	46,996
	1,301	/	/	/	/	/	3,861	/	/	5,162	R45	Income withdrawals by owners of quasicorporations		3,861	/	/	/	/	/	1,301	/	/	5,162
	2,555	/	163	7	/	/	/	/	/	2,725	R46	Profits assigned to employees		/	2,725	/	/	/	/	/	/	/	2,725
	8,784	19,795	44	29,123	207	87	1,573	/	/	59,613	R50	Casualty insurance transactions		6,635	23,311	24	29,123	43	46	431	/	/	59,613

cont'd

Box 21 (cont'd)

	8,784	19,795	44	/	207	87	507	/	/	29,424	R51	Net casualty insurance premiums		/	/	/	29,123	/	/	301	/	/	29,424
	/	/	/	29,123	/	/	1,066	/	/	30,189	R52	Casualty insurance claims		6,635	23,311	24	/	43	46	130	/	/	30,189
	46,353	356,358	8,619	6,042	352,152	1,206	12,674	/	/	783,404	R60	Unrequited current transfers n.e.c.		17,170	320,431	1,154	4,749	406,749	6,401	26,750	/	/	783,404
	22,900	73,790	6,987	1,072	574	113	197	/	/	105,633	R61	Current taxes on income and wealth		/	/	/	/	105,633	/	/	/	/	105,633
	/	263,271	/	/	/	/	865	/	/	264,136	R62/63	Social contributions		11,937	840	331	4,209	246,819	/	/	/	/	264,136
	11,937	840	331	4,444	291,674	942	/	/	/	310,168	R64	Social benefits		/	307,441	/	/	/	/	2,727	/	/	310,168
	11,516	18,457	1,301	526	59,904	151	11,612	/	/	103,467	R65–69	Other current transfers		5,233	12,150	823	540	54,297	6,401	24,023	/	/	103,467
	76,148	1,091,603	12,707	2,024	238,968	5,722	/	/	/	1,427,172	N3	"Gross disposable income"		76,148	1,091,603	12,707	2,024	238,968	5,722	/	/	/	1,427,172
USE OF INCOME C4	/	889,083	/	/	209,894	3,912	15,334	/	/	1,118,223	P30	Final Consumption	USE OF INCOME C4	/	/	/	/	/	/	13,915	880,345	223,963	1,118,223
	/	875,168	/	/	209,894	3,912	15,334	/	/	1,104,308	P3B	Final consumption on the economic territory		/	/	/	/	/	/	/	880,345	223,963	1,104,308
	/	13,915	/	/	/	/	/	/	/	13,915	P32	Final consumption outside the e.t. by resident households		/	/	/	/	/	/	13,915	/	/	13,915
	76,148	202,520	12,707	2,024	29,074	1,810	/	/	/	324,283	N4	"Gross saving"		76,148	202,520	12,707	2,024	29,074	1,810	/	/	/	324,283
CAPITAL C5	3,068	4,735	86	/	18,294	92	224	/	/	26,499	R70	Capital transfers	CAPITAL C5	5,730	3,476	1,120	8	14,209	505	1,451	/	/	26,499
	/	/	/	/	16,947	/	224	/	/	17,171	R71	Investment grants		4,285	2,326	/	/	8,604	505	1,451	/	/	17,171
	/	3,965	/	/	/	/	/	/	/	3,965	R72	Capital taxes		/	/	/	/	3,965	/	/	/	/	3,965
	3,068	770	86	/	1,347	92	/	/	/	5,363	R79	Other capital transfers		1,445	1,150	1,120	8	1,640	/	/	/	/	5,363
	130,416	120,693	12,248	2,327	55,426	1,117	/	/	/	322,227	P40	Gross capital formation		/	/	/	/	/	/	/	322,227	/	322,227
	142,751	124,992	12,208	2,327	52,040	1,117	/	/	/	335,435	P41	Gross fixed capital formation		/	/	/	/	/	/	/	335,435	/	335,435
	−12,335	−4,299	40	/	3,386	/	/	/	/	−13,208	P42	Changes in stocks		/	/	/	/	/	/	/	−13,208	/	−13,208
	246	−2,576	257	205	1,850	18	/	/	/	0	P70	Net purchases of land and intangible assets		/	/	/	/	/	/	/	/	/	/
	−51,852	83,144	1,236	−500	−32,287	1,088		/	/	829	N5	Net lending (+)/ net borrowing (−)								829	/	/	829
	2,634,952	3,781,602	273,613	71,078	1,343,611	28,533	335,089	2,579,523	223,963	11,271,964		Total non-financial transactions		2,634,952	3,781,602	273,613	71,078	1,343,611	28,533	335,089	2,579,523	223,963	11,271,964
	Net acquisition of financial assets													Net incurrence of liabilities									
FINANCIAL C6	102	−114	15,920	/	566	0	−435	/	/	16,039	F00	International means of payment	FINANCIAL C6	/	/	−435	/	/	/	16,474	/	/	16,039
	31,256	134,893	−8,500	1,199	10,942	257	32,902	/	/	202,949	F10/20	Currency and deposits		1,017	/	166,907	1,561	5,590	/	27,874	/	/	202,949
	4,364	9,628	57,712	12,336	8,804	−13	12,026	/	/	104,857	F30/40/50	Bills, bonds and equities		28,947	/	32,741	104	34,700	21	8,344	/	/	104,857
	−5,602	7,332	109,164	1,891	14,679	880	−3,730	/	/	124,614	F60/70	Loans		66,970	55,516	−20,774	633	25,549	15	−3,295	/	/	124,614
	1,641	11,312	/	/	257	/	257	/	/	13,467	F80	Insurance technical reserves		/	/	/	13,467	/	/	/	/	/	13,467
							8,377	/	/	8,377	N6	"Net changes in financial assets and liabilities"		−65,173	107,535	−4,143	−339	−30,591	1,088		/	/	8,377
	31,761	163,051	174,296	15,426	35,248	1,124	49,397	/	/	470,303		Total financial transactions		31,761	163,051	174,296	15,426	35,248	1,124	49,397	/	/	470,303
							−7,548	/	/	−7,548	N0	Adjustment (N5 – N6)		13,321	−24,391	5,379	−161	−1,696	0		/	/	−7,548

Classification of institutional sectors

S 10	Non-financial corporations and quasicorporations
S 40	Credit institutions
S 50	Insurance enterprises
S 90	Rest of the world
S 60	General government (non-consolidated)
S 70	Non-profit institutions
S 80	Households (including unincorporated enterprises)

Gross domestic product	1,437,149
Market gross domestic product	1,264,273
Non-market gross domestic product	172,876

cont'd

Box 21 (cont'd)

The Integrated Economic Accounts of the 1993 SNA/1995 ESA are established following a model close to that of the TEE of the SECN. They reflect the accounting structure of the new international system and are, as a consequence, more complete. Current accounts, accumulation accounts and balance sheets are three parts presented in a successive order, and therefore the sequence of accounts is more elaborate (see Box 20).

As an important innovation, a column "total economy" is introduced in each side of the table to indicate the sum of the accounts of resident sectors. In this way, the aggregates of the system can be read directly from the TEE/IEA: GDP/NDP, GNI/NNI, etc. A complete numerical example of an IEA is presented in Table 2.8 of the 1993 SNA (Table 8.18 of the 1995 ESA). The IEA have not adopted the subdivision of the columns corresponding to goods and services into a market part and a non-market part as found in the TEE of the SECN (see chapter 6 for comments on this issue).

The introduction of a TEE and its evolution towards the IEA shows (beyond the perceived need for a synthesized presentation of the results of national accounts) a conception of national accounting that attaches great importance to its nature as a general accounting construction. The fact that this had long remained a particularity of the French school of national accounting indicates, probably, strong differences among national accounting cultures.

Table 8.18 of the 1995 ESA, which is better organized than Table 2.18 of the 1993 SNA, is presented here. It is identical to the IEA of the 1993 SNA, except for the latter's capital account (Account III-1), which in the ESA is subdivided into two accounts, a particularity that was not required. It must be noted that Account IV.2, changes in balance sheet, is nothing more than a synthesis of the contents of the accumulation accounts. Another presentation might be viewed as economically more logical, in which the opening balance would be placed before the current accounts. In this case, Account IV.2 would not be necessary and the closing balance could have followed immediately after the last accumulation account. The uneven development of the balance sheets has led to a preference for the presentation finally retained in the SNA/ESA; it does not modify at all the spirit of the system that considers that all flow has an effect on net worth.

cont'd

Box 21 (cont'd)

Table 8.18. Integrated economic accounts

Current accounts

Account	Uses[a]									Code	Transactions and other flows stocks and balancing items	Resources[a]									Account
	Total	G/S(res).	RoW	S.1	S.15	S.14	S.13	S.12	S.11			S.11	S.12	S.13	S.14	S.15	S.1	RoW	G/S(res).	Total	
I. Production/ external account of goods and services	497	497								P.7	Imports of goods and services							497		497	I. Production/ external account of goods and services
	536		536							P.6	Exports of goods and services								536	536	
	3,595	3,595								P.1	Output	1,753	102	434	1,269	37	3,595			3,595	
	1,904			1,904	6	694	246	29	881	P.2	Intermediate consumption								1,904	1,904	
	133	133								D.21–D.31	Taxes less subsidies on products						133			133	
	1,824			1,824	31	575	188	73	872	B.1g/B.1*g	Value added, gross/Gross domestic product	872	73	188	575	31	1,824			1,824	II.1.1. Generation of income account
	222			222	3	42	30	10	137	K.1	Consumption of fixed capital										
	1,602			1,602	28	533	158	63	735	B.1n/B.1*n	Value added, net/Net domestic product	735	63	158	533	28	1,602			1,602	
	−39		−39							B.11	External balance of goods and services							−39		−39	
II.1.1. Generation of income account	768		6	762	23	39	140	15	545	D.1	Compensation of employees				766		766	2		768	II.1.2. Allocation of primary income account
	191		0	191	0	2	2	3	51	D.2–D.3	Taxes less subsidies on production and imports			191			191	0		191	
	133		0	133						D.21–D.31	Taxes less subsidies on products			133			133	0		133	
	58		0	58	0	2	2	3	51	D.29–D.39	Other taxes less subsidies on production			58			58	0		58	
	429			429	8	92	46	55	276	B.2g	Operating surplus, gross	276	55	46	92	8	429			429	
	442			442		442				B.3g	Mixed income, gross				442		442			442	
	217			217	5	60	16	45	139	B.2n	Operating surplus, net	139	45	16	60	5	217			217	
	432			432		432				B.3n	Mixed income, net				432		432			432	
II.1.2. Allocation of primary income account	446		66	380	7	44	46	138	145	D.4	Property income	78	160	30	134	5	407	39		446	
	1,855			1,855	6	1,390	221	29	209	B.5g	Balance of primary incomes, gross/National income, gross	209	29	221	1,390	6	1,855			1,855	II.2. Secondary distribution of income account
	1,633			1,633	3	1,348	191	19	72	B.5n/B.5*n	Balance of primary incomes, net/National income, net	72	19	191	1,348	3	1,633			1,633	
II.2. Secondary distribution of income account	213		1	212	0	178	0	10	24	D.5	Current taxes on income, wealth etc.			213			213	0		213	
	322		0	322		322				D.61	Social contributions	14	39	268	0	1	322	0		322	
	332		0	332	1	0	289	29	13	D.62	Social benefits other than social transfers in kind				332		332	0		332	
	278		9	269	2	71	139	46	11	D.7	Other current transfers	10	49	108	36	36	239	39		278	
	1,826			1,826	40	1,187	382	32	185	B.6g	Disposable income, gross	185	32	382	1,187	40	1,826			1,826	II.3. Redistribution of income in kind account
	1,604			1,604	37	1,145	352	22	48	B.6n	Disposable income, net	48	22	352	1,145	37	1,604			1,604	
II.3. Redistribution of income in kind account	219			219	13		206			D.63	Social transfers in kind				219		219			219	
	1,826			1,826	27	1,406	176	32	185	B.7g	Adjusted disposable income, gross	185	32	176	1,406	27	1,826			1,826	II.4. Use of income account
	1,604			1,604	24	1,364	146	22	48	B.7n	Adjusted disposable income, net	48	22	146	1,364	24	1,604			1,604	
II.4. Use of income account										B.6g	Disposable income,gross	185	32	382	1,187	40	1,826			1,826	
										B.6n	Disposable income, net	48	22	352	1,145	37	1,604			1,604	
	1,371			1,371		1,215	156			P.4	Actual final consumption								1,371	1,371	
	1,371			1,371	13	996	362			P3	Final consumption expenditure									1,371	1,371
	11		0	11	0		0	11	0	D.8	Adjustment for the change in net equity of households in pension funds reserves				11		11	0		11	
	455			455	27	202	20	21	185	B.8g	Saving, gross										
	233			233	24	160	−10	11	48	B.8n	Saving, net										
	−41		−41							B.12	Current external balance										

cont'd

Box 21 (cont'd)

Accumulation accounts

Account	Uses[a] Total	G/S(res).	RoW	S.1	S.15	S.14	S.13	S.12	S.11	Code	Transactions and other flows stocks and balancing items	Resources[a] S.11	S.12	S.13	S.14	S.15	S.1	RoW	G/S(res).	Total	Account
III.1.1 Change in net worth due to saving and capital transfer account										B.8n	Saving, net	48	11	–10	160	24	233			233	III.1.1 Change in net worth due to saving and capital transfer account
										B.12	Current external balance							–41		–41	
										D.9	Capital transfers, receivable	33	0	6	23	0	62	4		66	
										D.9	Capital transfers, payable (–)	–16	–7	–34	–5	–3	–65	–1		–66	
	192		–38	230	21	178	–38	4	65	B.10.1	Changes in net worth due to saving and capital transfers	65	4	–38	178	21	230	–38		192	III.1.2 Acquisition of non-financial assets account
III.1.2 Acquisition of non-financial assets account	376			376	19	61	37	9	250	P.51	Gross fixed capital formation								376	376	
	–222			–222	–3	–42	–30	–10	–137	K.1	Consumption of fixed capital (–)										
	28			28	0	2	0	0	26	P.52	Changes in inventories								28	28	
	10			10	0	5	3	0	2	P.53	Acquisitions less disposals of valuables								10	10	
	0		0	0	1	4	2	0	–7	K.2	Acquisitions less disposals of non-produced non-financial assets										
	0		–38	38	4	148	–50	5	–69	B.9	Net lending (+)/net borrowing (–)	–69	5	–50	148	4	38	–38		0	III.2. Financial account
III.2. Financial account	691		50	641	32	181	120	237	71	F	Net acquisition of financial assets/Net incurrence of liabilities	140	232	170	33	28	603	88		691	
	0		1	–1			0	–1		F.1	Monetary gold and SDRs										
	130		11	119	12	68	7	15	17	F.2	Currency and deposits	0	130	2	0	0	132	–2		130	
	143		5	138	12	29	26	53	18	F.3	Securities other than shares	6	53	64	0	0	123	20		143	
	254		10	244	0	5	45	167	27	F.4	Loans	71	0	94	28	24	217	37		254	
	46		2	44	0	3	36	3	2	F.5	Shares and other equity	26	13	0		4	43	3		46	
	36		0	36	0	36	0	0	0	F.6	Insurance technical reserves	0	36	0		0	36	0		36	
	82		21	61	8	40	6	0	7	F.7	Other accounts receivable/payable	37	0	10	5	0	52	30		82	
III.3.1. Other changes in volume of assets account	15			15	0	2	1	–2	14	K.3–10, K12	Other volume changes, total	–3	2	–1	0	0	–2	0		–2	III.3.1. Other changes in volume of assets account
	24			24	0	0	0	0	24	K.3	Economic appearance of non-produced assets										
	3			3	0	0	3	0	0	K.4	Economic appearance of produced assets										
	4			4	0	0	4	0	0	K.5	Natural growth of non-cultivated biological resources										
	–9			–9	0	0	–2	0	–7	K.6	Economic disappearance of non-produced assets										
	–11		0	–11	0	0	–6	0	–5	K.7	Catastrophic losses		0	0	0	0	0	0	0		0
	0		0	0	0	0	8	–3	–5	K.8	Uncompensated seizures	0	0	0	0	0	0	0		0	
	1			1	0	0	0	0	1	K.9	Other volume changes in non-financial assets n.e.c.										
	3		0	3	0	2	0	1	0	K.10	Other volume changes in financial assets and liabilities n.e.c.	–4	2	0	0	0	–2	0		–2	
	0		0	0	0	0	–6	0	6	K.12	Changes in classifications and structure, of which:	1	0	–1	0	0	0	0		0	
	10		0	10	0	0	0	–2	12	AN	Non-financial assets										
	–7			–7	0	0	–3	–2	–2	AN.1	Produced assets										
	17		0	17	0	0	3	0	14	AN.2	Non-produced assets										
	5		0	5	0	2	1	0	2	AF	Financial assets/Liabilities	–3	2	–1	0	0	–2	0		–2	
										B.10.2	Changes in net worth due to other changes in volume of assets	17	–4	2	2	0	17	0		17	
III.3.2. Revaluation account										K.11	Nominal holding gains/losses										III.3.2. Revaluation account
	280		0	280	8	80	44	4	144	AN	Non-financial assets										
	126			126	5	35	20	2	63	AN.1	Produced assets										
	154		0	154	3	45	23	2	81	AN.2	Non-produced assets										
	91		7	84	1	16	2	57	8	AF	Financial assets/Liabilities		18	51	7	0	0	76	3		78
										B.10.3	Changes in net worth due to nominal holding gains (+)/losses (–)	134	10	38	96	10	288	4		292	

cont'd

Box 21 (cont'd)

Balance sheets

Sheet	Uses[a]									Code	Transactions and other flows stocks and balancing items	Resources[a]									Sheet
	Total	G/S(res).	RoW	S.1	S.15	S.14	S.13	S.12	S.11			S.11	S.12	S.13	S.14	S.15	S.1	RoW	G/S(res).	Total	
IV.1. Opening balance sheet	9,922		0	9,922	324	2,822	1,591	144	5,041	AN	Non-financial assets										IV.1. Opening balance sheet
	6,047			6,047	243	1,698	1,001	104	3,001	AN.1	Produced assets										
	3,875		0	3,875	81	1,124	590	40	2,040	AN.2	Non-produced assets										
	7,365		573	6,792	172	1,819	396	3,508	897	AF	Financial assets/Liabilities	1,817	3,384	687	289	121	6,298	297		6,595	
										B.90	Net worth	4,121	268	1,300	4,352	375	10,416	276		10,692	
IV.2. Changes in balance sheet											Total changes in assets										IV.2. Changes in balance sheet
	482		0	482	25	110	56	1	290	AN	Non-financial assets										
	289			289	21	61	25	−1	182	AN.1	Produced assets										
	193		0	193	4	49	30	2	108	AN.2	Non-produced assets										
	787		57	730	33	199	123	294	81	AF	Financial assets/Liabilities	155	285	176	33	28	677	91		767	
										B.10	Changes in net worth, total	216	10	2	276	31	535	−34		501	
										B.10.1	Saving and capital transfers	65	4	−38	178	21	230	−38		192	
										B.10.2	Other changes in volume of assets	17	−4	2	2	0	17	0		17	
										B.10.3	Nominal holding gains (+)/losses (−)	134	10	38	96	10	288	4		292	
IV.3. Closing balance sheet	10,404		0	10,404	349	2,932	1,647	145	5,331	AN	Non-financial assets										IV.3. Closing balance sheet
	6,336			6,336	264	1,759	1,026	103	3,183	AN.1	Produced assets										
	4,068		0	4,068	85	1,173	620	42	2,148	AN.2	Non-produced assets										
	8,152		630	7,522	205	2,018	519	3,802	978	AF	Financial assets/Liabilities	1,972	3,669	863	322	149	6,975	388		7,362	
										B.90	Net worth	4,337	278	1,302	4,628	406	10,951	242		11,193	

[a] Abbreviations and codes: RoW: Rest of the world; G/S(res.): Goods and services (residents); S.1: Total economy; S.15: NPISHs; S.14: Households; S.13: General government; S.12: Financial corporations; S.11: Non-financial corporations.

Box 22

The input–output framework of the 1993 SNA/1995 ESA

The table of supply and use of products, in which output is valued at basic prices and uses are valued at purchasers' prices (net of deductible taxes), is totally integrated into the system. With the exception of details given by industries and by products, all its results are represented in the Integrated Economic Accounts (IEA). As it includes the production account by industries and the supply and use of goods and services, this table is an input–output table (IOT), a characterization which is not clearly expressed in its name and which some specialists of input–output analysis, used to more analytical tables, might not accept.

1. The supply and use table of products (SUT) takes the simplified form shown on p. 119. The upper part presents, in rows, the breakdown of resources for each category of products (goods and services), consisting of imports (at CIF prices), output of industries (at basic prices), taxes less subsidies on products, and trade and transport margins. In columns, it presents the detail by product of imports, output, etc. A given industry may have as output several types of products, principal and secondary.

   The lower part shows, first, the uses of goods and services by product broken down into: intermediate consumption of industries, exports (FOB), final consumption expenditure and gross capital formation. Next, for each industry, it presents the total and the components of its gross value added (compensations of employees, etc.), and it finally provides some characteristics of its means of production (number of hours worked, GFCF, closing stocks of fixed assets).

   The gross value added of an industry is defined as the difference between the output of this industry at basic prices and its intermediate consumption at purchasers' prices; it is said to be "at basic prices".

2. Table 15.1 of the 1993 SNA (p. 350) presents the complete version of the SUT. It includes mainly the detail of the columns omitted in the schematic version above. On the supply side, imports of goods and imports of services are separated, as well as taxes and subsidies on products. More relevant: the output of industries is broken down into market output, output produced for own final use (own final consumption, own gross fixed capital formation) and other non-market output, mainly from government. It should be mentioned that the 1995 ESA does not integrally include the presentation of Table 15.1 concerning the different types of output. This reflects the strange attitude of a number of national accountants toward the market/non-market distinction (see chapter 6).

   On the use side, the SUT shows final consumption expenditure of households, of non-profit institutions serving households (NPISHs), and of general government. As the latter consists of collective consumption expenditure and individual consumption expenditure, the actual consumption of households (their consumption expenditure plus the individual consumption expenditure of NPISHs and of general government) can easily be established, as can be that of general government, which corresponds to its collective consumption (partly by convention, all final consumption expenditure of NPISHs is taken as individual consumption). Gross capital formation includes GFCF, changes in inventories and acquisitions less disposals of valuables (see chapter 8).

   Finally, the SUT may show in its global results, using some internal adjustment entries, the total value of imports of goods valued FOB, the total value of imports of goods and services including purchases abroad made by residents, and the total value of exports including purchases of non-residents in the domestic market, so as to allow the direct reading of total GDP. These skilful presentations, not reproduced here, guarantee a complete conceptual homogeneity and visual integration between the SUT and the IEA. This integration was only partial in the 1968 SNA/1970 ESA, as was also the case for the Input–Output tables of countries.

   Thanks to these adjustments, it was possible to harmonize the valuation of total imports of goods, now recorded FOB in both the SNA and the *Balance of Payments Manual*. By the

cont'd

Box 22 (cont'd)

Supply

	Total supply at purchasers' prices	Trade and transport margins	Taxes less subsidies on products	Output of industries (basic prices) 1…………n	Imports of goods and services
Products 1					
.					
.					
.					
m					
Total					

Uses

	Total uses at purchasers' prices			Intermediate consumption of industries 1…………n	Exports of goods and services	Final consumption expenditure	Gross fixed capital formation
Products 1							
.							
.							
.							
.							
m							
Total uses							
Value Added/ PIB par components 1							
.							
.							
v							
Output of industries							
Factors of production							

Supply and use of products table (SUT).

cont'd

Box 22 (cont'd)

same token, the exchange of services with the rest of the world now corresponds in the SNA to actual exchanges while, in the former versions, the recording of total imports of goods using a CIF valuation required a double adjustment of services to avoid double counting. First of all, transport and insurance services on imports supplied by residents had to be artificially added to exports of services. Secondly, transport and insurance services on imports supplied by non-residents had to be deducted from imports of services.

3. For instance, it is possible to follow manufacturing products in Table 15.1. The value of supply comes from imports (283), from output of industries at basic prices (1,714), from taxes on products (94), less subsidies on products (–5), and from trade and transport margins (74). Their total value at purchasers' prices is 2,160. Uses go to intermediate consumption of industries (992), exports (422), final consumption expenditure of households (567) and of general government (3), GFCF (161), changes in inventories (5) and acquisitions less disposals of valuables (10), for a total of 2,160.
4. The integrated character of the system is reinforced by the innovation that constitutes the cross-classification between the industries of the SUT and the institutional sectors of the IEA for production and intermediate consumption (not detailed by product), as well as for the elements of value added. This cross-classification is as follows:

	Industries				
	1	. . .	. . .	. . .	*n*
Institutional sector 1 Output Intermediate consumption Gross value added Compensation of employees Other taxes less subsidies on production Operating surplus gross/net Mixed income gross/net Consumption of fixed capital					
. . .					
. . .					
Institutional sector 5					
Total economy					

Table 15.3 of the 1993 SNA (p. 358) provides a detailed presentation of the table, including the distinction of output (market, own final use, and non-market) that the 1995 ESA does not make in the scheme of its Table 9.11 (p. 224).

5. Each non-empty cell of the use side of the SUT records a value at purchasers' prices (net of deductible taxes). For instance, following the numerical example of Table 15.1 of the 1993 SNA, final consumption expenditure of households in manufacturing products is 567. This value can be broken down into:

Value at basic prices	504	(Table 15.4a)
Trade margins	17	(Table 15.2)
Transport margins	3	(Table 15.2)
Taxes on products	48	(Table 15.2)
Subsidies on products	–5	(Table 15.2)
	—— +	
Value at purchasers' prices	567	(Table 15.1)

The matrix of uses at purchasers' prices of the SUT may thus be partitioned into five sub-matrices.

cont'd

Box 22 (cont'd)

It is easy to understand then, simply by looking at this partition, why the SUT compilers insist so much on the study of the circuits, of trade and transport margins, of taxation and of subsidies on products. The distinction between taxes and subsidies on products and other taxes and subsidies on production is essential, and often presents some difficulties. Nevertheless the possibility of rigorously comparing resources coming from production and imports and uses requires this distinction to be made. In practice, only by starting from the uses is it possible to calculate trade and transport margins as well as non-deductible taxes on products.

This explains why the 1993 SNA/1995 ESA keep such a broad conception of taxes and subsidies on products as compared to other taxes and subsidies in order to obtain values of uses at basic prices that reflect as much as possible the underlying physical quantities (see Box 18).

6. For analytical purposes the value of each cell at basic prices may be broken down into what corresponds to imported products and what comes from domestic output. To continue with the example above:

Direct origin: domestic output	404	(Table 15.7)
Direct origin: imports	100	(Table 15.5)
	—— +	
Value at basic prices	504	(Table 15.4a)

   As the imports matrix is somewhat difficult to estimate, it is usually only compiled from time to time.

7. After the preceding elaborations, resources (output and imports) and uses are both available at basic prices. However, the output of a category of products comes in general from several industries. It constitutes, at a given level of detail of the classification, the principal output of an industry (for Manufacturing, the example used here, it is 1,666) and the secondary output of others (2 for Mining and quarrying, 6 for Construction, etc.) for a total of 48 (see Table 15.1). Intermediate inputs to an industry correspond to what is used both for the principal output and for the secondary ones.

   In the Manufacturing case, its total output of 1,844 corresponds to manufacturing products (1,666) and other categories of products (178 in total).

8. For some analyses and uses it might be necessary to compare the total output of a given category of products (1,714 for manufacturing products for instance) with the sole intermediate inputs used for its very production, as if an industry, called "of homogeneous production", produced only one category of products and was the only one doing it. It is necessary, for this purpose, to construct a symmetric table called "product [in fact, industry of homogeneous production]-by-product". To do this, secondary output should be transferred, an easy task directly read in Table 15.1. From 1,844, total output of the manufacturing industry, 178 are excluded (secondary non-manufacturing output) while 48 are added (manufacturing products obtained as secondary output in other industries), yielding 1,714. Next, it is necessary to exclude from the intermediate consumption of the manufacturing industry what corresponds to its secondary output, and add the intermediate consumption used by other industries to obtain manufacturing products. This is a difficult and approximate exercise that makes use, if possible, of supplementary information, or alternatively utilizes mathematical methods based on technology assumptions; the two extremes being a single technology by product or a single technology by industry (see 1968 SNA, §§ 3.24–3.27, and 1993 SNA, §§ 15.144–15.149, and the illustrative result of Table 15.6). The resulting symmetric table is shown on page 122.

   This simplified presentation combines features from Table 15.6 of the 1993 SNA and from Table 9.12 of the 1995 ESA that have kept slightly different versions. Table 15.6 places, as is classical practice in symmetric product-by-product tables, imports as a negative entry within the final uses, close to exports. By so doing, the total of the rows of uses is equivalent to output at basic prices. Table 9.12 of the ESA instead records imports among resources as above.

cont'd

Box 22 (cont'd)

<table>
<tr><th rowspan="2"></th><th rowspan="2">Products (homogeneous units of production)
1……………n
Intermediate consumption of units</th><th colspan="3">Final uses</th><th rowspan="2">Total uses at basic prices</th></tr>
<tr><th>Exports</th><th>Final consumption expenditure</th><th>Gross capital formation</th></tr>
<tr><td>Products
1
.
.
.
n</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>Total uses at basic prices</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>Taxes less subsidies/ products</td><td></td><td></td><td></td><td></td><td>Taxes less subsidies/ products</td></tr>
<tr><td>Total uses at purchasers' prices</td><td></td><td></td><td></td><td></td><td>Total uses at purchasers' prices</td></tr>
<tr><td>GVA/GDP by component
1
.
.
.
v</td><td></td><td></td><td></td><td></td><td>GVA/GDP by component</td></tr>
<tr><td>Output at basic prices</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>Imports</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>Total supply at basic prices</td><td></td><td></td><td></td><td></td><td></td></tr>
</table>

Symmetric product [homogeneous units of production]-by-product input–output table.

The two rectangles with thick borders contain only values at basic prices, as resources and as uses. However, the 1993 SNA/1995 ESA do not consider a concept of value added defined, for an industry, as the difference between output at basic prices and intermediate consumption also at basic prices. In fact, by doing so, the value added obtained would be greater than that

cont'd

Box 22 (cont'd)

used by the system; the difference would be the non-deductible taxes less subsidies on products corresponding to its intermediate consumption (that is, always following the example from the SNA, 35 for the industry "manufacturing products", Table 15.6). This additional concept, used by specialists of input–output analysis, was not introduced into the system for the sake of simplification and also because of the difficulty, or perhaps the impossibility, of its interpretation. However, different views exist on this issue, as expressed during the process of elaboration of the 1993 SNA.

To keep only one concept of value added, denominated at "basic prices" (see point 1), the 1993 SNA/1995 ESA reintroduce in the symmetric product-by-product IOT, the total value of taxes less subsidies on products for each type of use, so that it is possible to obtain the latter at purchasers' prices.

Nevertheless, in these tables, the notion of purchasers' price has a different meaning from that in the SUT, because the trade and transport services are directly assigned to users, without passing through the trade and transport margins.

9. The 1993 SNA has left open the possibility for countries to choose between the valuation of output at basic prices as a preferred option or, in case of difficulties, at producers' prices net of VAT. The 1995 ESA has kept only the valuation at basic prices.

Box 23
Accounts for key sectors

The purpose of accounts for key sectors (1993 SNA, §§ 19.49–19.61) or accounts for key kinds of economic activity (1968 SNA, §§ 9.37–9.46) is to enhance the presentation of activities "that play a predominant role in the economy's external transactions and equilibrium in general". (1993 SNA, § 19.50). They aim mainly at representing economies in which some activities such as petroleum, mining activities or some crops (coffee or cocoa for instance) "account for an important part of exports, foreign exchange assets and, very often, government resources." (*ibid.*)

The detailed representation of this type of activities might concern production (activities identified separately and with a greater breakdown) and transactions on goods and services (more detailed classification of products) as well as the whole set of accounts of one or more institutional sectors for which these activities play an essential role.

The accounts of some key sectors might be viewed as satellite accounts. This is the case, for instance, for the accounts relating to tourism, whose purpose is to highlight activities which are strongly interrelated with others within the central framework of the national accounts.

They also may be seen as being entitled to enter directly in the central framework, which structure might then depend primarily on the distinction between activities and key sectors and the rest of the economy. Table 19.4 of the 1993 SNA gives an example of a supply and use table with key activity and product details. Table 19.5 shows a presentation of Integrated Economic Accounts with specific details concerning a key sector, which appears separately.

While there exist some sketches of satellite accounts for domains such as tourism, up to now no accounts have been realized for key sectors such as crude oil or coffee, except for a few attempts. This type of accounts, introduced within the central analysis, would nevertheless be essential in order to represent, in an integrated way, the activity of economies that depend heavily on the income generated by crude oil, for instance. Many factors explain this situation and hinder the development of such initiatives: scarcity of statistical resources which is an obstacle to innovation, concentration of the attention of international organizations on the main results of the central framework in a strictly normalized way without giving impulse to original initiatives, national preference for secrecy on key activities, under-estimation of the interest of representing them more completely within the integrated framework of national accounts.

or that of inflation and in particular of interest (on these questions see chapter 8). The principal difficulties are to be found in the zones of contact between flows and balance sheets, and in the relationship between past, present and future that bring into play, among others, the very concept of income, and its link with the change in net worth. References to concepts of natural capital and human capital contribute to make the problematic still more complex. Later chapters will be dedicated to these substantial questions.

2.2. Towards universalization

Independently of its shortcomings, and they are not negligible, the system that will dominate the work on national accounting at the beginning of the 21st century is stamped with the seal of universality. The system is common to all the main international organizations that publish it jointly (even with distinct 1993 SNA and 1995 ESA, it is undoubtedly a single system). It tends to influence other sets of recommendations prepared by them (balance of payments, etc.). It replaces the MPS that was in use in countries with centrally planned economies. Through a sinuous path, the USA (see further) is joining in.

The MPS ceases to exist as an alternative international system at the beginning of the 1980s, an event obviously related to the end of the Soviet Union and its bloc. It had survived until then only for political reasons. During the previous decade, the latter had decelerated the process of getting closer to the SNA despite the will of experts in many countries. From 1970 on, Hungary goes further with her new official system. Hungarians (mainly Janos Arvay) try to influence the MPS standards, whose main aggregates they calculate while simultaneously introducing the main SNA aggregates. They are trying to integrate the MPS and the SNA into a single system. They are successful for production and transactions on goods and services, by means of an enlarged input–output table where both material and non-material activities are included but separately identified. A similar operation with the income circuit is impossible given the incompatibility, even formally, of the systems. SNA is followed in this case because it makes more sense for the new system of economic management introduced in 1968.

Prepared by the CMEA in the mid-1980s, a revision of the MPS is submitted for comments to the UN, which publishes it in 1989. More developed when compared to the 1971 version, it puts together a MPS without substantial modifications (an input–output table is introduced only for material production) with complements of a heterogeneous conceptual nature, such as a balance of non-material services and indicators of total consumption and total income of the population. That was a swan's song in what was already a transition period. The countries that had become members of the IMF and the World Bank in the 1980s (Yugoslavia, Romania, Poland, Hungary) provided them with data according to the SNA. But Hungary was the only one, until 1988, to officially publish the aggregates following both systems.

A rapid reversal takes place in 1988 and 1989 after the publication of GDP by the USSR. A majority of countries proceed also to do so. The year 1989 is somehow ambiguous. At the beginning of that year, Hungary has the UN Statistical Commission adopt the idea of an integration of both systems into a supersystem. As the future of the Soviet political regime remains uncertain, the objective is to push in the direction that Hungary has chosen since the 1970s. However there is the risk of perpetuating a less autonomous but more official MPS worldwide. The idea is then put forward at the UN, under a discrete Soviet nudge, that the MPS could be more relevant than the SNA for less developed countries, for which the option between MPS and SNA should remain open. Opposition to these two ideas, differently understood, is expressed during the last meeting on the links between MPS and SNA that takes place in Moscow in December 1989; these discussions are quickly surpassed by history. In September 1990, during a OECD meeting in Paris, the heads of the statistical offices of central and eastern European countries decide to introduce the SNA or the ESA in the next two or three years. The SNA is then going to replace the MPS very quickly, but within a context of frequently agitated economic conditions and with chaotic transformations of the information systems. China, on its side, after having used MPS and the ESA at the same time since 1985, adopts the SNA as its official system of accounts in 1992.

To be truly universal, the SNA still needs to be formally applied by the USA. Many US national accounts compilers are aware of the old-fashioned character – they would probably avoid the use of such an expression – of the form of their accounting system and the insufficient integration of their accounts. Many American scholars (Richard and Nancy Ruggles, for instance) have criticized the NIPA, that they know well, and extrapolate its inadequacies to the SNA that they often hardly know. At the beginning of the 1980s, the Ruggleses, then at the UN, contribute efficiently to the launching of the revision of the 1968 SNA.

Differently from the previous revision (1965–1968), the USA is going to fully play its role in the discussions and elaboration of the 1993 SNA. Carol Carson, shortly afterwards Director of BEA, is a member of the core expert group. By mid-1990, she is commissioned to reinforce the inter-secretariat working group in the organization of the revision that the UN, weakened and dissipating its forces, does not take efficiently in hand. She thus plays a crucial role in the final phase. The USA, deeply involved, has then made clear the intention to set up the future system, and to formally change over to the SNA. The technicians have the support of Congress.

But, as the 1993 SNA is completed, with some years of delay, the budgetary difficulties multiply for the statisticians. According to US budget law, credits agreed to by Congress concern specific operations and leave narrow margins to statisticians. The program concerning the implementation of the new system has been modified several times. The idea of a gradual implementation has come (for instance, GFCF is finally introduced for the general government).

Changes in staff take place. Orientations become less clear. It is possible that new wine is being partially poured into old skins, which means that the USA would bring their accounting treatments closer to the recommendations of the SNA without significantly modifying the traditional framework of the NIPA. That would be a pity because even if the NIPA, as a framework, has little influence on national accounts compilers worldwide, this situation contributes to a biased perception about national accounting by many economists and slows the American contributions to the international accounting system.

Outlook

The construction of a fully developed international system of national accounting covers a long period of time. It takes half a century from the Anglo–Canadian–American meeting in 1944 to the adoption of the 1993 SNA/1995 ESA. Emphasis originally put on the standardization of aggregates and their interrelations, in a summary set of simplified accounts, disregarding the Stone proposal of an effective system of sectors accounts, is finally set aside in favor of the construction of an integrated system.

The preparation and publication of the 1968 SNA and the 1970 ESA constitute important stages in the process. They witness the setting up of a conceptual model, influenced mainly by Stone (1968 SNA) and by the French national accountants (1970 ESA) with important contributions from other countries, Scandinavian in particular, that reflects more generally progress achieved in the most advanced countries. The French bring to an end the schism they had produced in the West at the beginning of the 1950s. In the East the process, during the 1960s, aims at a mutual understanding of the two systems (SNA and MPS) and at studying their differences that would eventually allow the cross-calculations of the principal magnitudes.

The following quarter century witnesses outstanding progress for the international system in two dimensions. First of all an achievement, even if imperfect, of the original implicit target (to provide a representation of the overall economy and its main actors, similar to what business accounting does for the economic entities taken individually), and second, unification. Several features illustrate this: an almost complete unification in a common conceptual model – within the limit of certain imperfections proper to all human deeds – encompassing the SNA, the ESA and the IMF manuals on balance of payments, government finance and monetary and banking statistics; the disappearance of MPS as an alternative system. The only unsatisfactory element in this scenario is the ambiguous attitude of the USA, which has not yet fully decided to adopt the new accounting model of the SNA and to renounce to the traditional NIPA as general reference, even though a simplified presentation of their main results could, if so desired, continue to follow this type of framework.

This almost complete unification of the accounting system of national accounting does not prevent differences in emphasis or in interpretation, nor the existence of different cultures on the topic (in particular, see chapter 4). Besides, the history of national accounting is punctuated with substantial discussions on its contents, in which initially mostly economists participate, then mostly statisticians and national accountants intervene; and finally all take part in frequently tense controversies on topics that bring into play the relations between national accounting and economic theories (see chapters 6 through 9 and the last part of chapter 10).

The standardization of the accounting system, once reached, is no guarantee of the effective homogeneity of data to be found in the accounts, in the same way as in each country the existence of a well-integrated system of national accounts does not ensure that the accounting and statistical measurements are able to reach with a good level of approximation the object of the study, that is the overall representation of the economy (see chapter 5).

Annotated bibliography

Volume 2 of *A Programme for Growth* (Chapman & Hall, 1962), is dedicated to *A Social Accounting Matrix for 1960* by Stone. A summarized presentation is found in Chapter II, Vol. 1. However, the best for the matrix presentation is to read Chapter II of the 1968 SNA (pp. 17–34) – *A System of National Accounts*, United Nations, 1968 – dedicated to the structure of the system (Box 17 of the present book may serve as an introduction). The complete structure is illustrated in the large matrix of Table 2.1 at the beginning of the chapter.

The first ESA is described in *European System of Integrated Economic Accounts 1970*; second edition, updated with changes in the treatment of VAT and introduction of a new chapter on changes in volume and price, 1979. The list of preparatory studies appears at the beginning.

The SECN (Enlarged System of National Accounting) appears in *Système élargi de comptabilité nationale. Méthodes* (Les collections de l'INSEE, series C, No. 44–45. First printing, May 1976; second printing, with some corrections and updates, September 1979; new edition reviewed and completed benchmark 1980, series C, No. 140–141, June 1987). On the emergence of French quarterly accounts, see Philippe Nasse "Les comptes trimestriels" [Quarterly accounts] in *Pour une histoire de la statistique* [For a History of Statistics] (Vol. 2, pp. 627–633). On the experiences with regional accounts, Pierre Soubie et al. "Comptes économiques régionaux. Essai de régionalisation des comptes de la nation 1962" [Regional economic accounts, an attempt at regionalization of the 1962 accounts of the nation] (*Etudes et Conjoncture*, Special issue, 1966), mainly the first part, "Présentation d'un cadre comptable régional" [Presentation of a regional accounting framework] (pp. 5–18) with the distinction between regional and non-regional agents.

The latest versions of the international systems are:

- *System of National Accounts*, 1993 (Statistical Commission of the European Communities, IMF, OECD, United Nations, World Bank). For an overview, see Chapters I ("Introduction", pp. 1–15) and II ("Overview", pp. 17–69).
- *European System of Accounts ESA 95* (Eurostat, 1996).

The publications listed above are reference books, to be consulted when needed, *but a general knowledge of the version in use at a given time is important for* economists and other users.

The publication of a new system or a new version usually brings about some comparisons with the previous one. The 1968 SNA presents only a comparison of general nature with the 1953 SNA (Preface, Chapter 1 §§ 1.1–1.11). The introduction to the SECN (version 1976, 1979) compares it with the former French national accounts. In a few pages, the 1993 SNA is placed within the background of former works ("Looking back", pp. xxxvii–xlii), and its "Annex I" (pp. 523–539) goes into a detailed analysis of the changes since the 1968 SNA. (The 1995 ESA only provides a short comparison with the 1970 ESA, but unpublished detailed technical documents do exist.) In "Constancy and change in the United Nations Manuals of National Accounting (1947, 1953, 1968 and 1993)", in *The Accounts of Nations* (1994, pp. 198–217), Fritz Bos attempts a useful diachronic analysis of the successive versions of the SNA, although on several points questionable or erroneous.

The final presentation of a system unfortunately does not allow readers to know and understand the debates that preceded its final adoption, or to see the play and the role of the different actors (on the history of international standardization, see the appendix to the present chapter "Investigating the decision process"). The traces are lost in the preliminary documents and meeting reports, or in the memory of the participants. Anne Harrison (OECD) made a somewhat "administrative" but appreciable effort to retrace the history of the 1993 SNA preparation: "The SNA: 1968–1993 and beyond", in *The Accounts of Nations* (*op. cit.*, pp. 169–197). A more committed point of view can be found in André Vanoli's lecture "La révision du SCN des Nations Unies" [The revision of the United Nations SNA], presented at the Fourth Conference of the *Association de Comptabilité Nationale* [National Accounting Association] in March 1991 ("La Comptabilité Nationale pour quoi faire?" [National Accounting. What for?] (*Economica*, 1992; text reviewed and completed for a meeting of the National Council for Statistical Information, CNIS in France). It presents, in particular, the debate on the treatment of R&D expenditures (§ 2.4). On this topic see Box 53.

The book edited by John W. Kendrick, *The New System of National Accounts* (Kluwer, 1996) has presentations and discussions on the new system (and related topics) that bring several interesting views and perspectives. However it is not possible to find there a well-balanced view on influences and contributions that have marked the 1993 SNA. In Carol Carson's paper, "Design of economic accounts and the 1993 System of National Accounts", the SECN is not mentioned as a source for the 1993 SNA; Robert Eisner's contribution on satellite accounts does not indicate the French origin of this idea; Richard Ruggles' contribution on the integration of micro–macro data totally ignores the existence of intermediate systems. Nevertheless, all this had been mentioned in André Vanoli's article "Sur la structure générale du SCN, à partir de l'expérience du système élargi de comptabilité nationale français" [On the general structure of the SNA, starting from the experience of the French enlarged system of national accounts] (*The Review of Income and Wealth*, June 1986, pp. 155–199; English translation available), quoted by Carson in reference to a particular point. It is only on page 381, in the paper by Yoshimasa Kurabayashi, a Japanese scholar who has been a Director of the United Nations Statistical Division, that an attentive reader will learn that "*In passing, one should note that the framework of SNA 93 as illustrated in figure 1* [of his text, page 382] *closely resembles the French framework of SECN* [the enlarged system of national accounts] *in its structure and presentation*)". And on page 385 he adds "*The framework of satellite accounts whose idea entirely originated from SECN* . . . ". (The above remarks may seem caustic. To omit them would seem to justify inelegant behavior).

The evolution of the material product accounting (MPS) is described by Janos Arvay in "The Material Product System (MPS): A retrospective", in *The Accounts of Nations* (*op. cit.*, pp. 218–236). It presents references to books, in Russian, by Popov (1926) and Sobol (1960) and to the different United Nations publications in the chapter. Excerpts from T. Ryabushkin's book *Essays on Economics Statistics* (1950) have been translated into French in *Statistiques et Etudes Financières, Supplément Finances Comparées* (No. 17–18, 1953). In particular they present a description of the system of balances. The analysis of national income in Marx' works, according to the Theories on surplus value (Marx writings 1861–1863, published as Book IV of *Capital*, by Karl Kaustky 1905–1910) is presented there (pp. 105–108). For a discussion on productive labor, see the article "Production, travail productif/improductif" [Production, productive/unproductive labor] in Gérard Bensussan and George Labica, *Dictionnaire critique du marxisme* [Critical Dictionary of Marxism] (PUF, coll. "Quadrige", 1999; first edition 1982).

Appendix. Investigating the decision process

Attempting the "sociology of decision making", or more modestly perhaps the "sociology of influences", with respect to the process of international standardization of the systems of national accounts would require specific research. The comments that follow will only provide some insights.

1. The initiative of the Committee of Statistical Experts of the League of Nations in 1939 to think about the subject came to a sudden end because of the war. Therefore, the first effort was done on a fully cooperative basis on the occasion of the *tripartite meeting – United Kingdom, Canada, United States – held in Washington in September 1944* with the representatives of the interested institutions: Richard Stone (United Kingdom), George Luxton (Canada), Milton Gilbert and several of his colleagues (USA). Edward F. Denison, one of the American participants, will present the conclusions one year later ("Report on the tripartite discussions of national income measurement", *Studies in Income and Wealth,* NBER, Volume X, 1947, pp. 3–22). He writes, from the outset, that the agreement reached resulted "partly through persuasion, partly through compromise" (p. 3), two classical mechanisms in all negotiation.

Differences among the three countries on a series of issues with important quantitative implications will be eliminated by the adoption of the British methods by the other two countries: exclusion of interest on the national debt from national income and product, taxation on corporations to be treated as direct taxes, inclusion of imputed rent for owner occupied dwellings. Denison notes though that the USA had decided to introduce those changes even before the meeting took place.

The conference also agrees to adopt a method developed by the Department of Commerce for the imputation of banking services not explicitly charged (see chapter 4).

Nevertheless, differences in points of view remain strong. They seem to correspond mainly to the very conception of a system of national accounts. The meeting retains six or seven basic accounts, or sets of tables, to show the interrelations among different sectors and types of transaction. The six NIPA accounts are to be found there (see Box 7). Stone wishfully considers the introduction of an account for financial institutions (the possible seventh one), but this suggestion is clearly retained out of politeness. Denison notes with some lack of deference in his report: "As its nature and necessity are not clear to me, and the Department of Commerce does not plan its inclusion, I shall not attempt to discuss it" (p. 7). The future isolationism of the US accounts is already noticeable.

The Gilbert–Stone disagreement is deeper. "Mr. Stone," writes Denison, "while satisfied with this system of social accounts as an immediate goal, envisages a much more elaborate system as a final desideratum" (p. 7), and indicates that

Stone is preparing a manuscript for the League of Nations presenting his views in full (see chapter 1, pp. 24–26 and its appendix). The US national accountants are, and will remain, in a top–down position. For them, the accounts are a means to link the aggregates and to show their main components. Stone, on the contrary, in this phase, thinks of a system of accounts bottom–up, adding up the elementary flows concerning economic transactors.

These differences in view are not easy to interpret. Americans, at the time very Keynesian, adopt an extremely macroeconomic approach to national accounting, closely linked to how they are using it. On the other hand, Stone, who at the time is not involved in economic policy (he is working at the Central Statistical Office), seems to defend a broader point of view and to be more interested in the organization of the system of economic statistics as a whole. In the extremely decentralized US statistical system, the National Income Unit of the Department of Commerce is placed downstream of the multiple institutional channels of statistical compilation. It probably views itself as federative at the top but in no way as an integrator at the bottom.

On other points, the tripartite discussions turn into a confirmed failure. The most important is related to the possible breakdown of the accounts of general government into a current and a capital account. The USA refuses. The issue was discussed at length but no agreement was reached, writes Denison, who unfortunately does not explain the reasons for the American opposition (as a consequence, there is no capital formation for the general government, everything is treated as current expenditures, and therefore no estimates for depreciation of capital). A rather curious position, as Denison speaks (p. 9) of the government services and of their valuation. There is also disagreement on the possibility of splitting the saving of proprietors of unincorporated enterprises between "business" and "personal" saving. The Department of Commerce is totally opposed to this, after having attempted to do it, while Stone is probably in favor. He will retain this solution in his 1945 project. There are other elements of disagreement such as, for instance, the interest on consumer debt and the interest of local government (whether to include them or not in national income).

It is clear, at this stage, that the objective is mostly, through unanimous agreement, to draw the approaches closer on the less controversial issues.

2. Just over a year later, at *the meeting of the Sub-committee of National Income Statistics of the League of Nations, at Princeton in December 1945*, the circle is larger and includes in particular Australia, the Netherlands and Mexico. Stone, who had recently been appointed Director of the Department of Applied Economics at Cambridge, chairs the meeting. The USA is represented by George Jaszi, the Netherlands by J.B.D. Derksen. The subcommittee report gives no details on the discussions about Stone's document. It presents the set of adopted tables and his memorandum as an appendix. The duality set of tables/reference accounting system has already been mentioned here (see chapter 1, p. 25 and chapter 2, Box 7). Did Stone really try to get his system through in a more complete form in this set of tables? Or, did he feel that it was very difficult to go beyond the 1944 tripartite agreement about the six accounts? Anyway, there are only a few direct signs in the proposed tables of the memorandum accounting framework: the breakdown of net output (Table 3) details productive enterprises, banks and other financial intermediaries, and finally insurance companies and social security funds (altogether). In fact, the group does not follow Stone on the social security funds which, as institutions, are grouped together with public collective providers in Table 9. These have a capital formation, as proposed by Stone. The US proposal on this point is not followed. In general, the sub-committee report consolidates the September 1944 agreement, and corresponds to what the USA will soon use as the structure of their system of accounts.

The United Nations then replaces the League of the Nations. Statistical matters are appended to the Economic and Social Council, which means in practice to the Statistical Commission of that Council, which consists of thirty or so country members elected on a regional representation basis (for a long time, permanent members of the Security Council will be always part of it). In February 1947, the Commission decides that the sub-committee's report and its appendix should be published among the last *Studies and Reports on Statistical Methods* of the League of Nations (United Nations, Geneva, No. 7, 1947). But "The Commission wishes it to be understood that these documents are published as valuable technical documents. They do not carry the Commission's endorsement in detail." (Editorial note, p. 4). At that time, therefore, there are still no official international recommendations.

3. Several years later began a *period of standardization in the framework of the OEEC*. This institution was established in Paris in 1948 mainly to coordinate recovery programs of the member countries in the context of utilisation of US aid provided through the Marshall Plan. On Richard Ruggles's instigation, at the time staff member of the Marshall's administration, a national accounts research unit is created at Cambridge, from 1949 to 1951, under Stone's direction, to prepare a normalized system of accounts. Stone's position then becomes dominant in the genesis of the first generation of standardized systems: *Simplified system* (1950), then *Standardised System of National Accounts* (1952) of the OEEC, then *System of National Accounts and Supporting Tables* (1952) of the United Nations (on the presentation and critical review of the first standardized system, whose structure is still inspired by the Anglo-American agreement, see section 2 of chapter 2). Within the OEEC framework, where Milton Gilbert has become the Statistics and National Accounts director, the discussions are limited to Europe. Stone is surely arbitrating most of the discussions (see, in chapter 2, p. 81, Aukrust's comment on the lack of Scandinavian influence). The United Nations is mostly useful in order to "globalize" the OEEC system. Everything is tied up in one month in New York (July 1952), indicates Stone in his Nobel Autobiography (p. 3) (www.nobel.se/laureates/economy), adding "In 1952, not many statisticians were familiar with national accounting and so there was no need for elaborate discussions outside the committee [called by the UN]".

4. The number of informed people was going to grow shortly after. At the beginning of the 1960s, the *Statistical Office of the European Communities* (SOEC) that has to answer the increasing demands of the Commission, experiences the insufficiency of the information collected following the OEEC Standardized System, and at the same time wishes to know the effective contents of the Accounts of Member States. To clarify this, and in order to look for a greater homogeneity, a national accounts working party carefully scrutinizes what countries include within the entries of a "sectors' accounts scheme". The group systematically cross-classifies the sectors and the flows of the OEEC system (now OECD) organized according to the simple reference accounting structure. Representatives of the Six (Germany, France, Italy, the Netherlands, Belgium and Luxembourg) and the SOEC staff in charge of the follow-up of national accounts exchange information and try to elaborate common solutions. The exercise is trying, but useful; it is done in the four official languages with simultaneous translation and many communication difficulties. Questions are many. Are transfers from the City of Ostende to urban transportation to be considered as subsidies or current transfers to households? Do payments made by the Ministries of Finance to Post Offices on behalf of net deposits on postal cheques accounts deposited with the Treasury represent interest or purchases of services? Are real estate taxes of a direct or an indirect nature? Should pension funds of civil servants in the Netherlands be considered general government or financial institutions? etc.

At this learning stage of international discussions, talks are relaxed: participants get information, analyse it, try to be convincing without imposing a decision. There is no dissymmetry among the participants (in particular, in the case of Germany, Hildegard Bartels, later Gunther Hamer, when the former became vice-president of the Federal Statistical Office, Vicenzo Siesto for Italy, C.A. Oomens for the Netherlands, Jacques Mayer and André Vanoli for France). But the exercise has its limitations, because the reference OEEC system is too narrow and it is impossible to progress much on a purely empirical basis. Besides, specific work is increasing inside the group (reports on agricultural accounts and rest of the world accounts) and outside (series of meetings on financial accounts, studies of the group on "Budget Comparison" of the General Directorate for Economic and Financial Affairs). It is necessary to widen the objectives.

5. In *February 1964*, the Conference of General Directors of Statistical Institutes (DGINS) of member countries decide to establish a national accounting system for the Community. Vanoli is asked to prepare a report that is presented in November ("*Propositions pour un cadre communautaire de comptabilité nationale*") [Propositions for a national accounting framework for the European Communities]. When the DGINS make their decision, at the beginning of the year, the intention of the UN and the OECD to review their first standardized systems is in the air, but nobody has a clue as to the orientation that is being considered. The OECD has asked for some reflections from a consultant, Thomas Schiøtz, head of the Norwegian National Accounting unit (1964–1965). The UN has requested a memorandum from Stone. International coordination is then weak, and it seems that at the SOEC no one knows about this request. The “Propositions” are completed shortly before Stone’s report is known. This report changes the situation, since, in presenting a developed and integrated system, it sheds reservations, some of them strong, in Europe (and obviously elsewhere) [see section 1 of the present chapter].

No one requests that the Community’s endeavour be suspended. On the other hand, the OECD decides in 1965 to abandon its own system. The UN Statistical Office is in its consolidation phase and OECD is inclined to leave the statistical standardization activities. A considerable number of consultations take place between 1965 and 1968, extending somewhat later within the European Community. In the European Community of Six, the National Accounts working group debates on the basis of its former work and of the 1964 “Propositions”, but at the same time taking Stone’s report into account as well as the developments happening at the UN.

A *worldwide group of experts, headed by Stone*, oversees the operation on behalf of the UN. Europe is strongly represented (Aukrust, Mayer, Oomens, D. McCarthy from Ireland and Margaret Mód from Hungary). George Jaszi (USA), Bernardo Ferrán (Venezuela), S.G. Tiwari (India), and Earl Hicks (IMF) complete the group that holds three meetings. Most of the discussions take place in the United Nations Regional Commissions. There are discussions in all regions, but those at the United Nations Economic Commission for Europe (UNECE) are particularly intense, lasting in several instances up to two weeks. The representatives from the European Community of Six that meet regularly in Brussels or Luxembourg frequently have converging positions, although without any previous attempt to harmonize them. Scandinavians and Danish, who for many years had developed cooperation in statistics within the Scandinavian Council framework, prepare common positions, eventually distributing the topics on which the position of one or another would be supported by all.

However, *the future ESA* (European System of Integrated Economic accounts) is being *elaborated in parallel* with the concern of being more precise and more rigorous in the recommendations. This is possible because there are only six countries involved and they have a solid knowledge of the institutional characteristics and specific aspects of the member states, based on their great similarity. It is interesting to note that in order to really reach understanding, use is made of successive translation, in the meeting room itself, which makes it possible to enter into details on an on-going basis. Raymond Dumas, head of General Statistics at SOEC, and Vittorio Paretti who replaces him, are eager to avoid the possibility for countries in the future to put divergent contents in apparently common categories, as is frequently the case in the OEEC–UN framework.

In this multi-polar international context [discussions about national accounting in the Eastern countries are taking place at a different level, see section 1 of the present chapter (pp. 101–102)], decisions are the product of a progressive winnowing process. Formally, things are simple. For the UN, the Statistical Commission is, in principle, the highest decision authority, as the Economic and Social Council only gives formal approval to decisions on technical matters. However, its main role is to set general orientations for the statistical program worldwide. It is difficult to imagine it arbitrating technical problems on its own behalf, a situation that may happen only on very rare occasions (there will be such a case in 1993). An unwritten rule avoids giving to countries that are at a certain moment member of the Commission the exorbitant privilege of approving solutions close to their particular preferences but which might harm the interests of non represented countries. In the case of the European Community, the DGINS Conference plays a role similar to that of the Statistical Commission, without getting involved, either, into technical debates. There is, however, a difference because the reduced number of countries makes it possible for all to be present in the assembly, which places the assembly closer to the statisticians.

In the UN, the Statistical Office has the initiative to trigger the operations, such as in this particular case, the report by Stone at the end of 1964. Consecutive versions of the project will lead to its final version adopted in 1968 by the Statistical Commission. In the meantime, a large process of consultation will have made sufficient consensus appear. This cannot mean unanimous agreement on all issues. The purpose is not to find the largest pre-existent common denominator, or to derive only the one that comes out from discussions. The reciprocal effort of persuasion has to be as intense as required to assure, in the absence of complete convergence, that compromises are accepted or, at least, that those with no intention of accepting them in practice will not oppose them openly, mainly when they are influential. The system that is adopted should at the same time represent a certain synthesis of the best existing practices and be in advance as compared to the average status of these practices. Very clearly this will frequently be far beyond the medium-term expectations of less advanced countries. The fact of UN recommendations not having a compulsory character for the internal practices of the countries makes it easier, in some cases, to obtain compromises.

The drafting of the UN meetings' minutes tries to take into account the different points of view expressed by weighing them on an approximate basis. Thus the fact that the arguments put forward and positions supported are attributable to *some, to a number of, to most, or to all the participants* has a strong influence on their probability of having a bearing on the subsequent parts of the process. An isolated opinion (*in one view*) has little chance of being adopted. Divergence or agreement might arise among Regional Commissions. The turn is then for the worldwide group of experts to intervene. In this context, the discussion of the draft minutes, always done during the last day of the meetings, takes on a great importance. It is not possible to reopen the main debate, but one has to be aware of omitted points, of unclear drafting, and possibly the correction of the weights given to various views following the scale mentioned above.

In all this interplay, participants exercise different influences depending on the stage of development and the importance of the country they represent, their own expertise and/or international reputation, their language abilities, although simultaneous translation services are available for the meetings except for those of the expert group (translation is a difficult art and those that totally depend on it may sometimes have difficulties in understanding what is being discussed), and finally – and this is not a small matter – their own capacity to argue and convince.

As the main lines of the integrated system proposed by Stone had been accepted without much opposition, he stays very elegantly clear of the fray. The rejection, from the very beginning, of his proposal to include the households' purchases of durable goods in capital formation does not disturb him much. During regional meetings he is mostly in a pedagogical position, an exercise at which he truly excels, and listening to him is a pleasure. But the responsibility of going into the twists and turns of the discussions, of participating in writing them down in the minutes, and then of drafting the successive versions of the project, is almost exclusively on the back of Abraham Aidenof, who also follows all the regional meetings. He skillfully accomplishes an enormous job. This American of Russian origin, who had lived in China, is then the Director of National Accounts at the UN. He is literally exhausted by the task (he is said to have installed a bed in his office and slept there for months).

Some discussions are recurrent among national accountants. That is the case for the traditional debate about distinguishing or not current transfers from capital transfers. Positions are strongly divided. Aukrust tries to tilt the balance in favor of excluding the concept of capital transfers but he does not prevail. He is more successful in obtaining the elimination of the allocation between users of the imputed bank service charges. Canadians and Americans are opposed to this position but their participation in meetings is weak. Aukrust, wisely, also obtains the replacement of the term "*factor cost*" by "*factor incomes*". The fine-tuning of the system is made under the strong influence of the European Community of Six, of Scandinavians (mainly Norway and Sweden) and of the British. Latin America, Africa and Asia, where national accounts lag behind, and discussion meetings are scarce, have difficulties making their voices heard. To take into account their difficulties, a chapter is added in midstream (Chapter 9, "Adaptation of the full system to the developing countries"). It proposes accounts for geographical zones, for essential activities, for the overall public sector, as well as a distinction between modern and traditional forms of production. These suggestions are scarcely implemented. It is interesting to mention the introduction of the table "Supply and disposition of goods and services" (Table 28, p. 227) the presentation of which is simpler than the classical supply and use table adopted by the 1968 SNA (Table 2, p. 168). Trade and transport services of goods are not assigned as such to different uses, intermediate or final. They are presented as a margin and their value is added by product to output at producers' value. This table, suggested by the Economic Commission for Africa, originates in the so-called "intermediate system" (or "Courcier system") prepared, for the francophone African countries, by Michel Courcier, national accountant from the SEEF. It inserts elements of the former French national accounts (tables of supply and use, Tableau économique d'ensemble) within the general categories of the first Standardised System.

Back to the European Communities of Six. Given the satisfactory evolution of the process at the UN, some countries, in particular the Netherlands, question the usefulness for the Communities to have their own system. The SOEC and most of the member countries are attached to this specifically elaborated product. It is clearer, better adapted to the six; it makes the distinction market/non-market more precise, and it has developed an in-depth treatment of social protection and of insurance as well as some aspects of financial analysis; it has a chapter on population and employment; it has a richer sequence of accounts, etc. The compromise consists in saying that ESA "represents the Communities' version of the United Nations' revised System of National Accounts" (foreword by Raymond Barre, p. 3). In practice, the existence and combination of ESA with other instruments like the "Statistical Classification of Economic Activities in the European Communities" (NACE according to the French acronym which was maintained), also adopted in 1970, gives the European Communities a powerful instrument of statistical harmonization, as regards to member countries, to other areas of the Commission and to countries which are candidates for joining the EEC; the sole reference to the 1968 SNA would not have provided it.

6. Fifteen years later, *the 1968 SNA revision that will lead to the 1993 SNA*, follows a quite different process. Formally, the rules are the same. Worldwide, there are the Statistical Commission, an Expert Group, and working groups in the Regional Commissions; all of them keep in principle the same relative position. However, this time the essential part of the work is done by and around the Expert Group whose discussions and decisions play a determinant role. There is no initial impulse given by a complete written project of the new system. There is no arbitrating, no final drafting by the United Nations Statistical Office. Discussions at United Nations Economic Commission for Europe play almost no role; in Europe the important discussions take place in the national accounts working groups of Eurostat and the OECD.

This change of balance is the result of several factors related to the objective of universalization of the system. Since the mid-1970s, the position of the UN Statistical Office has weakened considerably, mainly because of the financial crisis of the organization. At the same time the position of the statistical offices at the IMF and Eurostat are reinforced. On the IMF side, there are hopes for radical progress in the harmonization between the SNA and the recommendations of the Fund manuals (balance of payments, government finance, monetary and banking statistics). The IMF does not want only to be consulted like in the past. It wants to play a role in the very conception of the new revised system. The EEC expansion has seen an extension of ESA's role and more generally of the Communities statistical frameworks, but at the same time it has paid attention to the wishes of certain member countries, in particular the United Kingdom, to get a closer integration between SNA and ESA. Independently of the ideas on the future of ESA, no autonomous revision is to be envisaged.

All of this pushes for a joint organization for the revision of the SNA and to the creation, at the beginning of the 1980s, of an "Inter-Secretariat Working Group on National Accounts (ISWGNA)". The OECD and the World Bank join the three above-mentioned organizations. The OECD has seen a new surge in its statistical role, as a consequence both of the weakening of the UN and the strengthening of Eurostat. The USA, Canada, Australia and Japan have no vocation for joining the EEC but at the same time, the reduced statistical role of the United Nations restricts their possibilities of influencing the elaboration of statistical standards worldwide. There is a risk for them to be trailing behind Europe. As a consequence, the OECD finds itself in a position of being a world complement to Eurostat for developed countries, though without considering the elaboration of its own standards. As the member countries of the EU are also in the OECD, this situation presents a risk of ambiguity for the future (in the post 1993 SNA period) if there is not an excellent coordination.

Nevertheless, it is difficult to imagine the "inter-secretariat" group playing, at five, the direct role that UN had played in the past, in the drafting and setting up of what is still, at the beginning, a statistical tool carrying only the stamp of the UN. The five institutions have clear intentions of being very active but prefer to put their efforts within the framework of the *World Expert Group*. This latter group is thus going to closely associate experts and representatives of international organizations. The Expert Group had been conceived with variable geometry, consisting of a permanent core of six members to assure coherence and continuity of decisions taken, and members varying depending on the particular subject under consideration. Once the thematic meetings are over (1989), the group is given a permanent composition: eight experts chosen from the participants in the thematic meetings will join the original core.

In such circumstances the choice of experts is a matter of great importance, in particular that of the permanent members. The "inter-secretariat" group made this selection, behind closed doors, using the criterion of unanimity and not without some bargaining, as is not very difficult to imagine. The parity constraint between members of developed countries and developing countries had to be respected. One expert from Latin America (Pablo Mandler, Argentina), one from Asia (Jagdish Kumar, India), and one from Africa (Michel Mouyelo-Katoula, Congo, in fact a Eurostat consultant who will participate only during 18 months) are chosen for the developing countries; Carol Carson (USA), Heinrich Lützel (Germany) and André Vanoli (France), for the developed countries. Multiple motivations are behind the selections, sometimes beyond the experts' personal qualities. There is the hope for a larger involvement of the USA, that remained *de facto* at the margin of the 1968 SNA discussions, and to see this country applying the SNA in the future. There are also expectations for a stricter application of the coming system by Germany, that until then applied only partially the ESA, mainly as regards the classification of unincorporated enterprises: these were all considered as quasi-corporations because some large enterprises, like Krupp for instance, were not incorporated. Nevertheless, according to ESA, it is also necessary to take their size into account, and to classify them either as quasi-corporations or as, strictly speaking, unincorporated enterprises belonging to the household sector.

Eurostat proposes Vanoli to the "inter-secretariat" group as chairman of all the meetings of experts. The latter, previously consulted by Eurostat (Piero Erba, one of the authors of the 1970 ESA, was the director, responsible in particular for national accounting), accepts the proposition reluctantly. He fears a considerable loss of his freedom of action. His worries vanish soon as the "inter-secretariat group", which does not want to give a predominant role to someone, perhaps to the detriment of the international organizations or of other experts, does not accept Eurostat's proposal. Vanoli has then the required elbowroom to play *de facto* the role of intellectual leader of the revision.

Thus, there will be a chairperson for each meeting. The Expert Group will hold fourteen meetings in six years, from June 1986 to October 1992. Their preparation by the international organizations, playing by turns the main role depending of the subject under analysis, is outstanding. The secretariats write themselves numerous and substantial documents or have them written by experts of their choice. For example, the file for the meeting dedicated to the external relations, an IMF responsibility, consists of more than twenty papers including a note of comments and points of discussion for each of the main topics of the meeting: residents of an economy, international organizations, foreign currency conversion, principle of ownership transfer and the time of recording, classification of transactions, financial assets and liabilities, and some particular transactions (banking services, insurance).

A statement of the main conclusions ends each of the meetings. This is an essential exercise for the decision-making process and is clearly distinguished from the overall report of the meeting that gives the detail of the discussions. The same scenario is followed in each of the seven thematic meetings that take place until September 1988 (SNA structure; prices and quantity comparisons; external sector; household sector; public sector; production accounts and input–output tables; financial flows and balances). A last one, different from the others, about the SNA/MPS relationship will take place at the end of 1989 (see the text of the present chapter, p. 125).

Within the Expert Group the English language is used. Discussions, main conclusions, drafting of chapters, all is done in this language. In fact, it had been foreseen, at Eurostat's request, that the projects of chapters once written would be translated into French and immediately reviewed by Vanoli, in order to have in the future two original versions moving in parallel, one in English, the other one in French. However it will not be possible to work that way. The draft chapters in English are available later than originally thought; their successive versions are greater in number, and time constraints are stronger. Translation into other languages will only be made once the final English version has been adopted. (The situation will be similar for the 1995 ESA.)

The 1986–1988 phase is demanding in time and effort. Discussions are intense and exciting. They also turn out to be impassioned. This is particularly the case for the discussion on general government, a domain where the differences in the positions of the SNA and the *Manual on Government Finance Statistics* of the IMF are the deepest on fundamental issues, in particular the recording of the flows on a cash accounting basis (IMF) or on an accrual basis (SNA), and on many particular points that make both series of recommendations incompatible. It is an opportunity for the revival of confrontation, nothing of personal nature, between Jonathan Levin (responsible for Government Finance at the IMF) and Vanoli. In fact the revision sees the position of the Fund (that no longer follows entirely Levin's) modified progressively and coming closer to that of the SNA. On the contrary, regarding external transactions, movements take place in both directions which end up with the 1993 SNA and the IMF *Balance of Payments (BOP) Manual* (5th Edition, 1993) in almost total agreement with the exception of one or two details. For practical reasons, the Balance of Payments will not include the financial intermediation services indirectly measured (FISIM) in imports and exports of services with a counterpart adjustment for interest paid or received. The *BOP Manual* will follow the classification of transactions and the accounting structure of the SNA. The SNA on its side will accept, for instance, to treat the undistributed earnings of direct foreign investment as if they were fictitiously distributed. The SNA will also retain a FOB (Free on board) valuation for the total value of imports of goods instead of a CIF (Cost, Insurance and Freight) one, which, in the same way, allows one to retrace the effective exchange of services between residents and non-residents. This puts an end to a very significant and annoying difference between national accounts and balance of payments. This is made possible by the introduction of a set of adjustment terms allowing the detail of imports to be valued CIF while their total is valued FOB.

This harmonization between IMF recommendations and SNA, essential for the future, is achieved in the Expert Group mainly by consensus. This is facilitated by an initial choice of a statistical policy made by the Fund (Erick Danneman, then John McLenaghan). Detailed work to compare the systems is performed by the Fund and the Statistical Division of the UN, with a tendency for the latter to accept being carried too far as the forces in presence were uneven. The Group successfully fulfills the arbitrage/selection function.

The next, 1989–1993 phase will be equally intense, even more demanding and with more conflicts. Its purpose is to solve outstanding issues and to formalize all of the conclusions in the drafting of a new system. Views supported in the regional meetings also have to be taken into consideration. Difficulties begin to appear during 1988. They concern the content of the system, the organization of the revision process and the regional reactions mainly in Europe. Regarding the content, the worries are related to the accounting structure and the first draft chapters. The UN, which has been working on the accounting structure, has kept a good orientation (Jan van Tongeren is impressed by the approach followed by several Latin American countries, advised by the French, and in particular by the presentation of a Tableau économique d'ensemble [Overall Economic Table]) but has difficulties in getting to a conclusion. Peter Hill, a British scholar, on leave from the OECD where he was head of the National Accounts Division, has been given the task, obviously too heavy for a single person, of doing all of the writing. He presents the first draft chapters in 1988 but they are not completely in line with the conclusions of the Group. Besides, very soon the drafting is complicated by the lack of a final decision regarding the accounting framework and the classifications. Worried by the risk of confusion and discontinuity, Vanoli hesitates to continue his participation in the revision process. As it had been determinant during the first phase, the UN (William Seltzer, Director of the Statistical Office) in agreement with the "inter-secretariat" group asks him in March 1989 to set up the accounting structure and to draft its presentation as well as chapters devoted to adapting the SNA to particular situations and to satellite accounts.

Concerning the organization of the revision process, it is increasingly difficult for the Statistical Office to efficiently face the needs of such an endeavor. Eurostat is worried about the delays, because it has been decided to revise the ESA after the SNA. An updated SNA is also required for the dynamics of the revision of the IMF recommendations. The USA, then willing to apply the future SNA, is also impatient. Finally, in June 1990, Carol Carson is asked to reinforce the "inter-secretariat" group and help with the organization of the revision, a task that she is going to accomplish remarkably. The SNA, published until then under UN stamp, escapes from its sphere because of the weakness of the organization. All this will be eventually for the good. A SNA published under the stamp of the five organizations will definitively see its status as international standard strengthened.

As to the contents, most European countries oppose certain decisions of the Expert Group, in particular concerning the treatment of R&D expenditures in capital formation, the recording of reinvested earnings of direct foreign investment as flows, and the allocation of the financial intermediation services indirectly measured among users (see chapter 4 and Box 26).

More than four years of work and relentless discussions will follow. Hill will successively write several versions of a good number of chapters (nine in total). Initially, they are examined during meetings (summer 1989), but later discussions will be held by fax. Few experts participate thoroughly on most chapters. Only Vanoli, permanently assisted by Pierre Muller in INSEE, and in some cases by others, does it systematically and with great detail. As a consequence, the debates on the text show a tendency to take place mainly between Hill and Vanoli, which will give way to interpretations in terms of personal confrontations and influence struggle. Such contexts always involve influence struggles among persons or institutions. But there is no personal animosity whatsoever. Vanoli plays the role of warrant of the conceptual and accounting coherence of the system and tries to get texts expressing it fully (he has to confront strong incomprehension when submitting the first draft of Chapter II in the summer of 1989 – a general overview presenting and describing the accounting structure of the system). He is not alone in this position and the IMF and Carson also pay close attention to these issues. In general, compromises of bureaucratic nature are avoided and reasoning is used. Hill intends to present the theoretical background for a system, which in previous versions (and this is true for ESA as well), had only been described in terms of its operational content. He carries out a large amount of work of high quality. The successive drafts take very carefully into account the observations made and the tension "Hill–Vanoli", if one tries to schematise it that way, will be an essential source of quality for the end product. Chapters given, progressively, to other experts will also be submitted to a similar critical examination (see their list in the 1993 SNA Preface, Part B, Acknowledgements).

Different lines of force do in fact appear. Carol Carson, Kevin O'Connor (IMF), Brian Newson (Eurostat), Anne Harrison (World Bank, then *freelance*, then OECD), for instance, frequently play the role of tension reducers in a multipolar game. Frequently, it seems, this game makes Hill to accept criticisms at which he balks. The World Bank (Ramesh Chander) is mainly concerned by the inclusion of something about the environment and Social Accounting Matrices, but does not support, for instance, the idea of treating the R&D expenditures as GFCF. In the beginning of 1991, an offensive is carried out to reduce the importance of the texts written by Vanoli – *via* their length – as an alternative to reduce his influence. Initially inspired by the OECD, it is later conveyed by what was called at some point "the Washington group", in reference to the members of the "inter-secretariat" group living in that city. It does not last long though thanks to the clear attitude of Newson and van Tongeren. But very soon, and during the last two years of the process (1991–1993), the final synthesis function will in fact reside with the trio Carson, O'Connor, Vanoli. That is not sufficient to prevent the Expert Group, following the European offensive, to revert to its December 1990 position on the treatment of R&D expenditures as capital formation. Vanoli finds himself isolated on this issue. On the contrary, the group remains firm (April 1991) on the allocation of financial intermediation services indirectly measured (FISIM), and the treatment of reinvested earnings of direct foreign investment (see chapter 4). On these, the group resists the European pressures.

The negative decision concerning the R&D expenditures is certainly the least glorious point – the least one can say – of all the preparation of the 1993 SNA. The reasons given are summarized in chapter 8, pp. 308 and 310 and Box 53. In spite of these (which as a matter of fact, never question the central issue of the economic nature of these expenditures), it remains a mystery how the French experts, who are in favor of treating them as GFCF, a point that notably Pierre Muller defended permanently in Luxembourg, could be so completely alone on this point. Even the representatives of the USA do not act firmly on this issue. During the crucial meeting of the Expert Group in December 1990, badly prepared on this specific issue, neither Carson nor Hill clearly intervene. Vanoli finds himself alone to argue against the "European" group (Adriaan Bloem from the Netherlands, Lützel and Newson, the Eurostat representative). The others, in the absence of Enea Avondoglio, who is a firm supporter of the GFCF solution, keep silent (in general, within the non-OECD countries, there is a more open position on this issue but the investment in R&D is low). The great majority of experts that participate in the debates on this question, in Europe and in the group, clearly adopt a narrow point of view ("it is difficult, how difficult it is") and lack perspective. Comparatively, the French national accounting tradition favors the economic nature of a transaction, scarcely doubtful in this case, above all when the purpose is to build an accounting system for the future and on a crucial issue, without getting trapped in short-term difficulties.

Finally the revision ends without the need for authoritative decision or any purely bureaucratic trade-off ("I accept this for you, but you accept that for me"). Nevertheless, the authoritative procedure is close to being used in 1991 when the Statistical Commission, growing impatient, decides to request that the "inter-secretariat" group and Carol Carson make decisions on the issues where the experts would not have agreed, but excluding from this "decision authority" the two principal authors of the new SNA, Hill and Vanoli. Luckily, Carson is tempted to use it only once. "*I decided*", she said, to revert to the erroneous 1968 SNA treatment of non-life insurance (that did not take into account the income earned on the investment of technical reserves in the indirect calculation of output of services and therefore sub-estimated it increasingly, see Box 28) because of an unfortunate note, from the OECD side, based on a misunderstanding of the treatment elaborated by Vanoli. The latter has to write an explanatory paper (one more!) and O'Connor explains to the other participants that he is right. The introduction of the new treatment is then confirmed.

The purpose of this appendix is to illustrate the process in its broad lines, stressing more the 1993 SNA elaboration. Even so, it is difficult in a few pages to show all of its aspects, although the present author followed it closely and entirely. It could be interesting to analyse every one of the main decisions, to identify its origin and the role of the expert, or of those who pioneered its outcome (in most cases it is a matter of positive decisions, but there are also negative ones in the sense of the denial of an improvement, or in very rare cases a step backward).

It is possible to give some additional examples:

- The denomination of "mixed income" instead of "operating surplus", for the balancing item of the generation of income account of unincorporated enterprises, had been used in Indian national accounting for a long time, as well as in methodological papers, for instance in the United Kingdom (it is to be found in Studenski, *The Income of Nations, op. cit.* p. 280); the Indian national accountant Uma Roy Choudhury had it accepted for the new system.
- The problem of foreign exchange systems with multiple exchange rates has long worried countries like Venezuela in the 1980s. Van Tongeren (UN) and

Avondoglio (Argentina, member of the Experts Group in its second phase) who had been advising that country, write the main lines of a specific treatment, following the idea of implicit taxes and subsidies. Extensively discussed in particular with the participation of O'Connor (IMF) and Vanoli, a very elaborated system is introduced in Chapter XIX of the 1993 SNA (Annex A).

- The expression "factor incomes" that had replaced "factor cost" in the 1968 SNA, has been unfortunately eliminated in the very last period of preparation of the 1993 SNA, when a Dutch expert suddenly declared a war against the use of the word "factors" arguing that such a thing as "factors of production" did not exist. (A big question indeed on which obviously various points of view are possible.) In the confusion (many experts have never clearly realized what the content of the 1968 SNA actually was on this issue, and Stone's terminology, which used "factor cost" in the first chapters, was a source of ambiguity), unfortunately, he is followed by others.

  As a result, when coming to define precisely the GDP identities (1993 SNA, § 6.237) the expression "factor incomes" is deleted and replaced by "factor cost", which is accepted without any more trouble by the above-mentioned expert because, he said, it is a "traditional denomination" (poor Aukrust, who fought this tradition so much! [on the issue of "factor cost" see chapter 6, pp. 255–265]).
- The treatment in GFCF of a part of military expenditures in durable goods (see chapter 8, pp. 310–311) is an example of a decision made partly accidentally. It is taken up during the Expert Group meeting in Vienna (March 1988), by a one-voice majority, while the World Bank representative and an African member of the group, both opposed to this solution, are temporarily absent from the meeting. Here, opinions are well divided. The initiative of a modification of the traditional treatment on this issue did not come from the "inter-secretariat" group but from some European countries. At the beginning of the revision of the 1968 SNA, no one has in mind the eventuality of such a change. It is when scanning questions, as it is normally done, that the question rises in Europe, following a Dutch proposal to include in GFCF all purchases of military durables. The Expert Group is embarrassed. Carson agrees to ask some former senior staff, mainly in the USA, to elucidate the reasons for the traditional treatment as intermediate expenditures. The answers she collected were hazy. At the end, the decision of March 1988 is made, without a real study of the topic.
- On the contrary, the introduction in the 1993 SNA sequence of accounts of a redistribution of income in kind account, comes after mature consideration. A decisive stage is overcome thanks to the clarifying contribution by Jean Petre (one of the authors of the 1970 ESA at Eurostat), which he presents at the IARIW conference in 1981: "The treatment in national accounts of goods and services for individual consumption produced, distributed or paid for by government" (*Studies of National Accounts*, Eurostat, no. 1, 1983). He proposes on the one hand to assign the consumption expenditure to the

sector that finally supports it, even if households make the advance payment (case of social security reimbursements), and on the other hand to separate in the accounts of goods and services the individual consumption of households (coming from the consumption expenditure of households, and from the individual consumption expenditure of general government and NPISHs) from the collective consumption (of general government and NPISHs). The difficulty that still remains with Petre's proposals is that the concept of disposable income of households, that excludes transfers in kind, now understood in a broad sense (covering for instance a major part of health expenditures in the framework of social protection), is considered too narrow. The problem is solved by the accounting scheme proposed by Vanoli in 1989 for the revised SNA. The redistribution of income in kind appears as a phase of the process of redistribution of income. An additional concept of adjusted disposable income (the group did not find a better terminology) is introduced. Consumption gives rise to two different notions, consumption expenditure and actual consumption.

It is nevertheless remarkable that a product of such a good quality, despite some weaknesses, could be the result of such a long process, involving such a number of autonomous institutions and experts, and purporting to master such a large set of concepts.

The existence of the 1993 SNA then made possible a revision of the ESA in total accordance with it, with the exception of some details and refinements. The 1995 ESA keeps its quality of clarity (the quality of the 1993 SNA drafting has also improved considerably) but has no autonomous conceptual existence. Taking into account its compulsory character and its growing use in the EU policies, it is easy to imagine how difficult it would have been to elaborate the 1995 ESA as it is, under the constraint of the institutional procedures of the EU (see the appendix to chapter 10) and in the context of resistances to change that materialize in the old continent. This reveals a crucial problem of statistical strategy for the future of the international system of national accounts. (On the decision-making process see also the appendices to chapters 5 and 10).

Chapter 4

Trend towards Unification, and Persistent Accounting Problems

Contents

As the SNA becomes universal at the end of the 20th century, this does not mean the almost total convergence of views, far from it. There are still positions that have not been accepted. Different interpretations of the SNA/ESA exist, depending notably on different former traditions or semantic gaps. There are also opposite views on the ways to envision the enlargement of the system. All this is present, even independently from the major debates on the concepts of production, income and accumulation. Problematic issues go along with the history of national accounting, experience changes or makeovers, but show a tendency to survive, in one way or another, within the framework of an extensively unified accounting system.

1. Exchanges or "operations" (transactions)? What is recorded?

The market exchange is the touchstone of evaluation in monetary terms: goods or services against money. But, in spite of its extension, the system of monetary market exchanges is not universal. There is not always a market, and even less a futures market, for everything that is interesting to record.

Is it then necessary to restrict national accounting to what gives origin to a payment in money? In the mid-1980s, C.A. van Bochove and H.K. van Tuinen, Dutch national accountants, gave the most absolutely positive answer to this question, mainly in the first versions of their proposals. They limited it however to what they called the core of their system, the other elements appearing in various modules. Even after relaxing its conditions – originally, their rationale excluded non-market production of general government from the core, which they rapidly reintroduced – this position has hardly been shared.

In fact, national accountants have always experienced throughout their history the difficulty or even the impossibility of generating significant aggregates for output, income, consumption and accumulation that would be reasonably homogeneous in time and space (inclusive in the domestic social field), while restricting them to what gives rise to a payment in money. They have therefore always admitted, to various extents, the so-called "imputations", that is, in a broad sense, either the recording of actual physical flows, for which the value is not measured by a corresponding payment and has to be estimated (services of owner-occupied dwellings or the agricultural own-account consumption, for instance), or the recording of flows that are not directly observable and thus need to be constructed (consumption of fixed capital, for instance). At the same time, the introduction of these imputed flows has been a source of uneasiness for most of them, essentially because there is no single way of measuring them.

This discomfort is expressed in different ways in the terminology itself, frequently taken from the field of monetary exchanges. Thus Stone (1945) himself uses "*payments*" for the outlays of his accounts, even though he includes, for instance, imputed rents where there is no flow of payments. In the 1968 SNA, he uses a more neutral word "*outgoings*", although the descriptive chapters use "*disbursements*", which means payments, but whose French translation is "uses"! The accounts of the institutional sectors of the 1968 SNA present the "*current receipts*" and the "*current disbursements*" in English, but in French they follow the French national accounting practice with "les ressources courantes" and "les emplois courants". In the mind of many (Hill, for instance), imputed flows are still devised as imputed payments corresponding possibly to imputed exchanges, including those with oneself. For instance, an owner, in his producer capacity, "sells" to himself as consumer the housing service of a house that he owns and occupies.

To some extent because of a recurrent interpretation of this type, Aukrust tried "to avoid almost all of those unrealistic imputations, which are typical of contemporary work" ("On the theory of social accounting", *op. cit.*, p. 170). He was referring to Stone's 1945 memorandum that he qualified as characteristic of the "*money-flow approach*" as opposed to the concepts and terminology "in real terms" proposed by Frisch. During the preparation of the 1968 SNA, Aukrust would continue his almost systematic opposition to imputations, even though the logical basis of his position was not perceived at the time. On this particular issue, the English terminology is a source of ambiguity. The word "*transactions*" that irresistibly evokes commercial exchanges is still being used in the 1993 SNA/1995 ESA in English, while the French translation keeps the more neutral word “operations”, which the French national accounting has introduced since the 1952 “Principles”. As the consequences are so damaging, one might only regret the rigidity shown by the experts whose mother tongue is English, despite the efforts made to convince them to change their terminology.

In effect, with respect to imputations, two opposite attitudes can be observed. Either there is a tendency to assimilate them, at all cost, to a type of exchanges and quasi-payments, or else there is a desire to very clearly show their impure specificity by requiring their systematic distinction from the transactions that give rise to a payment. This position was favored during the elaboration of the 1993 SNA, and was strongly supported in spite of its unrealistic character [unrealistic in view of the burden it would cause when followed systematically, as was done in some instances (see Box 24)]. The final result was inevitably more modest. The 1993 SNA, in Annex V, part E [warning, what concerns insurance services is not correct], presents the elements of supplementary classifications that differentiate between monetary and non-monetary components (barter transactions, compensation of employees or transfers in kind, etc). It is doubtful whether any country presents its central accounts systematically following this approach, which is more likely to be applied on a “case by case” basis and generally in supplementary tables.

In fact, the history of national accounting has taken it away from the direct representation of exchanges that was still vivid in the middle of the 20th century. Stone and the 1945 Group of the League of Nations, the first normalized system, Gruson (1950), the 1952 “Principles” and their application to the 1951 “Tableau”, all present purchases and sales of goods and services. The 1952 “Principles” considers the separate recording and the aggregation of operations that give rise to payments (the term transactions is then used) from those that do not. Copeland’s *moneyflows* focus only on payments (see Box 12). This point of view left the forefront relatively early in France, often later in other countries. The first accounts of the new French National Accounting (CNF), at the end of 1955, have already abandoned the presentations in terms of commercial flows in favor of economic quantities that are more directly significant (output, intermediate or final consumption, capital formation). The movement generalizes and normalizes with the 1968 SNA and the 1970 ESA. Two principal reasons explain this: the intention to present the accounts in a simpler manner (a single operation combines several flows) and the influence of Leontief’s type of input–output tables. They focus on inter-industrial relations (use by one industry of the products of other industries) and not on inter-industrial exchanges (purchases by one industry from other industries), a position opposite to the former formulation of the CNF that speaks of an inter-industrial exchanges table.

Exchanges are fundamental, because they allow delineation of social monetary values, but they remain in the background. National accounting never records them as such, but always separates the counterparts, as for example, the flows

Box 24
"Imputations"

Conscious of the fact that the broad meaning of the term "imputation" was often the source of confused debates, the 1993 SNA intends to reduce its scope. "In the past, the estimation of a value has sometimes been called imputation, but it is preferable to reserve that term to the kind of situation that involves not only estimating a value, but also constructing a transaction" (1993 SNA, § 3.34). Nevertheless, it is doubtful whether this suggestion would have any practical application, simply because no alternate terminology has been proposed to designate the estimation of the monetary value of a flow that is observable in physical terms only.

The index of the 1968 SNA shows the main imputations, in the broad sense that the system has retained:

- Bank service charge, casualty insurance service charge, life insurance service charge.
- Own-account consumption; own-account fixed capital formation.
- Rent from owner-occupied dwellings or from dwellings supplied to employees.
- Compensation of employees in kind.
- Employers' contribution to private pension and other welfare schemes.
- Interest on equity of life insurance reserves and pensions funds.

One can see that consumption of fixed capital (CFC) does not appear in this list. Curiously in fact, it has not been traditionally mentioned among the imputations, possibly in order not to make so explicit the conventional nature of the concept of (net) income (see chapter 8). Rightly, the 1993 SNA takes precisely the CFC as the typical example of an imputation in the strict sense. From the index list to be found in the 1968 SNA, it would only retain the first and the fifth items.

During the preparation of the 1993 SNA, the Expert Group discusses the topic of imputations and re-routings (see Box 27) in its August–September 1987 meeting. Brian Newson's (Eurostat) preparatory note tries to establish their list but has to state ("Imputations and re-routeings in the SNA", p. 2): "Exactly what constitutes an imputation or a re-routeing is not clear. They are essentially any recording which departs from *transactions* as they actually occur", and concludes (p. 3): "nearly every SNA heading contains (except in the financial account) imputed or re-routed components to a greater or less extent". The group concludes that the text of the coming system should contain a comprehensive list of imputations and re-routings, as a guide to both users and compilers of the accounts.

As soon as the topic has been concretely studied, it is obvious that it is not realistic to think they can be presented systematically separated in the accounting framework. Finally, the 1993 SNA includes a table of "elements of complementary classifications of transactions and other flows" (pp. 589–593) presenting in particular a distinction between the monetary and non-monetary components of some transactions. For instance, household final consumption expenditure includes the following elements:

Purchases of consumption goods and services
− Sales of existing consumption goods and services
+ Bartered consumption goods and services (net)
+ Own final consumption
  in subsistence economy
  services of owner-occupied dwellings
  domestic services produced by employing paid domestic servants
  other
+ Compensation of employees in kind
+ Transfers in kind (other than from government or non-profit institutions)
+ Insurance services
+ Pension funds services
+ Financial intermediation services indirectly measured

cont'd

Box 24 (cont'd)

On the other hand, Table 19.2 suggests a complementary presentation of the accounts for the household sector, which shows in particular the in-kind components of their income. Finally, net disposable income is broken down between discretionary disposable income and disposable income in kind.

of goods and services on one side, and the flows of payments on the other. Therefore a typical market exchange gives rise to four potential entries in national accounting: two recordings, one of a "concrete" operation, the other of a monetary or more generally "financial" operation, for each of the two transactors involved. The basic principle of recording in national accounting is thus the quadruple-entry principle, which the 1993 SNA is finally going to state explicitly (§§ 2.57–2.62). It is only by referring to market values, or more generally to the value of actual monetary transactions, that it is possible to strive to assign a monetary value to non-market, non-monetary flows. But it is not correct to add that, by doing so, an exchange or a payment is imputed; this will only blur the scheme of analysis.

Despite some ambiguities in terminology coming from differences of view among drafters, the 1993 SNA has now clarified the issue by saying that economic flows, independent of their specific nature, have the effect of "creating, transforming, exchanging, transferring or extinguishing economic value" (1993 SNA, § 2.24). Assets are therefore stocks of economic value. The oral tradition of the CNF used "droits économiques" instead of "economic value". The expression seemed untranslatable into English but the idea is the same. It refers to the notion of claims and obligations, a basic concept for national accounting as well as for business accounting (see Box 25, p. 152).

2. The problem of the extent of imputations

Notwithstanding, the debate on imputation is not over. Undoubtedly, it is better defined. In effect, what should be the extent of imputations, since they place the national account compilers in an uneasy position? More imputations allow them to improve the coverage of their object, but in general the estimates will then lose precision. Moreover, the field of non-market, non-monetary phenomena, as potential candidates for economic measurement, is almost limitless (culture, environment, ...). The distinction between central accounting framework and other frameworks, introduced in the 1976 SECN, provides a first major answer. There is, for instance, agreement to exclude from the central framework the services resulting from non-remunerated domestic activities. Some difficulties still remain at the level of the central framework itself. Some are minor (Should the flowers of the family garden be estimated, or only fruits and vegetables?) Others are more relevant (Why include as output the services of owner-occupied dwellings while the services of other consumer durables are excluded?) The most complex cases concern the way of reporting actual economic flows whose nature

Box 25

From the opposition between real and financial to the concept of flows of economic value

(or does the 1993 SNA resolve the Frisch–Aukrust vs. Stone conflict?)

1. In the 1930s and 1940s, the Norwegians, and mainly Frisch and Aukrust, build their conceptual construct on the opposition between real objects and financial objects and the events that affect them. Frisch's graph representing economic circulation (1942, see appendix to chapter 2) makes a distinction between the real circulation and the financial circulation.

From then on, and in the late 1940s and early 1950s, Aukrust opposed Stone's constructs. He voiced his point of view in his paper "On the theory of social accounting" (*op. cit.*). The substance of the discussion, however, is not easy to grasp, as it is interwoven with many issues of terminology and interpretation of similar terms and of presentations that are sometimes very close.

Aukrust (*ibid*, p. 172) calls Stone's work, and the British and US official estimates approach, studies of *money flows* and *payable flows*. He adds that such an approach "ignores" all real flows. On the other hand, he calls Leontief's input–output scheme a study of real flows that is "ignoring all financial flows". This type of presentation was full of potential ambiguities, as all of them, in practice, were using monetary values.

Aukrust's position is not to be understood as a simple plea for a more complete system of national accounting. He is arguing for an accounting structure in which real accounts (real current accounts, real capital accounts) are distinguished from financial accounts (financial current accounts, financial capital accounts). This structure is inspired on the above-mentioned graph. Frisch's real circulation or Aukrust's real accounts have a broader scope than the financial circulation and financial accounts, but, except for transactions in kind, they both encompass the entire economic circuit. For instance, in Frisch's circulation both a *real turnover* and a *financial turnover* can be found. However in the real circulation, a non-sold *internal real production* appears that is not found, by definition, in the financial circulation. A simple case can illustrate Aukrust's scheme. Wages in kind are flows within the real current accounts of enterprises and households, whereas wages in cash are flows between their financial current accounts.

In the real circulation, as well as in the real accounts, what circulates or is recorded are real objects, even if they are accounted for using a monetary value. The other circuit only records actual transactions in money, classified according to the real transactions to which they are linked. The essence of Aukrust's scheme seems thus to be the systematically separate recording in different accounts of flows in kind and flows in cash (there is only a single income account for each sector, but it would have been possible to divide it in two parts accordingly). It is interesting to note how such an idea was echoed thirty-five years later in the beginning of the elaboration of the 1993 SNA (see Box 24).

Regarding Stone, in his 1945 proposals, he chose not to record flows in kind and flows in cash separately, which is much simpler. Partly for the same reasons, the 1993 SNA will not be able to maintain the idea of a systematic distinction, even if it would not have changed the accounting structure (differing in that respect from the Frisch–Aukrust scheme). In Stone's view, the Norwegians' position must probably appear as an over-subtle reasoning without practical consequences, as finally the same incomes are measured. But his terminology was a source of ambiguity as he applied the term "payments" to all his flows. Thus he speaks of "transfer payments in kind" (1945, p. 34) while only a physical flow is involved. Henceforth Aukrust's (exaggerated) criticism that he records flows of money and totally ignores real flows. Stone does not think apparently that attributing a value to a transaction in kind does not mean imputing a payment to it. This terminological ambiguity seems often to be found in the Anglo-Saxon tradition of national accounting. In fact, Stone does not ignore "real flows", but his terminology is not sufficiently precise.

cont'd

Box 25 (cont'd)

In practice, Frisch–Aukrust's theoretical positions, combined with a very uneven development of data in which statistics on production were favored, led Norway until the 1980s to markedly emphasize goods and services accounts – the "real flows" – at the expense of complete income and finance accounts for institutional sectors.

2. These issues have been gradually clarified as national accounting has evolved.

The distinction was made between non-financial flows and accounts (from the production account to the capital account) and financial flows and accounts. The former seem to comprise in fact what Frisch and Aukrust called the "real circulation". Payments are not recorded there. It might be observed that non-financial accounts have often been, and are still called "real accounts", in particular by financial experts. National accounting prefers not to use the term "real" which is often understood in the sense of "at constant prices" (see Box 71).

Financial accounts do not need to describe the economic circuit again once transactions in kind have been excluded (the financial circulation according to Frisch), as it would mostly be redundant. In the changes in financial assets and liabilities, they record the counterpart of non-financial "real" flows (wages, taxes, etc.), which generate payments, that is, those which have neither the characteristic of a transfer in kind (unilateral flow without a quid pro quo), nor that of a transaction internal to an economic transactor. If they have the characteristic of an exchange (barter transaction), transactions in kind might have a counterpart in the financial accounts (short-term claim/liability), if both agreed-upon deliveries do not occur simultaneously. From this perspective, the formulation of the 1993 SNA, § 2.65, first sentence, quoted below is not complete. Obviously, the counterpart of a financial transaction might also be financial.

The clarification brought about by the 1993 SNA is more complete and thoughtful. It is essential for the proper understanding of national accounting, and for this reason, is quoted here:

> "[. . .] elementary economic actions [. . .] result in economic flows, which, in addition to their specific nature (wages, taxes, fixed capital formation) create, transform, exchange, transfer or extinguish economic value; they involve changes in the volume, composition or value of an institutional unit's assets or liabilities. The economic value may take the form of ownership rights on concrete objects (a loaf of bread, a dwelling) or intangible assets (a film original) or of financial claims (liabilities being understood as negative economic value). In all cases, it represents a certain quantum of abstract economic value which is potentially usable to acquire goods or services, pay wages or taxes, etc." *(§ 2.24)*

> "The general principle in national accounting is that transactions between institutional units have to be recorded when claims and obligations arise, are transformed or are cancelled – that is, on an accrual basis. Transactions internal to one institutional unit are equivalently recorded when economic value is created, transformed or extinguished. Generally speaking, all transactions, apart from their intrinsic nature, can always be viewed as dealing with economic value." *(§ 2.64)*

> "One has thus to distinguish carefully between a transaction and the corresponding cash movement which takes place, except for a transaction in kind, at a given point of time. Even when a transaction (a purchase/sale of a good, for example) and the payment/receipt are simultaneous, the two aspects exist. The purchaser is incurring a liability, the seller acquiring a claim as a counterpart of the delivery of the good. Then liability and claim are cancelled by the payment." *(§ 2.65)*

The 1993 SNA underlines (§ 3.39) that a payment can be made in kind, well beyond the classical scope of wages in kind (share cropping in agriculture, legacies of works of art in payment for inheritance taxes, can also be mentioned). In such a case, it is the delivery of a good or service that cancels the claim. In principle, the payment is recorded as a decrease (debtor)/increase (creditor) of stocks of products or assets in the capital accounts as a counterpart of the reduction in liabilities/claims that appears in the financial accounts. In practice, these flows might be implicit.

cont'd

Box 25 (cont'd)

The terminology used for the two sides of the accounts (resources or uses; changes in assets or changes in liabilities) does not make reference any longer to the notions of payment or cash receipts.

The interpretation of national accounting presented in the preceding paragraphs in terms of movements of economic value comes from an unwritten tradition of the French national accounting according to which national accounting had to do basically with the creation, transformation and cancellation of "economic rights". As this expression did not seem to be directly translatable into English, someone (possibly Carol Carson) suggested the use of the term "economic value", which is equivalent.

3. This clarification might not be complete concerning the real/financial distinction for capital. This specific point of Frisch and Aukrust's general positions is more far-reaching than the others. Aukrust opposes ("On the theory of social accounting", *op. cit.*, 1949, p. 185) real capital and natural interest to financial capital and financial interest (which he moreover considers as transfers). This seems to echo Knut Wicksell's distinction between the natural interest rate and the monetary interest rate that, for him, are equal in a situation of equilibrium, but that fundamentally do not represent the same thing. Keynes condemned the confusion between the monetary exchange rate and the marginal efficiency of physical capital, while in Walras' system there is a unique interest rate, which is the net rate of return on physical capital.

The 1968 SNA, and more explicitly the 1993 SNA, by interpreting the previous concept of GNP as a concept of primary income and no longer as a concept of production, have implicitly (perhaps unconsciously) distinguished the use of equipment goods in the production processes from the remuneration (broadly speaking) of financial capital. This echoes the ideas defended in former days by Frisch and Aukrust. However, in qualifying as "transfers" the incomes of financial capital, because they resulted from the distribution of income of real capital [which is part of the primary distribution, A.V.], they were introducing some ambiguity with the idea of redistribution of income. In comparison, the 1993 SNA/1995 ESA, as it qualifies as "factors of production", though making a distinction between them, both the *real factors* of the Norwegians (labor and real capital in the sense of equipment goods) and the invested capital understood as an abstract value (the Nordics' *financial capital*; Lindhal, a Swede – which Ohlsson analyses, 1953, *pp. 251ff.* – is very close to the Norwegians on this point), might be criticized, particularly from this Nordic traditional perspective.

In any case, there is no doubt that on this topic, the SNA can be interpreted quite differently (see also chapters 8 and 9 and Box 65).

is composite. There is now considerable agreement about insurance transactions (see Box 27). Property income on technical reserves is assigned to policyholders, and the sum of this income and premiums is globally broken down into the payment of an insurance service, a transfer (non-life insurance) or a financial investment (life insurance). The breakdown inevitably lacks precision.

2.1. The case of financial intermediation services indirectly measured

The services of financial intermediaries not explicitly charged have given rise to perplexity, stress, reversals and memorable rows. Although in some cases they have been ignored, as by the former CNF for instance, that did not consider any production for the financial institutions, and by the United Kingdom for a long time, they have generally been estimated. To be brief, this is done mostly by taking the margin between borrowers' interest and lenders' interest, or in some cases by using costs. The main difficulties refer to the allocation of those services to users (final or intermediate, and therefore with consequence on the measurement of GDP). Stone (1945), the first Standardised System, and the US accounts allocate them entirely to depositors. That is all for Stone. The other two systems allocate them as the deposits (or according to the value added of economic activities if these deposits are not known). The 1968 SNA, greatly influenced by Aukrust on this point, excludes the allocation among users and treats them globally as a non-allocated intermediate consumption. The majority, including the French, and the 1970 ESA follow this recommendation based on practical considerations, but the Americans, the Canadians and the Indians continue to apply the previous system.

The boom in financial activities during the 1980s and 1990s made the 1968 solution unsustainable. The situation is no longer that of the early 1950s ("It should be emphasized that the total amount involved will in most countries be small ..." says the 1952 Standardised System, p. 51) and there is little justification to badly treat one of the major economic activities. Building on previous considerations mainly from the IMF, the preparation of the 1993 SNA leads to a more rigorous but more sophisticated proposal, based on the differences between the actual interest rates and a reference interest rate, which allows the breakdown of total estimated services among both lenders and borrowers of financial intermediaries, without changing the estimate of the value of those services (see Box 26). The project is presented to the UN Statistical Commission in 1991. There is an upheaval in the European Union (well, among most national accountants ...): this solution is too complicated, too imprecise. The world Expert Group holds its position. Tension is at its highest when the Statistical Commission again examines the final project of the new SNA in February 1993. Europe threatens not to vote in favor. A compromise is reached in the sense of leaving open the option between the new treatment, preferred by the 1993 SNA, and that of the 1968 SNA. A long phase of intense discussions starts then in Europe. It ends at the beginning of 1998 with a solution very close to the 1993 SNA, to be tested in the coming years.

This example of the financial intermediation services indirectly measured (FISIM) is particularly interesting. To begin with, it illustrates the *invariance principle* (see chapter 6), frequently put forward implicitly or explicitly in national accounting, according to which the measurement of main concepts (value added, domestic product, national income) should be as little influenced as possible by institutional differences, such as the market/non-market character of certain activities. A search for homogeneous measures is made within given limits, because the idea of measurements that are absolutely invariant in time and space is not realistic. But, mainly in the last decades of the 20th century, financial intermediaries invoice the services they provide, in proportions that depend on the country and vary over time. As a consequence, the 1968 SNA solution generates biases in the international and inter-temporal GDP comparisons. It should be verified,

Box 26

A difficult and intensively debated imputation: the production and distribution among users of Financial Intermediation Services Indirectly Measured (FISIM)

In economic life, financial intermediaries charge part of the services they provide to customers using different methods: commissions on transfers, fees for account maintenance and portfolio management, sales of check books, etc. For various reasons (difficulty in identifying the service and assigning a charge to it, banking traditions, public regulations such as those forbidding the remuneration of current accounts), they cover the rest of the services indirectly by means of the interest margin, that is, to simplify, by the difference between interest received from borrowers and interest paid to lenders.

Measuring their production only by the difference between revenues generated by invoiced services and costs of production not only leads to an under-estimation of production, but also to a negative value added, which is totally unrealistic. The British accounts, and possibly some other countries, followed this procedure for some time, and in this respect, did not apply the 1944–1945 Anglo-Saxon compromise adopted by Stone and the Standardised System.

With the purpose of correcting what is considered an anomaly, it is usually agreed to measure indirectly that part of the produced services which is not invoiced. This can be done by calculating the difference between total property income receivable by financial intermediaries, except those receivable from the investment of their own funds, and their total interest payable (see for instance the 1993 SNA, § 6.125). This solution was adopted as early as the late 1940s. Added to revenues derived from invoiced services, it is possible to correctly calculate the global output as well as the value added of financial intermediaries.

The problem then arises of properly allocating this indirectly measured output among the different categories of users. It must be noted that terminology has evolved, from "imputed bank service charges" (IBSC) used during some fifty years, to that of "financial intermediation services indirectly measured" (FISIM) used in the 1993 SNA/1995 ESA. The new terminology underlines the fact that the existence of the flows of services provided is a reality, which, in principle, does not need to be constructed. Nevertheless, it is not possible to directly compile its value as the sum of the values of elementary services. It is not even clear whether any sophisticated analytical accounting system of financial institutions would possibly allow an identification of those services, their costs and the customers beneficiating from them. Nevertheless, in the last decades of the 20th century there seems to be an extension in invoicing, usually associated with the remuneration of deposits, but with very large differences between countries.

Under such circumstances, it was not possible to have a direct measurement of the allocation of IBSC/FISIM among the categories of customers. A method of indirect allocation had to be devised. Three main stages can be distinguished, derived from the evolution of the international system.

From 1945 to 1968, the recommendations (1952 Standardised System) focus on an allocation according to deposits. The attribution of the imputed services solely to the depositors, and not to the borrowers, might be derived from the idea that non-invoiced services mainly correspond to the maintenance of accounts, which are not, or only modestly, remunerated, and some type of consulting. It does not seem to be recognized that the services provided to borrowers are effectively paid by them through an undefined fraction of payable interest. The allocation according to deposits probably tends to overvalue the final uses of imputed bank service charges, and thus to overestimate GDP.

Between 1968 and 1993, the existing recommendations (1968 SNA/1970 ESA) and the dominant practice relinquish for practical reasons all efforts at splitting the imputed bank service charges among users, as the allocation method is considered inadequate. Others also make a similar decision with the purpose of limiting imputations as much as possible. The imputed bank service charges

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Box 26 (cont'd)

are maintained, but are globally considered as an intermediate consumption of a fictitious industry, although some countries continue their allocation practice. As a consequence, households for instance have no imputed bank service charges in their final consumption. This time, GDP is clearly underestimated.

The 1993 SNA tries to introduce a solution that is in principle rigorous and satisfactory, although its implementation requires the adoption of additional conventions and the use of a vast array of information. The basic idea is that, on one side, borrowers pay to financial intermediaries interest whose rate is higher than if the services they receive were explicitly invoiced, and on the other, lenders do not receive from financial intermediaries the amounts of interest they would be entitled to receive if they also had to pay separately for all the services provided to them. Thus for depositors, the interest they do not receive is the counterpart of services apparently received for free.

The interest rate, lower than the actual one, that borrowers would have to pay, and the one, higher than the actual one, that depositors would receive if all services were explicitly invoiced (that is, if FISIM did not exist), is a pure interest rate, free of all elements of charges for services provided by financial intermediaries. It is a pure market rate, and is the same for borrowers and lenders. SNA calls it a reference interest rate.

From such a reference rate, it is possible to estimate (see 1993 SNA, § 6.127) the amount of FISIM corresponding to borrowers as the difference between interest actually paid and interest they would have paid if the reference rate r had been applied:

FISIM(B) = Interest paid by borrowers − ($r *$ average outstanding debt).

The amount of FISIM corresponding to depositors can be estimated as the difference between the interest they would have received, had the reference rate r been applied, and those that they effectively received:

FISIM(D) = ($r *$ average outstanding deposits) − Interest received by depositors.

Interest payable is then corrected accordingly. The borrowers pay less interest but consume FISIM (as intermediate consumption for producers and final consumption for final consumers). The depositors receive more interest, but consume FISIM (similar case). Supposing that funds borrowed from depositors and funds lent to borrowers by financial intermediaries are equal, the total interest they receive and pay are then equal.

Nevertheless, the implementation of this procedure raises many questions concerning: the choice of the reference rate (use of a market rate such as the inter-bank lending rate, or endogenous calculation); its uniqueness or its multiplicity associated in particular with the terms of the corresponding financial instrument; the reference rate to be used in order to assess the imports of FISIM; the treatment of the central bank; the allocation among institutional sectors; and even more, the allocation among industries of that part of FISIM considered as intermediate consumption; the estimation of changes of FISIM in volume and price, etc. ...

It also requires the use of an extensive amount of statistical information on the amounts and the structure of financial assets and liabilities and on the flows of interest receivable and payable. Obviously, to develop this knowledge is a necessity in modern economies. Quantitatively, the allocation of FISIM has a significant impact on GDP. According to Begg, Bournay, Weale and Wright (1996) who studied the 1979–1990 period, French GDP would be increased by 2.2–2.9%, British GDP by 0.7–2.4%.

Other methods have been proposed. An alternative analysis (Haig 1986, summarized by Begg *et al.*, 1996, p. 456) suggests treating this bank output as a public good, to measure it using its costs, and to assign it as a final consumption of the financial institutions themselves. It might be observed that Ohlsson (1953, p. 148) already considered that banks, insurance, and the pure activity of general government should be treated in the same way concerning the allocation of their services. Nevertheless, this solution does not seem to provide a satisfactory representation of the nature of the activity of financial intermediaries. However, similar questions are raised regarding the more limited case of central banks.

however, and this seems to be the case, that the lack of precision in the proposed remedial measurements is not greater than the importance of the bias itself.

The practical and political importance of a correct treatment of FISIM may be underlined with respect to the projects of extension of invoiced services (checkbook supplies, check processing, etc.) and with authorization of interest payments on transferable deposits (France, beginning of 21st century). The absence of distribution of FISIM among users may lead one to consider as an increase in household consumption and an increase in consumption prices a phenomenon that simply corresponds to the shift from imputed service charges to their explicit payment. Under the assumption of a strict compensation between an (introduced) invoice of services and an (introduced) remuneration of deposits, the invariance principle implies that, when this institutional change takes place, the income of depositors, the volume and value of the services they consume, and consequently the consumer price index in the case of households, should not be modified. In this case, made simple for the sake of illustration, an adequate breakdown of FISIM makes it possible to reach this objective. Interest explicitly received substitutes for imputed interest, and services explicitly paid substitute for imputed services. There are no increases, either in consumption or in prices to record. In practice, things of course may be more complicated.

2.2. Reality and appearance

The case of FISIM also clearly reveals what can be called the "dialectics of reality and appearance". Interest accrued or due are actual monetary flows. Those received by the banks include at the same time the implicit charge for a service that has been provided, possibly an element of compensation for inflation, and finally "interest proper". What the banks pay to depositors represents "interest proper", from which a service charge has been implicitly deducted, and possibly a compensation for inflation. Plain recording of actual flows of nominal interest reflects only the appearance of phenomena; it does not convey the economic reality that lies behind. A similar observation has to be made concerning insurance premiums.

These examples show the illusion of those national accountants (their cohorts seem in permanent renewal) who plead for national accounts strictly attached to the recording of exchanges as they happen, and rejecting as a matter of principle all that departs from immediate observation. During the elaboration of the 1993 SNA they loudly requested the minimizing of imputations and the exclusion of re-routings of transactions, that is, modifications of actual monetary circuits generally accompanied by a change in the category of transactions. The more characteristic examples of such re-routings refer to social contributions of employees and employers, undistributed earnings of direct foreign investment enterprises, or property income from the investment of insurance technical reserves (see Box 27). To demand this, citing realism of representation, is like

Box 27
Re-routing

Re-routing might be defined as a method of recording flows in national accounting that does not follow the movements of payables/receivables as they can be observed in practice. There are many cases of re-routing.

Employees' social security contributions are paid directly by employers to social security funds. These payments are obviously made on behalf of employees. National accounting records a flow from employers to households, then a flow from households to social security funds.

Cases of this type do not usually raise discussion. The 1970 ESA has characterized them as "*transactions on behalf of other units*" (§ 215: "Where an institutional unit carries out distributive or financial transactions on behalf of another institutional unit, these transactions should be recorded once only, in the accounts of the latter"). The 1970 ESA particularly stresses the situation in which a unit of general government collects taxes, the total or a specified part of which must automatically be transferred to another government unit. This type of transaction is often carried out by the central government on behalf of local government or social security funds. The collection of pay-as-you-earn income taxes is also typical of transactions carried out by employers or financial institutions on behalf of employees or holders of investment portfolios or life insurance contracts.

Regarding *employers' social security contributions*, which are charged to them by law, national accounts also record a flow from employers to households, and then a flow from households to social security funds. Here, the situation is not so obviously that of a transaction on behalf of another unit. And this is particularly not the case when these social security contributions are imputed as a counterpart to social security benefits paid directly by employers to their employees without contributing to any social security fund (classical case: the payment of retirement pensions by the state without employers' contribution).

The purpose of this kind of accounting practices is to obtain a homogeneous measurement of *compensation of employees*, including elements of indirect wages, beyond wages net of contributions effectively received by them. This measurement though is homogeneous only if social benefits, which are later paid to beneficiaries or their dependants, derive entirely from previous social contributions. This is the idea, and mostly the original situation. It gets blurred nevertheless when the financing of social protection partly derives from taxes (the major part in the case of national health systems such as the British one) and when elements of redistribution also occur among employees, or former employees, and other categories of the population, and not only among employees. The measurement of indirect wages is therefore muddled and the notion of compensation of employees less clear. It is possible, then, that future evolution might upset present conventions. This is the reason why, in 1986, during the first meeting of the Expert Group for the preparation of the 1993 SNA, Aukrust had already proposed to exclude from the system the concept of compensation of employees.

At the accounting level, the treatment of the *income from the investment of the insurance technical reserves* is more complex, as they are managed by the insurance enterprises themselves. The 1993 SNA (see §§ 6.135–6.140), as well as the 1995 ESA, consider these reserves as assets belonging to policyholders. Legal regulations might differ, but they always reflect the fact that these reserves are not at the free disposition of insurance enterprises. Income earned on the investment of these reserves is recorded as if it were payable by insurance enterprises to policyholders, who pay it back to the insurance enterprises as premium supplements. This treatment, which had been used for a long time in the case of life insurance, was extended by the 1993 SNA/1995 ESA to non-life insurance in order to improve the estimate of the output of insurance services. The previous systems (for instance the 1968 SNA, § 6.37) measured the production of non-life insurance services as the difference between the premiums received and the claims paid. But as claims are partly financed by the income earned on the investment of technical reserves, the application of this definition led to an increasingly lower estimate of the output of services, which frequently turned

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Box 27 (cont'd)

negative. In order to cope with this anomaly, the income from the investment of technical reserves is also taken into account for non-life insurance[1]. The output of non-life insurance services is then: actual premiums earned + premium supplements (corresponding to income from the investment of insurance technical reserves) – claims due – (if required) changes in actuarial reserves and reserves for with-profits insurance (see 1995 ESA, § 3.63 and Annex III, § 27; note that, by accident, the text to be found in the 1993 SNA § 6.140 as well as the corresponding part of the elements of complementary classifications (Annex V, part E) is erroneous, but that of Annex IV is correct).

Even with this modification, the estimate of the output of insurance services, which can only be measured indirectly, is still an approximation. This is due to the existence of important temporal irregularities in the flows of claims, mainly when catastrophes happen, and the lack of timeliness in the adaptation of premiums to the changes in risk recurrences and their costs. Under such circumstances, it might be necessary to adapt this treatment.

The treatment of insurance thus combines imputation (the service cannot be observed directly, even physically, although there are physical indicators such as the number of policies according to the different risks, files concerning claims, etc.) and re-routing (investment income).

A similar case concerns the treatment of *reinvested earnings on direct foreign investment*. They refer to the non-distributed part of the profits of enterprises, which the Balance of Payments characterizes by the existence of a foreign participation allowing a significant influence or decision-making power in its management (for a more technical definition see 1993 SNA, § 14.152, or 1995 ESA, § 4.65). For a long period of time, the *Balance of Payments Manual* of the IMF had treated that portion of profits as if it had been distributed to the foreign investors, as a pro-rata of their participation, and then reinvested by them. A flow of property income, and an equivalent flow of financial investment are therefore recorded, although, in practice, no corresponding flows of payments occur. This practice of the Balance of Payments is not based on pure ownership considerations, as this treatment is not recommended in the case of simple portfolio investments. It derives from an approach in terms of economic power.

Until the 1993 SNA, normalized national accounting refused to adopt this same solution. As a consequence, it only took into consideration actually distributed property income. Probably, no change would have occurred, had it not been for the desire to ensure as great a consistency as possible between the SNA and the *Balance of Payments Manual*. Nevertheless, strong opposition, mainly from Europe, was voiced. Besides the familiar argument concerning the restriction of imputations and re-routings and the difficulties of practical implementation, objections focused mostly on the inconsistency between the treatment of international transactions and that of domestic relations among enterprises and groups. Although this argument is valid in principle, it was not considered decisive, and the lack of consistency has been accepted as this partial solution makes possible a representation that is viewed as more significant of the interactions of economic power among countries and, as a consequence, of the measurement of national income.

More recently, the suggestion has been made to extend the solution adopted for foreign direct investment to all shares and participations (see chapter 8).

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[1] For the petty details of history, it might be observed than when Vanoli makes this proposal for the 1980 SECN, he ignores the fact that he is only rediscovering a treatment recommended by Stone as early as 1945(!), but which had not been adopted in the *Standardised System*. Any documentation on the possible discussion on this issue is lacking.

pretending that appearance is reality, whereas the basis for those practices is precisely to show more clearly the underlying economic realities (see also Box 28 about advertising). In the examples mentioned above, the observation of actual flows and a conceptual and numerical "deconstruction/reconstruction" of those

Box 28

A pending imputation–re-routing case: the consumption of advertising-supported television, radio broadcasts, etc. services

In national accounts, when a television viewer watches an advertising-supported program, no final consumption is recorded. As advertising expenditures represent a relevant part of TV, radio, newspapers and periodicals financing, an important part of the actual consumption of households is not being registered. In consumption only appears the part corresponding to a purchase by households: rental charges, taxes, subscriptions, newsstand price, etc.

This deficiency in the measurement of final consumption has been criticized for a long time. The analysis by John E. Cremeans from the Bureau of Economic Analysis seems to be the most detailed on this issue ("Consumer services provided by business through advertising-supported media in the United States", *The Review of Income and Wealth*, June 1980, pp. 151–174). The author recalls that in particular Richard and Nancy Ruggles (*The Design of Economic Accounts*, NBER, 1970), John Kendrick ("Expanding imputed values in the national income and product accounts", *The Review of Income and Wealth*, December 1971, pp. 349–364) and Robert Eisner ("Total income in the United States, 1959 and 1969", *The Review of Income and Wealth*, March 1978, pp. 41–70) have included the mass-media advertisement financing in their proposals of extended measures of consumption and income. It seems that Cremeans' work has not reverberated among national accountants. In fact, the problem, when mentioned by this book's author during the preparation of the 1993 SNA, was not even discussed. Implicitly, the difficulties raised by its solution within the central framework of national accounts seem to be judged insurmountable.

Certainly the question is not simple. It is necessary to show within household final consumption an amount of services financed by enterprises through their intermediate consumption expenditures, part of which are the advertising expenditures. And this has to be done without modifying the operating surplus of enterprises, therefore without modifying their intermediate consumption.

The Ruggleses (*The Design of Economic Accounts*, *op. cit.*, pp. 47, 52, 106, 110, 159, 160), who argue within the framework of a barely diversified accounting system, as they remain dependent on the US system of the NIPA, even though they aim at broadening it, propose to introduce a final consumption expenditure for enterprises. In thus doing, no flow has to be recorded between enterprises and households. Enterprises are thus treated as general government whose final consumption expenditures include the value of services which they provide free of charge to the population. The authors should thus increase by a similar value the disposable income of enterprises, and as a consequence their operating surplus, but they do not do that. In fact, they just (*ibid.* pp. 106, 160) increase by an equivalent value the *enterprise receipts expensed* in their enterprise non-subdivided income and product account, without questioning the origin of these additional receipts. This is one of the drawbacks of a limited accounting system, which is less integrated than claimed.

It is interesting to observe that in order to solve other questions, but perhaps this one as well, the Swedish national accountants (Lennart Fastbom, Ake Tengblad) had also proposed some years earlier, during the preparation of the 1968 SNA, the introduction of a concept of final consumption of enterprises. But they had not been able to find a solution respecting the constraints of the accounting system, and had not been followed.

Cremeans proposes an ingenious solution. He assumes that households that watch TV constitute a kind of *household display enterprise* that sells time and entertainment space to the TV broadcasting industry. The latter industry is broken down into three industries: an Advertising Agency, a TV Broadcasting (Advertising) Industry and a TV Broadcasting (Entertainment) Industry. Referring only to the main flows, it is possible to present Cremeans's numerical example (p. 164) in a simplified scheme the arrows following the physical flows (services in this case). Figures are in millions of US dollars (1976).

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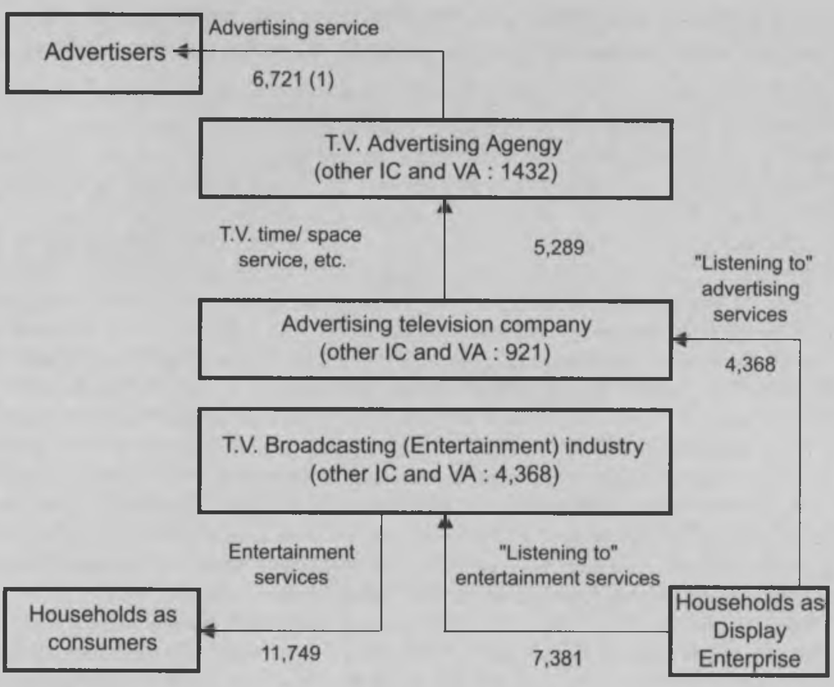
Box 28 (cont'd)


Advertisers
Advertising service
6,721 (1)
T.V. Advertising Agengy
(other IC and VA : 1432)
T.V. time/ space service, etc.
5,289
"Listening to" advertising services
Advertising television company
(other IC and VA : 921)
4,368
T.V. Broadcasting (Entertainment) industry
(other IC and VA : 4,368)
Entertainment services
"Listening to" entertainment services
Households as consumers
11,749
7,381
Households as Display Enterprise

(1)	Advertising services	6,721	Costs		
=	Actual cost of advertising		CFC (TV sets)	5,650	
	TV programs	= 2,353	Capital interest (imputed)	1,538	
+	Actual cost of entertainment		Maintenance, electricity	2,537	
	TV programs	+ 4,368			
(2)	"Profits"	2,024	"Profits"	2,024	(2)
=	Remuneration of "listening to"		Output value	11,749	
	advertising services	= 4,368			
-	Costs for households to receive				
	advertising messages	- 2,344			

Schematic of Cremeans' analysis.

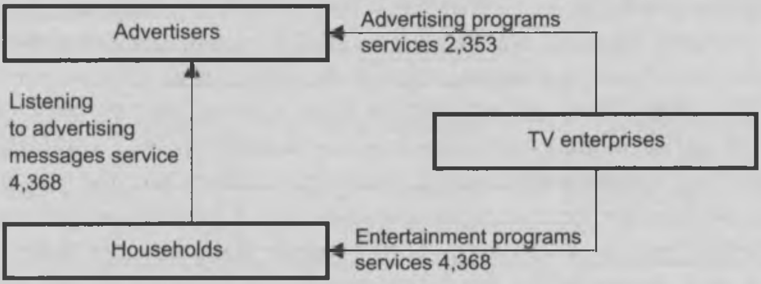
These proposals present two major problems. First, they suppose the introduction of a domestic production of services by households, a treatment that the SNA only admits in satellite accounts (see chapter 7). Their introduction would only be conceivable within the framework of a more general extension of the accounts as the author himself stresses in his conclusion (p. 174).

Secondly, their interpretation is somewhat difficult due to the assumption itself related to the introduction of a domestic production. In fact, the net advantage that households get from the advertising support of entertainment television programs is not equal to its amount (4,368) but to the difference between this value and the cost for households of receiving advertising messages. The total cost for households of setting up TV sets (9,725) is broken down into "listening to advertising messages" and "listening to entertainment programs" depending on their actual broadcasting times, which gives 2,344 and 7,381 respectively. The net advantage ("profit") in this case is only 2,024 (4,368 – 2,344). This is far from the simple initial idea of not treating the entertainment programs as intermediate services.

cont'd

Box 28 (cont'd)

It should have been necessary, no doubt, to look for a simpler scheme, which would not have required the introduction of a complete account for domestic production of display by households. The starting idea is that TV advertising expenditures cover the actual cost of both advertising programs (2,353) and entertainment programs (4,368). Households obtain benefits from the latter (in spite of frequent addiction of children and probably some other watchers, it may be thought that the benefit obtained by households from advertising programs is an externality). As a counterpart, they lend eyes and ears to enterprises for listening to their advertising messages. Even more: it might be viewed as a market service remunerated in kind, on the basis of an implicit quasi-contract, a barter. The corresponding simplified scheme is presented here, still using Cremeans' data and the arrows following the direction of physical flows.


Advertisers
Advertising programs services 2,353
Listening to advertising messages service 4,368
TV enterprises
Households
Entertainment programs services 4,368

A suggestion?

In reality, everything happens as if the advertisers buy from TV enterprises entertainment services in order to remunerate in kind the "listening" to advertising messages service provided to them by households. The scheme illustrates this by saying that advertisers buy from households this listening service and remunerate it in kind. The delivery of the entertainment service corresponding to the payment in kind is made *via* TV broadcasting.

This analysis is easily extendable to other media. Final consumption is increased by the share of the value of entertainment TV or radio programs, or of the cost of newspapers and periodicals financed by advertising expenditures. The total intermediate consumption of advertisers is not modified and their operating surplus remains unchanged, as well as those of the TV enterprises. In so doing, the two original targets may be reached. The required accounting refinement is limited: to introduce a sub-category of additional services, "listening to advertising", and to record as an operating surplus of households the remuneration in kind that they receive, assuming that this service is delivered free of charge.

Focussing on this example makes it possible to illustrate the problematics of imputations and re-routings. It requires the analysis of concrete situations, not the enunciation of principles, and the search for a satisfactory balance between the importance of the proposed solutions and the increasing complexity that may possibly derive from them.

flows are combined. The distance between appearance and economic reality is even greater in the case of consumption of fixed capital. Because of the absence of generalized and permanent markets for existing assets, CFC is not observable, so that its estimate necessarily derives from a modeling procedure. This is also true for depreciation in business accounting. In this context, there is no appearance at all, except the scrapping of worn-out or obsolete equipment.

3. A single system or multiple systems?

The 1976 SECN, the 1993 SNA, the 1995 ESA do not intend to cover everything in a single integrated accounting system, as they recommend in particular the elaboration of satellite accounts. Nevertheless, the central conceptual framework itself remains unique, though with some flexibility. This solution did not appear self-evident. Ingvar Ohlsson (Sweden, 1953) proposed different systems for different purposes. In fact, he calculated two. One was to measure results, output and welfare, and to estimate national aggregates, where he included several imputations. The other one was oriented towards the analysis of the economic cycle and the use of income. With very few exceptions, only actual monetary transactions were recorded. He also had in mind a system adapted to the analysis of economic structures, and another one for the preparation of economic budgets. Welcomed in the 1950s, his suggestions were not followed as such. Actually, French national accounting, when starting, implicitly followed a similar approach by constructing a system centered on short-term analysis and the preparation of economic budgets before moving to a system with a broader perspective.

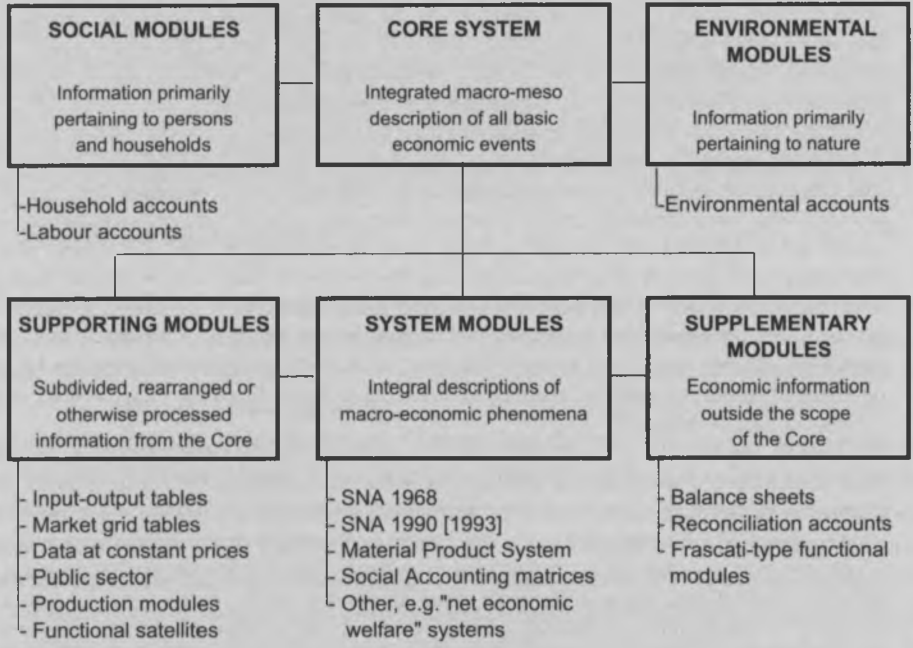
The Dutch proposals of the mid-1980s arise from an idea quite close to Ohlsson's, as it insists on the flexibility required to achieve different objectives. They limit the contents of their *core system* from which they exclude imputations, re-routings and reclassifications of flows. This core is very institutional and pretends to be close to the observation of reality as it appears to the subjective experience of economic transactors, without using any assumption derived from theoretical analysis. Nevertheless it is conceived as a coherent and self-sufficient system. Within this perspective, the SNA is not the central system, but can be obtained by the combination of the core system and a module of imputations, etc. (see Box 29).

For many reasons, the idea of a central framework for the SNA/ESA, aimed at meeting the principal needs addressed to national accounting, has prevailed during the 20th century: a concern for encompassing the essential phenomena of economic life in an economically significant way; the willingness for international standardization and integration with other sets of standards; the need for a single conceptual framework in order to facilitate the dialogue with users; the need for a conceptual coordination framework for economic statistics; economy of resources; possibility of linking additionally non-central concerns with the central framework. For uses that do not need to rigorously cover the whole field of analysis, the central framework can be used, through a partial coverage, a selection of the level of detail of the classifications, or even an adaptation of the methods of estimation, as in the case of quarterly accounts, and not through the elaboration of a particular system of national accounts. On the other hand, the enlargement of national accounting, in particular with the use of satellite accounts (or of modules joining the central core as in the Dutch proposal), allows the introduction of supplementary or alternative systems. The main debate concerns, then, the conception of the central system.

Box 29

An overview of the Dutch proposals in the second half of the 1980s

The scheme below, taken from Gorter and van der Laan (1992, Table 4, p. 210) illustrates the reflections initiated by van Bochove and van Tuinen (1986).


SOCIAL MODULES
Information primarily pertaining to persons and households
-Household accounts
-Labour accounts
CORE SYSTEM
Integrated macro-meso description of all basic economic events
ENVIRONMENTAL MODULES
Information primarily pertaining to nature
-Environmental accounts
SUPPORTING MODULES
Subdivided, rearranged or otherwise processed information from the Core
- Input-output tables
- Market grid tables
- Data at constant prices
- Public sector
- Production modules
- Functional satellites
SYSTEM MODULES
Integral descriptions of macro-economic phenomena
- SNA 1968
- SNA 1990 [1993]
- Material Product System
- Social Accounting matrices
- Other, e.g."net economic welfare" systems
SUPPLEMENTARY MODULES
Economic information outside the scope of the Core
- Balance sheets
- Reconciliation accounts
- Frascati-type functional modules

A system of economy-related statistics. (After Gorter and van der Laan, 1992.)

The scheme reflects three characteristics of the Dutch proposals:

1. As the caption itself indicates, the purpose is larger than the construction of a system of national accounting. It aims at organizing an ample set of economic statistics and of social statistics and environmental information in their relations to the economy. Basic statistics themselves are not represented but the system is conceived to facilitate the micro/macro relations. It is a meso (that is at an intermediate level of aggregation)–macro synthetic framework.
2. In the core system, imputations and re-routings are “as much as possible” excluded. The meaning of this restriction is not explained in the article. However it should be noted that the imputed output of bank services is not mentioned in the list of eliminated flows (p. 208).
3. Imputations and re-routings are introduced in additional modules; among them, the SNA, which is originally conceived as an instrument of international harmonization.

The content of the *core* is very institutional (in a broad sense) as it is oriented at showing what is directly observable. It is therefore influenced by the particular conditions of a given national economy. Nevertheless it is the *core* that has been considered by the authors of these propositions as their battle horse at the launching of the SNA revision process in 1985.

The *core* covers mainly the so-called *transitive transactions*, that is, transactions with a monetary counterpart between two economic transactors, of the exchange type (for goods and services they encompass *goods and services “on the market”*). These could be called bilateral monetary transactions. It includes nevertheless three other types of transactions:

- *Transformative transactions*, which include production, intermediate consumption and final consumption (they are not exchanges, although they give rise to exchanges).

cont'd

Box 29 (cont'd)

- *Preservative transactions,* which represent transactions linked to the contact zone between the past, the present and the future. They include the changes in inventories, the purchases of fixed capital goods, own account capital formation and consumption of fixed capital. The presence of CFC is surprising in a system that wants to eliminate imputations. Either the authors are not conscious of the fact that CFC is the main imputation in national accounting (and of economic life in general), or they use only the depreciation charges calculated by enterprises, which seems to have been the practice in the Netherlands, and do not see that even when done by businesses, an imputation remains an imputation.
- *Derivative transactions* with the example of GDP "*in the core*".

4. The *core* itself presents three ambiguities:
   a. The explanations given by the authors show that the Dutch national accountants conceive the content of the core as resulting directly from the observation of economic transactions exactly as they are understood and recorded by basic economic transactors. But, at the same time, they conceive of the core as a coherent and equilibrated frame. They do not seem to realize then, due to their lack of real experience in transposing elementary accounting to national accounts, that the perceptions and systems of recording transactions by economic transactors themselves are not mutually consistent. The *core* cannot be simultaneously a system based on direct observations, without referring to the national accounting conceptual system, and a consistent set of data.
   b. The *core* is meant to be a significant system in itself, inclusive of the aggregates derived from it. However, if one does not want to just define their contents by a truism, as in the expression GDP "*in the core*", one has the choice between two options: to say either that what is measured is market GDP in the strict sense (value added in the production activities which give rise to actual sales), or that what is measured is GDP whose production factors are of the market type, again in the strict sense. In the first option, many things have to be excluded (imputed output of banking services, of insurance services, of services of owner-occupied dwellings, output produced for own final use or own capital formation, non-market services from general government). Obviously the Dutch proposals do not go that far. In the 1992 text referred to here (Table 3, p. 207), there is explicitly a general government production and, implicitly if there is no misunderstanding, a complete output for banks and insurance services. Therefore an option of the second type seems to be followed, but then the price of introducing imputations and re-routings has to be paid when *transitive transactions* are reorganized into *transformative transactions*. One cannot see why, if this second option is followed, the CFC of owner-occupied dwellings would not be considered as linked to a market factor of production, given that CFC in general is included into the *core*.
   c. The *core* does not constitute a complete representation scheme of economic life, even by limiting it to market and monetary non-market activities, because *balance sheets* are excluded, probably because at the time they are not compiled in the Netherlands and, also, because to establish them requires many values to be imputed (see chapter 8).

These proposals gave rise to various reactions. As a project to structure the set of economy-related statistics, they join discussions carried out in several places about the desirable broadening and flexibility of national accounting from a statistical coordination point of view. Different expressions "supplementary accounts", "complementary accounts", "satellite accounts", "modules", reflect similar concerns about the links between central and peripheral elements.

In the case of the Netherlands however, these discussions are situated within the context of a far-reaching endeavor, whose purpose is to redesign the structure of the statistical system as a whole, in a more ambitious manner than elsewhere. From this point of view they are welcomed.

cont'd

Box 29 (cont'd)

By contrast, the ambiguous character of the core system (see above), and the insistence on promoting it as a basic national accounting system, lead to the almost general rejection of the idea by the national accountants of other countries. The discussion was closed in Europe itself and did not rebound in 1986 in the world Expert Group. As conceived, the idea of a *core system* did not influence the 1993 SNA at all. The latter's concept of a central framework comes from the 1976 SECN and maintains the requirement of imputations and re-routings (whose field of applications has, by the way, grown) to reach a significant economic representation.

Experts primarily concerned by the development and utilization of microeconomic data banks related mainly to households, were more receptive to the Dutch proposals. Some of them, Richard Ruggles for instance, wanted to exclude from the SNA all elements that could not be observed directly at the stage of household surveys.

4. Micro/macro relationships

The wish to get closer to the micro-accounts of economic transactors and/or to the way they perceive the economic phenomena is often the basis of a request made to national accounting to be closer to reality and to sacrifice less to economic analysis. Once again imputations, re-routings and reclassifications of transactions are questioned, though they are not the only ones. The Ruggleses, at the beginning of the 1980s, asked for their removal on behalf of the micro/macro linking. The Dutch joined them with their core system that stems partly from the same idea. Without assuming systematic positions of that kind, other national accountants (in Germany and in the United Kingdom, for instance) often refer to business accounting practices in order to reject solutions that would better fit a relevant economic representation (like the treatment of R&D expenditures in GFCF, for instance).

The micro/macro linkage is complex. Historically the expansion of national accounting goes together with that of macroeconomics. Interest is in "global quantities" (Perroux) that precisely have been ignored until then. Stone, who in 1945 clearly presents an aggregative conception of elementary flows and accounting entities, does not follow along this line. As a macro-model builder, the aggregation of micro-accounts themselves does not catch his attention. He mostly thinks in terms of disaggregating from top to bottom rather than of aggregating from bottom to top. The dominant train of thought does the same, as well as the international systems, as long as they emphasize aggregates. Norwegians remain attached to the ascending approach, although influenced by the original axiomatic approach that does not seem concerned with the aggregation of the elementary accounts of economic transactors.

At the beginning of the 1950s, the SEEF seems to be the only group that really conceives of national accounting as a potential aggregation of elementary accounts of economic transactors (a particularity emphasized by Prou, *Méthodes de la comptabilité nationale française* [Methodology of French National Accounting], *op. cit.* 1956) from a decidedly institutional point of view. Even though, as has been mentioned, the CNF has to accept some measure of functionalism right away, it remains strongly marked by this origin. In practice, in its methods of elaboration of the accounts of the market productive sector, it will focus on the use of business accounts of non-financial enterprises, collected *via* their income tax returns, which will be available shortly after on an individual basis. In other countries, for instance the USA and the United Kingdom, statistics of fiscal origin are used, but not the business accounts themselves.

Without practical experience in the use of individual data for the compilation of national accounts, some people tend to think that the micro/macro linkage is simple as long as the macro level, that of national accounts, is not saturated with the sophistications of theoreticians. Comforted by the existence in their country of a standardized accounting system, French national accounts compilers probably also think at the beginning that the problem is relatively simple. For some time their leading idea seems to be to adjust the "Plan Comptable Général" (PCG) [General Accounting Standards] to the solutions of national accounting, because business accounting seems often badly adapted to the needs of general economic analysis covering all the economic transactors. However the business accountants resist, often rightly, because of their specific needs. Finally the idea of an intermediate system for enterprises emerges.

This intermediate framework reorganizes the items of business accounting following a more general economic structure, showing namely value added, without however changing the figures directly presented in the business accounts. Publications by sub-sectors of activity simply add the intermediate accounts thus reorganized. At this stage, the micro/macro linkage is therefore totally assured. The transition from intermediate accounts to national accounts is then done by sub-sector and not individually (conversion of accounting classifications, adjustment for tax evasion, introduction of data coming from other institutional sectors, arbitration used with the Input–Output table). These elements of transformation cannot be estimated for each enterprise. The revaluations of inventories are only calculated at a global level because even at the sub-sector level this is considered a risky exercise (as is the case for consumption of fixed capital). Besides, and this is a strong restriction, the organization of information on financial transactions in business accounting makes it difficult to extend the intermediate system to financial accounts that resist the micro/macro linkage.

Difficulties and complexity in the establishment of the intermediate system for enterprises are considerable. Nevertheless, within the French experience, it seems fundamental, not only as a tool for the synthesis of accounts and enterprise statistics but also for its role in explaining the discrepancies between the evolution of the national accounts for enterprises and the one that can be derived directly from microeconomic databases.

The 1993 SNA does not formally introduce the idea of an intermediate system, which is difficult to normalize at the international level, but it makes reference to the possibility of implementing intermediate accounting systems (§ 1.65). It recognizes that, in spite of the development of microeconomic databases that are very fruitful for analysis, it is hardly possible to construct macroeconomic accounts by simply aggregating the respective microeconomic data, as is the case for general government, social security or financial institutions. The use of business accounts is nevertheless encouraged, which is new at the international level. In 2000, the UN publishes a manual on the relationship between business accounting and national accounting.

5. Disputes about SAMs

Promoters of social account matrices (SAMs) tend to contrast them to the national account systems, or at least to present them as something somehow different and of course more powerful. The expression and its acronym were introduced by the first publication of the *Cambridge Growth Project* in 1962 (Stone and Alan Brown), followed by the presentation of a SAM for the United Kingdom (1960 accounts). There seems to be a magic in this term, considering its success, in spite of the efforts made to explain that a SAM is ... a system of national accounts presented in matrix form. Stone and Brown are very clear on this detail (quote is from Stone): "... the activity of building up a detailed, interconnected system of accounting statements for the whole economy is termed social accounting. When presented in matrix form, the table that results is termed a social accounting matrix" ("A computable model of economic growth", in *A Programme for Growth*, Vol. 1, Chapman & Hall, 1962, p. 11).

The expressions "social accounting" or "social accounts" have been used extensively in the 1940s or 1950s, before "national accounting" or "national economic accounting" and "national accounts" imposed themselves, to designate the new discipline as opposed to the narrow former approach of "national income estimates". Emphasis was laid on the accounting aspect, that is the presentation of relationships among "sectors" (in a broad sense: the parts) of the economy as a set of double entry accounts. "Social" means simply "for the economy as a whole". Stone (1945) believes that Hicks first used the expression "social accounting" in 1942. Aukrust (1994) expresses doubts on this detail, but he has perhaps mainly in mind the issue itself (for which he claims priority for Frisch and Lindhal, but it is also possible to recall Fisher and Copeland) rather than the expression used to designate it. Anyhow, "social accounting" means exactly the same as "national accounting" or "economic accounting". The French publication of Stone's text (1947) says "comptabilité nationale [*social accounting*]". In those days the expressions are used as complete equivalents, possibly by the same authors (Perroux: "La comptabilité sociale ou nationale" [Social or national accounting], *Les Comptes de la Nation* [The Accounts of the Nation], PUF, 1949, p. v). Studenski (1958) introduces the term "*social accounts*" only at the margin, in a book prepared much earlier. Later on, "national accounting" becomes the almost general expression in the West, referring to the national economy ("*'social accounting' or 'national accounting' as it is usually termed today* ... ", Nancy D. Ruggles, in John Eatwell et al., *The New Palgrave: A Dictionary of Economics*, MacMillan, 1987, p. 377).

Why does Stone, in these circumstances, introduce a SAM instead of what he may equally have called a NAM (*National Accounting Matrix*) – the meaning is the same for him – with the risk of creating some confusion in the years to come? He perhaps wants to avoid ambiguity with the official accounts of the United Kingdom on which the 1960 SAM is based, though with some particularities and adjustments. Perhaps the limitations of the first international system at the beginning of the 1950s have also played a role. Stone sometimes gives the impression of letting himself be overcome by the narrow scope of the first SNA, although he is at its origin, but which he viewed only as a temporary stage. "Classical" national accounts, as people from SEEF said then, are still closely linked to the purpose of measuring aggregates, and not close enough to the description of the structure of the economy. And Stone possibly did not want to give the impression of presenting an alternative SNA before a revision of the 1952 system would be already officially under way. When that is finally the case (1968 SNA), Stone keeps the matrix presentation that he used for the British publications in 1962, without using the expression "social accounting" (no SAM then) because "national accounting" has generally imposed itself worldwide; neither does he explicitly use the expression "matrix of national accounting" when he refers to the system of the 1968 SNA (see Box 17) in matrix form. The way is thus paved for considerable misunderstanding, all the more so when Stone will be developing a project of demographic accounting (human stocks and flows and their relations) called "social demography", which in some cases he will present (1972, pp. 147–148) as the demographic aspect of a broader concept of social accounting. He will then speak of a system of social matrices (1973) but in a much larger context than the 1962 SAM, whose object was economic accounting.

However the term "social" in "social accounting matrix" will take on a life of its own and endorse a connotation of social analysis. Graham Pyatt, who worked for Stone's *Cambridge Growth Project,* developed SAMs, mainly at the World Bank, characterized by the importance given to the allocation and redistribution of income and by the breaking down of households by type, whereas the 1968 SNA is weak in this field. SAMs are then prepared for a significant number of developing countries. From its content point of view, a SAM is a national account in which, first of all, the part concerning income/household or some other aspects receives particular attention, and where specific adaptations to the country or to the specific problems scrutinized have been possibly introduced. It is thus a set of national accounts conceived with flexibility. This flexibility will be contrasted to the 1968 SNA, interpreted as being excessively rigid. And it is true that in practice, a narrow interpretation of the system has often been adopted, in particular in developing countries.

Pyatt goes further, emphasizing the term "matrix" as opposed to "account". In this approach, the concept of the social accounting matrix has the capacity to generate all types of national accounts. It is sufficient to carefully introduce the required rows and columns. In a striking formulation, during a presentation at a IARIW conference, Pyatt says: “The SNA is a SAM”. As the SNA is a system of national accounting and the SAM is a matrix representation of a system of national accounting, the formulation is equivalent to say that any system of national accounting is a system of national accounting. The 1968 SNA, as are all systems of national accounting, is evidently a particular system of national accounting, because it is possible to conceive an infinity of them. To say that it is a particular example of a SAM, besides its tautological aspect, means adopting an aggressive attitude that Stone himself does not seem to have ever endorsed.

The 1993 SNA/1995 ESA attach less importance than the 1968 SNA to the overall presentation of the system in the form of a square matrix (squared table as in the 1952 “Principles” of the French national accounting) where an account, in a very broad sense, is represented by a row/column pair. A more direct representation of accounts in the integrated economic accounts linked to a SUT is preferred, so as to show the articulations of the system, but other methods of presentation (square matrix, system of equations, diagrammatic presentation) are also used (see Annex to Chapter II of the 1993 SNA). Moreover, a chapter on SAMs has been introduced (Chapter XX), mainly under World Bank pressure. Without eliminating – by no means – all ambiguity, this solution has the advantage of having replaced the debate within the national accounting framework.

In absolute terms, no form of presentation is superior to any other. For Stone, a matrix presentation has qualities of elegance and simplicity (cf. chapter 3, p. 91), and perhaps more evident pedagogical virtues (the term “social” does nothing in this respect) to show the overall connections of complex systems, for instance the progressive construction of more complex systems starting from a simpler model with two accounts for a closed economy, and the transformation of systems into others. In 1965, G. Stuvel dedicated a book to this approach, completely based on the presentation of square matrices, entitled *Systems of Social Accounts* (Clarendon Press, 1965; with the term “social” used as a synonym of “national”, the title simply means *Systems of National Accounts*). As for the content itself of the systems, it obviously depends on the economic and accounting analysis pursued, the purposes of the endeavor and the possibilities of measurement. Nothing comes from a presumed miracle effect of the generative virtues of matrices.

6. Broadening the scope of national accounts

The real issue is that of a creative attitude towards the enhancement and enlargement of national accounting. Enhancement inside the limits – also submitted to evolution – of the central framework has different dimensions, the implementation of which corresponds to the general idea of flexibility and adaptability of a system. The 1993 SNA undoubtedly confirms that principle. Since the first meeting of the Expert Group (June 1986) it has been stated that the “accounting structure is general enough to suit most of the cases” (1993 SNA, § 19.2); it is possible to accommodate countries’ distinctive features “within the margins of flexibility provided by the system" (*ibid.*). "Countries should (thus) find it possible to implement the integrated framework without conflict with their own requirements. Conversely, countries should find it possible to innovate when elaborating their own national accounts so that they do not depart from the main international standards" (*ibid*, § 19.3). A full chapter is dedicated to the adaptation of the integrated framework to various circumstances and needs (Chapter XIX). It covers aspects already treated in the case of SAMs (detailed and supplemental analysis of the household sector), or introduced by the 1968 SNA (accounts of key sectors), or new (systems of multiple exchange rates, issues related to significant inflation).

It is not certain, though, that, in practice, countries often take advantage of this new flexibility of the SNA. More rigid interpretation may still prevail. Well-off countries experience similar situations and the European Union favors making things uniform, for evident reasons. The others are not rich enough to be able to innovate. Their information systems are very limited and the number of statisticians reduced.

The interest in covering topics that could not be conveniently treated within the central framework without making it burdensome, or that needed the use of treatments in contradiction to it, has brought about the idea of satellite accounts. The initial idea, introduced by the French (see in the appendix of the present chapter a paper written in 1967, published in 1969) aims at specific constructs, elaborated at the INSEE in particular by Philippe Pommier, which give details and broaden the analysis of a given field (housing, health, social protection, tourism, education, etc.), and even include non-monetary information. In such an approach, few elements need alternative logics, and contradict the concepts of the central system. Satellite is therefore taken in a rather narrow sense. Along these lines, several satellite accounts have been set up in France and in other countries (Germany, Norway, Canada, etc.) particularly in the field of health, and in some cases at the international level (social protection and environmental protection expenditure at the European level, tourism at a worldwide level).

Success obtained by the satellite accounts formula leads later to increase their scope (see for example the 1986 text quoted in the appendix of this chapter), in order to cover analyses which stress the use of alternative concepts, for instance, of production (inclusion of non-remunerated household activities) or of net worth (inclusion of human capital, of natural non-market assets). In these approaches the economic process is described differently, and complementary or alternative aggregates are proposed. The term satellite is thus taken in an appreciably different meaning. Satellites thus understood frequently set up a claim to replace, in the long run, the heart of the system or substantial parts of it.

It is possible to place within this extension of the concept, some research work by scholars who appear *a posteriori* to have elaborated satellite accounts. The impressive number of studies made in the USA in the 1970s, in the framework of the project called "*The Measurement of Economic and Social Performance*", following some concerns about the adequacy of National Income and Product Accounts (NIPA) for the analysis of such performances, might very well be qualified as part of the satellite analysis idea taken in a broad sense. Milton Moss, Thomas Juster (measure of welfare), John Kendrick (total capital, extension of imputations), Robert Eisner (total incomes), Henry Peskin (environment, non-market activities), Richard and Nancy Ruggles (extension of the accounts), Raymond Goldsmith (balance sheets) and Edward Wolff (household net worth distribution), have clearly in mind a wish to change the NIPA. Starting from that, the Ruggleses in 1980 propose their *Integrated Economic Accounts for the Unites States 1947–1978*. In 1989, Robert Eisner publishes the final version of his TISA (*Total Incomes System of Accounts*).

In the last decades of the 20th century, environmental concerns give rise to an important international effort that ends up with a preliminary and controversial version of a manual of integrated economic and environmental accounting, explicitly presented as a satellite system of SNA within a perspective of alternative complementarity (see Box 64 in chapter 8).

By assumption, there is no single model of satellite accounts. There is only one model for some families of them, for instance in Chapter XXI of SNA, for satellite accounts with a functional orientation (health, education, etc.). The use of a matrix presentation allows, in some cases, to show in a very illustrative manner, monetary data of central or satellite accounts and significant physical data, and to obtain some kind of integration without making use of an extended monetarization. Such is the case for the "*National Accounts Matrix with Environmental Accounts*" (or NAMEA) proposed by the Netherlands. It shows the emissions of the main polluting products and waste by main type of activity, and for household transportation consumption and other household functions. Scientific coefficients defined by groups of experts translate the contributions of pollutants into equivalents of pressure on the environment – allowing them to become additive – for each of the main environmental themes (greenhouse effect, ozone layer depletion, etc.). It is then possible to compare for each activity on the one hand its contribution to GDP and employment, and on the other its relative contribution to each of the damages under scrutiny. Dutch agriculture in 1991, for example, produced 4% of GDP and provided 5% of employment, while it contributed 16% to the greenhouse effect produced by productive activities, 0% to the deterioration of the ozone layer, 49% to acidification, and 86% to eutrophication.

By assumption also, satellite accounts, diverse in their form and purpose, cannot constitute a closed system. It is always possible to conceive new ones, even without using the name itself. Thus the enlargement of the system does not tend towards a system of systems.

Outlook

National accountants are in perpetual conflict in the search for what may constitute for them, if not the ideal system, at least the best system taking into account the various constraints. From the national level these debates progress to the international scene as soon as the concerns for standardization appear, as they do very rapidly. Their intensity increases as this standardization evolves from a soft type to an increasingly compelling normalization. The main subjects of the debates are three, with frequent intrusions: the modes of representation, the micro/macro relationships, and the broadening of the scope of national accounts.

Modes of representation. On the first topic, the graphical representations can be put aside (see chapter 2, appendix); they blossomed in the 1940s and 1950s. They had pedagogical purposes, at a time when the purpose was to familiarize the public with the ideas of economic circuit, inter-dependence of phenomena, significant aggregates and required consistency of quantitative estimates. They may reflect different concepts but they were not, by themselves, controversial matter.

The accounting representation is at the center of the debate. Once a transition phase is over, after the traditional estimates of national income, this representation itself is not, as a matter of principle, questioned. Nevertheless, not everyone perceives its role in the same way. For some, it is essentially a structure of interrelations among aggregates and their main components (US accounts, for instance). In fact, this concept will be the prevailing one until the end of the 1960s, due to the dominance of the first normalized system, the practical influence of which will extend even longer. In the other extreme, the accounting system should be understood as a mode of representation of an economy as a whole, which gives equal or even more importance to the detailed contents than to the aggregates, with the intention of linking, at least potentially, the micro, meso and macro levels of data. The empirical positions are often to be found in the middle ground, and frequently lack a clear perception of the more general implications of the solutions being debated. Thus a simple and scarcely differentiated accounting system is advocated in order not to complicate the task of the users. However, the move will be towards a complete and very differentiated system.

The problem of the matrix representation somewhat confuses the debate, as it is sometimes opposed to the accounting representation then qualified as traditional. By enlarging the concept of account, which is also done secondarily by national accounting, it tends to blur the role of the fundamental accounting structure. A SAM is, of course, a national accounting system, but represented in matrix form, and the choice of this form of presentation is secondary.

Micro/macro relationships. The second main topic, that of the micro/macro relationships, gives rise to a discussion that is often poorly informed due to a lack of knowledge concerning business accounting, but plentiful in illusions. From the time when many countries consider national accounts from the perspective of aggregates, a progressive move takes place, in the 1970s, towards a stage where the use of individual databases, for households or businesses, is considered more and more promising and essential for economic analyses. Total integration between those databases and the main variables of the national accounts would evidently allow a considerable enrichment of the analyses, regardless of the side from which they are undertaken.

Unfortunately, this is not the case. As the French experience with business accounts shows (see this chapter), the issue is very complex, and even in its more ambitious formulation does not provide a complete solution. Some (Richard Ruggles or the Dutch national accountants in the mid-1980s) think that modifying the macro level and excluding all elements not directly observable at the micro level would be sufficient to implement a satisfactory micro/macro integration, while keeping, at the same time, a consistent and meaningful macroeconomic system. Gradually however, it becomes clear to almost everyone that the micro/macro linkage can only be foreseen at intermediate conceptual and methodological levels, that differ depending on the categories of economic transactors. The "intermediate systems", in the terminology of French national accounting, correspond to these levels. Up to this point, the micro/macro transition is feasible, not without great efforts, for each individual unit (even if in practice this can be done for groups of units). Beyond this, it is difficult to consider the feasibility of conversions from the intermediate system to the central system of national accounts for each unit individually (modifications in order to take into account relations with other institutional sectors, tax evasion, re-estimates of changes in inventories and of consumption of fixed capital, for instance). Such conversions imply, in any case, a noticeable distancing from the elementary perceptions and records of the economic transactors.

Broadening the scope of national accounts. Extending national accounting, that is enlarging the scope which it already covers, is the third dominant issue – rather a family of issues – in the discussions among national accountants and with users. At first, the starting point is a rather narrow point of view aiming for the representation of a market economy. The monetary non-market economy (for which most costs are of a market nature) is then viewed as made up of final consumers only, even in the case of general government whose treatment as producer will slowly emerge later (see chapters 3 and 6). The typical mode of relationship is purchase/sale with the corresponding payments/receipts and implicitly the concomitant changes in inventories.

Economic realities shatter this narrow view: there are no purchases/sales for the essential parts of the services provided by general government; there are many transfers and not just exchanges; there are also many transactions related to production for own use, where the game of exchanges is disrupted. Or even transactions on behalf of other units where the circuits of economic flows do not correspond to the circuits of payments. Broad areas of the market economy – insurance premiums, interest – may cover, depending on the situation, purchases of services, transfers and investments or purchases of services and primary income. Those who watch television programs or listen to the radio seem, essentially, not to consume anything that is financed by advertisers.

It is necessary to face those situations that do not correspond to the simple monetary market basic scheme. However many national accountants will tend to think of them finally as unfortunate, somewhat inconvenient exceptions. That is the reason for the really astonishing extent of the debate on imputations and re-routings, that is, on all that cannot be based on the immediate observation of reality or even does not conform to appearances (see this chapter and Boxes 24 and 26–29). Others believe, on the contrary, that although the market economy constitutes the very heart of the modern economy and the market exchange is the foundation of monetary values, nothing justifies the disregard of the economic flows that do not take the form of directly identified market exchanges, as soon as they have a meaningful importance.

Tension between observation and analysis. These debates could be viewed as secondary and concerning only the reduced circle of specialists, if the restrictive attitude that favors the market transactions "as they are" did not have serious negative consequences, as shown by the majority denial to consider R&D expenditures as investment (see chapters 3 and 8). The main reasons for that denial were that business accounting did not do so (perverse consequence of a desire for a badly mastered micro/macro linkage), and that it was not possible to observe the corresponding asset, and what is more an uncertain one (effect of the naïve view that all that is tangible by hand is an unquestionable asset).

Economic evolution, with the extension into non-tangible activities and assets, and the need to treat cases of unusual form, fruit of the unlimited imagination of practitioners of economics and politics, will increasingly oblige national accountants to analyze and record phenomena that are not easily subject to direct simple observation.

What has become, with the 1976 SECN and 1993 SNA/1995 ESA, the system or central framework, cannot be limited to monetary transactions as they appear and as a non-informed observer views them.

Beyond the central framework, a system of national accounting in a broad sense may cover more extended phenomena or analyze some of them differently thanks to semi-integrated supplementary constructs, which tend to be generally designated as satellite accounts (see chapter 3 and the present chapter, this latter's appendix in particular). The Dutch "modules" or the various complementary accounts derive broadly from the same idea. Broadening and flexibility, thus accepted, may then counterbalance the risks of rigidity deriving from an international system in a process of standardization, which has frequently been understood in a restrictive way in the decades before the adoption of the 1993 SNA. The latter provides leeway for action in the central framework itself, but few countries take advantage of it.

Through passionate debates, national accounting has chosen the option not to depend strictly on perceptions from the elementary economic transactors. On the contrary, it has chosen to distance itself, when required, in order to provide a more meaningful economic analysis. It encounters, then, a second type of problem. If economic analysis is given an important weight and the representation of the true nature of economic flows is aimed at, even against their appearances, should then, on the opposite side, the views of economic theories, which by nature try to go beyond what is observable, be privileged? To this question national accountants generally reply that national accounting is a discipline of *ex-post* observation of economic life with all its complexities, which is not usually the case for economic theories.

The relationship between observation and analysis is an uneasy one. On one hand, it is said that the result of observation should not necessarily be the reflect of the appearances of phenomena, but on the other it is noted that tension could be strong between observation and economic theories and that the observation of the past should not presuppose that the theoretical assumptions are necessarily verified, as it could bring in the risk of prejudging of the results. These delicate problems will appear again concerning issues such as the measurement of welfare (chapter 7), the relationship between production, income and wealth (chapter 8) and the measurement of the volume and price changes (chapter 9). It will be revisited globally in chapter 10.

Annotated bibliography

Many references given in the annotated bibliographies of preceding chapters are relevant here.

A new generation of Dutch national accountants has developed, from the mid-1980s, a set of stimulating reflections on the general structure of national accounts and its relations to socio-economic and environmental statistics. See in particular: C.A. van Bochove and H.K. van Tuinen: “Flexibility in the next SNA: The case for an institutional core” (*The Review of Income and Wealth*, June 1986, pp. 127–154); and Cor Gorter and Paul van der Laan, “An economic core system and the socio-economic accounts module for the Netherlands” (*The Review of Income and Wealth*, June 1992, pp. 199–223; with numerous references). A brief summary of these works is found in G.P. den Bakker’s article “Dutch national accounts: A history”, in Zoltan Kenessey (ed.), *The Accounts of Nations*, *op. cit.*, pp. 83–85.

In the 1990s, Steven Keuning, who then worked for the Dutch Central Bureau of Statistics, has on the other hand stressed social accounting matrices, an approach which, although coming from a basic common idea (the one on flexibility), has largely confused the former message.

Alain Desrosières’ article “La statistique aux Pays-Bas: information et intégration, un projet futuriste” [Statistics in the Netherlands: Information and integration, a futuristic project] (*Courrier des Statistiques*, no. 91–92, December 1999, pp. 51–59) shows, nevertheless, the continuation to almost the end of the century of works around the concepts of coordination and integration along the ideas initiated at the Central Bureau of Statistics (CBS), in the mid-1980s. He analyses in particular several papers by van Bochove, who has since left the CBS, and P. Everaers (1996, references p. 59). The vision of an advanced micro/macro integration is kept and developed, through electronic data processing, but the necessity of a partial integration under the form of intermediate accounts is well understood (p. 56).

Outlook
Bibliography

Ingvar Ohlsson's masterly work *On National Accounting* (Konjunkturinstitutet Stockholm, 1953) presents his ideas of systems differentiation in its chapters III "The Problem of Valuation" and IV "The Accounting Design" (see a short presentation by Aukrust in Zoltan Kenessey (ed.), *The Accounts of Nations, op. cit.*, pp. 32–34). His book deals with all the national accounting problems that were discussed at that time.

On the micro/macro linkage, the French experience is synthesized in Vanoli's article "Sur la structure générale du SCN, à partir de l'expérience du système élargi de comptabilité nationale français" [On the general structure of SNA, from the experience of the enlarged French system of National Accounting], *op. cit.*, pp. 166–177. For a more complete and more technical presentation see *SECN base 1980* (pp. 247–270). See also Pierre Muller, "Nouveau plan comptable et élaboration des comptes d'entreprises" [New accounting standard and compilation of accounts for enterprises], a paper presented to the 1986 ACN Conference, in E. Archambault and O. Arkhipoff (eds.), *Nouveaux aspects de la comptabilité nationale* [New Aspects of National Accounting] (Economica, 1988). The basic ideas are presented in 1969–1971 papers: "La comptabilité nationale s'adapte à de nouveaux besoins" [National accounting adapts to new needs] (*Economie et Statistique*, no. 7, December 1969, pp. 53–60), a document for the October 1969 meeting of the *Commission des comptes et des budgets économiques de la nation*, probably written by Jean-Pierre Januard and André Vanoli, presenting the guidelines proposed for the future SECN; "La comptabilité nationale et la comptabilité d'entreprise se rapprochent" [National and business accounting draw closer], Alain Benedetti and Bernard Brunhes (*Economie et Statistique*, no. 29, December 1971, pp. 5–16).

Among the many papers on this topic by Richard Ruggles – frequently in association with Nancy Ruggles – see for example "The United Nations System of National Accounts and the integration of macro and micro data", in J.W. Kendrick (ed.) *The New System of National Accounts* (Kluwer Academic Publishers, 1996, pp. 387–416; with numerous references). Harry H. Postner, from the Economic Council of Canada, has discussed the micro/macro linkages for enterprises in "Microbusiness accounting and macroeconomic accounting: the limits to consistency" (*The Review of Income and Wealth*, September 1986, pp. 217–244), and in "Linkages between macro and micro business accounts: implications for economic measurement" (*The Review of Income and Wealth*, September 1988, pp. 313–335). This last article dedicates a section – The French 'Intermediate Accounts' connection – to the French experience (based on the analysis of Vanoli's above-mentioned paper).

The United Nations in 2000 published *Links between Business Accounting and National Accounting, Handbook of National Accounting*, mainly based on countries' experiences: Canada (Kishori Lal), France (Patrick Augeraud), USA (Robert P. Parker), Malaysia (Ching Hea Choo) and Latin America (Magda Ascues and Jan van Tongeren). The book also presents two general studies by Vu Quang Viet (UN Coordinator of the publication) and by Francis Rousse, a chartered accountant involved over a long period in the French technical cooperation activities.

A paper by Tomo Suzuki "The epistemology of macroeconomic reality: the Keynesian revolution from an accounting point of view" (*Accounting, Organizations and Society*, 2003, vol. 28, issue 5, pp. 471–571), presents an attempt to influence business accounting developed in the UK under the leadership of Stone and Franck Sewell Bray, an accountant to which Stone owes much of his knowledge of accounting. Nothing resulted from the series of meetings held in 1946–1947, in which Hicks and Meade also participated.

There is an abundant bibliography on SAMs. It develops from the mid-1970s, in particular: G. Pyatt and E. Thorbecke, *Planning Techniques for a Better Future* (International Labour Organization, 1976); G. Pyatt, A.R. Roe et al., *Social Accounting for Development Planning with Special Reference to Sri Lanka* (Cambridge University Press, 1977); G. Pyatt and J.I. Round "Social accounting matrices for development planning" (*The Review of Income and Wealth*, December 1977, pp. 339–364); Steven Keuning and Willem de Ruyter, "Guidelines for the construction of a social accounting matrix" (*The Review of Income and Wealth*, March 1988, pp. 71–100) [Keuning, at the time at the Institute for Social Studies in The Hague, presents van Bochove's ideas of 1986 as ... complementary to his own proposal, the SAM serving as a core system]; Chapter XX "Social Account Matrices" of the 1993 SNA: unluckily the text, written by Keuning, does not remove all ambiguities; in essence it could be rewritten using the expression "national accounting matrices"; that would underline the tautological character of the sentence "It is clear that the social [this would be written national] accounting matrices are closely related to national accounting" (§ 20.4); as if for the author SAMs remain something that is really different, and not only formally. The links to Chapter XIX, "Application of the integrated framework to various circumstances and needs", are completely ignored. Chapter XX can be replaced in the more general context of the 1993 SNA by reading §§ 2.239–2.249 of Chapter II (Section E. "The integrated central framework and flexibility"); Guido Ferrari, "A la recherche de la matrice perdue" [In Search of the Matrix Lost], in Edith Archambault and Michel Boëda (eds.), *Comptabilité nationale, Nouvelles frontières* [National Accounting, New Frontiers] (1998 ACN Conference, Economica 1999, pp. 297–310) [the SAM as "a general accounting structure" in which "every accounting scheme can be inserted", p. 297].

In the context of a short reflection on national accounting as a whole, André Vanoli introduced the idea of satellite accounts in a paper dating back to 1967, "Le système actuel de comptabilité nationale et la planification" [The present system of national accounting and planning] (*The Review of Income and Wealth*, June 1969, pp. 171–184; see pp. 179–183). Its development is presented in Chapter 2 (Satellite accounts) of the 1976 and 1987 SECN; in Maryvonne Lemaire and Jean-Louis Weber's paper "L'expérience française d'extension des comptes nationaux" [French experience in extending national accounting] (*Proceedings of the 44th Session of the International Statistical*

Institute, vol. 2, Madrid, pp. 1036–1038, 1983; with bibliography); in the fourth part of Vanoli, 1986, pp. 176–186. Chapter XXI “Satellite Analysis and Accounts” of the 1993 SNA, broadens the issue (Section B “Satellite Analysis”) and describes a model of satellite accounting with functional orientation (Section C), systematizing and rethinking the French experience on the topic. ACN Conferences refer frequently to satellite accounts (1984 Conference Proceedings, published in 1986; 1991 Conference Proceedings, published in 1992; 1993 Conference Proceedings, published in 1996; 1996 Conference Proceedings, published in 1997, Economica).

The proposal of a satellite system of *Integrated Environmental and Economic Accounting* (Interim Version) was published by the UN in 1993.

The NAMEA has been proposed by Abram J. de Boo, Peter R. Bosch, Cor N. Gorter and Steven J. Keuning in “An Environmental module and the complete system of national accounts”, in Alfred Franz and Carsten Stahmer (eds.), *Approaches to Environmental Accounting*, Proceedings of the IARIW Conference on Environmental Accounting, May 1991 (Physica-Verlag, 1993). See also Mark de Haan and Steven J. Keuning “Taking the environment into account: The NAMEA approach” (*The Review of Income and Wealth*, June 1966, pp. 131–148).

On FISIM, one can consult the article by Iain Begg, Jacques Bournay, Martin Weale and Stephen Wright “Financial intermediation services indirectly measured: estimates for France and the UK based on the approach adopted in the 1993 SNA” (*The Review of Income and Wealth*, December 1996, pp. 453–472; review of earlier studies, pp. 455–457); B. Haig’s proposal that they summarized is in “The treatment of financial intermediaries in the national accounts of Australia” (*The Review of Income and Wealth*, December 1986, pp. 409–424). The 1993 SNA treats the issue in §§ 6.120–6.134.

Appendix. Broadening and flexibility of the system: satellite accounts and intermediate systems

Origin

"[. . .] to conceive of a system that, although keeping the rigour of the present one, would have a somehow different conception of coherence, would considerably develop flexibility and understanding. Such a process is based on several ideas. First idea: the present system is too elaborated, too abstract, to be a good instrument of statistical coordination and economic consultation, and, at the same time, a good scheme for economic analysis. The concepts and categories of national accounting are too distant from the everyday practices of enterprises and general government to make the links between them directly understandable by the interested public, even when completely mastered by national accountants. A solution could be to design a two-layer system of accounts. The first one, a framework for coordination and information presentation, would remain close to business accounting and public accounting, but would already represent a first elaboration. The second one, a framework for macroeconomic analysis, would correspond to the present system. Second idea: the present system, with its economic sectors and economic objects accounts, integrated or semi-integrated, cross-classified and balanced in rows and columns, is too rigid to take into account all the aspects of economic reality. Key topics such as housing, research, etc., are not or insufficiently covered. The functional analysis of public expenditure does it imperfectly. Transverse sections are required. One solution could be [. . .] to develop a system having several satellites around a central kernel, coherent with the system, but linked to it following flexible and various modalities. The implementation of these two ideas would probably lead to a slightly different construction of the central kernel of the second layer of the system. National particularities would largely determine the first layer and the satellites. Third idea, already in the air: the present system, as it is limited to monetarily quantifiable stocks and flows, is highly dependent on a narrow concept of accounting. Its enlargement to quantifiable domains without valuation is desirable and probably possible.

It is clear that the critical comments presented in this paper are applicable both to the statistical system and to the national accounting system itself. Actual progress in the latter depends on those of statistics, which in turn are guided by them. It seems desirable to search for new developments in national accounting, even if the implementation difficulties look enormous."

(Quoted and translated from pp. 183–184 of André Vanoli, "Le système actuel de comptabilité nationale et la planification" [The present system of national accounting and planning], *The Review of Income and Wealth*, June 1969, pp. 171–184; paper presented to the 1967 IARIW General Conference.)

This text introduces at the same time the idea of intermediate systems, as the first stage of the outlined system, and that of satellite accounts, which articulate around a central kernel, which is still not yet designated as the central system.

Regarding *intermediate systems*, the reader might refer to the text of the present chapter, pp. 168–169. It is useful to observe the relationship, but also the essential difference, between the above-mentioned first stage and the core system that was proposed in the mid-1980s by the new wave of the Dutch national accountants (see Box 29). The first stage here is not viewed as being itself a complete integrated system, but only as the intermediate stage of a more economic elaboration of basic data, which might be different according to the different types of economic units and their own accounting systems, and which would maintain, in principle, and when the availability of basic micro-data makes it feasible, an individual micro–meso conversion. Such a conversion to the macro level is generally not thought possible for every unit (with exceptions) because of adjustments such as for tax evasion, the revaluation of inventories or the estimate of the consumption of fixed capital instead of accounting or tax provisions for depreciation. To the extent that it is possible (for instance through conversion of accounting classifications), as the macro level has to respond to constraints of general coherence, it is then necessary to depart to some extent from the direct perception of economic transactors themselves.

Further elaboration of the notion of satellite account

"*b. Notion of a satellite account*. Thus, a satellite account is aimed at achieving two objectives which at the first glance seem contradictory: on the one hand, to reveal and develop elements which are included or admissible in the central system and which therefore impose constraints upon that system, and on the other hand, to permit approaches which include degrees of freedom *vis-à-vis* certain constraints of that same system, that is to say, include some elements which in their original form would not be admissible in the central system.

Let us try to illustrate the second point a little bit further by using the example of functional breakdowns. The functional classification of general government expenditure is designed to make it possible to apportion these expenditures according to function (education, health, etc.). One franc or one dollar should therefore be counted at one place and at no other. This is what gives rise to the well-known discussions on where to classify medical education (under education or health), military health services (health or defense), officer-training schools (defense or education), or research conducted at institutions of higher education (research or education). This is also why it is difficult to make an exhaustive display of an environment function or a tourism function, for example. The functional classification of the central system cannot satisfy all points of view at the same time. In satellite accounts, on the other hand, solutions which are redundant from one account to another, can be admitted. Where shall we list medical education? Under education in the education account, and under health in the health account. The military health service? Under health here and under defense there. [...]

Still considering matters from a functional viewpoint, the expenditures of enterprises, which are included in their production costs, could be shown in such a way as to make them similar to those of general government and of households that relate to the same functions [. . .]. Satellite accounts [. . .] can list labor medicine under health, internal training under education, etc. [. . .]

The required margin of freedom, illustrated in connection with functional breakdowns, can be extended further to other elements of the accounts. Thus, the concept of expanded consumption of the population (what is called "total consumption" by international organizations) is indeed part of the degrees of freedom available to a satellite account; but it includes an impact on the borderline between intermediate and final uses if one includes certain expenditures of enterprises, and thus it leads to a supplementary measure of GDP. The introduction of a notion of expanded investment also necessitates a supplementary degree of freedom, since, as it presents an alternative delimitation between current final uses and capital uses, it yields a supplementary measure of savings.

More generally, supplementary/alternative measurements of production, consumption, income, saving and investment [. . .] may, if they have not been adopted as part of the central system, be inserted into satellite accounts. For example, transfers may be subjected to more detailed analyses. Thus, non-market services provided free of charge by general government may be attributed to those actually using them; corresponding transfers may be recorded. More indirectly, the advantages or disadvantages resulting from tax legislation[1] have been the subject of studies leading to the notion of tax benefit. One may imagine similar studies on the differentiation of interest rates, some differentiation in prices, or also, but in a much more complex manner, certain externalities. The case of transfers clearly shows that it is possible in satellite accounts to say more about explicit transfers[2] defined and measured by the central system and, at the same time, to make the notion of transfer extend beyond these, in order to conceive and measure implicit transfers and insert them into expanded analyses of redistribution [. . .].

It will more often be possible to associate physical quantities with the more numerous groups of building blocks of a satellite account than with the groups of building blocks of the central system [. . .]. Satellite accounts are more mesoeconomic and can present some physical quantities which, although covering different qualities in each case, nevertheless relate to sufficiently homogeneous elements.

Thus we may think of data on employment (medical and health personnel, teachers, researchers, etc.), on equipment (hospitals and their beds, schools, data-processing equipment, etc.), on goods and services produced (marketed goods, but specifically services, notably non-market services, the analysis of which is still lagging far behind), on the recipients of income, notably transfers, and on the recipients/users of goods and services, specially non-market services [. . .].

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[1] Various exemptions and deductions, differentiation of tax rates, etc.

[2] In particular, to apportion them in accordance with various classifications of the recipients.

Thus, a satellite account contains both characteristics and data of the central system and characteristics and data relating to particular fields of statistics.

c. Central system, satellite accounts, specific information systems. In relation to the central system, a satellite account may be called semi-integrated. The elements of integration of the central system (classifications, evaluations, etc.) are found in satellite accounts for the most part[3], although in forms which may be different. Many supplementary elements also appear in them. Some of them are strictly compatible with the preceding ones, i.e. do not involve any contradiction with them[4]. Others, normally few of them, relate to alternative logics and actually involve some contradictions with the central system. But as these contradictions are controlled, constructed, such elements may nevertheless be considered compatible, although not in the strict sense of the term[5].

When considered in relation to the special field it covers, a satellite account also proceeds from the logic of the information system relative to that field. From this point of view, the satellite account is both structuring and structured. Let us consider each of these two aspects in turn.

A satellite account is an instrument for the structuring of the corresponding information system, essentially of the monetary part of the system and of certain aspects of physical data associated with it. This function results, *inter alia*, from everything that the satellite account borrows from the integrating elements of the central system and then develops. Considered from this point of view, the account is, in the most direct sense, "a satellite account of the national accounting system".

However, while it is thus simplified, the national accounting system would not provide all the elements enabling researchers to structure the information system of a particular field, even in the field of economy. Other elements proceed directly from the logic proper to that field. [...] I may [...] mention numerous notions of equivalence for specific uses: housing equivalent of a certain type, caloric equivalent of certain food-stuff, oil equivalent of energy balances, and so on. The case of energy is particularly rich, showing how a satellite account can have two synthetic tables: on the one hand, energy input–output table, such as those being developed by the European Economic Community, which is a development

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[3] This point would require a considerably more detailed discussion if one wished to say more concerning the various integrating elements and their various degrees of rigidity and flexibility. The coherence of the evaluations between the central system and the satellite accounts, in particular, deserves careful examination. This coherence is a necessary principle of the construction of satellite accounts. In practice, it would undoubtedly be difficult to ensure such coherence in every case and at every moment, when there is a large number of satellite accounts.

[4] This compatibility may be inherent in the nature of the arrangement, owing to the fact that no corresponding element exists in the central system (the case of classification of diseases or scientific disciplines).

[5] This sentence also would need to be studied much more thoroughly. The device of satellite accounts presupposes, in fact, at times the maintenance of strict coherence and at times the acceptance of degrees of freedom. The latter cannot be simply "taken" by specialists in the various fields. They should be the result of a joint analysis, of a collaboration between the generalist national accountants and these specialists. As one can readily imagine, the organization of such a process is not a simple matter.

or intensification of the general input–output table with more detailed activities and products with which balances in physical quantities may be associated; on the other hand, energy balances[6] which convert to a general physical equivalent what the input–output table expresses in monetary equivalent.

The combination of general structuring elements, which are derived from the central system, and specific structuring elements, which come from particular fields, makes it possible for the satellite account (or the satellite systems) to serve the function of organizing the information systems in those fields and thus to serve as framework for statistical co-ordination.

This general presentation can do no more than outline the problems involved in the relationships between the central system, the satellite accounts and systems and the specific information systems[7]. If we wished to go further, we would have to discuss in more detail, *inter alia*, the notion of the conceptual system of a field[8] and would have to have a larger amount of experience to draw on.

Without describing the experiments conducted thus far[9], I shall outline briefly several families of satellite accounts.

d. Families of satellite accounts. The first such family relates to accounts of economic activities. Many studies have been carried out in France over a long period, concerning agricultural, transport and trade accounts, even before the term "satellite accounts" came into use. Consequently, those accounts were not described as satellite accounts and were simply added to the general category of supplementary studies. They do, however, possess the characteristics of satellite accounts. They detail the central system and supplement it in various ways.

Thus, agricultural accounts include not only the accounts of the activity and of the agricultural sector of the central framework, but also accounts of the activity according to department (i.e. for about 100 administrative subdivisions) and an account of farmers' social protection. Accounts relating to trade contain, *inter alia*, data arranged according to type of commercial enterprises.

Transport accounts give essentially a detailed description of the transport activities which are described in a global manner in the central system, as well as supplementary data on manpower, the principal characteristics of infrastructure networks, some problems arising out of transport arrangements, and the like. If the available data and study papers permit, the satellite account could describe transport activities on own account, primarily the activities of enterprises and

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[6] The plural is used intentionally. It is possible to construct several balances from different points of view, and thus with different equivalence calculations.

[7] In order not to make this description too complicated, I have not mentioned the possible types of interference between intermediate systems and satellite accounts.

[8] The term "field" is deliberately used in a relatively vague sense; it covers both economic activities and functions.

[9] A short presentation of French studies and a bibliography will be found in the previously quoted paper by Maryvonne Lemaire and Jean-Louis Weber, "L'expérience française d'extension des comptes nationaux" [The French experience of broadening national accounting].

other producers, but also those of households. (These activities are not reflected in the central framework, except through some of the costs they entail.) It would thus be possible to go from accounts limited to transport considered as an activity or as a sector, to accounts corresponding to the transport function as a whole.

A conceptual framework has been devised for data processing. Plans for energy accounts are now being drawn up.

It will be observed that the preparation of a satellite account is especially useful in the case of activities which the central accounts do not illustrate globally at all. This is the case of data processing, mentioned above, or of tourism, for which experimental accounts were published in 1979.

Of particularly fundamental importance for certain countries would be the construction of accounts for essential economic activity or activities. The 1968 SNA outlines this in Chapter IX relating to the adaptation of the system to developing countries. The countries that naturally spring to mind are those whose exports consist mostly of a few products obtained by extraction or agriculture. For oil in particular, a table analyzing primary incomes, transfers depending on them and the uses to which they are put is especially useful. A few years ago, Ecuador outlined an account for oil[10].

A second family corresponds to what is most commonly meant by the expression "satellite account". I am referring to accounts set up from a more functional point of view: research, education, health, social protection, culture, housing, environment, to mention those that have been developed or proposed in France[11]. These accounts have a common methodological basis. For each function they distinguish an aggregate of national expenditure, which, it may be noted, cannot be easily exhibited in the central system[12]. This national expenditure[13] is analyzed from three points of view: that of activities and products, that of financing, and that of the recipients [...].

A third family of satellite accounts, less clearly defined, could relate to certain actions of the general government that are more limited than those exercised within the framework of the large collective functions mentioned above. Considerable pressure is being exerted in France today for the elaboration of an account on public support to the productive system.

A fourth family is probably constituted by a single system, the complementary system relating to the distribution of income, consumption and wealth. The course followed by the United Nations in elaborating this system corresponded implicitly

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[10] An attempt could, of course, be made to structure the central system of accounts in such a way that these essential economic activities will appear directly in all their aspects, but that is a different issue.

[11] OECD's so-called Frascati manual proposes the equivalent of a satellite account for research. Outlines for accounts covering health and education have been prepared in a number of countries. The Statistical Office of the European Communities has developed an account for social protection.

[12] This is so, *inter alia*, because the problem involves institutional sectors which, in the central system, are not covered by functional breakdowns.

[13] Since the fields covered by satellite accounts may overlap, certain precautions would, of course, have to be taken in the possible aggregation of the various national expenditures.

to the idea of satellite accounts: the introduction of supplementary concepts of income, transfer and consumption, as well as supplementary criteria (according to size, income bracket, economic category, etc.).

I shall not propose at this stage any real typology of satellite accounts. The families of accounts which I have mentioned – and among which there is some overlap – do not exhaust the range of possibilities, nor even that of the observed demand. There is an emerging and growing demand for studies that either seek to develop national accounts or endeavor to utilize their techniques.

The general idea of satellite accounts may in fact be applied, with some adaptation, to domains which are not unrelated to the central system of national accounts but have a different logical basis. One may think, for example, of an account on alcoholism or an account on highway accidents. In this application, cost–benefit balances would have a central place.

A particularly interesting experiment is being conducted on natural wealth accounts[14]. The zone of contact with enlarged national economic accounts is [...] very small in comparison to the potential extension of the accounts of natural wealth [...].

Unlike the central system, satellite accounts do not constitute a closed set. It is always possible to think of new ones. A satellite account/system of a particular field may be closed; one can, in fact, imagine that it structures the totality of the variables of that field. At the present stage however, owing to the still experimental nature of these accounts, they are conceived as frameworks for the organization of information, which are capable of evolution. A homogeneous family of satellite accounts could probably be thought of as a complete system of the accounts of this family. I am thinking in particular of accounts relating to major collective functions (health, education, culture, etc.). It is possible, in fact, to envisage a generalized functional analysis so as to cover all institutional sectors and all functions of economic and social life, from a standpoint close to that of needs. Most of the elements of the central system, when viewed from this standpoint, would take on an intermediate aspect. Some functions would themselves become intermediate in nature. Such a generalization, even supposing that it is really meaningful, certainly has not been developed thus far".

(Quoted and translated from pp. 180–186 of André Vanoli, "Sur la structure générale du SCN à partir de l'expérience du Système élargi de comptabilité nationale français" [The general structure of the system of national accounts on the basis of the experience from the French Enlarged National Accounting System], *The Review of Income and Wealth*, June 1986, pp. 155–199; paper presented to the IARIW 1985 General Conference.)

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[14] A succinct presentation of this may be found in the previously quoted paper by M. Lemaire and J.-L. Weber. See also the article by Jean-Louis Weber, "The French natural patrimony accounts" (*Statistical Journal of the United Nations*, ECE1, 1983, pp. 419–444). A study will be published in 1986.

PART III

Statistical Synthesis

Chapter 5

National Accounts as a Statistical Synthesis[1]

Contents

National accounting aims at providing a consistent and quantified representation of economic life. The preceding chapters have shown how its conceptual frameworks have evolved over time in order to provide an accounting system as adequate as possible for such representation. To this system corresponds, in an interactive process, a set of measurements.

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[1] The term "synthesis" is commonly used in the French national accounting practice and corresponds to what is called balancing, reconciliation, etc. We shall maintain this practice here.

In practice, (national) accountants cannot compile the accounts of the nation by recording each of the elementary economic transactions, as can business accountants in each enterprise, or as can public accountants for central or local government. National accounts compilers intervene only at a second level, frequently after several intermediate instances. They have to use quantitative information that has been recorded in the accounts of economic transactors or that comes from statistics of diverse origins. The accounting data themselves are usually collected, given the case, through statistical processes, directly or at a secondary stage, in which case they rely on administrative procedures and forms. And, of course, a great number of economic transactors, mainly households, with the exception some times of their production activities, do not have accounts at all. For them there are no elementary records. When accounts do exist, they never follow a unique set of norms and coherent accounting practices (see chapter 4).

The main task of national accounts compilers is then to transform a considerable amount of information, always with gaps of various, but never negligible, importance, into a set of meso- and macroeconomic estimates. The latter have to be conceptually and methodologically adequate, even though the basic data are not or only partially so. They have to be consistent and finally reliable, that is, they should lead to measures whose quality is considered sufficient for them to be significant.

Because of this triple requirement, such an ambitious endeavor, although on the road to undeniable success, will undoubtedly encounter enormous difficulties. To try to follow the evolution over time of the work that marks the path of the transformation of basic information into national accounts is totally out of question here. Books and papers describing sources and methods of compilation constitute the essential references that producers and users of national accounts should consult if needed. Such presentations, when available, are frequently partial or scattered, too general or, on the contrary, excessively detailed. The few hundreds of pages of the British *Sources and Methods* of 1956, 1968, and 1985 (the 1998 one refers to the transition to the 1995 ESA, and thus has a different character) constitute undoubtedly the best example of a well-equilibrated publication, aiming at an informed, but not specialist, audience.

This chapter will place its standpoint at a long distance to identify some main trends.

1. From scattered statistical data towards a system of economic statistics

1.1. Secondary use of available information as a starting point

Immediately after World War II, estimates of national income, and then the first works in national accounting, are still totally disconnected from the process of production of the economic information itself. They apply, far downstream, pre-existent information elaborated for other purposes. Besides, they are still of little use despite its growing role in some countries during the interwar period.

During the 1920s and 1930s, national income estimates, which had been compiled by curious-minded individuals in the previous centuries, are generally carried out by small groups of people (although Clark in the United Kingdom remains isolated), frequently working in research institutions. Focused on innovative developments, it is not their role to compile regular estimates, which very soon will appear to require important resources. A good number of them (Kuznets, Clark) plead that the relay be taken up by official bodies.

After World War II, it becomes evident that the implementation of the ambitious national accounting projects requested by all will not only require an outstanding development of economic data but also the programming of this process from the start, in order to achieve strong consistency of the information that will be produced. Until then, statistics, though very limited, have developed – given the case – field by field, or even more often instrument by instrument, without much concern for mutual consistency, even if some statistical procedures (population censuses, economic censuses, for instance, when they exist) periodically cover an extended domain of variables. With national accounting, and more generally the explosion of information needs, the burden of post-adjusting *a priori* inconsistent information cannot be left exclusively to users.

1.2. Acting in advance of the information production process

It is therefore necessary to act in advance of the production of information. To facilitate this, the statistical offices will be given the responsibility of the compilation of national accounts, although the first developments – as is frequently the case – take place somewhere else (in research institutes, planning bodies, central banks, finance ministries). Outstanding exceptions will persist. In Latin America, in the interwar period, central banks, viewed as more reliable organizations in a weak institutional surrounding, were given functions extending well beyond their traditional role, including the field of general economic information. Involved (except in Brazil) in the first developments of national accounting in those countries, a majority of them will keep this responsibility. For a shorter or longer period in Africa, planning organizations will be in charge. That is still the case today in Japan. The US solution, where national accounting is the responsibility of the Department of Commerce, is due to the lack of a central statistics agency in the USA.

1.3. Emergence of the concept of "system of economic statistics"

Permitting the national offices of statistics to take charge of the elaboration of national accounts gives them the opportunity to consolidate their social status, at par with the prestige that the discipline enjoys at the time. The idea of a system of economic statistics appears, as opposed to the simple juxtaposition of isolated statistics (the idea of a system of social statistics, which arises shortly after, and that of a system of environmental statistics somewhat later, will face more difficulties). And with it comes the idea of statistical coordination. In this context, national accounts become both an essential part of the statistical output and at the same time a cohesive instrument for economic statistics, which they tend to integrate within actual general syntheses. National accounting also plays an incentive role for statistical development, either directly through the investments required for its estimations, or indirectly by the big move towards quantification of economic life in which it extensively participates.

In the quarter century that follows the war, this role so predominates that some more conventional statisticians may be concerned that some aspects of the statistical activity will be neglected as a result, unless they "fill up the cells of national accounts". These concerns are not substantiated, because of the general character and wide scope of the resulting statistical progress. For instance, in the mid-1960s, France witnesses a massive development of surveys on household living conditions, which are included in the "priority investment program" of the (1966–1970) 5th plan.

1.4. A more ambitious, but isolated effort: the French experience in the linkage with microeconomic accounts

As mentioned in the preceding chapters, statisticians build national accounting systems following two main approaches which are very different in their principles. One is a method proceeding from top to bottom. It starts with the aggregates and the set of relations that links them and progressively disaggregates the global quantities. This is the more "Keynesian" way, notably followed by Anglo-Saxon countries, and which strongly dominates for a long time. Consistency is looked for at the macroeconomic level. The other method proceeds from bottom to top. Although macroeconomic relations are kept in the background, it conceives of the construction of the national accounting system as if it were to be compiled at the level of individual transactors, the remaining part of the system then resulting from successive aggregations, virtually at least. This is a more statistical accounting approach, less macroeconomic, more oriented towards the transformation of microeconomic observation into macroeconomic statement than the former one. It was mostly formulated and formalized in France and, later, in the Netherlands (see chapter 4).

In both cases, coordination and statistical integration are advocated, but the two attitudes tend to induce very different ways of conceiving national accounting. Besides the influence of one of the fathers of French national accounting (Vincent), the French marked peculiarity responds to the introduction of a Plan Comptable Général (PCG) [General Accounting Standard] immediately after the war (1947) – for businesses, but with a broader potential scope – developed under the leadership of the public authorities and which includes among its objectives the provision of general economic information. Thus, national account compilers and business statisticians will set up an actual experiment in the micro/macro linkage for businesses by referring to the PCG, in the revisions of which they will participate and try to influence. In this context their original views, excessively strict, aiming at substantial changes in the PCG, will grow more flexible. This will lead, with the introduction of an intermediate system for enterprises, to the recognition that a complete transformation of individual data, such that aggregates could be derived by addition–consolidation, is not completely possible partly for conceptual and partly for practical reasons (see chapter 4).

So firmly rooted in accounting is French national accounting that René Mercier, one of its founding fathers, is going to defend much later (1993), at the end of a professional career conducted elsewhere, a dissertation with the suggestive and revealing title of *Echanges et Patrimoines. Esquisse d'une théorie générale de la comptabilité* [Exchanges and Wealth, Outline of a General Theory of Accounting], published under the title *Une analyse des principes fondamentaux de la comptabilité d'entreprise* [An Analysis of the Fundamental Principles of Business Accounting] (Economica, 1996). In the fundamental visionary analysis that takes place in France during the war years, national accounting is not viewed as a specific accounting framework for macroeconomic analysis but rather as what would (or should?) constitute the general accounting standard of the nation, from which particular accounting standards would derive.

For many years, this French experiment remains isolated. In most countries, business accounting standardization has taken different directions, such as direct agreements among accounting professionals, and has adopted forms that have made its direct use by statisticians very difficult. They are directly functional, for the most part, without differentiation between general accounting, well adapted for overall economic information, and analytical accounting, more management oriented, and they accept a relatively broad range of alternative solutions. Decades later, when micro/macro linkage comes into fashion (see chapter 4), similar concerns will be shared by numerous countries and international organizations and, as happens frequently, problems will be rediscovered. Thus, the ardent Dutch national accountants will recommend, by the mid-1980s, the direct micro/macro linkage, before discovering by themselves – by the mid-1990s – the hardly unavoidable virtues of intermediate accounts (see the reference to an article by Alain Desrosières in the Annotated Bibliography of chapter 4).

Nevertheless, the question is then approached differently. The continental attempt in Europe, to sketch a kind of general accounting standard close to the French inspiration, by means of European accounting directives, but, it must be said, from the strict perspective of corporate law, does not finalize. Statisticians do not expect – do they try? – in advance to be able to influence the Anglo-Saxon accounting standards that become dominant. Therefore, in order to build complete accounts for corporations, they have to envisage the implementation of more complex transformation procedures (supported at the end by data-processing techniques) of individual accounting statements less adapted to their needs and less homogeneous than in the PCG perspective. French statisticians will, no doubt, face, very soon, a similar situation given the evolution in the accounting environment . . .

This is not yet the situation during the glorious 1930s, and the French statisticians are able to develop, thanks to this original micro/macro construct which goes beyond enterprises alone, a project of conceptual and methodological coordination for the system of economic statistics – the administrative data refer maximally to the PCG categories – much more ambitious than elsewhere. In other countries, statisticians aim at harmonizing censuses and surveys, an essential task indeed, without being able to influence the elementary accounting entries themselves.

1.5. Developing tools and frameworks for statistical integration

Most countries, with varying intensity, try to develop instruments of transversal nature in order to structure economic and social statistics, by setting up directories of statistical units – mostly of enterprises and/or establishments – and general purpose classifications. The former tend to solve the problems originating in multiple *ad hoc* survey files, lacking continuity, and in the few cases where they have an administrative character (France and Canada, mostly) to facilitate the access to administrative sources. The latter (mainly classifications of economic activities and products, connected in particular with the classifications of international trade, an older tradition) aim at making the observed phenomena compatible along some essential dimensions. In several countries, survey statisticians have started them right after the war, without waiting for national accounting to actually appear. National accounting gives to those initiatives decisive impetus by stressing interrelations and by its need for integrated statistics. Input–output tables, always significantly detailed and linked to a very large set of economic statistics, constitute the technical vector that guides this integration, notwithstanding the fact that in many countries their status vis-à-vis national accounting remains ambiguous for a long time, as they are set aside and believed to accomplish a different function.

In the statistical tradition, the economic censuses, which in some countries have a long history, conveyed also the idea of integrated observation, because they try to collect on each covered unit – with variants according to size classes and kinds of activity – a set of homogeneously defined data. However their periodicity, in the best cases quinquennial, and sometimes their irregularity, almost always their lack of continuity over time (in many countries each census is conceived as an operation, largely independent from others) tend to deprive them of their core function in structural statistics that they have played for many years (benchmark estimates for national accounts were generally made for a year when economic censuses data were available).

Box 30
System of economic statistics

Basic instruments and frameworks for integration	Statistical units directories	Economical and social classifications	Classifications and accounting frameworks		
			National accounting system	Other macroeconomic standards (Balance of payments, etc.)	Microeconomic accounting standards
Sources	Censuses	Statistical surveys	Procedures and administrative forms		Accounting data
Statistical products	Primary results (source by source)				Intermediate accounts
Syntheses	Microeconomic syntheses (combination of sources)		Meso- and macroeconomic syntheses (national accounts)		Indicators (indexes of production, prices, etc)

There has been a progressive move towards the conception of a system of economic statistics, the content of which is briefly recalled in Box 30 (collection, processing and data dissemination techniques are not shown). The concern for potential consistency of measures is fundamental at this point, even though actual consistency is not necessarily verified (for different reasons, such as for instance the diversity in the collecting information channels). In this context, economic censuses are often replaced by regular structural statistical surveys (as opposed to short-term ones), implemented mostly on a yearly basis, and associated with other statistical, accounting, and administrative sources.

From the start of the process, this is possible (upper part of the box) by using transversally official economic and social classifications, directories of statistical units and – things become somewhat more complicated here – homogeneous sets of concepts and definitions in the whole statistical system. The status of the latter is less clear. It may consist of direct references to the system of national accounts, or if they exist, to normalized microeconomic accounting standards, and also to sets of definitions that practitioners elaborate when preparing main statistical operations (censuses, if they exist, or large structural surveys), to which they tend to refer afterwards. In this last scenario, consistency and continuity may be, even in principle, only imperfectly assured. As a consequence, the links with national accounting on one side, and with microeconomic accounting on the other, are less clear.

Many economic statisticians will probably be surprised to see, at the turn of the century, that the system of national accounting appears in the upper part in the scheme of Box 30 and not in the lower part as a user of statistical products. However, as soon as one refers to a system of economic statistics or of business statistics, one is already adopting a perspective of consistency and interrelations originally designed by national accounting. To exaggerate somewhat, one is already practicing national accounting without being conscious of it, the same as Mr Jourdain speaking in prose. [This refers to a well-known play by Molière “Le bourgeois gentilhomme”, in which the ‘gentleman’, Mr. Jourdain, is informed by the charlatan teacher that he was speaking in prose without being conscious of it.]

1.6. Statistical coordination at the international level

The effort of coordination, originally to be found in the national sphere, has become international, in particular since the 1968 SNA and the 1970 ESA (and also, at the time, the MPS) provide more complete, more detailed and better inter-connected national accounting schemes. The "frameworks for statistical integration" (systems of national accounts and principal classifications, as directories remain strictly a national issue at the time) constitute in this period, and under this name, the center of discussions within the United Nations Statistical Commission. In contrast, financial statistics in a broad sense (balance of payments, government finance statistics, banking statistics) experiment with their own standardization process. Particularities of central banks and ministries of finance, which consider themselves outside the general systems of statistics coordinated by national statistical offices, are reflected in the elaboration by the IMF of manuals of recommendations in the three above-mentioned fields, where, at that stage, consistency with those of the national accounting systems is not a major concern.

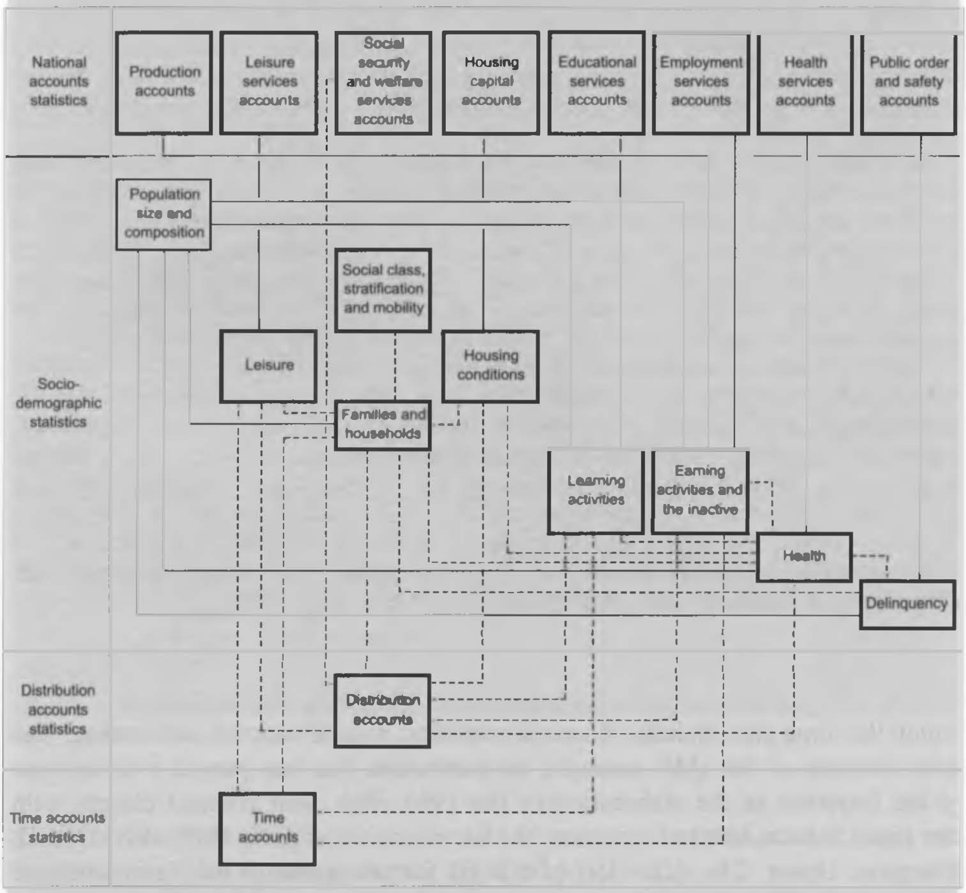
The efficiency of national accounting in providing at the same time a set of synthetic results and links among the different parts of the economic statistics system is so much appreciated that, at the end of the 1960s and beginning of the 1970s, there is an attempt by Stone to try to obtain similar benefits in the field of demographic and social statistics (See Box 31).

While Stone's initiative concerning the System of Demographic and Social Statistics is discussed at the UN, the European Economic Community consolidates the structuring of its economic statistics around the new 1970 ESA, common classifications, and coordinated or integrated surveys. This marks a turning point that will be more completely understood in the last two decades of the century. The driving role in the search for a consistent representation of the economy tends in fact to carry over to the international level, which is where the interaction, the design of solutions and the search for consensus take place. National developments will have, more and more and from the beginning, multinational purposes, because in the framework of what will become the European Union, statistical standards will tend to become compulsory. Increasingly, innovative national ideas will only enter the practice of their initiators on a long-term basis if they have been able to convince their partners during an interactive process. However, as the European countries also belong to larger groupings (OECD, IMF, UN) the interactive process and the search for consensus is bound to have wider targets than Europe alone.

The European integration, the enlargement of the Union, its consolidation as a monetary and economic Union, its extended influence on its borderlands after the USSR break-up, and in other respects the economic globalization and the intensification of interdependencies that it brings about, will thus become, from the mid-1980s, the essential forces for the coordination of economic statistics,

Box 31
Richard Stone's attempt to design a system of demographic and social statistics

In 1970, Stone proposes an impressive inter-connected set of socio-demographic matrices, both in flows and in stocks, of tables, accounts for non-market activities, use of time models, etc. For each field (health, justice, education, income distribution, active or passive demographic sequence, etc. – all social life and its linkage to the economy are covered), types of data, classifications and derived social indicators are presented. The title of the final report published by the UN in 1976, *Towards a System of Social and Demographic Statistics*, shows how ambitious the project was, though it reflects – in the use of "towards" – questions and doubts that arose. The outline below (taken from *op. cit.*, Diagram 3.1, p. 21) sketches the structure of such a system. The upper part (data from economic accounts) includes at the same time components of the central framework and elements specific to satellite accounts in these fields (see the appendix of chapter 4).


National accounts statistics
Production accounts
Leisure services accounts
Social security and welfare services accounts
Housing capital accounts
Educational services accounts
Employment services accounts
Health services accounts
Public order and safety accounts
Population size and composition
Social class, stratification and mobility
Leisure
Housing conditions
Socio-demographic statistics
Families and households
Learning activities
Earning activities and the inactive
Health
Delinquency
Distribution accounts statistics
Distribution accounts
Time accounts statistics
Time accounts

Outline of a system of social and demographic statistics.

The rather generalized opposition of social statisticians to this idea of strong inter-field coordination can be explained at the same time as the reaction of the besieged to what was felt as an imperialist attempt from national accountants, fears of risks of rigidity and reluctance

cont'd

Box 31 (cont'd)

in principle, derived from a different statistical culture. Regarding national accountants, although they understand the idea of extending the techniques of statistical integration inspired by national accounting experience beyond the field of economic analysis, they have strong reservations on the possible extension of the analogy between the National Accounts System and the Social and Demographic Statistics System. In the whole social field, there is nothing similar to exchange values and to money as a general equivalent. The "individual" as a unit has nothing to do with the monetary unit.

Very few countries will start national experiments on the subject, and the 1976 attempt will not be successful. *Towards a SSDS* will thus remain without sequence. No doubt a more limited, more progressive, approach, which would not tackle the whole idea of a SDSS at one time, could have made some progress possible in a field where more consistency and interrelationships among statistics would have been beneficial. In any case, very shortly after, analysts' attention will focus on the use of individual databases for persons and households, which will be viewed as more promising.

Stone's great integrationist vision within the footprints of National Accounting (the title of his 1970 first draft report is "An integrated system of demographic, manpower and social statistics and its links with the system of national economic accounts"), is not implemented, in spite of the outstanding character of his essay.

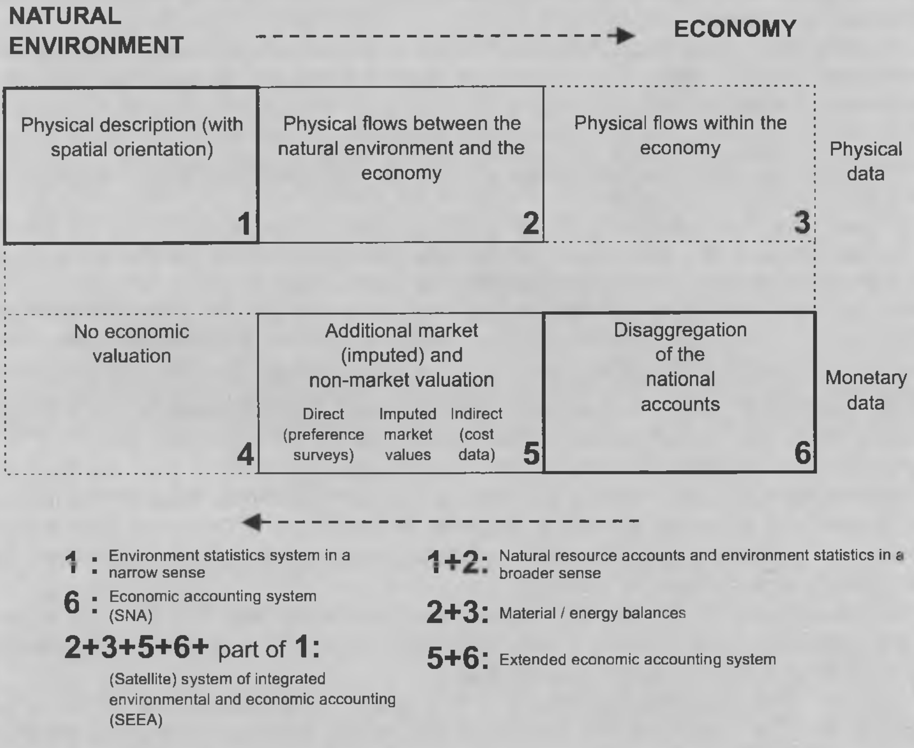
Stone tried in fact to organize something like a system of systems (in the 1976 publication, § 1.14, he alludes to the links between the SSDS and a system of environmental statistics being prepared by the UN), characterized by the basic idea of link, of interrelationship (§ 1.4), rather than that of integration, a national accounting characteristic. This implies different forms of relationship among the elements of the system that compatible concepts, definitions and nomenclatures should permit, sometimes with integrations (for example, between the demographic flows and stocks), but without a general integration, such as that assured by monetary values for economic phenomena.

Later, Dutch national accountants reinitiate an analogous research, with the 1986 van Bochove and van Tuinen proposal (see chapter 4). Then, later on, starting from 1994–1995, Keuning systematizes his own approach, as he promotes the idea of developing a System of Economic and Social Accounting Matrices and Extensions (SESAME) based on SAMs, that he presents as an extended system of national accounting. The main interest of such initiatives is that they refer to the interrelations among the different parts of a statistical system and its structuring, a necessary approach that remains very promising. In contrast, the possible actual construction of a meso-economic presentation framework covering an ample set of statistics that have been made consistent or compatible, is more problematic.

which this time also includes financial statistics, around national accounting. The new versions of the IMF manuals, an institution that has played a direct role in the forefront of the elaboration of the 1993 SNA, will connect closely with the latter, which became common for all institutions: UN, IMF, WB, OECD, European Union. The definition of criteria for accession to the Economic and Monetary Union, regarding government finance (debt and deficit) based on ESA (see the appendix of chapter 10), shows the interest that represents the *a priori* availability of harmonized sets of statistics around a central pole. These uses had not been foreseen when the meetings of the national accounts group of the SOEC (later called Eurostat) started at the beginning of the 1960s. A wonderful illustration of Gruson's idea that statistical development is a long-term investment

Box 32
Statistical system and environment

The following diagram has been taken from *Integrated Environmental and Economic Accounting* (United Nations, 1993, Figure 1, p. 21). It shows that, here also, there is an intent for integrating environmental statistics and national accounting. However, the main objective is different from that of the SSDS project (see Box 31). In this case, a real extension of the economic monetary accounting is expected (cell 5) to obtain alternative aggregates, adjusted for the environment (cells 5+6). With Stone's SSDS project, national accountants had been suspected of imperialist motivation regarding social statistics. With the project of integrated environmental and economic accounting, they are the ones who have to resist external pressure. They are then blamed for resisting an extension desired from several sides (see chapter 7 and in particular chapter 8, as well as Box 64).


NATURAL ENVIRONMENT
ECONOMY
Physical description (with spatial orientation) 1
Physical flows between the natural environment and the economy 2
Physical flows within the economy 3
Physical data
No economic valuation 4
Additional market (imputed) and non-market valuation
Direct (preference surveys)
Imputed market values
Indirect (cost data) 5
Disaggregation of the national accounts 6
Monetary data
1 : Environment statistics system in a narrow sense
6 : Economic accounting system (SNA)
2+3+5+6+ part of 1: (Satellite) system of integrated environmental and economic accounting (SEEA)
1+2: Natural resource accounts and environment statistics in a broader sense
2+3: Material / energy balances
5+6: Extended economic accounting system

Data sources for integrated environmental and economic accounting.

(see, for example, *Origine et espoirs de la planification française* [Origin and Hopes of French Planning], Dunod, 1968, p. 357).

Summarizing, in the course of half a century, an intensive effort of national and international harmonization has led to the consolidation of the concept of a statistical system, with various rates of integration and with several forms of inter-connection. It tends also to be used in the environmental field, as shown in Box 32. More modestly, in specific domains, satellite account development extends the scope of statistical syntheses (see Box 33).

Box 33
Satellite accounts and extension of statistical syntheses

This chapter is dedicated to central national accounting, viewed as a statistical synthesis in the framework of a completely integrated system covering the entire economy. Satellite accounts (or analogous developments under various labels, such as modules, etc.) aim at providing a synthesis in the particular field under study, a more limited field but covering additional dimensions, both monetary and non-monetary. Regarding monetary variables, the objective may be focusing on elements that are included, though not apparent, in the stocks and flows of the central framework (that is the case in particular for tourism accounts or for expenditures for environmental protection). Or it can be measuring other phenomena, as in the case of transportation, transport services on own account or of the nuisances generated by transportation, in particular pollution. Non-monetary variables, absent as such from the central accounts, are by nature specific to each and every one of the satellite accounts.

The presentation of a housing account may indicate the requirements deriving from the objective of building "a tool for analyzing the economic environment of housing" in relation with the central national accounting:

> "Several requirements derive from this purpose:
> - Exhaustiveness: the intention is to describe both flows and stocks, physical and financial, concerning the field of housing;
> - Internal consistency among the data that have been compiled;
> - Consistency with the central framework of national accounts in order to make possible the comparison between the aggregates of the account and those of national accounts."
>
> *"Comptes du Logement, Edition 2000" [Housing Accounts, 2000 Edition]*
> *(Synthèses, INSEE, No. 44–45, September 2000, p. 85).*

It is possible to replace "housing" by tourism, health, education, etc.)

The statement of the first two requirements clearly shows two characteristics that a satellite account shares with central national accounting, but that do not necessarily imply *per se* a consistency with the latter. The purpose of the third requirement is both to obtain the maximum benefit from the application of national accounting techniques to a particular domain and to increase the interest for the analysis in that specific domain by the possibilities of linkages of different types (although in the above quotation they refer specifically to aggregates), with central accounts and through them with other satellite accounts.

Satellite accounts are therefore tools for statistical coordination both from the point of view of the statisticians of each specific domain under study and from that of central statisticians, in particular those that are in charge of coordination.

As a result there are specific requirements for the conception of satellite accounts and their actual quantification. The conception of a satellite account requires collaboration between specialists in a given field – who *a priori* are not necessarily trained in national accounting or more generally in statistical integration tools – and generalists having in particular a good knowledge of national accounting but not of the specific fields under study. The quality of the conceptual and methodological framework of a satellite account depends to a great extent on those collaborations and the quality of the participants. The very idea of an account satellite to national accounting implies, from this perspective, an utmost strictness in the use of the potential margins of freedom between the central system and the satellite accounts, to avoid the risk of obtaining badly conceived instruments.

The linkages between data of the central system and those of satellite accounts, as they exist at a given date, unavoidably call for subtler answers. Because of practical reasons (times of availability of information, time-schedule constraints for the dissemination of results, difficulties in jointly managing various large statistical syntheses) and institutional ones (diversity of teams needing to

cont'd

Box 33 (cont'd)

collaborate outside a hierarchical dependency framework) it is not always possible to achieve a complete numerical consistency.

In practice, economists and statisticians involved in such an endeavor should choose:

a. results for which numerical consistency is always required: that could be the case for many data concerning social protection, or GFCF in housing;
b. results for which the consistency is only required for specific versions of the accounts, in particular final ones; this allows taking into consideration differences in schedule constraints of statisticians;
c. results for which the consistency will only be possibly required when general revisions of central accounts take place (frequently called benchmark changes); this takes into consideration the need for a satellite account to be closer to the evolution of information and of the methods of analysis in the given field, a context that is familiar to users in that domain;
d. results for which the consistency is not considered as requiring verification.

These questions are the more relevant as a country develops more satellite accounts. No general list seems to exist. From a national point of view, France is the country that has created the largest number of satellite accounts: transportation, housing, tourism, research, environmental protection expenditures, health, education, social protection, audio-visual, defense. Besides, accounts developed for certain activities (agriculture, trade, other market services) may have elements of a satellite type. From an international point of view, several fields have progressively seen the materialization of joint efforts: social protection (European Union), environmental protection (European Union, later extended), tourism (OECD, World Tourism Organization in progress at the end of the 20th century). OECD has promoted health accounts in the 1970s; several countries started up or set them up (mainly Norway and Canada). Norway regularly elaborates tourism accounts (annually at the end of the 20th century). OECD has also promoted the development of statistics on research (Frascati manual) in a form close to the idea of a satellite account long before the term had been coined.

2. The quest for consistency

2.1. Wide geographical extension, though with unequal coverage of the system

Half a century after the great blossoming of national accounting, almost all countries have parts of national accounts but few of them regularly compile complete accounts. Probably less than ten, including the USA, France, Japan, United Kingdom, Canada and Australia, also cover yearly balance sheets, which are more recently integrated to the system. Successive versions of the SNA and the ESA, boosted by the more advanced countries, become for other countries challenges difficult to live up to. The unequal coverage of the system remains a strong characteristic. Lack of data, lack of qualified people, weak demand and administrative support, wrong orientations combined in one way or another explain delays that do not exclusively concern developing countries.

At the beginning, before and shortly after World War II, national motivations themselves explain the blossoming of national accounts where it occurs. In Europe, pressure from the Marshall Plan Administration also plays a role. Before independence, the colonial powers launch operations in Africa and Asia. International technical cooperation follows on a broader geographical scale. The OECD, the IMF, the WB and the CMEA require information. The European Communities of Six starts setting up a program and developing originally incomplete and non-compulsory instruments that progressively tend to constitute – for members and candidates, but the sphere of influence is larger – a genuine Communities statistical device. At the end of the 20th century, the outcome for national accounts is a large compulsory transmission program of data, according to the 1995 ESA (Eurostat 1997), which covers all its aspects. The European integration is the driving force not only for conceptual harmonization but also for the actual generalized implementation of common standards.

It is in fact a coordinated movement, with varying degrees, for the OECD countries, non-members of the European Union. For the rest of the world, since the United Nations statistical offices had already been weakened for a long time and had lost their influence, the IMF tends to make the system of international standards *de facto* compulsory and negotiates/imposes the transmission of data according to its rule. Independently and for a long time, the World Bank missions collect from most of the developing countries the results provided by statistical offices and central banks, and subject them, when required, to some supplementary treatments (see the yearly publications *World Bank Atlas* and *World Development Indicators*). It is thus necessary to correct a retrospective glance, which gives a feeling of slowness and disparity in the development of national accounts, into a dynamic perspective, even though transition is difficult and turbulent for many of the central and eastern European countries and for the ex-Soviet countries. On the other hand, the fate of most African countries remains fundamentally uncertain.

2.2. Synthesizing and balancing

Searching for consistency is a fundamental concern in the compilation of national accounts. This concern is new compared with traditional estimates of national income that looked for one or several methods, possibly combined but geared towards the estimation of a unique aggregate, national income. Critical analysis of data developed within that framework. This tradition is strongly reflected in Studenski's book (see Box 34).

In spite of the general, though imperfect trend towards the harmonization of economic statistics, these statistics do not provide to national accountants, in practice, spontaneously consistent data, even after later correcting the conceptual differences that were not eliminated earlier. Neither are they spontaneously exhaustive. A critical review and a comparison of data are essential. They lead to various rectifications, complements and adjustments in order that estimates provided by one source, or by a group of them, give more appropriate measures of the observed phenomena. However, within sources or groups of sources, these measures do not completely converge. Differences of varying importance persist.

Box 34

Methods of national income estimates according to Studenski's book *The Income of Nations* (1958)

Studenski's book, which covers a very long period of time, analyses the main methods used and their evolution until the mid-1950s. The book, conceived and written beginning in the mid-1930s, clearly reflects the state of the art associated with the estimates of national income, and reflects a debate between Kuznets on one side and Gilbert and his staff on the other, on the relationships between the national-income approach and the national-accounting (social-accounting) approach. Although Studenski notes (p. 213) that "the spread of the social accounting approach during the decade following World War II has been truly phenomenal", he believes (p. 214) that "it is probably still much too early to define the exact nature and extent of the contribution it is likely to make to national income analysis." (On social accounts, see pp. 209–214 of his book.)

This point of view of Studenski, already a narrow one when the book appeared, leads to the fact that he says nothing about the building of (institutional) sector accounts. The fifty large-format pages he dedicates to the methods of estimation of national income focus on the presentation and analysis of each of the three historically identified methods: the net output by activity method (that is still the terminology used for value added), the income-distributed method by type of income, and the expenditure or final products method, by large categories of final expenditure. The purpose is to analyze the same quantity following three statistical approaches and not to measure three phenomena leading *in fine* to an identical total value in a closed economy.

A section of Chapter 17 is dedicated to a general evaluation of the degree of accuracy of each of those methods (see in particular pp. 256–258). The net-output (value-added) method that will tend to become dominant during the remainder of the century is then considered less reliable than the income-distributed method (Studenski indicates that for the Netherlands, in the period 1921–1938, results obtained were considerably lower than with the income-distributed method). It is only considered useful as a second choice, or when there is nothing else to make use of, such as in the case of developing countries. The income-distributed method is less reliable in the income-received variant (under-reporting) than in the income-paid-out variant. From the three methods the income-disposed on final products one (with three variants: commodity flow, final sales or family budget surveys) is considered as the least satisfactory.

Studenski does not consider a truly integrated approach. He is interested (pp. 251ff) in how the different methods are combined, following the purposes of the measurements, but not in setting them up systematically in a joint manner. The author reflects the dominant view at the time that "the input–output approach is not necessarily connected with national income data [. . .]; it represents to a large extent an independent analysis of the operations of the national economy" (p. 216). Although he has indicated (p. 215) that Norway and Denmark ". . . accorded a prominent place" to it in recent national income estimates, he does not refer to it as a possible instrument of statistical reconciliation. The idea of integrated analysis, for both estimates of national income and the nascent national accounting, is then largely absent.

The issue of arbitrating between inconsistent estimates of the same economic magnitude has appeared of crucial importance. Is it necessary to pursue it until the end in such a way as to provide users with a series of estimates at the same time unique for each magnitude and totally consistent among them? Or should one completely give up balancing to avoid the risk of being arbitrary, and let the differences subsist?

National accounts compilers will provide different answers depending on the part of the accounts involved. On goods and services and estimates of GDP, they will have differing views.

2.3. Goods and services and GDP

2.3.1. To balance or not to balance supposedly independent estimates?

Since, in practice, GDP (or GNP) has replaced national income as main reference aggregate, it is the focus of discussion. As it had been defined according to three different approaches (production, income, expenditure), it was expected to be measured in a completely independent way following any two or all of these approaches. From a tradition of having a single estimate resulting from one or several methods combined (see Box 34), the idea arises of three measurements somehow put side by side and corresponding each to one of the methods inherited from tradition. It is easy to see the relation between this idea and the conception of national accounting, in a very macroeconomic way as a set of interrelations among the aggregates.

Given these stated divergences, choices will mostly depend on the type of sources used and the level of detail at which the balance of transactions on goods and services is established. When this balance is only global, balancing at an aggregated level leads to "forced" consistency if nothing permits one to recognize the radical qualitative superiority of one approach over the other. On the contrary, balancing at a detailed level, within a SUT or IOT framework, allows one to make use of all available information without any pre-established preference, and to decide case by case between the output data and expenditure data. Those that follow this way are in general distrustful of the quality of their sources of information on income, because of tax evasion for instance. On the other hand, in other countries there is more confidence in these sources that have provided them for a long time with the main database for their measurement of national income.

Statistically developed countries that do not take the option of the SUT will put several GDP estimates side by side and show a statistical discrepancy (United Kingdom – see Box 35 – USA, Canada, Australia, etc.). Usually, only two approaches are used (income and expenditure). Next, because many users need to refer to a single official estimate, either one of the two measures is retained (expenditure in the USA and the discrepancy is shown on the income side, income in Australia and the discrepancy appears in the expenditure side), or an average is calculated (between expenditure and income in Canada, between the three estimates of expenditure–income–production in the United Kingdom so as to calculate quarterly rates of growth, although, for some time, production received a double weight in the middle of the period).

Statistically weak countries, where direct information on income is viewed as insufficient or unreliable, will estimate, to the best of their knowledge, value added by industry and the main items of expenditure, without presenting them as independent estimates leading to two measures of GDP. In fact, very often, household consumption is globally calculated as a residual.

Very soon in the immediate after-war period, other statistically developed countries, such as Norway, Denmark and the Netherlands, choose the integrated

Box 35
Presentation of a statistical discrepancy in the United Kingdom

The methodological book published in 1956, *National Income Statistics. Sources and Methods*, indicates the reasons for this practice introduced since 1953 (p. 33): "These problems of internal consistency between different types of records have an important bearing on the reconciliation between the largely independent estimates of aggregate income and aggregate expenditure. It is, of course, always possible to manipulate the least reliable estimates so that complete reconciliation of the totals is achieved; until 1953 this was always done. In view of the development of the statistical sources, it is now felt, however, that it is no longer reasonable to presume that the whole discrepancy is more likely to be due to one item than to another. The error may arise, for example, not from incompleteness or inaccuracies in basic data, but from an undetectable lack of simultaneity in timing, which there is no reason to attribute to any one particular component. Hence the residual discrepancy between the income and expenditure estimates is now shown as 'residual error'. It is presented as though it were an unknown item (positive or negative) of income. This is purely for convenience of presentation, and does not imply that the estimates of expenditure are regarded as superior in accuracy to the estimates of income".

The 1968 publication, *National Accounts Statistics. Sources and Methods*, presents the same text (p. 39) with a refinement: "An adjustment is still made when there is a reason to attribute a discrepancy to a particular item but no attempt is made to allocate all the discrepancy . . .". The 1985 book (same title) only adds, "when there is a good reason" (p. 20).

estimate of GDP method using annual IOT. France also makes the same choice very soon, at the moment where her own statistics are taking off. This choice is guided both by the design of French national accounting, which is not centered on the aggregates, and by the nature of the available data (detailed production statistics inherited from the period of the organization of the Vichy's committees; data on incomes were heavily distorted because of tax evasion). This group of countries are also developing in parallel indicative planning, while the aforementioned Anglo-Saxon countries, once freed from the war economy, return soon to a more liberal orientation (see also chapter 10).

These two principal options (plurality of non-integrated estimates of GDP or single integrated estimate) do not oppose virtuous statisticians, who honestly confess the limits of their knowledge by explicitly showing statistical discrepancies (and they often prided themselves on it), to less scrupulous ones, who would not hesitate to evade the issue by giving the impression of a more complete mastering than the one they really have. Reciprocally, it is not possible to conclude from the lack of statistical discrepancies in the latter that the quality of their accounts is almost perfect and in any case better than those of the former. In any case, the statistical discrepancy between two independent measures of an aggregate does not constitute an estimate of the degree of approximation of its measurement. The true value may well be outside the interval between those results.

2.3.2. Not completely independent estimates

Furthermore and increasingly as time passes by, it becomes clear that it is very difficult for multiple estimates to be really independent. There is the tendency to balance them to a lesser or greater degree or, by lack of completeness in each of the set of observations, to partially combine them. Thus many countries try, before the development of statistics on services, to use the tax data on income for some categories of businesses in order to measure output. Or, due to the lack of direct information on farmers' income, it is generally the balance of their production account that is used for income. Or even household consumption, an essential item on the expenditure side, is obtained in some cases from summary balances between supply and use for certain products, which are indirectly derived from estimates of production and foreign trade and not from observation of the expenditure itself. GFCF is often measured that way. The old partial method of commodity flows appears again.

For benchmark years, when national accounts are systematically revised, countries using non-integrated current estimates often compile also a very detailed and completely balanced SUT. As anywhere else, a final phase of automatic adjustments of residuals follows the detailed work of reconciliation and balancing. Income estimates, whose information has been taken into account during the elaboration of the SUT, are made completely consistent with that SUT. The discrepancies in current years, among the different estimates of GDP, appear then only as a last resort, resulting from the complexity of the compilation process of annual SUTs.

Statisticians increasingly question the relevance of these last resort solutions. Somehow the greater initial trust, to be observed here and there, on income data tends to crumble, as doubts affect them and other statistics develop. Experience also shows that surveys on household consumption, whatever the abundance of data they provide or their interest, incorrectly measure the global change and the absolute level of this consumption. Even after adjustments to make their scope compatible with that of national accounts, it has to be recognized that they under-estimate significantly, and in some cases considerably, the total value of consumption estimated through general reconciliation of all available data (see Box 36). Transformations in the way of life also tend to increase this gap: decentralization of spending among members of the households, *via* pocket money in particular, increases in the share of out-of-home consumption, etc.

The statistical discrepancy may reach such a scale that it becomes doubtful to reasonably estimate the change in GDP by averaging the results that have been obtained. The United Kingdom experiences this in the 1972 accounts because of the observed discrepancies between the various measures in constant prices (see: "Measurement of GDP in 1972", *Economic Trends*, No. 234, April 1973). It is, in fact, in the estimates of changes in volume that the independence of the approaches is possibly complete. That is the case in the United Kingdom. The 1972 series of quarterly accounts shows unusual discrepancies between the growth of GDP measured from the production side (+3.3% as compared to 1971) and the same growth measured from the expenditure side (+1.4%). Year-to-year, the discrepancy between the two measurements is +1.9%, when it was only

Box 36

Gaps in the measurement of total household consumption between household surveys and national accounts

In an article (Atsushi Maki and Shigeru Nishiyama, “Consistency between macro- and micro-data sets in the Japanese household sector”, *The Review of Income and Wealth*, July 1993, p. 195–207) two Japanese scholars compare estimates for Japan derived from these two sources. The methodology they use consists in excluding from national accounts results the data which are, broadly speaking, imputations of elements that do not appear in family budgets surveys (mostly rent for owner-occupied dwellings, reimbursements of health care expenses, insurance services) and in comparing the rest with the totals derived from the surveys.

The authors conclude that the latter represent only about 80% of consumption calculated in the national accounts on the basis of available data on products. In the five-year period that they cover (1984 to 1988), the coverage ratio declines steadily (from 83.5% in 1984 to 78% in 1988).

From different sources, including some ongoing work, they derive elements for international comparison (just for the sake of approximation). According to this paper (p. 206), in the 1980s, the corresponding coverage ratio would be 75% in the USA, 87% in Canada, 80% in Australia, 87% in Finland, 85% in Sweden and 92% in the United Kingdom (this last ratio seems exceptionally high).

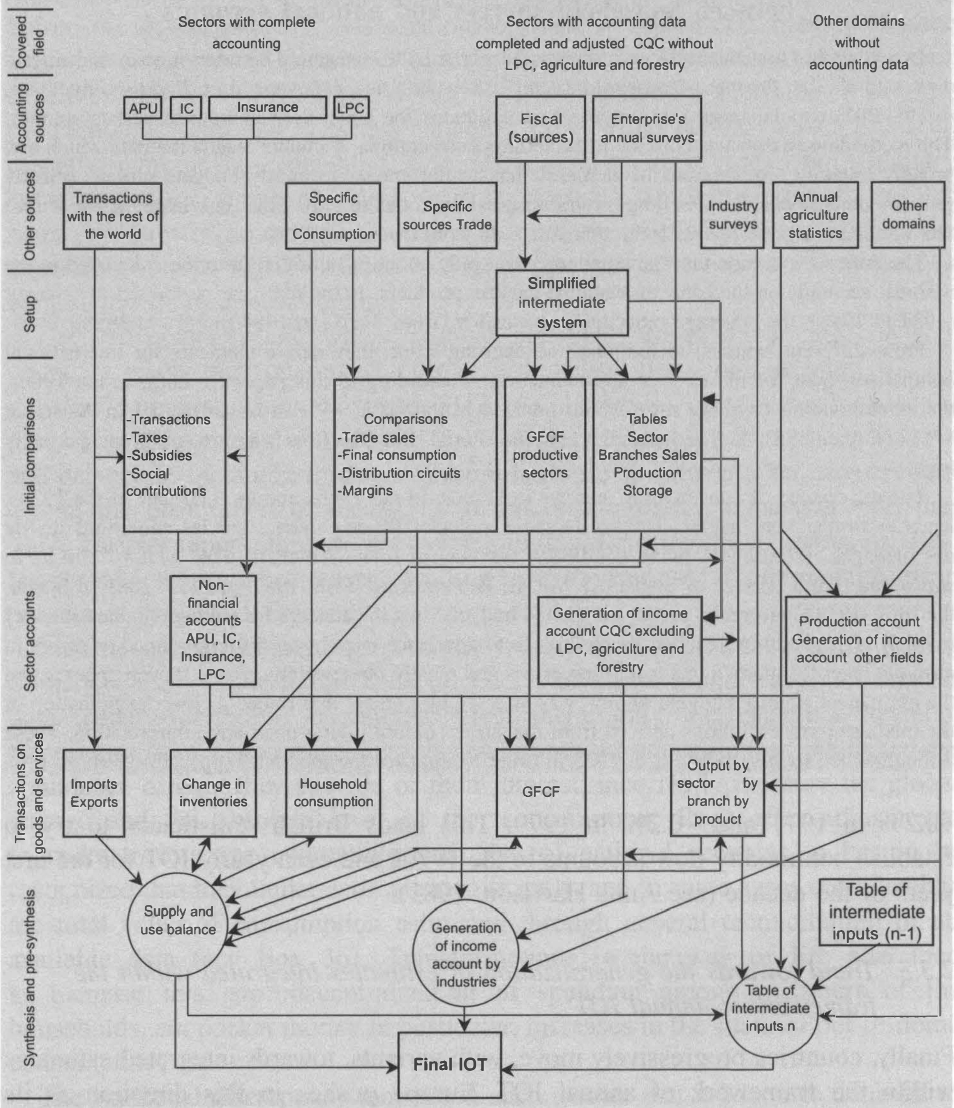
The experience of consumption surveys in France, in the 1960s and the first half of the 1970s, leads to similar conclusions. Jacques Desabie indicates (“Les enquêtes sur les conditions de vie des ménages” [Household living conditions surveys] in Joëlle Affichard, *Pour une histoire de la statistique* [For a History of Statistics], Vol. II, Economica/INSEE, 1987, pp. 253–286) “It is with the 1963–1964 Community survey on ‘family budgets’ that the concern for getting reliable estimates by item of expenditure reached its climax. But experience has shown the importance of errors in absolute level for many items (sampling errors and mostly observation errors). It even appears that the permanent ‘family budgets survey’ was affected by a ‘bias’ that forced a closer examination of the medium-term evolutions derived from the survey before giving them any interpretation. These difficulties led to suspending it in 1975 in order to improve the methods” (pp. 258–259).

+0.2% in 1971 and –0.2% in 1970. This leads British statisticians to try to establish commodity flow accounts in the 1970s and even yearly IOT for the first years of the decade (see Anne Harrison, 1983).

2.3.3. Trend towards the generalization of estimates integrated within the framework of annual IOT

Finally, countries progressively move, with variants, towards integrated estimates within the framework of annual IOT. Europe pushes in this direction as its compulsory transmission program of data according to the 1995 ESA includes annual IOT (this had already been Eurostat’s orientation for many years but it is true that there were time lags that did not always guarantee their complete integration). The United Kingdom (its experience in the 1970s had been interrupted following a reduction of resources) and Australia have introduced in the mid-1990s annual IOTs which for the covered years eliminate statistical discrepancies by a balancing process. In Canada, on the contrary, annual IOTs have been compiled for a longer time – at first only at current prices, later also at constant prices (1979) – although with a time lag. They are integrated with the annual accounts for GDP estimated from the production side. Differences

Box 37
Diagram of a synthesis with an annual input–output table


Covered field
Accounting sources
Other sources
Setup
Initial comparisons
Sector accounts
Transactions on goods and services
Synthesis and pre-synthesis
Sectors with complete accounting
Sectors with accounting data completed and adjusted CQC without LPC, agriculture and forestry
Other domains without accounting data
APU
IC
Insurance
LPC
Fiscal (sources)
Enterprise's annual surveys
Transactions with the rest of the world
Specific sources Consumption
Specific sources Trade
Industry surveys
Annual agriculture statistics
Other domains
Simplified intermediate system
-Transactions
-Taxes
-Subsidies
-Social contributions
Comparisons
-Trade sales
-Final consumption
-Distribution circuits
-Margins
GFCF productive sectors
Tables Sector Branches Sales Production Storage
Non-financial accounts APU, IC, Insurance, LPC
Generation of income account CQC excluding LPC, agriculture and forestry
Production account Generation of income account other fields
Imports Exports
Change in inventories
Household consumption
GFCF
Output by sector by branch by product
Supply and use balance
Generation of income account by industries
Table of intermediate inputs (n-1)
Table of intermediate inputs n
Final IOT

The three approaches and their synthesis. Abbreviations: APU, General Government; IC, Financial institutions without insurance; LPC, Large Public Corporations; CQC, Corporate and quasi-corporate enterprises.

This diagram comes from the book *Le produit national brut. Sources et méthodes d'évaluation* [Gross National Product. Sources and Methods of Evaluation] (INSEE, October 1993), p. 298. It concerns the "GNP Inventory" for France (on GNP Inventories, see the appendix to the present chapter). The diagram shows the deep integration of the process of elaboration of goods and services accounts that will culminate in the IOT at the final stage. There is no independent calculation of GDP according to each of the three approaches leading to a final comparison. Many steps of

cont'd

Box 37 (cont'd)

the process of elaboration of the accounts are interdependent. In the case of strong interaction between two sets, arrows pointing in both directions have been drawn. Such is the case of the circle Supply and use balance and the boxes Output, GFCF, Household Consumption and Changes in Inventories. On the one hand, a balance between output and imports and final and intermediate demand is drawn and reconciled product by product. On the other, the balance between output and income is checked and reconciled *via* the circle of generation of income accounts by industry. To be noted is the role of the intermediate system for enterprises, in this case in a simplified version, for non-financial corporations, except agriculture and some activities like hospitals. Down at the right side, the intermediate inputs table for the previous year is shown projected for the year of analysis without autonomous recalculation. Pre-synthesis and synthesis lead to a unique estimation of GDP. Different types of adjustments have occurred along the way.

This diagram is particular to France because of the more intensive use made of business accounting. Nevertheless, the existence of pre-synthesis, with adjustments among the various categories of supply and use of goods and services, before the final reconciliation phase is present in all countries where SUT's are compiled on a yearly basis.

remain with the accounts of expenditure and income, which, as is the case of quarterly accounts, maintain a statistical discrepancy. This is also the case in the USA except for benchmark years, but there is a debate again on the possibility of establishing annual IOTs (*Survey of Current Business*, November 1997, p. 85). A number of countries that benefited from French technical assistance, in particular in Latin America, North Africa, and in Europe (Portugal and Greece), also follow the procedure of annual IOTs.

The objective is not to compile each year a benchmark IOT. In the intermediate period between two benchmarks, the table of intermediate consumption of industries is projected. The basic idea is that it is better to establish an annual statistical synthesis with reconciliation (in which the supply and use balances of products play a major role) than a more difficult to assess global balance. The solutions used vary from country to country (see for example Box 37). The list of industries varies less (from several tens in Latin America or Tunisia to a hundred in France) than the larger list of products (one or several hundreds in general, but more than two thousand in Japan and almost three thousand in Denmark or Norway). The borderline between judgmental or automatic balancing procedures is variable. In some cases the reconciliation with the IOT is only done for non-provisional versions of the annual accounts (Australia, United Kingdom, for instance), and in consequence provisional accounts and quarterly accounts may still include discrepancies. In other countries, a table of IOT type is used for all the versions of the accounts, including quarterly accounts (Denmark, France, Norway, the Netherlands, Sweden).

This general trend, in line with the spirit of national accounting, nevertheless raises some problems. There is the risk of neglecting (either by lack of resources, or as in France by lack of sufficient information in particular on intermediate consumption) the quality of the IOT in the benchmark years, which could diminish the capacity of the IOT series to reflect the structural changes of the economy. Besides, if applied carelessly, the technique of adjustment of the IOT, year after year, may lead to an inaccurate description of evolution over larger periods of time. Mastering simultaneously diachronic and synchronic analyses of economic life remains at the end of the 20th century a considerable challenge for national accounts compilers and economic statisticians.

2.4. Institutional sector accounts and synthesis of the Tableau économique d'ensemble [Overall Economic Account]

2.4.1. Slow and uneven implementation

Until the beginning of the 1970s only a few countries have complete accounts for all the institutional sectors, as is the case in the United Kingdom and France. Regarding non-financial accounts, in general there are at least accounts for General Government (and the Rest of the world account). For the rest, there are rather a set of accounts and tables consisting of large blocks of transactions and some aggregates for all enterprises (from a functional viewpoint) on one side and for households on the other.

The idea, that has been familiar for so long in French national accounting, of a synthesis of the overall economic table, has not yet spread elsewhere. It is based on the idea of a systematic cross-classification of transaction accounts and institutional sector accounts. Obviously everybody does some, but empirically, on an *ad hoc* basis. Very clever is the person who, on the basis of published national accounts, could reconstruct an account for interest, even in a country with developed national accounting.

The following decades, mostly under the impetus of the 1968 SNA/1970 ESA, will see the extension of the compilation of accounts for all institutional sectors, but often facing great difficulties. Splitting between non-financial corporations and households is particularly difficult. In fact, because of the difficulty of directly establishing household accounts from autonomous sources, it is necessary to deduct them mostly from information coming from other sectors. This implies building an account for non-financial corporations, for which most statisticians, without good-quality tax data, nor any access to individual enterprises' tax returns to correct them, lack experience. Statistical systems have been generally based on the concept of establishment, very little or not at all on the concept of enterprise unit. This is a reciprocal situation from France, which enjoys advantages but suffers from opposing inadequacies.

2.4.2. Sector/industry linkage

To correctly articulate the relationships between industries (of the SUT) and institutional sectors, it is imperative to link industries and institutional sectors at the level of kind of economic activity. In France, the idea was part of the objectives of the 1951 "tableau", but it soon collapsed. Several years later it takes the form of a juxtaposition of a SUT by industry (based on statistics of supply and use of products) and accounts for corporations and partially unincorporated enterprises by enterprise sector, where enterprises are grouped according to their principal economic activity (based on tax data and the annual enterprise survey). The "industry/sector" reconciliation only happens at the level of total value added. It is therefore a limited but valuable integration because sources of data on enterprises allow in France a better control of the global economic dynamics. Later on, but with lots of problems and fragile results, the industry/sector linkage is established at the level of about forty sectors.

From the 1980s, more countries pay attention to the analysis of enterprise sectors, in particular in response to the increased interest for microeconomic databases and the micro/macro links. Under Dutch insistence, cross-classification by industries and principal institutional sectors for the main variables of the production account, including the components of value added, is introduced in the 1993 SNA and the 1995 ESA at the beginning of their preparation. Nevertheless the cross-classification, which is detailed regarding the activity of industries, does not include a subdivision of sectors according to the principal activity of enterprises. This is due to the fact that it is not well suited for international standardization because of the differences, conceptual and practical, regarding the "enterprise" type statistical units. 1993 SNA Chapter XIX (§ 19.49) places it among national adaptations of the integrated framework.

2.4.3. Synthesizing the Overall Economic Account

For distributive transactions, synthesizing the TEE [Overall Economic Account) is the method that allows checking simultaneously the compatibility of estimates and completing the accounts for sectors with less information (households in particular). It seems that the possible presentation of statistical discrepancies, similar to those of the GDP balance, has not been considered anywhere because of the complete lack of direct sources for some counterpart sectors (mostly households). Here, *de facto* or in a more formal way (France) the concept of (a) pilot sector(s) for certain transactions, including possibly a priority ordering, has prevailed. Central government, social security, other government, financial institutions, insurance corporations play this role. Their data are in principle imposed on other sectors or are used to establish a balancing item to be shared in the best possible way by the remaining ones.

The compilation of the interest account, when one tries to correctly do it, is the most sophisticated example of such a process. From other sectors' data, it is possible to infer the total amounts of interest paid and received by non-financial corporations and households taken as a whole, for which direct data are insufficient or non-existent. A first separate estimate of the interest paid and received by non-financial corporations and households is then made, by applying to their respective outstanding stocks of financial assets and liabilities (estimated from financial statistics) the interest rates that look relevant from regulations or market information. Finally, the overall process of reconciliation is done by trial and error. More generally, the accounts of all distributive transactions are adjusted and balanced, which does not mean that everything is well known. The main difficulties concern property and entrepreneurial income.

The same procedure is applied to financial accounts. More advanced countries establish, simultaneously and consistently, accounts for flows and stocks of financial assets and liabilities. The problem that unfortunately appeared since the 1950s, and seems not entirely solved anywhere, is that net lending/net borrowing, calculated as the balancing item of non-financial accounts, does not coincide with the same item calculated as balancing item of the financial accounts (such is the situation for major sectors, non-financial corporations and households, and to a lesser degree for other sectors). That is the reason for the famous "adjustment" (statistical discrepancy) between these two subsets of accounts.

2.5. The financial/non-financial adjustment: a problematic issue

In this case national accountants never choose, it seems, to adjust and balance their estimates completely, although they keep an eye on the variation of the discrepancies when they close their accounts. What is the reason for this? It is because the non-financial transactions and their financial counterparts are not observed simultaneously by the statisticians themselves who cannot in practice make up the accounts of the nation as a private accountant does for the accounts of an individual economic transactor. They follow a quadruple-entry principle, but the accounts are not built in practice as business accounts are (see the beginning of this chapter). When information concerning these two types of transactions arrives, from two different sources, there is no way to analyze and adjust, case by case, a type of non-financial transactions as compared to a type of financial transactions. Balancing would have to be made globally but, given the lack of decision criteria, there is the risk of being arbitrary in the full sense of the word.

The purpose of integration is thus put in check. In some sectors, in principle, it is relatively easily achievable (general government, financial institutions). Incomplete conceptual harmonization, non-exhaustive collection of data and/or incomplete treatment of the collected data might be possible obstacles to the process. Even for central banks, whose accounting statements are initially balanced, it is not always possible to fully eliminate all residual adjustment. On the other hand, the existence of the "errors and omissions" item in the balance of payments indicates a structural difficulty. The balance of payments of a country is never completely balanced, because of the imperfect estimates of some flows and of their monetary counterparts, the heterogeneity of the sources used and the time lags between transactions and payments.

Next comes the nagging problem of non-financial corporations. Their elementary accounts are integrated. This integration is lost in the process of collection and treatment of the information. One of the reasons is the great difficulty of reconciling financial data from businesses with the general approach of monetary and financial statistics and national accounts. In France, after a period of unrealistic evolution of national accounts for non-financial enterprises, at the end of the 1980s, a task force of the *Conseil National de l'Information Statistique* [National Council for Statistical Information] has thoroughly examined the problems and the ways to solve them, without hiding their enormous difficulty (*Les opérations financières des enterprises, cohérence avec les comptes non financiers* [Financial Transactions of Corporations; Consistency with the Non-Financial Accounts], Chairman: Bernard Enfrun, Rapporteur: Patrick Poncet, October 1986). On the household side, where there are no micro-accounts, except partially for unincorporated enterprises, progress is sought in the development of statistics of financial institutions and in surveys on financial assets and liabilities of households.

Although the discrepancies between non-financial and financial flows are due to deficiencies in the general economic information system, interpreting their magnitude and their irregular evolution reveals itself to be very difficult. For instance, during the Indochina and Algeria wars, households, French by nationality, but non-resident according to national accounting principles, made important financial investments in national currency, but the information available did not permit distinguishing them from resident households in France and attributing their investment to the rest of the world. The existence of non-registered economic activities (illegal or not, including parallel foreign exchange markets) and of tax havens, make things obviously even more difficult. The important circulation of dollars worldwide, outside of the official reserves, is also a problem.

In countries producing and exporting drugs, capital flows enter and income is distributed, while frequently the corresponding activities of production and sale are not recorded. Summarizing, the financial/non-financial adjustment comes, on the one hand, from problems that may be resolved (difficult but feasible) by progress in harmonization, compilation and treatment of information, on the other hand from anomalous phenomena, which result from the dysfunctions of economies.

3. Reliability challenged

3.1. Isolated British attempt to estimate margins of error

Few national income compilers have attempted to assess a probable margin of error for their results. Studenski (*The Income of Nations*, pp. 261–262) mentions Kuznets (*National Income and its Composition, 1919–1938*, 1941) who does it for each industry and for each type of payable income. Assessments of more qualitative nature are provided in some countries (Ireland, Switzerland) at the eve of the war (p. 261). Clark in *The Conditions of Economic Progress* classifies the existing estimates of different countries in four general categories of quality (1941). Studenski himself classifies countries in three reliability groups: high, medium or low (p. 263).

A vast synthesis of statistics, national accounting soon is asked and asks itself: What is the margin of error for GDP (or some other magnitude) estimates? Only the United Kingdom assumes the risk of an official estimate in her methodological publications (*United Kingdom National Income Statistics, Sources and Methods*, 1956; *National Accounts Statistics, Sources and Methods*, 1968, 1985). It is not possible to calculate statistical margins of error in a scientific way, like in random sampling surveys (a great number of very different sources are combined, a complex process of completing the data is performed, there are numerous conciliations, adjustments, indirect estimates, etc.). Nevertheless it seems possible, from the knowledge of data, "to form very rough and mainly subjective judgments of the ranges of reasonable doubt attaching to the estimates" (1956, p. 33; 1985, § 3.38, p. 21). Three categories are established for aggregates at current prices: good (A) with a margin of error less than 3%, fair (B) from 3% to 10%, poor (C) with more than 10%. In the case of the 1985 publication, C is limited in some cases to less than 20%, and a fourth category D, definitively poor (error greater than 20%) is introduced. Thus, in 1985, GDP receives the A grade, as well as household consumption, general government consumption and also foreign trade, while GFCF is graded B and changes in inventories C. Household consumption detailed by product is graded from A to D. Few items get A, most of them are B or C. The total is nevertheless graded A, because it is considered possible for errors to compensate to some extent. Reliability of CFC is considered poor (C). Regarding income, wages are well estimated (A), but income of unincorporated entrepreneurs, graded as fair (B) when gross, is graded poor (C) when net. Household saving (the balance between income and consumption) is definitely poor (D). Reliability at constant prices is very difficult to assess, and increasingly so as benchmark years are further away. In general it is considered as lower than for current price estimates (thus GFCF is downgraded from B to C, foreign trade from A to B).

3.2. Revision of estimates at benchmark operations

Excepting the British experience and similar attempts concerning household consumption (as that of the CREDOC in France [Jean Albert, 1961]), national accountants do not venture to estimate margins of error for the aggregates they compile. Benchmark revisions of estimates – it is accepted that they improve with time – provide an *a posteriori a minima* estimate of the reliability of former estimates. Revisions are in general limited in scope at the global level (though larger differences are to be found in the details) in the case of countries at a rather high level of statistical maturity. For instance, following the introduction of the new ESA, the revision of 1995 GDP assessments varies – once taken into account the effects of changes in concepts and definitions – from –0.8% (Belgium, Italy) to +2.3% (Denmark), +2.9% (Spain), +3.2% (Ireland), with some in the range of +1% (Germany, the Netherlands, Sweden, United Kingdom) (Christian Ravets and Claude Hublart, contribution to the Eighth Conference of the National Accounting Association, "Le SEC 95. Nouveaux concepts et premiers résultats" [The 1995 ESA. New concepts and first results] in Edith Archambault and Michel Boëda (eds.), *Comptabilité Nationale. Nouveau système et patrimoines* [National Accounting, New System and Patrimony], Economica, 2001, pp. 275–292).

A much broader scope of revisions occur in the accounts of countries where statistical development lags behind and estimates are in general rather aggregated. This happens mostly when special effort is made to improve the coverage of economic activities. Very frequent in less developed countries, this case might also be found in Europe. It is the case of the Italian GDP, which is increased by 16% in 1982 (due to a great extent to a review of the estimate of regular or irregular employment level and the assignment of an output to all identified employment), and that of Greece by 22% in 1988.

3.3. Comparing successive versions of the accounts

A method often used to indirectly assess the accuracy of the accounts consists of comparing their successive versions, from the first quarterly accounts (if they exist) to the final annual accounts (excepting the effect of general revisions made at the moment of benchmark changes). Such an analysis is very important from the point of view of the users, as they are mostly interested in changes over time. It is why many countries increasingly comment and explain the differences among those versions. From time to time, statistical studies tend to systematize this analysis (see for instance Gallais, 1995). However the purpose of the exercise is not to assess the margin of error of the estimates, but the level of accuracy of successive versions with respect to the final one, which is based on the set of final statistics, and to detect possible biases (systematic errors) in order to correct them if required. The relevance of provisional statistics, as compared to final ones, and that of the techniques applied to the former for an improved evaluation of the accounts' final results, are then simultaneously at stake. Conclusions derived from these comparisons might however be misleading because some countries – Germany for instance – may require that subsequent versions of the accounts remain as close as possible to the initial estimates. At the turn of the century, as announced in *United Kingdom National Accounts, Concepts, Sources and Methods* (1998), the United Kingdom gives up the assessment of the margin of error in GDP and its components, and turns also to the analysis of successive versions of her accounts (see Box 38).

It is possible to conclude that assessing qualitatively the reliability of a country's accounts requires a deep knowledge of the sources and methods that

Box 38
The United Kingdom gives up quantitative estimates of the accounts reliability

> "Even if the reliability of individual data sources were known, the complexity of the process by which GDP is estimated is such that it would be difficult to build up an overall estimate of reliability from the component series. The process of bringing together the three approaches to GDP into one measure, which uses detailed supply and demand balances, and brings in extra information about the reliability of the raw data and consistency with other sources [...] adds significantly to the reliability of the overall estimate of GDP, but this reliability cannot be measured scientifically. Our current approach to measuring reliability is to use the evidence from analyses of revisions to growth rates [...]"
>
> *United Kingdom National Accounts – Concepts, Sources and Methods, 1998, § 11.183, p. 223*

The text indicates next that tests are performed to detect biases between the quarterly original estimates and the "final" estimates published three years later (§§ 11.184–11.187) and concludes (§ 11.188) that the Office for National Statistics "has not up till now found reason to put in bias correction factors".

have been used. Their multiplicity and the complex character of the construction, that consists of varying processes of syntheses and judgmental decisions, which are difficult to describe completely, make this an arduous endeavor. Because of the difficulty met in characterizing quantitatively the reliability of the accounts, there is the risk that, due to an insufficient effort of communication by the producers and/or of information from the users, national accounts be transformed into a black box leading to inappropriate uses.

3.4. Accurately measuring changes, or absolute levels, or both at the same time?

The idea that it is essential to grasp correctly the changes, even when estimates of absolute levels are marred by noticeable inaccuracies, prevails for a long time. There is a tendency to think that, in fact, evolutions are better measured, which is equivalent to believing that it is *grosso modo* acceptable to have a hardly known or totally ignored variable evolve as something known, for lack of anything better. Good proportionality between observed and non-observed elements is assumed, as long as the measurement of changes does not become very blurred or until a change of benchmark – general revision of evaluations – possibly corrects the levels. In the familiar talk of French staff, between two benchmark revisions, the work is done "at constant stupidity", an expression later corrected to the more refined one: "at constant error".

These comforting but non-rigorous views badly stand the test of time. For some uses, such as international comparisons of real product and purchasing power, the levels themselves play the major role. For others, the requirement of accuracy in the measurement and time profile of short-term variations is in fact essential, but it tends to become more demanding as economies evolve from a more or less directed growth to the free interplay of markets under macroeconomic regulation. Annual accounts badly respond to those aforementioned needs, because of their periodicity, the partial availability of information for the compilation of provisional accounts (which concentrate most of users' attention), and finally because there is a fuzzy area at a year's end for the assignment of some transactions to this year's exercise or to the following one.

3.4.1. Quarterly accounts and follow-up on changes

The right answer is the introduction of quarterly accounts. In the USA this happens in the 1940s (it is true, because of a particularly valid reason at the time: the disparity between the calendar year and the fiscal year); then follows Norway in 1953 and the United Kingdom in 1957; in general later in other countries. This pressure becomes generalized over the century. Although they make it possible to take advantage of the existing short-term indicators, their reliability depends finally on the quality of those indicators, in particular when referring to movements in inventories. This quality itself is only perceivable in the background, by reference to other information that comes later and better represents the observed phenomena. Contrary to what can be derived from a quick superficial view, robust final accounts, annual and quarterly, the latter firmly benchmarked *in fine* on the former if required, remain essential.

The true debate, differently solved in practice depending on the country and the time, refers to the respective extent of quarterly accounts and provisional annual accounts, and their mutual relations, in particular for goods and services accounts. For some countries (for instance the USA, Canada), in periods between two benchmark years, annual goods and services accounts are the sum of the four respective quarters. In others, this is the case only for the first versions of the annual accounts, in particular when an annual IOT has been introduced, however, only in a later version (the United Kingdom, 1990s). In the group of countries that prepare an IOT for their provisional accounts, as Norway, the Netherlands, Denmark, and France, provisional annual accounts result from an autonomous elaboration process. It may then be necessary to force a consistency between these estimates and those of the quarterly accounts, a sometimes difficult and stressful operation that punctuates, for instance, the history of French national accounts.

When different methods are applied (econometric processes relating the changes in indicators and those of the magnitudes to be estimated, a lesser level of disaggregation for quarterly accounts, base years for prices temporarily non-harmonized for accounts in volume using fixed base-year prices, analyses at previous-year prices for annual accounts and not for quarterly accounts) to still incomplete information, by work teams that functionally do not share exactly the same commitments (follow-up of short-term economy and their turning points for some, first approximation of an account for the whole year for others), differences of some tenths of a point may appear in the provisionally measured growth rates. After critical examination, residual differences may be considered irreconcilable from a technical point of view and left apparent or, contrarily it may be decided that they should be eliminated in order not to trouble the users. The doctrine on this point may vary in time and space. Towards the end of the 1990s, France tends towards a simplification of the compilation process of provisional annual accounts using methods brought closer to those of quarterly accounts.

Finally, for countries with limited statistical resources, very simplified quarterly accounts – combinations of indicators, already very partial – cannot represent a first approximation for the annual accounts.

3.4.2. Increased importance attached to levels

In parallel to the debate on annual accounts/quarterly accounts that reflects the growing interest in an improved follow-up of short-term changes, there are tendencies that reinforce the importance of the knowledge of absolute levels. Since the mid-1970s, a great concern emerges due to the extension of market-concealed activities. Qualified as "hidden economy" – the most frequently used expression – or "black", "underground", "parallel", "submerged", etc., they comprise informal activities, illegal activities, tax evasion, corruption, etc. Important in other periods (crises, wars and postwar periods) and in least developed regions, they tend to disappear in the period of strong economic growth after World War II, but they regain scale also in developed countries, with the difficulties that followed the first oil crisis and the weakening of the growth model.

The attempt to evaluate their importance brings about many research activities, appealing to different methods (anomalies in the change of monetary variables over time, inconsistencies between declared income/expenses, identified uses/availability of certain products, critical analyses of employment statistics, etc.). Final results presented in the 1970s and the early 1980s show considerable differences, the largest resulting from unconvincing methods based on the increase, considered as anomalous, of monetary circulation. Some of these go even to estimate the hidden sector to represent one third of the US GDP in 1978. However other applications of monetary methods lead, in many cases, to rather smaller results, of 3.5–11%. The other methods, as applied to developed countries, very frequently lead to estimates of about 2.5–8%, with some peaks beyond 10%, and for Italy definitely higher levels (7–15% or even 30%) [see the summary table by Philippe Barthélémy, reprinted in Archambault and Greffe, 1984, p. 20].

National accountants' studies, many of them internal, relativize the problem. First, by an effort to clarify to which extent this type of activity is already included in the accounts. Thus in France, adjustments made to correct for fraud and tax evasion, black labor and non-declared tips and in-kind compensation represent around 4–4.5% of GDP in the 1980s. Then, by some attempted assessment, using sensitivity studies by activity (for instance Broesterhuizen, 1983), of the order of magnitude of what could still be missing; it has been estimated, too cautiously perhaps, as some percent points only. Future versions of accounts for developed and quasi-developed countries do not indicate distressing revisions, with the aforementioned exceptions (Italy and Greece), for which there was a mix of some backwardness in statistical data development and national accounting methods and the recognized existence of non-declared activities on a large scale. In these cases, the revisions do not cover just the underground economy.

As structural adjustment policies have brought about a proliferation of informal counterbalancing activities in many developing countries, as well as in the so-called economies in transition from central planning and dominant state ownership to a market economy based on private property, national accounts in some countries have grown more difficult to compile and the margin of error, already high, has probably tended to increase (that was already previously the case for the USSR and similar economies but for different reasons, see Box 39). Facing this difficult situation, statisticians have tried, depending on their particular case, to set up special household surveys on informal activities, to estimate the economic circuits associated with drugs (but their inclusion in the official accounts presents some problems), to compare household surveys on employment with production and exchange statistics, etc. Large revisions are not infrequent: +16.5% for 1994 GDP in Colombia, by including in particular illegal crops (Mariana Magdalena Cortés Arévalo and Rómulo Enrique Pinzón Santos, *Bases de contabilidad nacional según el SCN 1993* [Bases for National Accounting according to the 1993 SNA], DANE, June 2000, pp. 50–51).

The search for completeness in covering economic activities by national accounting and for improved estimates of level, undergo an increasing importance in the last quarter of the century. The non-accounted-for economy, when large in scope, makes even more uncertain the measurement of short-term trends, in cases where, almost by definition, the assumption of proportionality between what is observed and what is omitted lacks realism. It certainly biases the international comparisons of levels.

The comparisons in level draw increased attention in Europe since the launching of European construction in the mid-1980s. By referring to GNP as the basis for the fourth resource of the European Community and later on, by defining the criteria for accession to the Economic and Monetary Union (EMU) in national accounting terms, Europe gives political importance to measures as accurate and homogeneous as possible for the aggregates of national accounts (see the appendix of chapter 10). Hence, reciprocal control mechanisms among national accountants are introduced, with a central role for Eurostat, *via* the GNP Committee. This stage crowns a long-term tendency that, under the leadership of Eurostat, has led to the development of methods for the actual harmonization of measurement, thanks, for instance, to harmonized Community surveys and common conceptual frameworks. The verification of the exhaustiveness of the accounts is one of the purposes of the GNP Committee. A great effort to make explicit the methods used (principally by means of the

Box 39

Questioning the growth rates of the USSR and other economies with similar systems

USSR. Studenski notes (*The Income of Nations*, p. 352): "From the very outset the Soviet estimates were regarded with suspicion abroad because they indicated a rate of growth of the country's national income that was unbelievably high. Independent calculations made by several expatriate Russian economists as well as by non-Russians confirmed this suspicion, suggesting a much lower rate of growth of the country's national income. Independent calculations of the Soviet national income became even more important when the Soviet government ceased publishing any details for its broad and enigmatic figures." (References to publications by S.N. Prokopovitch, Colin Clark, Abram Bergson, etc., p. 352).

During a short period of time, in the 1920s, published estimates of national income "[. . .] became increasingly informative and were quoted in governmental budgets and other documents of prime importance. They were rapidly developing into an important tool of financial, economic, and social planning and analysis." (p. 351).

A drastic change takes place just at the beginning of the 1930s. Estimates – or at least the publication – of national income at current prices is suddenly suspended and only the estimate at 1926–27 constant prices was continued. "With the discontinuance of estimates of national income in current prices, the estimates in constant prices lost their contact with reality. The estimates became completely divorced from all current financial transactions of society [. . .]" (p. 351).

"National income estimates became a mere index number of the growth of material production and a very imperfect and abstract index of it" (p. 352)

Western attempts to recalculate the Soviets' results continued until the end of the 1980s. It became a branch of "sovietology" in which the CIA particularly shone . . . . It tries to evaluate at best the economic potential of the USSR concerning the means dedicated to defense.

Just before the USSR break-up, the IMF, the WB, the OECD and the European Bank for Reconstruction and Development published a three-volume document, *A Study of the Soviet Economy* (February 1991) that takes stock of the knowledge about the Soviet economy and its problems. One appendix to the second part is dedicated to statistical problems (Vol. 1, p. 133–169). A few pages on national accounts insist on the bias in the growth rate: "Few indicators have been singled out for greater criticism than the official real growth rates for NMP (net material product). Soviet critics [they strongly expressed themselves during the period of the *perestroïka*] maintain that official growth rates are overstated because of inadequate accounting for inflation. Soviet growth rates are calculated in 'comparable prices' which until 1989 were simply official list prices. Since list price increases associated with the introduction of new or improved products were not regarded as inflationary (even if there was no actual improvement in product quality), price deflators implicit in 'comparable price' rates of growth for NMP tended to underestimate actual inflation, and therefore overstated official growth rates. How large is this bias? Official NMP growth rates for 1966–1985 averaged 5.3 percent, compared to much lower alternative estimates by Soviet analysts ranging from 2.2 to 2.9 percent. Researchers at the USSR Institute of World Economy and International Relations have recently estimated that real growth in NMP between 1913 and 1987 was approximately one-third the official rate. Soviet scholars have gone as far as to use CIA estimates of real growth in Soviet GNP to suggest that official growth rates are twice as high as actual growth. In an even more unusual turn, Goskomstat [the State Committee for Statistics] has used CIA estimates of real growth to call into question the reliability of even lower growth rates set forth by Soviet critics" (p. 140).

Without coming to a conclusion on the quantitative importance of the bias the study concluded: "While these alternative estimates of real growth should be regarded with caution, the message they send is unmistakable. Official growth rates are upwardly biased because inflation has not

cont'd

Box 39 (cont'd)

been accounted for fully. The only point of contention is the magnitude by which growth has been overestimated." (p. 141).

Other European countries. Lack of precision and doubts concern other "centrally planned economies", as they are called. Since 1966, the World Bank includes dollar GNP (since 1964) and growth rates (since 1961) for the centrally planned economies in its annual *Atlas*. "In view of the serious methodological and practical problems of obtaining reliable per capita dollar GNPs and growth rates for CPEs (centrally planned economies), it is not surprising to find that the estimating methods used to obtain these figures for publication in the *Atlas* have been altered several times since the early 1960s, sometimes causing very large changes in the CPE figures from year to year, or from period to period." (Paul Marer, *Dollar GNPs of the USSR and Eastern Europe*, Johns Hopkins University Press for the World Bank, 1985, p. 13). By the mid-1980s, the Bank gives up the publication of data concerning the CPEs for which it has not been possible to satisfactorily solve the problems of data and methods (*ibid.*). The 1983 *Atlas* (results for 1980 and 1981) only publishes per capita dollar GNP for Romania and Hungary (*ibid.*, p. 211). In 1985 (there was no publication for 1984) only Hungary is included (*ibid.*, p. 13, see also Appendix A, "Atlas Methods Applied to CPEs", pp. 205–227).

Structural transformations in the 1990s introduce, then, strong statistical discontinuities. Measurement of evolutions in the transition period faces enormous difficulties of observation that weigh heavily on the uncertainties attached to these measurements.

China. China itself presents a case apart, as the introduction of the market economy happens without any fundamental change in the political system. There is discontinuity within continuity. Despite the change in the system of national accounts used (the MPS from 1952 to 1984; the MPS and the SNA in parallel from 1985 to 1992 in which accounts following the SNA are derived essentially from the MPS accounts using a conversion system; the SNA as official system in 1992), Chinese accounts are strongly criticized outside China. The introduction to *National Accounts for China. Sources and Methods* (OECD, 2000) written by Derek Blades, Head of the Division of non-member countries in the Statistics Directorate, echoes such criticism: "There can be no doubt that China's official national accounts are regarded with suspicion by many users outside China. Professor Maddison's 1998 study [*Chinese Economic Performance in the Long Run*, OECD, 1999] raised serious questions about both the levels and growth rates of China's GDP. His criticism carries particular weight because it is based on a careful reworking of the GDP estimates and because he consulted widely with Chinese scholars who have first-hand knowledge of economic developments in China. The lower rates of growth reported in his study are regarded by most observers outside China (and by some experts in China) as more plausible than the official estimates." (§ 32, p. 16). The text then continues cautiously: "Professor Maddison's insight that the official growth rates and levels give an implausible level of per capita GDP for the 1950's is compelling. It is possible that most of the errors occurred in the early years of the period when the GDP estimates were being derived indirectly from MPS data rather than in the last decade when the SNA statistics have been estimated directly. However, as noted above, estimates of China's national accounts are likely to be subject to quite large error margins." (§ 36, p. 17).

GNP inventories) and to get them closer has been undertaken (See the appendix of the present chapter, "The GNP Committee and the GNP inventories").

But at the same time, in order to have a short-term follow-up of the economies, the EMU presses the countries to provide accounts as relevant as possible to these purposes. European national accountants should then be imperatively providing, towards the turn of the century, reliable accounts both in level and changes; both objectives are given equal importance, at least for the part of the economies actually encompassed by the countries' accounts, whereas completeness should be approached progressively (see appendix of the present chapter). But their non-European colleagues, although submitted to less institutional constraints of this type, tend to head for similar targets.

3.5. Towards an economy more difficult to describe and measure

A difficult mission, because it must be implemented when the economy at the end of the 20th century is more difficult to describe and measure than that of the 1950s. At the beginning of this period, the statistical systems take off or become stronger. From the end of the war to the mid-1970s, in many countries, knowledge progresses enormously. Reality is better grasped. Up to the point where some get to thinking that the construction of statistical systems is over and that the only remaining task is to adjust and marginally improve them.

In fact, at different stages and at different moments in time, these systems will enter into crisis. On the one hand, their means will, without exception, cease growing or diminish. Economic transactors, mostly businesses, will become reticent to answer the questionnaires addressed to them. The use of administrative sources increases but does not provide answers to all the questions. On the other hand, economic evolution will transform the phenomena that statistics and accounts seek to observe and measure in such a manner as to render them increasingly resistant to be correctly ascertained.

3.5.1. More complex economies

Within the system of production and exchanges, products (goods and services) renew increasingly faster, differentiate and, at the same time grow permanently more sophisticated. The economy of services and of information occupies a larger place. Intangible investments and intangible assets tend to play a decisive role. The traditional borderline between goods and services fades and tends to lose any essential economic meaning and to be used only for the sake of convenience.

Transformation of enterprises and groups (outsourcing of activities, restructuring) makes particularly arduous the follow-up of statistical units of the productive system that frequently change boundaries, and for which usual legal categories become less significant. The relations between production of goods and trade are transformed. Internationalization, then globalization of groups, complicate the observation of their national truncations, and even on various aspects reduce it to a mere formality.

Technical sophistication of products on the one hand, refinement of price policies (fares for instance) and tendency to combine different services, possibly also goods, into one "package" offered at a global price, on the other, make more difficult the observation of nominal prices or at least of quantities associated to different tariff specifications. This particularly affects differentiation within the unit price changes of what actually represents the movements of price and what the changes of value resulting from the transformation of the characteristics of the product (quality effect). Measurement of changes in the price of equipment goods is particularly delicate (see chapter 9), although similar difficulties also affect consumer goods. Traditionally more resistant to the measurement of volumes and prices, services diversify and represent a growing part of activities and products.

In general, concerning the system of production and exchanges, technical progress, its new forms and its acceleration are at the center of the increasing difficulties of measurement. The nature of the problems, either totally new or on a new scale, makes necessary the growing use of modeling in the measurement of essential phenomena beyond what is directly observable, in order to understand the economies (volume/price factoring within nominal changes, measurement of the volume of stocks of fixed capital and of consumption of fixed capital). The velocity of technical progress combines with the increased role of anticipations in complicating the analysis of the changes in the value of assets.

3.5.2. Imbalances in the measurement of international exchanges

These internal difficulties of measurement are in part to be found also in international exchanges. The calculation of true price indexes for external trade for goods, as compared to simple indexes of unit values, has always been a more delicate exercise than for domestic trade. In the last decades of the 20th century exchanges of services are increasing and adding to the challenge. But, in the field of international exchanges and capital flows, the observation of the flows themselves in current value tends to show important gaps, because of the opening of the economies and the liberalization of flows, and the additional difficulties generated in the last decades by illegal activities, the development of *off-shore* financial centers, flags of convenience, etc.

Very important discrepancies appear between the sum of credits and the sum of debits in the balance of payments at the worldwide level. Although traditional, this disequilibrium inflates and profoundly worries the IMF after the second oil crisis; the Fund estimates it at 2% in 1982 of the total of current transactions (113 billion dollars of net deficit, before any correction). It then decreases, but increases again at a very high level at the beginning of the 1990s and then starts decreasing again. Due essentially to technical weaknesses of balances of payments (unilateral registration, differing amounts) and to the impossibility to measure what totally escapes detection, the phenomenon has serious consequences for the compilation of national accounts that require the balances of payments data. Imbalances also exist in the registration of international capital flows.

Global movements are difficult to elucidate even after several adjustments. Thus, were it not for the artificial net surplus in the trade of goods that appears in the European Union beginning in 1993 (see below) – almost 55 billion dollars

Box 40

An opinion from the Federal Reserve Board (1991) on the issue of financial statistics

"The other form of current problem in flow-of-funds work [besides ... "the lack of distributional data as to who holds the assets and who owes the debts" which causes "severe problems in reading the aggregate these days that make analysis much more complicated than, say, in the 1950's"] is in the statistics, which are in a wretched state [...] a combination of increasingly complicated financial practices, tight statistical budgets, and tired statistical operations has left Washington far out of touch with the mainstream of finance. Non-financial business, pension funds, and international capital flows are a few of the outstanding cases of data hopelessly inadequate for their current tasks .... Statistical discrepancies in balance of payments and flow-of-funds accounts have been at levels over the past ten years – $30 billion to 50 billion commonly unexplained – that make the 1950s accounts look unbelievable precise. The 1950s *were* a simpler world in financial markets, one where reports from a few strategic institutions in New York and from major corporations covered the picture well. We now have worldwide markets, many times as many players and intermediaries in the markets, much laundering offshore, and other transformations that don't begin to appear in standard old statistical sources."

Stephen P. Taylor, "From money-flows accounts to flow-of-funds accounts" (1991), reprinted in John C. Dawson (ed.), Flow-of-Funds Analysis: A Handbook for Practitioners, M.E. Sharp, 1996, pp. 107–108 (Taylor has been for many years in charge of flow of funds accounts at the United States Federal Reserve.)

for 1996 – the global current balance would not show in the 1990s any trend towards a net decrease of the deficit. Net deficit tends to decrease for services, but among them, the deficit for transportation increases strongly. Regarding primary income, its negative asymmetry increases markedly, also (Isabelle Rabaud, 1999).

Since 1993, in Europe, a greater integration brings about increasing difficulties in the observation of intra-community exchanges for several countries. For 1996, the excess of exports over imports represents 5% of the total and about 0.8% of GDP of the European Community of 15. More generally, the possibility for member countries to compile national accounts in the future supposes that complete and sufficiently detailed foreign trade statistics will continue to be compiled as well as balances of payments. To continue measuring intra-community exchanges of all types (products, income, capital) remains thus essential, but the task is very hard for the concerned statisticians.

The financial crises in the 1980s and 1990s show the importance of the movements of floating capital, and also the frequently insufficient knowledge of short-term business liabilities in some countries. The combination of considerable consolidated amounts of saving to invest (pension funds for instance), financial innovation, modern communication techniques and their consequences on the financial markets in particular, make more complicated the observation of phenomena whose movements escape to some extent national and multinational sovereignties (see Box 40).

3.6. Trend of economic information systems to misadjust

The overall impression over a quarter of a century is that there is a trend of the economic information systems to misadjust. Progress has been made, but the objects of observation and analyses themselves transform even faster. The challenge is not exclusively one of national accounts; it also concerns economic (and financial) information as a whole. At the turn of the 20th century, it is nevertheless difficult to assess the overall effects of the phenomena that have been mentioned in terms of the reliability of statistics and national accounts.

A very interesting effort at synthesis has been attempted by a well-known scholar in the field of productivity, Zvi Griliches, in his presidential speech at the American Economic Association, January 4, 1994 ("Productivity, R&D, and the Data Constraint", *The American Economic Review*, March 1994, pp. 1–23). He concluded that a loss of measurability can be observed over the last half-century. The best measured activities (agriculture, mining, manufacturing, transportation) have seen their participation in the US GDP go from 49% in 1947 to 38% in 1977 and 31% in 1990. In other market and non-market activities, mostly services, lack of adequate measures of the volume of output or price variations produces, according to him, wrong assessments of output and productivity growth, when these activities (and households) have absorbed between two thirds (1979) and three quarters (1992) of the investment in computers and information processing machines. Griliches sees there the principal explanation of the "computer paradox" formulated by Solow (the outstanding expansion of the computer is not followed by visible gains in productivity), all the more when prices of computers were supposedly unchanged until the 1985 revision of the US accounts.

For Griliches, progress in statistical data has been very slow (his criticism refers in particular to the essential volume/price factoring). From that: "our measurement and observational tools are becoming increasingly inadequate in the context of our changing economy" (p. 2). He underlines that "great advances have been made in theory and in economic techniques, but these will be wasted unless they are applied to the right data" (*ibid*).

This is not an academic issue. The intense US discussion (worldwide as a consequence) during the 1970s and the 1980s on the slowdown of productivity in the USA, the drying up of the sources of growth, the decreasing returns of science and technology, etc., has been based, at least in part, on inadequate data.

Griliches concludes positively in favor of economists paying an increased attention to the less prestigious tasks of observation and measurement and of the need to develop the observation, collection and analysis of data in the highest levels of education, and to attach more importance to them in the reward structure of the profession. Perhaps, on this last point, it is a rather utopian view …

Outlook

The ambition to represent accurately an economy as a whole characterizes national accounting and differentiates it from previous periods when it was essentially a matter of measuring the size of an economy by only one of its dimensions, national income, and some of its components (still with the exception of the more ambitious attempt of Gregory King, but for a long time without consequence; see chapter 1, Box 2).

National Accounting expands rapidly – during the 1940s and 1950s – in the framework of developed industrial economies, with certain characteristics (preponderance of goods, increasing participation of the State and strict controls in war economy, then, in time of reconstruction, restriction in consumer choice, technical progress directed, or rather well controlled) that, taken as a whole, describe economies considered to be within the scope of satisfactory measurements. With few exceptions, the statistical offices in charge of economic observation are usually under-equipped. They will grow at pace with the interest in national accounting and, more generally, the demand for quantitative data. Growth of statistical systems is particularly strong in the 1950s, 1960s and early 1970s. There is the impression that the ambitious initial program – although there are gaps, uneven developments among countries and some are considerably late – is on the way to being implemented, as the experience of the statistically developed countries show.

From the middle of the 1970s, the growth models of the capitalist economies come to a crisis. The resulting changes in the field of orientations of economic policy, economic structures, strategies of firms and consumers, tend to diversify and make the objects of economic observation more complex. At the same time, redirections in economic policy reduce the prestige of statistical observations. This sometimes translates into an absolute and very significant reduction of the resources dedicated to statistics; the most clear case being the crisis undergone by the British Statistical System at the beginning of the 1980s under Mrs. Thatcher's administration. Canada also experiences a sensitive period in this respect, whereas in the USA a latent situation of low prestige for Federal statistics creeps in. In many developing countries, statistical services suffer because of general or insufficiently differentiated programs geared towards the reduction of public expenditure.

Thanks to European construction, and in spite of its hesitations, continental Europe resists rather well and does better than resisting. The European statistical program plays an incentive role that frequently takes over more hesitant national motivations. Certain countries even come to experience a statistical blossoming later than anywhere else. This is the case of Italy, clearly left behind during the 1960s boom of statistical resources by lack of political support, which catches up at the end of the 1980s. By that time, the United Kingdom, mostly encouraged by internal motivations, but also supported by the European context, starts to repair the damages of the Thatcher period's orientations, to restructure and to give a new impulse to its statistical system.

The last decades of the century also see important technical innovations in the systems of processing and transmission of information which provide more efficient means to statistical offices and make possible an increase in productivity.

Compared with the situation prevailing in the middle of the 20th century, the statistical offices have undoubtedly been strongly developed, with the exception of the African countries and those of economies in transition. But, in the two last decades of the 20th century, the object of observation tends to transform itself in a permanent and strong way. It is therefore necessary to fight against the permanent tendency of the instruments of observation to become inadequate with respect to the changes in the underlying realities.

The fate of national accounts is evidently strongly linked to that of economic statistics in general. Achieving the great initial design grows increasingly problematic as it is shown by the critical examination of issues associated with exhaustiveness in the coverage of the economic field, the consistency of estimations and their degree of accuracy. This chapter has referred almost exclusively to the estimations of variables in current value, and has left aside the measurement of consumption of fixed capital. It has also remained within the scope of what is observable, even though imputations (see chapter 4) require, at least in part, the use of analogous objects of substitution (for instance costs instead of prices) and even if there are not always direct observation techniques for the phenomena (tax evasion for instance).

On the other hand, the measurement of value added and income, net of consumption of fixed capital (see chapter 8), that of the respective evolution in the changing of current values of goods and services of what comes respectively from changes in prices and from changes in volume (modifications of quantities and qualities of products) [see chapter 9 and also Griliches' opinion in the present chapter, p. 227], require different forms of modeling in order to estimate variables that by nature are not directly observable. These two additional dimensions increase considerably the challenges for statistics and for national accounting. By bringing into play the stocks of assets (wealth) and their variations, they refer, in effect, to the inter-relationships between the past, the present and the future.

At the turn of the century, it is difficult to assess the actual level of inadequacy of economic statistics and national accounting. Griliches (1994), whose arguments impress, considers it high, mostly regarding the measurement of changes in volume. The Canadian statistician Jacob Ryten (1999) presents a view that he himself qualifies as optimistic. He considers that statistical offices are in a position to overcome the challenge, without mentioning whether he precisely considers it to be the case at the end of the century.

In any case, the levels of acceptability as regards the reliability, in the general sense of the word, of actual measures differ depending on the variable and the uses for which it is intended. Often mentioned, this issue seems not to be, however, the subject of precise and systematic examination. It is nevertheless very important because, based on the evidence, the general target of "zero defect" is out of the question.

There is the prevailing impression that the challenges to be overcome are in fact enormous. So substantial are they, that they require, undoubtedly, intellectual investment programs of considerable scope and intensive statistical research work.

Annotated bibliography

On the SESAME proposed by Keuning, one may read, for instance, of this author "SESAME: An integrated economic and social accounting system" (*International Statistical Review,* Vol. 65, no. 1, 1997) and "Interaction between national accounts and socio-economic policy" (*The Review of Income and Wealth*, September 1998, pp. 345–359; in particular sections 5 and 6).

Michel Séruzier's book, *Construire les comptes de la nation selon le SCN 93* [Building the Accounts of the Nation According to the 1993 SNA] (Economica, 1996, 753 pages), although he does not treat the subject in a historical perspective, is most valuable for the analysis of the relations between the information sources and national accounts [see in particular, Chapters 2, "Building the nation's accounts"; 13, "Stages in the synthesis of the S(upply) U(se) T(able)"; and 16, "Distributive Transactions and Overall Synthesis"].

On the concept of a statistical system for enterprises, one may refer to Michel Quélennec's "Les statistiques d'entreprises (réalités observées et méthodes d'observation)" [Enterprise statistics – observed realities and methods of observation] (*Les collections de l'INSEE* series E, no. 101, June 1986) [the author underlines in the introduction "strong analogies with foreign systems"], a publication complemented by "Les sources statistiques sur les entreprises" [Statistical sources concerning enterprises] (*ibid.*, no. 117, September 1988).

British experience aiming at implementing IOTs and annual balances of products is the topic of a very interesting presentation by Anne Harrison, "The role of input–output tables and commodity balances within the national accounts of the United Kingdom", in Proceedings of the 44th Conference of the International Statistical Institute (Madrid, 1983, pp. 992–1015). A series of tables present, in annex, the relative importance of discrepancies that annually appear from 1976 to 1980 between supply and use by type of product when looking at a detailed level, in this case 39 categories of products, the information to be found in the sources from which the three different estimates of GDP are compiled. These discrepancies are relevant for most of the products.

A report of the Office for National Statistics of the United Kingdom prepared for Eurostat, presents an invaluable synthesis of the bibliography on the issue *Reliability and Quality Indicators for National Account Aggregates* (David Wroe, Peter Kenny, Uzair Rizki and Ishani Weerakkody, January 1999). Bibliographical references are to be found on pp. 80–83. The formalized methods, starting with Stone, Champernowne and Meade ("The precision of national income estimates", *Review of Economic Studies*, no. 9, 1942, pp. 111–125) are intended to propose an optimal way to automatically balance the accounts from components whose reliability is supposed to have been previously estimated.

An attempt to assess the "reliability level" in the valuation of each item of household consumption for France is to be found in the research directed by Jean Albert and presented in "Tableau général de la consommation des Français de 1950 à 1960" [General review of French consumption from 1950 to 1960]

(*Consommation*, CREDOC, no. 3–4, July–December 1961). It is mentioned ("Notes méthodologiques" [Methodological notes], p. 130) that "this assessment is subjective and qualitative although, for practical purposes, it has been associated to a percentage scale as follows: * 20% and more, ** 10% to 20%, *** 5% to 10%, **** 0% to 5%". (No overall evaluation is provided but, at first sight, the stars' distribution shows that at the time, consumption is assessed with considerable uncertainty.)

Concerning comparison of successive versions of accounts, see Allain Gallais, "Révisions et précision des comptes nationaux français" [Revisions and accuracy of French National Accounts] (*Economie et Statistique*, no. 285–286, 1955, pp. 59–80; with international comparisons for six European countries, the USA and Japan, pp. 66–69). See also, for instance, Allan H. Young, "Reliability and accuracy of the Quarterly Estimates of GDP" (*Survey of Current Business*, October 1993, pp. 29–43).

On "hidden" economies, see Edith Archambault and Xavier Greffe (eds.), *Les économies non-officielles* [Non-Official Economies] (La Découverte, 1984; in particular the presentation, pp. 5–45 with a bibliography). A more technical discussion on the most used methods and their results is to be found in Philippe Barthélémy, "The macroeconomic estimates of the hidden economy: a critical analysis" (*The Review of Income and Wealth*, June 1988, pp. 183–208). He discusses in particular Feige's and Gutmann's simplified monetary approaches, and the more complex one by Tanzi, that gives results undoubtedly lower (pp. 184–188), and presents results on a long series since 1960 of several applications of these methods (pp. 199–202). See also Bruno Lautier's *L'Economie informelle dans le tiers monde* [Informal Economy in the Third World] (La Découverte, coll "Repères", 1994).

The methods used in Italy, particularly from a new measurement of the quantity of labor, in order to estimate the concealed economy during the important revision of the 1982 benchmark accounts are described in "The underground economy in Italian Economic Accounts" (*Annali di Statistica*, Istituto Nazionale di Statistica, serie X, Vol. 2, 1993).

G.A.A.M. Broesterhuizen gives an example of a sensitivity analysis, made by an official statistical service, in "The unobserved economy and the national accounts in the Netherlands, a sensitivity analysis" (*National Accounts Occasional Papers*, NA/02, Netherlands Central Bureau of Statistics, 1983). The author concludes that an effect of the lack of declaration or sub-declaration causing a bias of more than 0.5% on the estimate of the GDP growth rate is most unlikely.

Isabelle Rabaud synthetically analyzes the statistical imbalance in the balances of payments in "Les causes du désajustement de la balance courante mondiale: un réexamen" [Causes of imbalance in the world current account: a reexamination] (proceedings of the 1998 Conference of the National Account Association) in Edith Archambault and Michel Boëda (eds.), *Comptabilité Nationale. Nouvelles frontières* [National Accounting. New Frontiers] (Economica, 1999, pp. 135–

146). In the same publication see Henry Tyrman's "Les comptes nationaux face à l'évolution des statistiques du commerce extérieur" [National accounts facing the evolution of foreign trade statistics] (pp. 153–162), for asymmetries in the intra-community exchanges; see also by the same expert "Problèmes de mesure du commerce extérieur de l'Union monétaire" [Problems in the measurement of the Monetary Union foreign trade], working document, Eurostat, April 2000.

The Directorate for Business Statistics at the INSEE organizes every year a seminar to analyze the transformations taking place in the economy and the resulting problems for the statistical observation, with participation of French and foreign statisticians, scholars and businessmen. See particularly *Normes comptables, entreprises et statistiques, 8 octobre 1997* [Accounting Standards, Enterprises and Statistics, October 8, 1997] (*INSEE Méthodes*, no. 74–75, January 1998), with the following papers: "Les normes: principes et applications" [Standards: principles and applications]; "Des comptabilités aux statistiques" [From micro-accounts to statistics]; "L'expérience canadienne" [The Canadian experience]; "S'adapter aux normes de demain" [Adapting to tomorrow's standards]. Also, *L'intégration des biens et des services: une stratégie qui se généralise, 21 octobre 1998* [Integration of Goods and Services: A Developing Supply Strategy, October 21, 1998] (*INSEE Méthodes*, no. 87–88, April 1999) with "Entreprises: des parcours variés" [Enterprises: differing paths]; "Réflexions et avancées statistiques. A l'étranger: les cas des technologies de l'information. En France: à la recherche d'un nouveau paradigme" [Reflections and statistical progresses. Abroad: the case of the information technologies. In France: the search for a new paradigm].

On the issue of statistical units, see *Des unités statistiques pour représenter l'économie. Approche française et mise en perspective internationale* [Statistical Units to Represent the Economy. The French Approach within an International Context] (*INSEE Méthodes*, no. 90, October 1999); presentation and synthesis on the Canadian, Dutch and French practices; the Australian experience.

A less critical view, the least one can say, than that presented in this chapter on the tendency towards unadjusted systems of economic statistics is given by Jacob Ryten, in "Twenty-first century challenges for national statistical offices: an optimistic note" (*Annual Report on International Statistics*, International Statistical Institute, 1999, pp. 3–7).

Appendix. The GNP Committee and the GNP Inventories

The outstanding interest of the GNP inventories, launched in the early 1990s in the European Union, comes from the fact that they are implemented at the same time, in similar forms, by an important number of countries in the framework of institutional constraints, under the leadership of Eurostat.

At the beginning of the 1950s, the research unit on national accounting of OEEC had devoted some monographic studies to the national accounting developments in some countries (Denmark, France, Norway, Sweden, the Netherlands, Switzerland). Studenski shows for France the results of a detailed attempt at characterizing the relative precision of several components of the first official estimates for the year 1949 (*The Income of Nations*, pp. 262 and 398–399).

Next, the description of methods depends solely on the countries' own initiative. International organizations follow things more or less closely. Residents and missions from the World Bank and the IMF initiate a careful and critical examination for internal purposes. The OEEC in the 1950s follows closely how members apply, with more or less rigor, the Standardised System. Regarding the Statistical Office of the European Community of Six, it has a detailed knowledge of the developments of Member States. All this remains internal. Concerning the UN, it lacks the resources to individually follow the methods of the Member States or to implement syntheses. The scarce reviews made, now and then, have a rather formal character (types of tables filled in from international questionnaires in particular).

After the first years of the 1960s and the discussions of the group of national accounting of the SOEC are over, national accountants concentrate on the development of their own accounts that will be greatly extended in the coming decades, and, at the time of international works, on the conceptual debate regarding international harmonization. The knowledge of the methods of compilation of other countries' accounts remains weak or, at least, partial.

Nevertheless, in its beginnings, the European Economic Community had adopted, among the objectives of its information policy, the actual harmonization of the contents of the accounts and, more generally, of the statistical system (in the field of coal and steel since the Plan Schuman, and then in agriculture, etc.). The introduction of the fourth own resource of the Communities, in 1988, calculated as a function of the Member States GNP, brings about the acceleration of the process.

A directive of the Council of February 12, 1989 refers to harmonization of the compilation of GNP at market prices. It establishes a procedure for the verification and evaluation of the comparability and representativeness among the Member States GDP. It creates a management committee, named the GNP Committee, principally made up of representatives from statistical agencies, which is responsible for the application of the directive. In particular, the Committee makes every effort to launch the drafting, by each Member State, of an inventory of procedures and statistical bases used for the compilation of GNP and its components, as established by the directive. After the drafting of summarized inventories during the year 1989, the completion of final inventories extend from the summer of 1990 to October 1991.

In March 1992, the Commission of the European Communities presents to the Council a report on the application of the February 13, 1989 Directive (reference: SEC 92 588 final 31 March 1992, 39 pages).

The publication of the inventories is left to the discretion of each of the Member States (for France, *Le Produit national brut. Sources et méthodes d'évaluation*, INSEE, October 1993; also published in English: The French Gross National Product. Statistical Bases and Valuation Procedures, INSEE, March 1995).

The report confirms that "[. . .] at the beginning of 1989, Eurostat's knowledge of the methods used by Member States to draw up their accounts was fairly patchy, as was each Member State's knowledge of the methods used in other countries" (p. 8). It indicates (p. 14) that as the directive refers to the level of GNP, it introduces for national accountants a slightly different focus from their current-year concern, as their attention concentrates then on the plausibility of growth rates.

In the summary, the report distinguishes the compliance with the ESA recommendations (at the time the 1979 version), the reliability of the measurement of GNP, and finally the exhaustiveness of the measurements of GNP.

1. With the exception of Belgium and Greece, who are still following the OECD *Standardised System* which pre-dates the 1968 SNA, all countries follow the ESA, with some differences. Some of them are corrected when the countries, based on their national publications, forward their data to Eurostat. Others remain, in some cases because the countries anticipate current revisions of international accounting systems (that is the case of the treatment of insurance in France, for instance). However the report does not mention major differences, a situation that reflects the conceptual convergence pursued for more than forty years. It indicates the points that deserve complementary research. In most cases, it is about problems with the estimation methods that may reflect differences of interpretation of the ESA (measurement of compensation in kind, differences between fixed assets in the sense of business accounting and the GFCF of national accounting – mostly the case of major repairs). The report insists principally on the delimitation between subsidies, collective consumption and social welfare transfers where outstanding differences of treatment subsist (some countries consider the subsidy granted to market units in order to ensure certain categories of households to benefit from price reductions as a social benefit to households).

The measurement of the services of owner-occupied dwellings is treated by the report as one of the issues related to the application of the ESA. It concerns the harmonization of the evaluation methods, and will later be the topic of a decision of the commission (1995).

Discussions in the Committee about the delimitation of the economic territory of the Member States led to the decision (1991) that the distant areas of those

States [The Canary Islands, Ceuta and Melilla for Spain, The Azores and Madeira for Portugal, the Overseas Departments for France] should be integrated in the future to the economic territory covered by their national accounts. They had been left aside before, for simplification purposes.

2. The report understands the reliability of GNP measurement in the specific sense of the degree of accuracy of what is actually measured, while the present chapter of this book conceives of it in broader terms, and also includes the issue of completeness of the measurement (reliability is then considered in relation to what should be measured). “It is mainly those economic activities carried out under conditions compatible with the legal obligations which are concerned by this notion [of reliability]” (p. 22). It is with this point of view that the report, restricted to a qualitative approach, characterizes broadly the methods and the sources.

On the compilation process, the report starts by examining the relation between the estimates for current years and for benchmark years. Three groups of countries are identified. In the first one, current estimates are fairly independent of the estimates made in the base year, although with noticeable differences among countries. In Ireland and the United Kingdom, the low level of integration of the methods of compilation of annual accounts (without detailed reconciliation in the current year, a policy that later will be changed in the United Kingdom) allows the incorporation of new statistical sources as soon as they become available, which is followed with a recalculation of the series. Germany and Luxembourg combine extrapolation for some of the accounts with assessment of levels for others. In Denmark and France, estimates for current year are fairly independent of the base. The Netherlands strongly favors continuity of series; however a large part of the value added of the industries is calculated in terms of levels for current years.

In a second group of countries (Spain, Italy), estimates are strongly dependent on a base year that is recent, using trend indicators that extrapolate base-year estimates; in Italy, in most branches, value added is calculated by multiplying unit value added by the number of work units within the branch.

In a third group (Greece and Portugal), the bulk of estimates refer to an old base year and extrapolations from an old benchmark year are widely done. These two countries will promptly commit to drastic transformations of their accounts. This will also later be the case for Belgium (national accounting is transferred to the Central Bank) that has never created the conditions for a true development of its national statistical office.

The issue of reliability is still seen from the perspective of the plurality of approaches used: three (Belgium, France, United Kingdom), two – that is, output and expenditure, with reconciliation of estimates within an IOT framework (Denmark, Spain, Italy, the Netherlands, Portugal) as France does, while in Germany this reconciliation is done at the aggregate level – or only one approach (production for Greece at the time and Luxembourg; income mostly in Ireland).

Regarding the statistical sources, the report underlines in particular the problem of the follow-up of statistical units belonging to the universe of non-financial enterprises. Clear distinction is made between countries where a permanent central directory of statistical units is available (Denmark, France, Luxembourg, the Netherlands), or a complete fiscal source on profits (the United Kingdom, Ireland), and the others where a census of local production units is carried out at the same time as the population census (Germany), a census of manufacturing (Greece, Spain, Portugal before setting up a register of statistical units), or periodic censuses of establishments (Italy). France is the only country where statisticians have access to individual micro-accounting data attached to the enterprises' income tax declarations (returns). The development of national business registers and the extension of statistics on market services are identified as priorities for improving the accuracy of the estimates (p. 37).

3. In the report, the exhaustiveness of the measurement of GNP is essentially considered "from the point of view of the black economy" (p. 29). The latter is viewed as covering non-declared but licit activities (under-statement of production or income by properly registered units; clandestine production units, relying on hidden labor).

The report summarizes the practices followed by countries in order to take explicitly or implicitly into account the black economy. Except for Denmark, Germany and Luxembourg, Member States implement some adjustments because of fraud (concealment) and tax avoidance (non-declaration, licit below a certain level). In most cases they are specific adjustments (tips, income of liberal professions or trade). A systematic rectification is done in the Italian accounts (a businessman's income in small businesses estimated as being at least equal to the average wage of employees in similar enterprises) and in the French accounts (using the results of systematic verification realized by the revenue authorities).

Corrections are made to include the use of hidden labor, either systematically (Italy from employment identified through population censuses or labor force surveys), or for some specific activities in a large number of member countries.

Part of fiscal fraud and black labor may be covered implicitly in the accounts when the expenditure approach gives higher results than the income or the production approaches. In the United Kingdom, an "evasion adjustment" is calculated from the difference between GNP estimated via the expenditure approach and the sum of income of factors observed. This adjustment is added to the latter to measure GNP according to income.

For the future, the report proposes the improvement in the exhaustiveness of GNP as an important line of action for improvement of the accounts of the member countries. Suggestions aim at inciting countries to implement, according to their national particularities, the best practices used in other countries, in particular the results of fiscal controls and the systematic comparison of employment as measured by censuses and general household surveys and employment derived from producers surveys.

A new series of inventories has been launched at the end of 1999, based this time on the 1995 ESA. It should cover 15 member countries, as well as Iceland and Norway. The format adopted by the GNP committee is as follows:

Standard Structure for GNP Inventories (1995 ESA)
Table of contents

Chapter 1. Overview of the system of accounts
Chapter 2. The production approach
Chapter 3. The income approach
Chapter 4. The expenditure approach
Chapter 5. The balancing or integration procedure and validating the estimates
Chapter 6. The revision policy and the timetable for revising and finalising the estimates
Chapter 7. The transition from GDP to GNI
Chapter 8. The transition from GDP to GNP (1979 ESA definitions)
Chapter 9. Overview of the allowances for exhaustiveness
Chapter 10. Main classifications used
Chapter 11. Main data sources used

As in the previous inventories, the study is based on GDP. The former description of the transition from GDP to GNP is replaced by two items: first, the transition from GDP to GNI, a primary income aggregate that in the 1993 SNA/1995 ESA has replaced the old GNP prior to the 1968 SNA/1970 ESA; second, the transition from GDP to GNP (1979 ESA definitions). The last element comes from legal and political constraints that make difficult the simple – and logical – immediate substitution of the term GNI for the term GNP in the Community legislation.

It is interesting to underline that, in the texts concerning the fourth resource of the European Communities, the difficulty introduced by the reference to GNP in 1988, is due to a vagueness of the 1968 SNA/1970 ESA, that did not include the concept of GNP but had not replaced it by that of GNI (gross national income). As European policy makers wanted to retain the contents of the expression GNP, and not GDP, in order to include in the "taxable" basis of each member country the compensation of employees and the income from property and enterprises received from abroad, and to exclude the flows of this type paid to the rest of the world, they had to use the term GNP. From there, the GNP Committee and the GNP Inventories and not the GNI Committee, etc.

And, as no one wants to change immediately the Community texts for 1988–1989, so as to avoid opening basic political discussions, the 1979 ESA remains for the time being the reference in this case, and with it, the GNP according to the 1979 ESA definitions!

The situation normalizes later on. Beginning in January 2002, and thus before the inventories 2002, the base for the establishment of “own resources”, GNP is defined as GNI following the 1995 ESA (in the case in which changes in the 1995 ESA would entail changes in GNI, the Council will decide whether they apply the establishment of “own resources”). On July 21, 2003, the GNP Committee becomes the GNI Committee.

PART IV

Concepts and Economic Theory

Chapter 6

Production, Value and Welfare

A. Controversies surrounding government activities

Contents

Chapters 2 to 4 focused on the operational character of national accounting viewed as a technique to record flows and stocks of economic value in a system encompassing all economic transactors in a coherent way. The often formal nature of the solutions that have been adopted was observed. From there, one should not conclude, however, that the representations and the results provided are necessarily arbitrary. In any case, the significance of the results is not conditioned by the accounting construct alone. It largely depends on the contents given to the principal basic concepts, such as production, income, consumption and accumulation.

To each of these notions, it is possible to associate various types of empirical observations: wheat is grown on a farm, an employee receives a wage, a child eats a slice of bread, a manufacturer buys some machinery, etc. Such empirical observations, although multiplied, juxtaposed and combined, cannot by themselves determine the content and significance of these concepts, neither at the microeconomic level, nor for the economy as a whole.

Beyond appearances, theoretical analyses look for significance. No national accounting scheme can be structured without reference to some theoretical constructs. Its main concepts – production, income, consumption and accumulation – proceed from very specific thinking, although, at the same time, they can be associated with one or various economic theories. Theoretical constructs essentially aim at giving a meaning to balancing items and major aggregates corresponding to these concepts. Accounting conventions, for their part, define their precise contours.

Box 41
The 1993 SNA concept of production

The 1993 SNA is immersed in the tradition of a broad concept of production. In contrast with the very empirical approach of the previous versions, it tries to rigorously base its choices for production, as an "[...] activity in which an enterprise [in a very general sense] uses inputs to produce outputs." There is no production as an economic activity unless outputs, goods or services, can be delivered or supplied to other units, either individually or collectively (§ 6.6), in exchange for a payment [that can be in kind] or without charge (§ 1.20). The SNA is thus based on the criterion of potential exchange and the possibility of the division of labor. The legal or illegal character of the activity is not taken into consideration (§§ 3.54, 6.30–6.33).

This general definition of the concept of economic production includes goods and services that the members of a household may provide to other members of this household (that is, the traditional household activities). However, the SNA then retains a more restricted scope for its central framework. It explains extensively (§§ 6.21, 6.22) why the estimate of services provided within households is not included in the central framework but placed in satellite accounts: relative independence and isolation of these activities from markets, the extreme difficulty in making economically meaningful assessments of their values (see later on, Box 50), the adverse effects on the usefulness of the accounts for current economic analysis and policies, induced ambiguity regarding the concept of an economically active person as the International Labor Organization (ILO) defines the latter by referring to production in the sense of the SNA. Finally thanks to this distinction between a general concept of production and the concept actually used in the central system, the SNA/ESA centrally retains the character of production as being a "socially organized economic activity" (formulation of the 1976 SECN, § 4.20), the subject of discussions and tensions of the economic and political life. As a consequence, GDP is defined in the SNA in such a way as to represent the aggregated value of the production of goods and services within the field of socially organized employment. Voluntary work in the framework of associations constitutes a borderline case. It is not included in the central framework GDP except in the case of communal construction by households, (1993 SNA, § 10.78). Nevertheless, nothing in principle prevents its inclusion within a complementary measurement of GDP implemented in the framework of a satellite account using the general definition of economic production of the SNA, as in the case of household services.

Services resulting from household activities are thus excluded from the central framework concept of production, but not goods produced in the same conditions. "When the amount of a good produced within households is believed to be quantitatively important in relation to the total supply of that good in the country, its production should be recorded." (1993 SNA, § 6.25). This conventional rule for goods, based on the implicit idea (1993 SNA, § 6.24) that goods are potentially more tradable than domestic services, only extends previous recommendations that tried in particular to cover the production and transformation of agricultural products, or other primary products for own final consumption (see 1968 SNA, §§ 6.19, 6.20) or for on own-account construction.

By retaining the criterion of potential exchange of the result of an activity for its general definition of production, the SNA excludes leisure (see later on, Box 51). The creation of a useful effect is a necessary, though not sufficient, condition to define a productive economic activity. On this basis, national accounts do not include externalities (positive or negative) in production, as by definition they are beyond the scope of exchanges (see Box 52).

Exchanges may also take place on goods that have not been produced. Production is a man-controlled activity, possibly associated with nature, but "a purely natural process, without any human involvement or direction is not production in an economic sense" (1993 SNA, § 6.15). So natural growth of a virgin forest, growth of the stocks of fish in international waters, all the more so, the constitution of hydrocarbons or other mineral deposits resulting from millennial processes

cont'd

Box 41 (cont'd)

are not production. Although the SNA does not derive from this rule all necessary consequences (see chapter 8), it does not entirely annex nature to the economy. Nevertheless, as soon as natural growth intervenes in an activity exercised under man's control and responsibility, it is part of production. The 1968 SNA had introduced this rule for livestock; the 1993 version extends it to all natural growth of cultivated natural assets, including therefore forests, of course with problems of boundary delimitations between cultivated and non-cultivated assets and difficulties associated with estimates.

The SNA has thus progressively specified its concept of production in relation to nature, to private life and to social norms (on illegal activities see chapter 7, p. 280, and Box 47, p. 281). It also specifies it in relation to time in two different ways. On the one hand, production takes place and must be recorded in principle during the production process itself, not at the time of its completion (1993 SNA, § 6.72). The concept of work-in-progress is thus generalized in the 1993 SNA, inclusively for agriculture (§§ 6.95–6.100) and for services (§ 6.73). On the other hand, the mere fact that products are being stored, the sole passing of time, does not represent a continuation of the production process, except if there is a maturation of the product (wine) or some regular seasonal changes in the conditions of supply and demand (§§ 6.107–6.109). This issue is different from that of the production of storage services (§ 6.104).

On the restricted versions of the concept of production, see chapter 1, pp. 11–13 (historic evolution), chapter 2, p. 44 (former CNF) and chapter 3, pp. 100–102 and pp. 124–126 (material product accounting system).

The relationships between economic theories and national accounts concepts are not simple. Some empiricist attitudes tend to grant them very little importance. As a matter of fact, from the 1950s to the 1970s, a period of strong economic growth and remarkable expansion of national accounting, there was almost no questioning at all. On the contrary, the 1940s and the beginning of the 1950s was a period of intense questioning regarding the interpretation of national income from the point of view of the neoclassical theory, essentially from the perspective of welfare. Later on, in the last decades of the century, the analyses are going to be both more extended and more pressing. This time, currents of purely theoretical nature are voiced, that tend to have national accounting depending heavily on standard economic theory and to underestimate the existing tensions between *ex post* observation and theoretical assumptions.

The four chapters that follow focus on the presentation of research and discussions that took place around the major conceptual issues.

The issue of the relationships between production, value and welfare is the topic of two chapters. The present chapter does not go back over the problem of choice between a narrow and a broad concept of production (see Box 41). It shows that, once this problem has been solved, the question of the activities of government raises numerous controversies regarding the combination of market and non-market values and particularly the analysis of indirect taxes.

Associated partly with these problems, but in a much wider context, conflicts of interpretation emerge – in terms of exchange values or in terms of welfare estimates – concerning the variables which national accounting measures or, for some views, should measure (chapter 7).

1. The accounting design

The explicit representation of a process of production associated to government, leading to the creation of non-market services (NMS), free or quasi-free of charge, is slow to emerge. The traditional national income approach leads to raising questions about which elements to include or not in national income in addition to private incomes or, later, to private consumption and capital formation expenditure. Measures of national income using the value added approach are exceptional and limited in the interwar period, sometimes on an additional basis, to certain activities.

Stone, in his 1945 memorandum – see the appendix of chapter 1 – does not use an accounting structure for government similar to that of productive enterprises, but rather one similar to that of persons. Therefore, there is no operating account, but a current expenditure and revenue account, which shows payments to factors of production, purchases of goods and services as well as transfers and direct and indirect taxes. Moreover, government is only viewed as a sub-sector of final consumers, under the expressive heading of "public collective providers". Thus at this stage, government is for him a sort of cooperative of common purchases by society, which includes the wages of employees, without any process of transformation, a treatment similar to that of food and other purchases by households for the preparation of meals. Government is a consumer or an agent for the consumers, for example in the organization of some services (the ambiguity of the concept is perceivable), rather than a producer.

The first Standardised System already departs from this design. Government constitutes a full-fledged sector and its contribution to value added is included in the distribution of GNP at factor cost among activities. However there is no detailed analysis of production in this version of the system. The elements of a production account for government are scattered in different tables.

The following version (1968 SNA/1970 ESA), which integrates input–output analysis, explicitly describes the process of production of government, especially the non-market one, though maintaining in its English wording a partially unsatisfactory terminology, which will be finally modified in the 1993 SNA (see chapter 3). However, only French national accounting (1976 SECN) goes, indeed, to the end of the idea, by explicitly calculating both a market and a non-market GDP, and by publishing separate balances, in addition to the global balance, for market GDP and its uses on one hand, for non-market GDP and its uses on the other (see Box 42). This originality will not live long, and the *Comptes et indicateurs économiques. Rapport sur les comptes de la nation 1999* (Accounts and Economic Indicators. Report on the 1999 Accounts of the Nation (*INSEE*

Box 42

The balances of market GDP and non-market GDP in the French 1976 SECN

The French 1976 SECN (see chapter 3) presents the supply and use balances of goods and services under three forms, first globally, then separately for market goods and services and for non-market services. The following tables ("Rapport sur les Comptes de la Nation 1978" [Report on the 1978 Accounts of the Nation], *Les collections de l'INSEE*, no. C72–73, Vol. III, p. 6, June 1979) show these results for 1971 and 1972.

Not surprisingly, the SECN authors, who broadened the concept of production in relation to the former French national accounts (see chapter 2), spontaneously imagined a presentation that had the advantage of showing the continuity between the former restricted definition and the new one, even though the new treatment of banks and insurance corporations extended the scope of market goods and services.

Beyond this peculiar circumstance, this type of presentation has the advantage of focusing on two essentially different forms of organization for the production activity. Structurally, the ratio of the share of GDP corresponding to each of these two components is a meaningful indicator. Here non-market GDP represents about 11% of total GDP for metropolitan France (the accounts of this period do not cover overseas departments – DOM) [NB: In the 1976 SECN, imputed rents are considered as market services, while the 1993 SNA treats them as non-market services]. This share is much higher for the DOM. In 1995 non-market regional GDP represents about 34% of total GDP in Guadeloupe and Martinique, 31% in Guyana (*Les Comptes économiques des départements français d'Amérique. Années 1993, 1994, 1995. Base 1995* [The Economic Accounts of the French Departments of America. Years 1993, 1994, 1995. 1995 Benchmark], INSEE Antilles–Guyana, November 1999). This ratio cannot be read as easily in other accounting presentations. It is then necessary to build it up, which requires that the necessary details be available.

The breakdown of non-market GDP by activity (education, health, etc.) provides very useful complementary structural information. It cannot be obtained from most results of national accounts published, insofar as the classification of activities that is used mixes for a given branch (education for example) market and non-market activities. Under the joint influence of the French national accountants and Eurostat (Vittorio Paretti in particular), the 1973 French classification of activities and products on the one hand, and the NACE/CLIO (derived, for the establishment of input–output tables, from the activity classification of the European Communities) used for the 1970 ESA on the other, distinguish systematically, when relevant, market and non-market activities, as well as market and non-market services.

This characteristic disappears from the 1990s classifications (1990 NACE, 1993 French activity classification). The 1993 SNA/1995 ESA consider that the distinction is not a matter of classification of activities but of their cross-classification with the main types of production (market production, production for own final use, other non-market production) that the new systems distinguish. On this point, the more directly integrating point of view defended by Paretti and Vanoli is not accepted.

The table reproduced here is also interesting for short-term analysis. The price indices of the market balance cover essentially the movement of market prices. It is not, by assumption, the same for those of non-market GDP and its uses, that essentially refer to the compensation of employees of government, variable for which it is particularly difficult to allocate the change in value between volume and price components while taking into account changes in productivity.

For this reason, the studies on the measurement of productivity changes are limited in general to market activities.

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Box 42 (cont'd)

Supply and use table for goods and services (Million francs)

	1971	1972			
	Values at current prices	Volume indices	Values at 1971 prices	Price indices	Values at current prices
Resources					
Gross Domestic Product	872,433	105.8	922,877	106.3	981,115
Imports	131,423	116.3	152,863	98.5	150,494
imports of goods	118,308	118.3	139,980	97.4	136,314
imports of services	13,115	105.9	13,883	102.1	14,180
Total	**1,003,856**	**107.2**	**1,075,740**	**105.2**	**1,131,609**
Uses					
Final consumption	645,703	105.3	679,769	106.3	722,518
Households	526,004	105.9	556,929	106.1	590,761
General government	117,326	102.6	120,417	107.2	129,094
Non-profit institutions	2,373	102.1	2,423	109.9	2,663
GFCF	205,929	107.1	220,641	105.2	232,048
Non financial corporations, quasi-corporations and unincorporated enterprises	117,767	106.0	124,780	104.8	130,820
General government	29,984	100.9	30,242	105.4	31,881
Non-profit institutions	616	114.1	703	99.3	698
Credit institutions and insurance enterprises	7,876	141.7	11,157	103.6	11,562
Households (excl. unincorporated enterprises)	49,686	108.2	53,759	106.2	57,087
Changes in inventories	12,772	136.4	17,417	105.5	18,379
Exports	139,452	113.2	157,913	100.5	158,664
Exports of goods	114,355	114.4	130,840	101.0	132,155
Exports of services	25,097	107.9	27,073	97.9	26,509
Total	**1,003,856**	**107.2**	**1,075,740**	**105.2**	**1,131,609**

cont'd

Résultats. Economie Générale, July 2000) that presents the application in France of the 1995 ESA, simply notes: "the distinction between market GDP and non-market GDP does not any longer exist" (p. 5).

2. To include or not to include?

This situation is not attributable though to a lack of insistence by economists and national accountants (Kuznets, Perroux for example) on the essential heterogeneity between the valuation using market prices and the valuation using costs, on which the estimation of non-market output is almost unavoidably based.

The allocation of resources and the use of production factors would be different

Box 42 (cont'd)

Supply and use table for market goods and services (Million francs)

	1971	1972			
	Values at current prices	Volume indices	Values at 1971 prices	Price indices	Values at current prices
Resources					
Market Gross Domestic Product	777,266	106.1	824,874	106.1	875,159
Residual sales	9,128	113.0	10,319	105.6	10,896
Imports	131,423	116.3	152,863	98.5	150,494
Total	**917,817**	**107.7**	**988,056**	**104.9**	**1,036,549**
Uses					
Intermediate consumption of general government non-market branches	39,602	103.7	41,063	105.2	43,199
Household final consumption	520,062	106.0	551,022	106.0	584,259
GFCF	205,929	107.1	220,641	105.2	232,048
Changes in inventories	12,772	136.4	17,417	105.5	18,379
Exports	139,452	113.2	157,913	100.5	158,664
Total	**917,817**	**107.7**	**988,056**	**104.9**	**1,036,549**

Supply and use table for non-market services (Million francs)

	1971	1972			
	Values at current prices	Volume indices	Values at 1971 prices	Price indices	Values at current prices
Supply					
Non-market Gross Domestic Product	95,167	103.0	98,003	108.1	105,956
Intermediate consumption of general government non-market branches	39,602	103.7	41,063	105.2	43,199
Less: Residual sales	–9,128	113.0	–10,319	105.6	–10,896
Total output of non-market services	**125,641**	**102.5**	**128,747**	**107.4**	**138,259**
Uses					
Household final consumption	5,942	99.4	5,907	110.1	6,502
General government final consumption	119,699	102.6	122,840	107.3	131,757
Total	**125,641**	**102.5**	**128,747**	**107.4**	**138,259**

if everything that does not go through the markets had to be organized according to their rules, even assuming that it always makes sense (which is not the case, for instance, for defense and justice). But, above all, the heterogeneity of the valuations fundamentally questions those, numerous in particular in the 1930s and 1940s, that try to interpret income or national product in the continuity of Arthur Cecil Pigou (*The Economics of Welfare*, 1920) as an indicator of welfare derived from the theory of consumers' choices.

John Hicks, Nobel Prize 1972, in "The valuation of the social income" (*Economica*, May 1940) clearly shows the dilemma that has, necessarily, to be faced. There are strong bases in favor of the position that would consist of entirely excluding public services from national income calculations, since they do not enter into the market mechanism (p. 115) [and as a consequence cannot be themselves the object of analysis in terms either of consumer preferences, or of combination of factors by businesses]. But, one must in this case be ready to understand economic welfare in a narrow sense and to restrict it to national income of private goods. If one is not satisfied with this limited scope, there is no other alternative than to suppose that public services are worth, for the society in general, at least what they cost, and therefore to admit that the choices of the authorities, even if expressed by a Nero or a Robespierre, represent the actual wants of society (*ibid*, p. 116).

Let us momentarily put aside the problematic of welfare (which will be discussed in chapter 7). Hicks evokes (*ibid*, p. 115) a solution that would make it possible to include the free services, while excluding them in fact from consumption. It would consist of considering these services as subsidized to the extent of 100% of their costs, and, therefore, as finally recorded at a zero (market) price for consumers. In terms of the 1968/1993 SNA (see chapter 3), one would say that they are assigned a positive basic price, equal to the sum of the costs, and a zero purchasers' price for the users. Such an artifice would be equivalent to restrict welfare to national income from private goods, precisely what one wanted to avoid. By "subsidizing" all the supply of some goods and services, in order to encourage their availability for consumers, or for some of them, one would achieve paradoxically, in this setting, their total exclusion from the measurement of consumption!

One can note, in parentheses, that without using the expression, Hicks introduces the notion of "consumption subsidies" that will be present recurrently in several ulterior discussions and that will rebound – without a satisfactory solution – at the time of the preparation of the 1993 SNA. It will be evoked, then, in an opposite perspective. "Since, will it be said, the SNA includes within final consumption and GDP a good or a service produced by government and provided free or almost free of charge to final consumers for a value equal to the sum of its costs, why then, when government partially subsidizes market producers instead of producing itself, is the value corresponding to the part of the market costs covered by a subsidy excluded from the estimation of final consumption?" (see Box 43).

Box 43
The issue of "consumption subsidies"

The issue of "consumption subsidies" occupies a noteworthy place in the discussions by national accountants during the 1970s and especially 1980s (it was at that time formulated in this manner), mostly in the European Economic Community. However similar discussions also take place among statisticians of countries following the MPS, as well as in the framework of the SNA/MPS comparisons, and also in various developing countries where, during these decades, the subsidies to some products of mass consumption take a considerable importance. Once again, the combination of market and non-market values is at stake.

The core of the problem results from the fact that, in order to achieve a similar objective of support to household final consumption, in terms of public expenditure, the government has the choice between several forms of intervention:

1. To buy some market products and to provide them free or almost free of charge to households;
2. To subsidize those market products so that their prices are reduced for final consumers;
3. To produce itself on a non-market basis the corresponding goods and services and provide them free or almost free of charge to households;

Or finally, but the effect is less direct and the corresponding products remain unspecified:

4. To give the same amount of cash to households. They are free to buy what they want (the assumption here is that these households have a marginal propensity to consume equal to 1).

Forms 1, 3 and 4 have an analogous effect on GDP at market prices. In terms of the 1993 SNA/1995 ESA, in 1 and 3 there is a final consumption expenditure of government, followed by a social transfer in kind from government to households; in 4, a transfer in cash to households, and a final consumption expenditure by households. In contrast, if form 2 of intervention is followed, GDP at market prices is lower by an amount equivalent to the value of subsidies on products, as their effect is to reduce purchasers' prices.

This lack of invariance was disturbing, especially as it appeared when making detailed comparisons between EEC member countries, as treatments followed in quite similar cases were sometimes different from country to country. A classical case refers to that of payments to transportation enterprises, either of a general type, as is the case of payments to urban transportation, or of a specific type, as those that go to railroads in order to compensate for reduced fares granted to certain categories of travelers. Some countries treated them as subsidies to transportation enterprises (form 2), others as cash transfers to households, which were supposed to pay then the complete fare (analogy with form 4, but with predetermined choice), with differing effects on GDP at market prices.

Although the debate often dealt with other questions too, it ended up concentrating on the comparison of forms 2 (subsidy) and 3 (production on a non-market basis). Indeed (see in this chapter Hicks and Bowley 1940, pp. 248–251), form 3 can be viewed in an analogical manner as a 100% subsidy. From this stems the dilemma: if one subsidizes a product 100% (form 3), 100% of its value in terms of costs enters final consumption and GDP; in contrast, if one subsidizes 40% of a product (form 2), only 60% of its costs is recorded as final consumption and GDP. In the USSR and countries under analogous regime, a most perturbing case was that of rents of dwellings, whose fixed "price" often covered only a tenth of the corresponding costs.

The discussion crystallized in the year and a half separating the group of experts meeting on SNA/MPS relationships (Moscow, December 1989) and that of the Expert Group in Harare (April 1991), after the one in Washington (December 1990). Marked often by very divergent views, on the side of SNA experts as on the side of MPS experts, in December 1990 it was possible to sketch a compromise that would have consisted of treating, in some cases, the given expenditures of government no longer as subsidies (form 2) but as final consumption expenditure of government, as if the latter had bought a part (of the value) of the products (analogy with form 1). Then a

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Box 43 (cont'd)

social transfer in kind from government to households, according to the new SNA drafting, would have permitted for 100% of the value (of the costs) of the products in question to be recorded as actual household consumption.

It was still necessary to determine, at least in general terms, in which cases to proceed in this manner. In April 1991, the Expert Group was not able to come to an agreement and the previous December compromise did not translate into decision. On this point the previous system was maintained.

It is true that, by its nature, the problem was very difficult to solve. Should this treatment cover only the payments of government in favor of particular groups of the population (a position mostly supported in Europe, and defended in particular by Heinrich Lützel), or also those that had a general character, as is the case of subsidies for some basic staple foods in many developing countries – bread was a typical case in Morocco and in Tunisia? Did the solution only apply to those payments that directly reduce consumption prices (subsidies at the final stage) or, in some cases, also to upstream interventions made for the benefit of final consumers (the case of agricultural products, in particular meat, in the USSR)? How should some situations be treated where government covered a considerable deficit of railroads for example (the case of the Pakistani railways with notably more than half of the costs covered by government was mentioned), but globally for all types of transportation (passengers and freight)?

In any case, the question could not have an absolute answer. The debate grew partly obscure, especially because of some Eastern European statisticians who argued that subsidies granted by government were often financed by indirect taxes levied on other products. The double-counting issue thus came up again, although doubly irrelevant. On the one hand, because subsidies, a component of global public budgets, can be financed through any type of revenue, except the case of taxes designated for a particular use. In the case of developing countries, this financing might be provided, among others, by foreign aid or by loans. On the other hand and above all because the general debate had already reached a conclusion, since the SNA admits from the beginning the addition of non-market value added and final demand to market GDP at market prices in order to get total GDP at market price. To reinterpret payments of form 2 according to a broadened version of form 1 would not have required to devise any new principle.

Anyhow, there is no such thing as an absolute value of GDP at market prices, since this amount depends in part on public choices between various forms of intervention of government. The proposition to treat some form 2 interventions in the same way as those of form 1, in order to reduce the heterogeneity of the measurement of GDP depending on whether form 2 or form 3 is used, aimed at limiting the variability of total GDP according to institutional differences considered as secondary. In an internal note to the Expert Group ("A Note on the 'Subsidy' Issue", December 15, 1989), Lazlo Drechsler, a Hungarian national accounts expert, at the time a UN staff member, had wisely presented the decision as a choice of opportunity rather than a general issue. The use of the proposed method would be recommended in particularly meaningful cases, when proceeding this way would provide a structure by product of household actual consumption more representative of the relative importance of the various goods and services.

Having closed the door, after a truly poorly prepared discussion, the Expert Group concluded that "Outside the integrated system, there should be a supplementary table in which actual final consumption will be shown with a different valuation that includes the value of consumption subsidies" (§ 27 of the conclusions of the Harare meeting). But it seems that such a table was not prepared anywhere.

If interest no longer focuses on the structure of final consumption associated with consumers' behavior and thus under the constraint of purchasers' prices for market products, but on the structure considered this time from the point of view of resources (labor and capital) used, it is possible to

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Box 43 (cont'd)

think of establishing a table in which all final consumption is valued at basic prices. It thus avoids the use of the more rigorous but more sophisticated valuation at factor "cost" ("incomes") (see Box 45).

The 1995 ESA departs from the 1993 SNA in the treatment of certain flows relating to the issue of "consumption subsidies". It includes as social assistance benefits in kind (item D.6313 of the classification of transactions) social benefits provided to households by government concerning "social housing, dwelling allowance, day nurseries, professional training, reductions on transport prices (provided that there is a social purpose) and similar goods and services in the context of social risks or needs" (last part of § 4.105). The list of these risks and needs, as for example sickness, old age, housing, general neediness, is provided in the ESA, § 4.84. Government expenditures covered by item D.6313 are first treated as purchases by government and go into government final consumption expenditure, and not in subsidies. Then, in the redistribution of income in kind account, the value of these goods and services is transferred to households as social transfers in kind (D.63). It enters then into household actual consumption.

Apparently, nobody entirely follows the solution imagined, but not recommended, by Hicks in 1940. It is followed however, but only in part, by A.L. Bowley, who in 1940 (see Hicks, *ibid.*, p. 117) distinguishes the part of public services financed by direct taxes from the one financed by indirect taxes. He considers the former as a cooperative purchase of certain public services (an idea to be found again in Stone 1945), estimated by the corresponding expenditure (cost), and the latter as subsidized up to 100% and therefore at a zero price. Hicks easily shows that national income thus obtained includes in principle an element which is wholly arbitrary since the government does not use two separate cashboxes.

3. Is there any double-counting?

Here is, then, via Bowley's solution, the type of taxes now questioned. In fact the debate, already initiated two decades earlier, which is going to intensify in the 1940s and the early 1950s, refers alternatively or at the same time to the mode of financing for free or almost free public services, to the nature and destination of these services, and to the definition and interpretation of the aggregates.

The famous problem of a possible double-counting in the aggregation of market and non-market values is then set down. Its discussion occupies an important place in this period. Simplifying, the thesis of the double-counting says that as the revenues of government come from charges imposed on market activities or on the incomes derived from them, a given amount is counted twice when, in order to measure national product, one adds to the product of private activities at market prices the value of public activities measured by their costs.

The topic of double-counting may lead to at least two interpretations. According to the first one, value is only created by market activity, since public activity is financed by charges on the former. As a consequence, there is no non-market production and therefore government is only a final consumer. Without keeping this premise, Stone retains the consequence in his 1945 accounting treatment (see chapter 1 and its appendix). But he does not go so far as to say, as was the case later on of the French national accounts of the 1950s, that the civil servants' wages are redistribution transfers. Civil servants are in his scheme of that time, although not explicitly, (market) producers of labor services.

In the second interpretation, the existence of a value for the production of free or almost free public services is accepted. But total national product should not be obtained by adding the value of market activities at market prices and the value of non-market activities at cost. From this total amount, something must be deducted.

The debate is going to turn frequently around the question of indirect taxes (net of subsidies). Unfortunately, discussions become often very complex because they directly concern an aggregate, called national income or national product, essentially measured using the income approach in the absence of a complete and rigorous accounting framework. The clarifying vocabulary "market/non-market" introduced in an anticipated way in the above paragraphs, in order to simplify the presentation, was not in use at the time.

Until Pigou, indirect taxes are not included in national income, either mechanically, because the latter is traditionally compiled from income received by individuals and enterprises, before direct taxes and transfers from government, but after indirect taxes that are not qualified as incomes for enterprises, or on the basis of first fragile attempts at argumentation (Edwin Cannan 1919, Bowley 1922). Pigou (*op. cit*, First Part, Chapter III, p. 41) says that it is necessary to include them, or at least most of them, as long as they increase the prices and do not entail a decrease of production. It is required in order to correctly measure the evolution of real income using price indices. The argument is strong. Clark rallies to this position in 1937.

An implication of Pigou's solution, that he does not make explicit, is that all, or nearly all, free or almost free services provided by government are treated as final uses. Indeed, its national dividend, a name that following Marshall he uses for national income or for national product, is equivalent to the net national product (NNP) at market prices of the future international systems. He anticipates a difficulty however while evoking in a note (p. 42) the possible replacement of a service bought by businesses by an identical free service financed through businesses' income tax. Monetary income increases in that case (the businesses' income before taxes increases), although real income remains unchanged (prices, income after taxes and transfers do not change). And Pigou correctly suggests, in fact, with a different formulation, to deduct from the calculation of income the cost of any service provided to businesses, either free or for a fee, as long as, if it were for a fee, it would be treated as intermediate consumption. A correct intuition indeed that, had it been developed then, would have avoided a lot of difficulties.

The NBER since 1921, then Kuznets, will start effectively with the idea that government provides both intermediate services to market producers and final services to individuals. However, they will, for both theoretical and practical reasons, confuse the question considerably. First, government is viewed following the model of market enterprises. It sells its services that are paid for in the form of taxes. Total taxes measure, therefore, the value of its production, not total costs. Government may have a surplus or a deficit, as ordinary enterprises do. Obviously, the correspondence between taxes paid and services received does not apply at the micro level, but at that of some global values. It could even not be assumed at the level of total intermediate services and total final services, but only globally. If actual services were allocated between these two types, for example, on the basis of corresponding costs, a set of implicit transfers between taxpayers and recipients of services would appear.

Unfortunately, as allocating services of government between these two major types of use seems then impossible, it is decided to assimilate the total of taxes paid by enterprises (direct as well as indirect, net of subsidies) to intermediate consumption of government non-market services, and the total of direct taxes paid by households to final consumption of government non-market services. This solution, fully inadequate, muddles national income thus calculated with an arbitrary component. Besides, in the absence of any simultaneous evaluation using both the income approach and the expenditure approach, and although national income must be equal to final expenditure of the economy, a mistake is committed then in perceiving the consequences of these assumptions on the actual calculation of national income. The latter is measured indeed by the sum of payments to factors after payment of all taxes by enterprises and before payment of direct taxes by households, which appears at first sight coherent with the premises (according to the terminology introduced later, this national income is equal to national income at factor cost less direct taxes on enterprises).

But a relevant accounting scheme for government would have shown that this formula excluded from the market final uses of the economy and therefore from national income, the uses of the possible excess of taxes over costs ("the surplus" of government) not used for the repayment of the public debt. In fact, in the accounts of government: total taxes – total costs of non-market services = transfers + net capital formation – debt changes. In other words, government surplus = household consumption financed by government transfers + government net capital formation – debt changes. In the case of costs greater than taxes, national income was overestimated by the amount of the "deficit" of government financed by debt changes.

Kuznets rectifies this mistake in his 1941 master publication: *National Income and its Composition, 1919–1938*. While keeping the same assumptions as before on the measure of total production of government and its two main uses, he modifies the previous calculation formula of national income by including the transfers to households in the payments to factors and by taking into account net capital formation less the change in the government debt. Ten years later he will even pretend, but it is an illusion, that he had only retained in 1941 the assumption of the equivalence between direct taxes on households and services provided to them.

In his 1951 paper, "Government product and national income", Kuznets adopts the measurement of non-market services through their costs and supposes – because he now thinks that it is possible – that a distribution between intermediate services and final services provided by government is done. He starts from incomes coming from production (*income shares*) after deduction of all taxes (indirect or direct). He speculates upon what has to be added, or possibly subtracted, following various scenarios. Kuznets cross-classifies types of use of public funds (expenditure on goods and services, transfers to businesses or to households, transfers to the rest of the world) and forms of financing (indirect taxes, direct taxes on enterprises, direct taxes on households, other non inflationary sources, in particular loans, other inflationary sources), taking into account, when applicable, the destination of expenditure on goods and services (the provision of intermediate services or services to final consumers, or net capital formation). The complexity of his procedure is easy to imagine! Here Kuznets gives his readers a headache.

It is simpler to read the equivalent of his findings in a paper by Gottfried Haberler and Everett E. Hagen written in 1943–44 and published in 1946 (Kuznets indicates that his approach and his findings are similar to theirs) under the title "Taxes, government expenditures and national income". Two of their formulas are especially illustrative. One (definition 4 p. 7) indicates that national income is equal to the sum of the incomes of enterprises and households, once all taxes have been paid to and all transfers received from government, *plus* government services to final consumers, *plus* government net capital formation, *less* net debt changes. The other (definition 7 p. 10) shows that national income is equal to the sum of *1)* payments to factors of production (it does not include transfers) before direct taxes – that is what is usually called value added at factor cost –, *plus 2)* indirect taxes (net of subsidies), *less 3)* intermediate services provided by government.

Terms 1 and 2 of the second quoted formula are Pigou's formula, the one that Clark (1937), Meade and Stone (1941), Gilbert and the US official services (1942), Hicks (1942) and then the Standardised Systems are going to keep for the aggregate "at market prices", and which implies the allocation of all government non-market output to final uses. When comparing this income or product at market prices with the second quoted formula of Haberler and Hagen, in its entirety, it is easy to see that the case under dispute is about the treatment of intermediate services provided free of charge by government to market producers (see Box 44). There lies, in effect, the essence of the problem of double-counting, and not in the inclusion itself of such or such type of taxes, since there is no *a priori* reason for intermediate consumption of non-market services by market producers to be equal either to the sum of net indirect taxes or to the sum of both these and direct taxes on businesses.

4. Measuring at factor cost?

To resolve the difficulties created by the heterogeneity between market prices and the valuation by costs, Hicks (1940) proposes a double approach. On the one hand, when he is interested in welfare, he tries to interpret the costs of government as significant from the point of view of social choices (see above and later) and liable to be aggregated to market values. On the other hand, when he aims at measuring productivity changes (in 1942, "On factor cost", appendix F of *The Social Framework*, pp. 268–269, he will rather insist on the distribution of resources among uses), he prefers to look at market production also from the cost side: "why not to value all goods at cost"? (p. 119). In 1940, the term "factor cost" is still implicit for him. Factor cost, applied only to labor in a wide sense, is an expression of Keynes in the *General Theory* (see the beginning of his Chapter III). Keynes extends it later as for instance in *The Economic Journal* (March 1940, pp. 60–65); he insists on the current value at factor cost of private consumption and crosses swords with Clark and his inclusion of indirect taxes: "Thus there is a misleading suggestion that taxes, provided they are indirect, are part of our national physical resources" (p. 62). The last words of this quotation, strange by themselves, reflect the worries of wartime.

The aggregates at factor cost dominate the 1941 British accounts (Meade and Stone). Net national income, net national output and net national expenditure, are presented, first of all, at factor cost. Net national income at market prices timidly appears in the last table. Stone and the sub-committee of the League of Nations (1945) still give pre-eminence to the three approaches at factor cost, but rebalance in favor of product and expenditure at market prices (see chapter 1).

The Americans, as opposed to the British, show reluctance at the idea of aggregates of national product and expenditure at factor cost. Since 1942, the US accounts give preference to product and expenditure, both concepts gross and at market prices, that are better adapted in their view to the study of public expenditure; only national income is expressed at factor cost in 1947, when direct taxes on enterprises are reintroduced. But the concept of factor cost is hardly appealing for most Americans, neither by its terminology, they prefer to speak of "*income shares*" (Kuznets) or of payments to factors (Haberler and Hagen, Carl S. Shoup, Richard Ruggles), nor by its content,

Box 44

To adjust National Income/GDP for intermediate consumption of non-market services by market producers?

With the exception of some attempts by a few scholars, only the German official publication of 1932 and the Swedish publication of 1937 (Lindahl *et alii*) have, at the cost of numerous conventions, broken down government services between final and intermediate uses within the framework of complete estimates of national income. Hicks, totally skeptical in 1940 on the possibility of such a distribution, changes his mind in 1948 (*Economica*, August), under his wife's (the economist Ursula Hicks) influence. Kuznets, also a pessimist himself in 1941, becomes confident (*Economica*, February 1948), but he has a very broad conception of services provided as intermediate (see section 3 of the present chapter) that Hicks, Haberler and Hagen do not share.

Differing from its predecessors, the 1993 SNA/1995 ESA takes a significant, but insufficient, step in the direction of a more complete analysis and treatment of government non-market services. They are kept within government final consumption expenditure, but a break down is then done between individual services provided to households (as social transfers in kind, they complete the redistribution of income and go into household actual consumption) and other services. Unfortunately, the latter are all included in the collective consumption of government. The SNA recognizes that they are too broad in scope, since they also include services for which it seems difficult to distinguish the part provided to final consumers and the one that goes to producers. But it does not say what should be done if the allocation were finally done. Would Haberler and Hagen, Kuznets and Hicks, be followed in the measure of product and income, and, if that is the case, how would the accounts be adjusted?

To begin with, is it necessary in fact to adjust them? Indeed, few attempts have been done to justify as a principle the treatment of all government non-market output as final uses. In their answer to Kuznets, at the time of the controversy raised by the publication of the new US official accounts in 1947, Gilbert, Jaszi, Denison and Schwartz mention the fact that government, as households, is a final purchaser who "does not buy to resell on the market" (*The Review of Economics and Statistics*, August 1948). This is an ill-founded position that corresponds, as in Stone 1945, to treating government as households: no production, only final purchases of goods and services, including services of civil servants. Americans then go farther than Stone: there is no government capital formation, only current purchases. In this conception, there is no value added by government, but a value added by employees who provide it with the service of labor factor. Regarding Stone, in brief passages (1945, 1951), he maintains that there is no problem of global adjustment, but at most different distributions of the same total, in order to reassign for example the services associated to transportation provided to enterprises free of charge, to goods and services acquired by households in the production of which the services in question have been used (see end of Box 45).

To have a clearer look, the principle of invariance formulated by Haberler and Hagen in their 1946 paper ("Taxes, Government Expenditures and National Income", p. 5) can be called upon: "the measure of *real* (i.e. deflated) national income should be invariant to all purely institutional, monetary and price changes". Let us suppose that at time 2, non-market services provided to households at time 1 are reduced, in order to increase the non-market services provided to market enterprises, by an amount equivalent to N, for instance, under the form of surveillance of their environment against theft, and the output of these enterprises is not modified, other things being equal. To simplify, risks of theft are assumed not to exist at time 1, while at time 2 such risks have appeared but have not materialized thanks to the surveillance provided. Haberler and Hagen would say that real product is reduced by N, since the non-market services provided to households decrease by N in volume, while the volume of market output remains unchanged. This reflects a decrease of the productivity of the market sector since more factors are actually used to get the same result. On the contrary the SNA, continuing to classify in final uses the services now

cont'd

Box 44 (cont'd)

provided to enterprises, calculates a domestic product at market prices that remains unmodified both in current value and in volume.

Let us suppose alternatively that at time 2 government reduces its output of non-market services by the same amount N, freeing factors of production by an amount N which are directly used by enterprises, and compensates the rise of their costs by a subsidy of N in order to avoid the increase of their prices or the decrease of their incomes. In Haberler and Hagen or Kuznets' view, the effect on product or real income is the same as in the previous case. The SNA, this time, is also going to record a decrease of real product by an amount N equal to the value of the reduction in the output of non-market services. So Haberler, etc., measure in an invariant way the change in real income between time 1 and the two alternative situations at time 2, which only differ in terms of institutional organization, while the SNA does not meet the test, since it provides two different results for the change in real income.

The tradition of Haberler and Hagen (1946), Kuznets (1951) and Hicks (1948), etc. is right against that of Gilbert, Stone, and of the SNA. GDP at market prices, as it is currently compiled, should be reduced by the amount of intermediate consumption of non-market services by market producers. A full treatment in the framework of the SNA supposes that, after recording this additional intermediate consumption, a subsidy in kind on the *market products* of the producers concerned compensates the increase of both output and costs at basic prices, so that value added at basic prices (in the sense of the 1993 SNA) remains unchanged. Then GDP is calculated with a smaller amount of taxes net of subsidies on products.

As it does not go all the way down into this problem, the 1993 SNA has left a strong ambiguity. It has not held on its original purpose not to mix principles and empirical conventions. It would have been necessary to say that, in principle, non-market goods or services produced by government could be subject to uses of three types: individualizable final use in actual consumption by household (see chapter 3), individualizable intermediate use in intermediate consumption by producers, essentially by market producers, and finally collective use, non-individualizable by nature, and constituting a collective consumption by society as a whole. The presentation as government actual final consumption is a matter of convenience from a practical point of view, but does not mean at all that government itself is the consumer of these services. It should have been indicated though, that, at this stage in the evolution of national accounting, agreement had temporarily been made not to separate out the intermediate consumption of non-market services, due to the lack of instruments to differentiate it for the time being from uses of similar services by households (notably services of transportation infrastructures). As a consequence, collective consumption had been overestimated by amounts that actually should not appear there.

It was unfortunate not to show that in principle, non-market services should be allocated to households (as final consumption) or to producers (as intermediate consumption) depending on who would buy them if they were not provided free of charge by government, and therefore became market services. As a matter of principle, collective consumption should only cover non-market services that could not be provided individually on a market basis to producers or to households; that means, for example, that jail services would remain in collective consumption, even if they were produced by market enterprises and sold to government. By providing these explanations, the problem would have been clarified; it is often confused because the question is wrongly stated. It is not a matter of identifying who finally benefits from such or such part of "final consumption expenditure", but who would acquire these goods or services in the market if the government gave up providing them for free.

In defense of the Expert Group, it must be said that the topic was only discussed late, and in an incidental manner, when trying to specify the content of social transfers in kind. Neither chapter 6 of this book, nor Box 44 were available then! Only a short room-document by Vanoli was available, which sketched a complete technical solution of the accounting treatment indicated above.

because value at factor cost (before deduction of direct taxes) does not look at all clear to them, influenced as it is, in their view, by the structure of the tax system. Haberler and Hagen note that national income at factor cost is "decidedly inferior" and cannot meet their invariance test (p. 16). Haberler and Hagen, as well as Kuznets, prefer to start from net incomes (all taxes being deducted) and from there to look for the best aggregate, simultaneously for product and income, that they consider to be a single one and in fact at market prices, but after intermediate consumption of non-market services is deducted (see above).

The concept of aggregate at factor cost has, nevertheless, its period of glory. For Stone (1945), NNI at factor cost is "the true net output of all branches of activity" (p. 36). And for Studenski, ten years later, "national income at factor cost is the true objective of all national income estimates" (*The Income of Nations*, p. 173). The underlying idea seems to be that the value at factor cost is the true economic value, and that the rest is a disruptive superstructure. Frisch does not agree: for him there are not two different methods of assessment of output or income but several components of the value of output (Aukrust 1994). In contrast, Ohlsson (1953) is obviously impressed. It is because he follows Hicks's idea of two specific measures, one for welfare, the other for productivity, an idea that Kuznets rejects (1948), as he defends the uniqueness of the aggregate in these two perspectives.

Initially, the idea of measuring value added of enterprises and industries and their respective contributions, independently from any indirect tax system structure, is a correct intuition. However, the expression "factor cost" is unfortunate, as is its use for major aggregates such as output, income and expenditure. The relevance of the term "cost" is often objected for business income. The cost of capital, as defined in theory, does not correspond to the actual capital and entrepreneurial income; rather it is an important criterion for their evaluation. In fact, the use of "cost" can also be questioned in the case of labor as, in a perspective of the dynamics of production and market, the compensation of labor constitutes *ex post* a result as much as a cost. An aggregate at factor cost at constant prices evidently does not measure the volume of factor inputs, but the volume of outputs of goods and services as indicated by Haberler and Hagen (*op. cit.*, p. 16).

At current prices, the major inconvenience of values at factor cost is that in general they do not correspond, for market goods and services, to the amounts effectively paid by users. Tables of expenditure, those of Meade and Stone for example, that show the values of components at market prices and then globally deduct indirect taxes net of subsidies constitute only a presentation device. They reveal an accounting system still incompletely integrated.

Hicks (*The Social Framework*, 1942) is aware of these difficulties. He explores the implications of completely integrated treatments. How to reconcile prices effectively paid by consumers and prices received by producers? Since government, by imposing indirect taxes, does not make tax revenues come out of thin air, there are only two solutions. Either recording is totally at market prices: indirect taxes enter into business receipts, then into their income account with the profits, and they are transferred from there to government with direct taxes. That does not make much sense, since businesses are only collecting these taxes. Or recording is completely at factor cost. Indirect taxes do not go through business accounts. They are treated as direct taxes, coming from the consumers' income and outlay account while, in this same account, final consumption is measured at factor cost. Indirect taxes possibly levied on investment, government purchases and exports evidently complicate the picture, and bring into play the capital account and the external account (*ibid.*, pp. 172–175, 241–242).

In spite of his initial interest for the concept of factor cost, Stone does not follow Hicks in either of these two directions. Indirect taxes are transferred by the operating account (1945) or the production accounts (first Normalised System) of enterprises. They do not become quasi-factor costs (government being considered then like an "invisible shareholder" of the enterprises). Furthermore, in his accounting framework, expenditure is at market prices, and indirect taxes do not become a kind of direct tax paid by final consumers.

Later, due to Stone's work, the 1968 SNA (see in the present book chapter 3, in particular Box 18) takes a decisive step in distinguishing among indirect taxes, taxes on products – those that are proportional to the quantity or to the value of products – and others; as well as among subsidies those that are on products and others, and in introducing the notion of basic prices. Value at basic prices is obtained by deducting from market prices only taxes on products, net of subsidies. However the latter still enter the production accounts of industries where output is valued at producers' prices, including taxes. The ESA (1979) second edition makes a decisive break by excluding VAT from the value added of industries. The 1993 SNA, preferred version – as it leaves open the 1968 solution in case the evaluation is impossible – and the 1995 ESA completely clear the way. The output of industries is recorded at basic prices, net of all taxes and subsidies on products. It is not at market prices in the traditional sense, because of what it excludes, nor at factor cost, because of what it does not exclude (other taxes on production), but the aggregates, either of product, income or expenditure are at market prices, all taxes less subsidies on products being included.

These treatments reconcile almost antagonistic points of view that divided national account compilers. Uses of products are recorded at purchasers' prices (including non-deductible taxes and deducting subsidies on products), that is, at the actual prices on the basis of which users make their choices. It is the "true" economic value in the sense that relative prices – which are essentially those that interest the economists – are the relative prices of acquisition, established through markets, not the relative "factor costs" that consumers ignore.

On the other hand, output by industries and by products is recorded at basic prices. Like the old value at factor cost, it avoids distortions among the value added of various industries due to differential taxes on products (net of subsidies) and represents an adequate value to compare productivities and to measure their changes. Besides, it is an actual transaction price, net of taxes less subsidies on products, observable in markets. Relative basic prices also constitute a true economic value – it is the one that counts in the eyes of producers – but in a position that may viewed as subordinated, because it is not directly perceived by users except in the absence of non-deductible taxes, subsidies, and trade and transport margins.

Finally, value added at basic prices, the difference between output at basic prices and intermediate consumption at purchasers' prices, although it can be aggregated over industries as a whole, does not pretend to compete with GDP at market prices as an aggregate. Frisch on this point was right: it is a part of GDP, not an alternative way to measure it. From that point of view, it is characteristic of the 1993 SNA, when it introduces, for particular analytical purposes, IOT where uses of goods and services are valued at basic prices (the structure of these uses is then closer to that of underlying physical flows), to show separately taxes less subsidies on products so that GDP can always be measured in the same way (Box 22, section 8). At the end of the 20th century, the logic of presentation of IOT's at purchasers' prices is to breakdown every cell of the use matrix into the components of value at purchasers' price (value at basic price, non-deductible taxes on products, subsidies on products, trade and transport margins) [see Box 22, section 5].

But then, if net taxes on products do not come from the production of industries but are nevertheless a part of GDP, do they come "out of thin air" or does government produce them? None of them. The interpretation that results from the 1993 SNA is that general government imposes a component of the purchasers' prices and charges it directly on transactions (exchanges). This component does not enter into the value added of any industry, even though businesses serve as collecting agents. Such a conclusion probably embarrasses some national accountants still attached to a tradition in which value added is calculated for every industry at market prices including indirect taxes. The introduction of the tax on value added (VAT) or more generally of taxes including mechanisms of deductibility has clearly shown that such a way leads nowhere. Even earlier, J.L. Nicholson, for example, considered ("National income at factor cost or market prices?" 1955, p. 222) that "any detailed allocation of indirect taxes by industries is bound to be very arbitrary", and that besides, there is no need to estimate the contribution of each industry at market prices.

The example of custom duties is illuminating. Their accounting treatment was a matter of some hesitation in the past. Was it a value levied on the producers of the supplying countries? However, no sovereignty was exercised on these by the government of the importing country. Was it rather necessary to include it in the value added of the importing country trade industry? But this solution, quite often used, was arbitrary. At the end, in general, they were kept apart, even when the value added of industries was calculated at market prices, and were added finally to total value added to obtain GDP.

Indirect taxes that do not have the character of taxes on products, that is the other taxes on production in the sense of the 1993 SNA, are recorded within the value added of industries because, as they are proportional neither to the quantity, nor to the sale price of the concerned products, they cannot be separately invoiced to purchasers and remain included in the value of the output of industries. Their impact on the relative purchasers' prices of the products is not direct, but is passed on through total costs (similar reasoning for other subsidies on products).

In the perspective of the 1993 SNA, net taxes on production and imports constitute a primary income, not a transfer. The primary income concept is thus broader than that of "factor income". To such taxes, it is not possible to associate the supply of a "government factor", although such an interpretation has sometimes been proposed. As the incomes of labor and capital are valued before income taxes, income taxes constitute transfers that are taken into account in the secondary distribution of income. In contrast, from this viewpoint, taxes on production and exchanges do not appear like a mechanism of redistribution of primary incomes.

The explanations of the previous paragraph can pose a problem to the economists who sometimes analyze indirect taxes in the context of redistribution. The alternative solution, that would include all taxes in the redistribution process, would consist of treating them all as direct taxes, following then the second solution analyzed by Hicks in 1942 (see above). But then, final demand must be valued "at factor incomes" and not at "market prices" as would also be the case for all other aggregates. All the difficulties raised by the concept of aggregate "at factor cost" (the expression "factor incomes" is only, from that point of view, a more satisfactory wording with fewer connotations) are again met. In particular, contact with relative purchasers' prices is lost, as they include non-deductible taxes (less subsidies), which play an essential role in all analysis of consumers' choices. All national accounting in terms of market prices vanishes.

The accounting construct of the 1993 SNA is an elegant way to escape from the Hicks dilemma (1942) without falling into the traps that each of his solutions would convey. It raises, nevertheless, some subtle questions of interpretation. The debate is most probably not closed (on the global issue, see Box 45).

Box 45

Market Prices and Factor Cost (incomes): a synthetic presentation of the main alternatives

The developments of this chapter tried to follow, not in all their details but along their main stages and various perspectives, the evolution of the viewpoints regarding the problems that have been analyzed. The synoptic table on p. 263, prepared for homogeneous presentation purposes, summarizes the main alternatives that have been either proposed or applied as regards the treatment of net indirect taxes (taxes less subsidies on production and imports, in the sense of the 1993 SNA). These alternatives refer to an essential problem of valuation concerning the relative importance given to values at market prices and values at factor cost.

This table presents only the elements required for the proper understanding of the problem. The term "net" means: "less subsidies". No specification is given for Domestic Product whether it is gross or net of consumption of fixed capital, as the issue does not have a specific bearing in this context. For simplification purposes, in the solutions of the first two columns, it is assumed that net taxes on imports transit through value added of industries at market prices and follow exactly the same circuit as indirect taxes in general. The most usual terminology "indirect taxes"/"direct taxes" has been used. In the same way the expression "factor cost", more frequent in national accounting work, has been used without recalling each time that the formulation "factor incomes" seemed preferable to some authors and the 1968 SNA.

The four solutions that are described are set into a simplified accounting scheme in four steps inspired from the 1993 SNA. Obviously, such a presentation is not to be found originally in any of the analyses, in particular in Hicks (1942).

The first and fourth solutions have been presented as a dilemma by Hicks in *The Social Framework* (1942) when he examines what accounting scheme can avoid indirect taxes coming seemingly out of thin air. His first solution is to be found on p. 241 of his book, his second one (column 4) on p. 242.

With the top part of the table it is possible to compare the contents of value added of industries, according to three concepts (market prices, basic prices and factor cost) of different magnitude, as well as domestic product, either at market prices, or at factor cost. To facilitate the reading, each column shows equivalent blocks that do not necessarily correspond to the form of presentation used in the original versions. For instance, neither the accounting framework of the 1993 SNA, nor that of the 1968 SNA include the concept of value added at factor cost, although it can be found in some chapters. Other example, Hicks in 1942 does not distinguish indirect taxes on products from the others, a distinction introduced in the 1968 SNA.

Regarding basic questions, the table makes possible to revisit, more synthetically, some aspects of the last century debates.

The treatment at factor cost (incomes) in the fourth solution corresponds to an application of the theory of production according to which production results from the combination of factors of production (labor and capital, the latter corresponding, in general, only to produced capital – equipment –, but the debate on non-produced factors of production can be disregarded here). The value of output – value added once aggregation is done – results from the productivity of these factors. It is in this perspective (see for instance Stone, Studenski, p. 258 of the present chapter) that value added, domestic product or national income at factor cost is often viewed as constituting the true economic value, that is the one that is created by the factors of production (primary ones, as in a short-term perspective, non-human produced capital can be included among them). These factor incomes are rightly measured before direct taxes, since the decisions of production and the combinations of factors by enterprises cannot be made on the basis of after tax values, as the latter are unknown to them. In this approach, indirect taxes are analyzed like a mechanism of income redistribution, of the same type as direct taxes, to be recorded in a similar way. Taxes (net, direct and indirect) are used to redistribute the incomes of factors between economic transactors and to

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Box 45 (cont'd)

finance public non-market services. The logic leads then, as Hicks shows in his second solution of 1942, to record final demand at factor cost. Therefore, everything here is recorded right through at factor cost.

Market price and factor (income) cost: Simplified accounting scheme with alternative treatments for indirect taxes

	Accounts at market prices			Accounts at factor cost (Incomes) Hicks 1942, sol. 2
	Hicks 1942, sol. 1	1968 SNA	1993 SNA/1995 ESA	
Value added and domestic product	**VA at f.c.** + other net indirect taxes	**VA at f.c.** + other net indirect taxes	**VA at f.c.** + other net indirect taxes	**VA at f.c.**
			= VA at basic prices	
	+ net indirect taxes on products	+ net indirect taxes on products	+ net indirect taxes on products	
	= VA at m.p.	**= VA at m.p.**		
	Domestic product m.p.	DP m.p.	DP m.p.	DP f.c.
Primary distribution	Factor incomes	Factor incomes	Factor incomes	Factor incomes
	[............]	[............]	[............]	(labor, property and enterprise)
	net indirect taxes remaining in enterprise income	net indirect taxes going to general gvmt (primary allocation of VA at m.p.)	net indirect taxes going to general gvmt – on products (orig.: market exchanges) – others (orig.: primary allocation of VA at b.p.)	
Secondary distribution	in transfers to general government:	in transfers to general government:	in transfers to general government:	in transfers to general government:
	direct taxes	direct taxes	direct taxes	direct taxes
	net indirect taxes			net indirect taxes
	(as direct taxes on enterprises			(as direct taxes on final users)
	Disposable income for final demand at m.p. (purchasers’ price)	Disposable income for final demand at m.p. (purchasers’ price)	Disposable income for final demand at m.p. (purchasers’ price)	Disposable income for final demand at factor cost
Use of income	Final demand at m.p. (purchasers’ price)	Final demand at m.p. (purchasers’ price)	Final demand at m.p. (purchasers’ price)	Final demand at factor cost
	Net lending/ Net borrowing	Net lending/ Net borrowing	Net lending/ Net borrowing	Net lending/ Net borrowing

cont'd

Box 45 (cont'd)

The first solution touched upon then by Hicks – and of which he indicates (note 1 p. 241) that he never found it in practice, and indeed it seems never to have been applied – is interesting as far as it permits testing an interpretation, also coherent through and through, but at market prices, that is, totally opposite from the previous one. This interpretation would consist in saying that indirect taxes also come from the productivity of factors, which would be measured not by incomes before direct taxes but by incomes before all taxes (indirect and direct).

Although Hicks does not explicitly make clear such a possible implication, he suggests it indirectly while saying that this solution is equivalent to considering government as "an invisible shareholder" of the enterprises that are paying taxes (p. 241). This hypothesis would suppose that government provides to the enterprises a factor of production as capital does. But it is difficult to understand why the contribution of this possible factor of production to each business would be measured by an arbitrary amount of indirect taxes.

Another interpretation of solution 1, which is followed in the table above, would correspond to treating indirect taxes as direct taxes on enterprises. It would say that they are levied on primary factor incomes, which contain indirect as well as direct taxes. Such a position is difficult to sustain, however, because again there is no way to explain how the productivity of factors used in tobacco, alcoholic beverages, or refined oil products industries would be so high in relation to the productivity of similar factors used in other activities.

The treatment in terms of market prices, from the beginning to the end, does not obviously hold in face of the treatment in which all flows are expressed consistently at factor cost. But why then, under these conditions, has national accounting distanced itself from this solution instead of getting closer to it? It is because it presents four major drawbacks:

1. Demand measured at factor cost does not correspond to the actual monetary expenditure as it is observed and perceived by the economic transactors.
2. Final demand at factor costs, different from final demand at purchasers' prices (non deductible net taxes included), does not respect relative purchasers' prices, which are the basis of the decision-making process of economic transactors.
3. Intermediate demand at factor cost does not correspond either to the relative purchasers' prices of intermediate products to which enterprises are exposed, as soon as indirect taxes do not consist solely in fully deductible taxes on products, (this is, in particular, not the case in France for the domestic tax on refined petroleum products).
4. Accounting for production and use of goods and services at factor cost additionally requires a sophisticated methodology. The issue may seem simple at the global level. Global final demand at factor cost is thus obtained by subtracting from the global final demand at market prices (purchasers' prices) total indirect taxes net of subsidies. This is what the Meade and Stone (*op. cit.* 1941) tables and many others did. But when entering in the detailed analysis by industry and by product, it appeared that to be coherently at factor cost, it was necessary to eliminate from the value of each cell at purchasers' price of the underlying detailed table all indirect, net, directly or indirectly payable taxes. In other words, it was necessary to value each cell by the sole amount of the accumulated factor costs, that is the true factor value, according to Stone's terminology used in the 1968 SNA (see Box 18, item 5 of the diagram).

To overcome at once the difficulties of the first and fourth solutions of the synoptic table, national accounting moved then in a way that led to the treatment finally adopted in the 1993 SNA/1995 ESA, after the essential stage for the analysis of the valuation of goods and services represented by the 1968 SNA (see the present chapter, chapter 3, and boxes 18 and 22). This treatment corresponds to a compromise that remains in the spirit of Hick's 1940 paper. It tries to reconcile, in an integrated framework, an analysis of production very close to the fourth column of the table (but with specifications of output at basic prices and intermediate consumption at purchasers' prices, including net non-deductible taxes, a valuation procedure closer to actual observation and variables

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Box 45 (cont'd)

intervening in decision making regarding production than the corresponding magnitudes estimated "at true factor value") and an analysis of demand corresponding to actual purchasers' prices, the market prices for the users on which basis they make their choices. The SNA lets specific types of input–output analyses take care, if so wished, of refining the estimate of all flows at factor cost or factor incomes.

Such a reconciliation is made possible due to the double negative determination that (non-deductible) taxes net of subsidies on products are not a component of value added of industries, and that they do not constitute either a transfer from the economic transactors who are final users. If one admits that the latter make their choices according to the prices to which they are confronted, the relationship among market prices, including non-deductible net taxes, represent for them the true relationship of the economic values of goods and services. (The *gabelle* – the infamous tax on salt levied in Europe – would be analyzed differently. As this vital consumption, essentially non-elastic, was abusively charged, and even subject to compulsory purchases, the *gabelle* had the character of a tax on income.)

A possible interpretation of Hick's second solution would consist in recording net indirect taxes, not within the secondary redistribution stage, but in that of use of income (Hicks was reasoning indeed with an undifferentiated income and outlay account). The taxes in question would then be a use in the use of income account, going from there to government. Sometimes one can read that such a solution would permit to have final demand both at market prices and at factor cost, since all components would be there. Hicks 1942 (p. 242), who, as was usual in those days, argues essentially in terms of aggregates and components of aggregates, does not seem to note that it would be a trick. As soon as net indirect taxes are directly transferred from users to government, either from a use of income account or from a secondary distribution account, final demand enters into the goods and services accounts with its value at factor cost, and no longer at purchasers' prices.

Complementary remarks about government non-market services

In all the treatments described in the table, value added at factor cost (explicit or implicit) covers the factors used in the market economy as well as in the government non-market economy. The main text of the chapter analyses the problem of the non-market services provided by government to market producers in the case where GDP is measured at market prices. It would be necessary in principle to subtract from the total market GDP at market prices + non-market value added at factor cost (incomes) the value of non-market services used as intermediate consumption by market producers (see Box 44).

In the full treatment at factor cost (last column), the possible existence of such uses of non-market services has no impact on total domestic product at factor cost. As value added is measured at factor cost, it is, from this point of view, invariant, as well as the value of market GDP at factor cost and the value of non-market GDP at factor cost. The possible intermediate consumption of non-market services only results, under these conditions, in the fact that the value of output and final uses of market goods and services using non-market services as intermediate consumption is increased while the value of final uses of non-market services is reduced accordingly. It is in this sense that one must understand Stone's remarks (1945, 1951) arguing that there is no global adjustment to make for intermediate consumption of non-market services – see Box 44. Stone is then reasoning implicitly at factor cost.

5. Interest on the public debt and national income compilation

Of more restricted scope, the issue of interest on the public debt, in relation to the compilation of national income, has also troubled economists and compilers of national income. Is interest on the public debt a part of national income, or is it a transfer? The question, formulated originally in these terms, has often led to rather confused answers. Here again the absence of a complete and rigorous accounting framework did not help the analysis. No one was wondering whether interest on the public debt was a cost to be integrated into the value of non-market services, since the concept of production of non-market services by government had still not clearly emerged. Although Studenski, in his book published in 1958, regrets government services not being more completely evaluated and analyzed, he still defines them as "composed of both the personal services of employees and the goods and services government purchases from business including net government capital formation" (p. 195), echoing then what others before him, with variants in relation to this enumeration, qualified as "government final product". Concerning interest, questions arose generally in relationship to business and household income, valued in various forms, in order to decide whether it was necessary, given the case, to leave it in or to put it in, or, on the contrary, to exclude it altogether in order to compile national income.

The question, in fact, is whether interest on the public debt originated in any production process, but without an explicit analysis of the process of production of government. This is why very rapidly, an answer is looked for in the distinction between interest on the productive public debt and interest on the unproductive public debt, or in analogous terms between productive and unproductive interest. Financing of deficits related to the big crisis and even more to the World Wars is on everyone's mind. The part of the debt that is used to constitute productive assets used in current activity is considered as productive, the rest is not. The former one is sometimes approximately assessed by the interest on the local public debt, while the interest on the central government debt – considered as the result of the financing of the war, etc. – is excluded (British white books of the 1940s). But there are more radical choices. Beginning with 1947, the US official evaluations exclude all interest, while before they included all (their new treatment leads however to a correct global result, see last paragraph of Box 7). According to Studenski (1958, p. 280) nearly all countries then exclude the interest on the public debt. Interest on consumer debt follows the fate of unproductive interest on the public debt. Stone (1945) keeps the distinction between productive debt (interest is then included in the payment to production factors and in national income), and unproductive debt (interest is excluded and constitutes transfers). Perceiving, without expressing it explicitly, the conceptual difficulty of this treatment as transfer (Hicks criticizes it in 1942), Stone presents an alternative solution consisting of analyzing unproductive debt similarly to consumer debt, which does not lead to an increase in national wealth but to financial assets and liabilities generating interest recorded as negative or positive property income and balanced, with the exception of the relations with the rest of the world. An ingenious solution, leading to the same result as that of Hicks, though uneasiness is still noticeable.

In fact, from the beginning, the problem is not adequately formulated. Haberler and Hagen (1946), followed by Shoup (1947), clarify it considerably.

Measurement of the services of public capital and payments of interest by government should not be mixed up. The former are a component of production costs of government non-market services. As soon as public facilities exist and are used this way, whether they have been financed by taxes or by loans is irrelevant. Its depreciation and an imputed interest on its net value (implicit reference to the opportunity cost of immobilized capital) have to be included in the costs of government – as a substitute of the direct measurement of the services they provide.

At first it is a well-received message. Kuznets (1951), Ohlsson (1953), and more timidly the first Standardised System go in this direction. The latter chooses a partial solution, since it restricts it to the introduction of an imputed rent for public buildings occupied by civil administrative services and does not impute either interest, or depreciation for equipment, roads and other means of communication belonging to government. For reasons more practical than theoretical, such a recording of an imputed rent is not taken up by the 1968 SNA. The preparation of the 1993 SNA reopens the debate. In terms of imputed rents of administrative buildings, it comes to a sudden end. In more general terms, in the logic of Haberler and Hagen, the proposition to estimate an imputed interest on the immobilized capital in public assets does not find acceptance either. Fears of practical difficulties, uneasiness with imputations lead thus to keep an unsatisfactory solution in the 1993 SNA/1995 ESA, that underestimates the value of non-market output and does not clarify the limit between issues of principle and conventions based on empirical considerations.

5.1. Nature of interest in the SNA

Regarding the interest on the public debt, since the first Standardised System, it is totally recorded as property income as any other interest. The way opened by Hicks and Stone's variant is therefore followed. Contrary to Hicks position however (*The Social Framework*, p. 134, 138), the identity product/income is maintained for an open economy by keeping a national product that, and this is different from what is done in the case of domestic product, treats factor incomes (including interest) exchanged with the rest of the world as if they were some value added. Hicks does not approve this *de facto* extension of the concept of production by Meade and Stone. The 1968 SNA is going to side with him, and GNP disappears from its accounting framework. Only GDP and national income are kept. National income appears still timidly in the 1968 SNA as the sum of factor incomes (the expression factor cost disappears) but national income at market prices appears. The latter is the only one that remains in the 1993 SNA/1995 ESA. When it is compiled gross, it corresponds to the former GNP, but it is truly a concept of income, not a concept of production or of value added.

By defining national income as a primary income concept, the 1993 SNA highlights the original nature of interest. It considers interest as a primary income and by no means a transfer, since it is the counterpart for a creditor of putting a sum of money at the disposal of a debtor. By clearly distinguishing the primary distribution of income from redistribution in the sequence of accounts – following in this the 1964 "Propositions pour un cadre Communautaire de Comptabilité Nationale" (Propositions for a National Accounting Framework for the European Communities), the System eliminates the ambiguity that for a long time obscured the concept of transfer.

For example, the former French National Accounting (CNF) wavers in this respect. The 1952 Principles adopt a broad notion of services including labor and credit. Wages and interest are then transactions on goods and services. But the first published accounts (1955) change direction completely. Perhaps because of reservations concerning the neoclassical theory of income distribution as well as of Marxist influences, there is a denial to make the wage paid be the measure of the service provided by the worker. An extensive concept of transfers is then adopted, including wages, interest and even dividends (about similar views by Frisch and Aukrust, who qualified the income of financial capital as a transfer, see Box 25, section 3). A stream of criticisms emerges as soon as the March 1956 meeting of the Commission des Comptes (Commission of Accounts) (see chapter 2). Jean Marczewski, Pierre Le Brun, François Perroux and the "Methods" subcommittee are against this position. The following volume of *Méthodes* (National Accounts Methodology) (1960) takes a step backwards. The concept of transfer is then restricted to transactions without a quid pro quo.

The debate on interest has traditionally been set in too narrow a framework. A current flow was either a transaction on goods and services, or the remuneration of a factor of production actually involved in production, or a transfer. From this came the uneasiness felt about the interest on consumer debt or on the unproductive public debt. However, once again, interest remunerates the fact that a creditor has put a sum of money at the disposal of a debtor, irrespective of the destination of this money, and the origin of the resources used to pay interest (as value added resulting from production, as primary income derived from this value added or a transfer). On the other hand, its specificity leads to avoid making interest the payment of a service, in the common understanding of the term (a new proposal of this type by Preetom S. Sunga in 1984 has not been accepted). Finally, interest still needs to be recognized as a category of primary income, in its own right, positive for the creditor, negative for the debtor.

Outlook

Issues covered in this chapter are extensively discussed in the period that precedes and then sees the emergence of national accounting in the twentieth century; an emergence concomitant, and not by the whims of fate, with the enormous extension of the role of government and the scope of its transactions.

The description of government and its actions in national accounts takes however a long time to be clarified. In the traditional compilation of national income, centered on private incomes, government actions are disruptive. They do not fit well, either, in the categories of economists, used to thinking in terms of market producers, even though the adjective itself is not used explicitly, and with workers/consumers in the framework of market-type exchanges, or with simplifying categories of labor and capital.

Many would willingly see it as transparent, as a fund playing a role of redistribution between producers and the various categories of consumers, but government intervenes too much. It also organizes services for people (education for example), on a lesser scale for producers (economic organization and infrastructure) and, more extensively, for society as a whole with the development of properly governmental functions, due to wars, crises and the increasing complexity of numerically larger societies (defense, police, justice, international relations).

In order to include government within the newborn accounting framework, alternatively it will be assimilated to market enterprises (Kuznets) or, in the other extreme, to consumers (in Stone's mid-1940s proposals). Since neither one nor the other of these views hold up to analysis, the creation of a third pole is accepted. But first, and for many people for a long time, with a simplified trilogy: producers–consumers–government, the latter being centered on regulation and redistribution, in the framework of three pure economic functions. Then, in a more elaborate and more institutional form, although still inspired by the previous functions, comes the trinity: enterprises (implicitly: market)–households–government.

It can be noted, by the way, that in this scheme financial institutions are themselves badly treated. Even though Stone in his memorandum of 1945, Copeland in the USA, or Gruson and the SEEF in France discern the specificity of the financial pole, national accounts in many countries will only slowly introduce these institutions in a specific manner and this also generally concerns the financial accounts. Not to make things easy, government itself exercises, in many countries and for rather long periods of time, an important function in the financing of the economy.

Progressively, and it is clarified in the 1968 SNA/1970 ESA, the production activity of government is recognized and recorded as such. Non-market production (implicitly: of government though the non-market concept is broader, see chapter 7, section 2) becomes explicitly the second form of organization of productive activities, market production being the first one. However, the combination of these two types of activity in national accounting had been the subject of intense discussions in the past, even before that the terminology market/non-market was retained (later in English than in French for the SNA, simultaneously for the ESA).

No national accountant of the 1940s and 1950s had possibly escaped the famous question: "Is there any double-counting in the aggregate of product at market prices?" Whereas the actual question was to know whether government provided services to market producers that should be recorded as intermediate consumption (see particularly Box 44). This question clarified from time to time, as early as in the 1940s, has been mixed-up again, indeed not made explicit in the 1993 SNA, and finally not solved in practice.

Often mingled, but not reducible to the previous question, is the existing alternative between value at market prices and value at factor cost, the latter being considered by many in the beginning as the fundamental economic value (cf. Stone, Studenski), a view challenged by others (Frisch, the US national accountants).

The expression "factor cost" itself, that covers the income of labor, property and enterprise before direct taxes and other transfers, is inconvenient. It might derive from the theoretical idea that, except for situations where "pure profit" appears, the whole product amounts to costs of physical factors of production (labor and capital). This idea is formulated in the framework of perfect competition, where entrepreneurs are submitted to an existing price system. However national accounting, which must reflect the institutions of the real world, cannot *a priori* suppose that the strict conditions on which this theory is based do materialize in practice. For national accounting, as for business accounting, operating surplus is an *ex post* result which tax authorities and shareholders carefully examine. That does not prevent analysts from rightly scrutinizing if the rate of remuneration of capital (in its financial meaning) invested in an enterprise is lower, equal or greater than the rate of return considered on average normal for the activity under scrutiny or for the economy as a whole.

As, thanks to Stone, the 1968 SNA introduces the concept of "basic prices", national accounting is able to escape this terminology trap, even though it is still used marginally here and there.

Theoretical analysis does not etch the term "factor cost" in marble either. The model on which growth accounting and productivity estimates are based, as it develops throughout the century, progressively reasons in terms of labor services and capital (understood as fixed assets) services. In the user cost of capital that is used to aggregate physical services of various types of fixed assets (see chapter 8, Box 56), the interest on immobilized capital (own or borrowed) is an auxiliary variable that serves to assign a price to the physical services of these stocks of assets.

This evolution of the analytic approaches will generate ambiguity in the interpretation of *ex post* national accounts results (see at the end of Box 56 certain proposals that emerge at the beginning of the 21st century).

The problems of interpretation are linked to the ambivalence of the expression "factor of production". It is used both in a concrete, physical sense (concerning capital: "equipment goods", generally speaking, tangible or intangible), and also in the sense of an abstract economic value (the financial capital, giving to this qualifier a very broad significance) [see chapter 7, Box 65]. Whether used in the two meanings or reserved to the first one, the basic problem of economic theory and social philosophy remains regarding the relationship between the interest of the invested capital seen under the angle of the physical productivity of the concrete "capital" production factor and the remuneration of the financial capital considered from the point of view of "*waiting*" as financial investment income.

The historical analysis of the discussion around the treatment in national accounting of interest on the public debt, with the one-time distinction in this context between productive debt and unproductive debt, provides a meaningful illustration of this problematic and facilitates the understanding of the treatment finally given to interest (on lent/borrowed funds) in national accounting (see the text of the present chapter).

While going from the old expression of "factor cost" to the more convenient one of "factor incomes" (Frisch, Aukrust and the 1968 SNA), national accounting tries to remove the ambiguity attached to "cost". But then the ambiguity of "factors" still remains. The 1993 SNA no longer introduces any of them in its framework, even though they are not completely excluded from its drafting. They are replaced de facto by the broader expression of "primary incomes" (incomes that are not transfers). When they are detailed in its classification of transaction, as in the previous versions of the normalized system, more empirical and institutional formulations such as "compensation of employees" and "property income" (previously, "property and entrepreneurial income") are used.

Words count. In this context, their choices reflect tensions that exist between the concepts of theoretical analyses and those of statistical and accounting observation and their constraints.

Annotated bibliography

For references to Stone 1945, see chapter 1, p. 30; for references to the normalized systems and the French systems, see chapters 2 and 3.

Chapter 7 "The Government Sector" (pp. 231–288) of Carl S. Shoup's book, *Principles of National Income Analysis* (Houghton Mifflin Company, the Riverside Press, Cambridge, 1947) presents an excellent general analysis of the treatment of government. More generally, this manual makes a clear and rigorous presentation of the state of the questions shortly after the end of the war, when the process of international normalization is barely underway.

On government, Shoup is in line with Gottfried Haberler and Everett E. Hagen's 1943–1944 paper, "Taxes, government expenditures, and national income" (*Studies in Income and Wealth*, National Bureau of Economic Research, Vol. VIII, pp. 1–31, 1946). Using their test of invariance, the authors formulate seven equivalent definitions of national income, that they compare then to the views of other authors (summaries of and references to J.C. Stamp, Edwin Cannan, Hugh Dalton, A.L. Bowley, A.C. Pigou, Colin Clark, J.R. Hicks, S. Kuznets, etc., pp. 10–22), including those that concretely analyzed the nature of government activities (see p. 13).

By Simon Kuznets, besides the references in chapter 1, see the article "National Income" (*Encyclopedia of the Social Sciences*, Vol. XI, pp. 205–224, 1933;

reprinted in William Fellner and B.F. Halley, *Readings in the Theory of Income Distribution*, The Blackiston Company, 1946, pp. 3–43). In 1941, he publishes *National Income and its Composition, 1919–1938*, (National Bureau of Economic Research, 2 volumes), and in 1951 "Government Product and National Income" (*Income and Wealth*, Series I, Bowes and Bowes, Cambridge). The first chapter of the 1941 paper (The Concept of National Income) has been published in French as "Le revenu national" [National Income] (*L'Actualité économique et financière à l'étranger*, June 1946, pp. 27–52). This publication includes an initial text by François Perroux, "Introduction: l'évaluation du revenu national et la politique économique quantitative" [Introduction: the assessment of national income and quantitative economic policy], pp. 3–24 [reprinted in *Les Comptes de la nation* [The Accounts of the Nation], PUF 1949, pp. 59–113]. Of the same author "L'évaluation du revenu national et ses utilisations" [Assessment of national income and its uses), in *Le Revenu national. Son calcul et sa signification* [(National Income. Its Compilation and Significance] (PUF 1947, pp. 3–168).

References to Pigou, *The Economics of Welfare* (1920) are according to the 4th edition (Macmillan, 1932; reprint, 1948).

For an American critical view of the concept of national income at factor cost, see Haberler and Hagen, pp. 16–17. The uniqueness in the measure of the aggregate is defended by Kuznets arguing against Hicks in "On the valuation of social income. Reflections on Professor Hick's article" (*Economica*, May 1948, pp. 116–131). For references to Aukrust, see chapter 1; for references to Ohlsson, see chapter 4.

A critical view with regard to the concept of national income at factor cost is also expressed, in opposition to the dominant British position, by the English statistician J.L. Nicholson in a very incisive paper "National income at factor cost or market prices" (*The Economic Journal*, June 1955, pp. 216–224). He also prefers to speak of "factor rewards" or "factor incomes" rather than of factor cost which he considers a false label.

John Hicks's publication, *The Social Framework* (Oxford University Press, 1942), an introduction to economics based on national accounting, discusses numerous questions debated at that time.

On the interest on the public debt see in particular Kuznets (1933, p. 13), Hicks (1942, pp. 157–158), Haberler and Hagen (1946, pp. 22–24), Perroux (1946, pp. 16–17; 1947, pp. 46–48), Shoup (1947, pp. 280–285), Studenski (1958, pp. 181, 280–283), Stone (1945, pp. 72–73).

The proposal to impute an interest on immobilized capital for government assets has only been supported, in the Expert Group that prepared the 1993 SNA, by Carson and Vanoli. The alternative proposed by Preetom S. Sunga for the treatment of interest as services is to be found in "An alternative to current treatment of interest as transfer in the United Nations and Canadian system of national accounts" (*The Review of Income and Wealth*, December 1984, pp. 385–402).

Chapter 7

Production, Value and Welfare

B. National accounting and welfare

Contents

Does national income or national product provide a measure of welfare, or at least of its evolution? Indeed, can it do so? For nearly two and a half centuries, whatever the reason, the question does not seem to have been asked, either because concerns were different, notably that of measuring the nations' economic strength, or because the relationship between income and standard of living was regarded as self-evident, or finally because exchange values, measured through prices and the object of economic analysis, were considered as completely different from use values, linked to the utilization of goods. That could no longer be the case once the utility theory set the relationship between preferences and prices at the core of the analysis.

1. National income and changes in welfare: the search for a rigorous demonstration

Still implicit in Marshall (*Principles of Economics*, 1890), the question is explicitly formulated by Pigou (*The Economics of Welfare*, 1920); for him, the "national dividend" is the objective counterpart of economic welfare, which is, following the famous formula (p. 11), "that part of social welfare that can be brought directly or indirectly into relation with the measuring-rod of money". Kuznets follows this approach: National Income = National Product = Indicator of economic welfare.

Attempts to answer the question will follow two distinct, although often entangled, paths. One is centered on the interpretation of market values, in the strict framework of utility theory, the other on the analysis of the final objectives pursued by economic activity. Pigou and Hicks especially illustrate the first approach, Kuznets the second one. Curiously, as he anticipates some difficulties, Pigou suggests, as a natural solution, estimating changes in the national dividend, if it were possible, in reference to some objective physical unit – since, for him, the dividend is something objective, consisting of a set of goods and services – irrespective of what people may have in mind about these goods. He does not mean to say that changes in public tastes do not have any influence on the size of national dividend, but that the latter – once its objective components have been defined – depends on these alone and by no means on the state of tastes (*ibid.*, p. 50). Kuznets echoes this view ("National Income", 1933, pp. 15–16) by suggesting the possible substitution of the economic bases of assessment by physical standards derived from other sciences (energy units, labor units, for example). Perroux ("Le revenu national" [National Income], 1946, p. 11; "*Les comptes de la nation*" [The Accounts of the Nation], 1949, p. 80) also suggests the assumption of physical units, which would be characteristic of certain effects viewed as objectively useful to mankind, which would therefore constitute objective scales of welfare. He then concludes that they would likely be restricted to certain fields, but especially that "such objective scales set us on the path of a theory of 'value' which has *no direct* relationship to current utility theories and use value, nor with those of exchange value and price."

1.1. Pigou's initial attempt in a framework of cardinal utility

It is impossible then to get away from prices or, by the same token, from the difficulties involved in their interpretation. In the strict framework of neoclassical theory, Perroux's aforementioned formulation is hardly orthodox. There is only one theory of value. Prices are related both to marginal utilities and marginal costs *via* marginal rates of substitution. But, within a perspective of macroeconomic measurement, costs and utility are not in equivalent positions. "Costs" are finally expressed in terms of factor incomes and taxes on production. Aggregation of prices of different products raises no major difficulty from this perspective.

In contrast, prices, although they reflect marginal utility, do not measure the average utility of products. If it were possible to measure total utility in cardinal form, by taking into account inter-personal comparison of utilities, there would be a way of measuring economic welfare by aggregating, not market prices, but "utility-equivalents" expressed in monetary terms. Pigou (*op. cit.*, pp. 56–57) writes that the path that should be followed to measure changes in the national dividend would involve the aggregation of consumer surpluses in order to estimate for each period "the aggregate money demand". However, he recalls, Marshall has already considered this task as insuperable in practice (Principles, p. 131), even though elaborated mathematical formulas theoretically resolved the problem. Marshall points out in particular that it is only in the neighborhood of normal prices that it is possible to establish demand prices, that is, the value (the utility) attached by consumers to successive units of goods.

Given the lack of such direct process, that makes it possible to measure at the same time the direction and the size of the change in the national dividend, it is at least necessary to be able to assess the direction of this change. Pigou had previously formulated (*op. cit.*, pp. 51–52) a criterion for decision-making under certain assumptions. *If the tastes and the distribution of purchasing power of a group of persons of a given size were fixed*, one could say that the dividend is greater in II than in I if the group was willing to pay more money to retain the elements that are added in II as compared to I rather than to retain the elements of I that have been taken away in II. *As in fact both tastes and distribution change,* the criterion has to be defined for tastes and distribution prevailing in period I, and for those prevailing in period II. The dividend of one period is greater than that of the other if the two results have the same direction. If these directions diverge, then the national dividends corresponding to periods I and II are incommensurable (*ibid.*, p. 54).

In practice, only actual prices and quantities are more or less available for each period, and not always completely, without knowing what they would have been if tastes and distribution had been those of the other period. Then comes the problem of knowing what conclusions can be reached, regarding the direction of the change in the national dividend, from the compilation of volume indices based on the first-period prices (Laspeyres volume index) or with those of the second period (Paasche volume index) [see appendix to chapter 9, "Reviewing indices"]. Pigou, making the same assumptions, concludes that if the two indices move in the same direction, the economic satisfaction obtained also moves in this direction. If the two indices move in opposite directions, it is not possible to conclude, except in terms of common sense: "probably", depending on whether one index or the other varies strongly while the second moves only slightly. Pigou refuses, in this case, to propose an intermediate expression between the two indices, whereas he recommends, when the two indices move in the same direction, the use of a Fisher index (the geometric mean of the Laspeyres and Paasche indices) because "it is practically much more convenient to write down some single expression intermediate between the two limiting expressions rather than both of these" (*ibid.*, p. 67). Paul Samuelson (1950, Nobel Prize 1970) will later underline the risk of ambiguity in the use of ratios of indices, instead of expressions $\sum pq$ alone. In his view, they are likely to induce people "to attach cardinal significance, in an exact or probabilistic sense, to the numeric value of the $\sum pq$ ratios" (*ibid.*, p. 425).

1.2. Hicks and the *Economica* debate

Hicks (1940) continues the debate opened by Pigou in a more rigorous conceptual framework (indifference curves, ordinal utility) [see Box 46]. The basic issue is still the same: which criterion should be used in order to decide whether real national income is higher or lower in one situation than in another; and what conclusions can be drawn from prices and quantities observed in the various situations? Hicks shows that an individual, with unchanged tastes and considered in isolation, is in a better situation in II than in I – he is on a higher indifference curve – if $\sum p_2q_2 > \sum p_2q_1$ (meaning that he could continue to buy Q_1 but he prefers Q_2), or alternatively better in I than in II, if $\sum p_1q_1 > \sum p_1q_2$. On the other hand, the opposite inequality $\sum p_2q_2 < \sum p_2q_1$ cannot be given a meaning, which Gérard Klotz (1985 dissertation, p. 143) interprets by saying that the set of goods Q_1 can then be situated on an indifference curve that is higher or lower than the set of goods Q_2.

Hicks extends the application of these tests to any number of goods (assuming that they all have a positive utility), and then to the level of society as a whole. If the first significant inequality holds and not the second one, then real income has increased. If the second holds and not the first one, then real income has decreased. If neither holds, nothing can rigorously be said. Finally, if both hold simultaneously, the test is inconclusive since real income would have increased and decreased at the same time, which is nonsensical. The starting assumptions for the comparison do not hold, most probably because the assumption of constant needs is not applicable.

But Hicks was only able to move to the level of society by taking into consideration the basic difficulty brought about by the problem of income distribution. Indeed, the aggregates under consideration could be similar, whereas the distribution of income may have radically changed between the two situations being compared. He does it, by taking into account the attention paid to the Pareto optimum by the New Welfare Economics at the end of the 1930s (Nicolas Kaldor was the first of them in 1939); he proposes saying that "the real income of society is higher in Situation II than in Situation I, if it is impossible to make everyone as well off as he is in Situation II by any redistribution of the actual quantities acquired in Situation I" (p. 111). This basis seems to justify for him the application of his criteria to aggregate indices of prices and quantities.

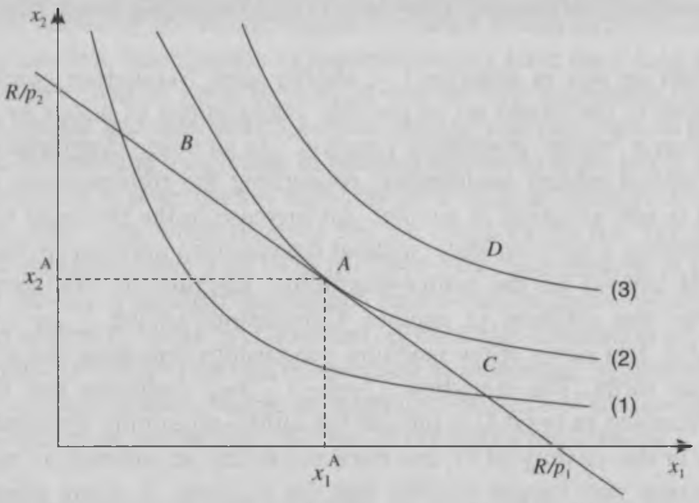
Hicks' formulation shows the close interrelationship thus established between the theoretical discussions of welfare economics (on what condition(s) is situation X better than situation Y?) and the problems of interpretation of changes in national income in terms of welfare. His article triggers a debate, in particular in the review *Economica*, in which T. Scitovsky (1941), Kuznets and again Hicks (1948), I.M.D. Little (1949) and Samuelson (1950) will participate. This is a subtle discussion during which, among other things, a double criterion is proposed (first by Scitovsky, then by Kuznets) – while the condition is also formulated that there is a reallocation of quantities in II such that each one is

Box 46
Hicks' conceptual framework

Hicks reasons in the context of the neo-classical theory. Let us recall that, in a framework of ordinal utility, the microeconomic theory supposes that each consumer is able to classify, according to his preferences, all sets of available goods (taken in all possible proportions). This ordering of sets, each one with respect to the others, is based on preferences defined outside any quantification of utility. An indifference curve between two goods represents all combinations (vectors) of quantities of these two goods that the consumer considers as equivalent, that is, which provide him with the same level of satisfaction. The consumer's optimal choice is made of the consumption vector (the combination of the quantities of the two goods) that, while respecting the available amount of money (his budget constraint), is situated on the indifference curve that yields him the highest level of satisfaction. This choice corresponds to the point where the indifference curve in question is tangent to the budget line.

Microeconomics textbooks represent graphically the determination of the optimal consumption vector. For example, the figure shown below is extracted from Pierre Picard, *Eléments de microéconomie 1. Théorie et Applications* [Elements of Microeconomics 1. Theory and Applications], 4th ed. (Montchrestien, 1994), fig. 2.16, p. 46. The coordinates of the intersection of the budget line with the axes have been added (R/p_2, only good x_2 is consumed, R/p_1, only good x_1 is consumed).

The consumption vectors located on the indifference curve (3) to the right of (2) are preferred to those that are on curve (2), but are inaccessible because they do not respect the budget constraint. Those that are located on curve (2) are preferred to those that are on curve (1), to the left of (2). At point A the highest satisfaction is reached considering the budget constraint. The consumer chooses quantity x_1^A of good **1** at the given price p_1 and quantity x_2^A of good **2** at the given price p_2.



Determination of the optimal consumption vector

($x_1^A \cdot p_1 + x_2^A \cdot p_2 = R$, total expenditure). For more precision, see chapter "les fondements de la théorie du consommateur" [The foundations of consumer theory], § 2C, "Utilité ordinale et courbes d'indifférence" [Ordinal utility and indifference curves] of the aforementioned textbook.

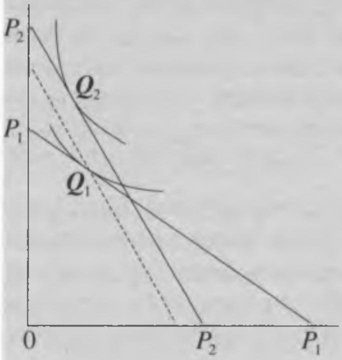
The problem that Hicks tries to elucidate, as Pigou did before him and many others after him, is the following: "What can be said about the change in welfare between situations 1 and 2, when prices and quantities chosen in these two situations are known and we do not know the actual positions of the indifference curves?" Or, to quote Hicks himself: "The logical problem which presents

cont'd

Box 46 (cont'd)

itself is as follows. In situation I, market prices are such and such, and the individual buys such and such quantities. In situation II, prices are such and such, and the individual buys certain other quantities. From these data, can one say that one position or the other is a preferred position?" (p. 108).

The graphic used by Hicks in his argument referring to one consumer and two goods is presented below (Hicks, *ibid.*, fig. i, p. 109).



The two consumption vectors Q_1 and Q_2 that have been chosen are observable as well as total expenditure in the two situations. As prices are known, the budget lines can be drawn. According to the assumptions of the theoretical analysis (see above), by points Q_1 and Q_2 located on the budget lines it is possible to draw the two unknown indifference curves, that are tangent to each of the budget lines (that Hicks then calls "price lines"). These curves are convex in relation to the axes of the coordinates and therefore cannot intersect the corresponding budget lines.

better off than he was in situation I –; shortly after, Samuelson generalizes the necessary tests to the whole set of possible reallocations of goods by giving for every situation a "utility–possibility function". In so doing, Samuelson hopes to avoid the implicit ethical assumptions concerning the righteousness of income distribution in one situation or another. An increase in the potential real income of society implies a uniform shift (without intersection) outward (in the direction of increased utility) of the utility–possibility function of this society while moving from one situation to another. Calculations of the $\sum pq$ types based on aggregated data never allow reaching conclusions regarding the existence of such uniform shifts. The condition $\sum p_2q_2 > \sum p_2q_1$ indicates that the utility–possibility function in point II is outside the utility–possibility function at point I somewhere in the vicinity of II, but does not define an increase in real income notably because one cannot exclude that for a group, at some point in time, $\sum p_2q_2 > \sum p_2q_1$ and $\sum p_1q_1 > p_1q_2$ hold simultaneously (p. 404), something that Hicks regarded as nonsensical.

1.3. Taking income distribution into account

The discussion on national income, in general, separates the two problems, that of its level from that of its distribution. Amartya Sen, appreciably later (1976, Nobel Prize 1998), follows the position of J. de V. Graaff (1957), for whom "we do not know what the size is until we know the distribution" (quoted by Sen). Sen proposes to treat "the same commodity going to two different persons as two different goods". The distributional weights of goods so defined, the "named goods", will embody some judgmental elements on distribution. This approach explicitly recognizes the fact that comparisons of real national income, including ones over time, concern different groups of persons (some are born, others die, and welfare characteristics may differ over time). Sen maintains that a poorer person's dollar should receive a higher weight than one of a richer person (p. 30). He considers indeed that the assumption introduced by Samuelson on social indifference curves (1956), of optimal redistributions of income in order "to keep the ethical worth of each person's marginal dollar equal" (quoted by Sen) is extraordinarily unrealistic. Sen's analysis remains in an ordinal framework (ordinal equity). The ordering of the weights in dollars is inverse to that of the ranking of persons' incomes. A special case consists of making the weights "equidistant". "The ratio of the weights of two ranked goods is given by the ratio of their respective market prices each multiplied by the income rank of the person enjoying the commodity." The relevance of the results depends, of course, on the acceptability of the value judgments explicitly used (the general framework makes it possible to take explicitly into account the distribution of the population, as well as its composition and size), which reflect (A.B. Atkinson, 1970) the society's degree of aversion to inequality.

The hopes raised by the interpretation of market values in terms of economic welfare explain that theoreticians of national income have for a long time paid a lot of attention to market imperfections as well as their uneasiness regarding the addition of market and non-market values. But the analyses showed the extreme difficulty in interpreting the change in national income in these terms, even under the assumption of a pure market economy in a state of equilibrium in perfect competition, and even when limiting the interpretation to the direction of the change. As Hicks analyses it in 1975 (p. 324): "We have indexes of production; we do not have – it is clear we cannot have – an Index of Welfare". While writing this sentence, Hicks probably had in mind the calculation of production (or consumption) indices that can be qualified as empirical, by opposition to the conception of such indices within an ambitious theoretical framework bringing in both the theory of production and that of consumer preferences.

2. National accounting and changes in economic welfare: the search for a composite indicator

2.1. Kuznets and the ultimate objectives of economic activity

These difficulties never induced Kuznets to give up the conception of national income as an indicator of welfare, but he never placed himself in the rigorous framework of the welfare theory. He argues principally on the basis of the ultimate objectives of economic activity, which consist of satisfying the needs of individual consumers.

He excludes from national income everything that, in the activity of government, does not result directly in a flow of goods and services for consumers. This exclusion not only concerns services provided to producers but also what corresponds to the preservation and extension of the social framework (public administration, defense, justice, international relations, infrastructures, etc.). Since he tries to define strict criteria for what truly goes directly to individuals, Kuznets considers that the largest part of the result of government activities should not be included in national income. It has an intermediate character.

Therefore, "intermediate" does not mean for him "what is used to produce other goods and services" but "what is not used directly for the satisfaction of consumers". On the basis of the first definition, K. Horz and U.P. Reich (1982) estimate, for example, that the part of government output going to intermediate consumption is about 15% in Sweden, the United Kingdom, and Germany. For Kuznets the proportion involved is much larger, indeed the major part of government output. For him, it is only in the case of a major war threatening, when the survival of the social framework is at risk, that war expenditures can be raised to the level of final objective, with at least equal importance to individuals' welfare, and included, exceptionally, in national product (1951, pp. 184–185).

For Kuznets however, not all goods and services expenditures by individuals and households necessarily represent final expenditure. Beyond contentious border cases such as transport between home and work, he is thinking more generally of what he calls "the inflated costs of urban civilization" (*National Income and Economic Welfare*, 1949, p. 196). These include, for instance, banking services induced by the participation in a money economy, trade union dues, costs linked to life in cities, expenditure made "not for any personal satisfaction, but as a condition for earning his living" (*ibid.*, p. 195). What he calls, using an expression seen as too narrow, "occupational expenses" may cover, according to him, elements such as "the executive's big automobile or expensive membership in various clubs which may be considered indispensable prerequisites of his occupational status rather that freely made personal choices". For 1929, in the USA, Kuznets estimates these inflated costs of urban civilization to represent about 20–30% of consumer expenditure.

Conversely, some non-market activities, such as domestic services performed by housewives, contribute to welfare but are excluded from current compilations of national income, whereas Kuznets would agree to include them. Nevertheless, he is more doubtful regarding the inclusion of leisure. Finally, he does not ignore the importance of the distribution of products between social groups in judging the level of economic welfare, "clearly one and the same national income or product total, measured with due respect to the question of inclusion, exclusion and valuation raised above, may represent different magnitudes of economic welfare under different systems of distribution by size, by conditions of securing income, or by stability or variability of such income over time" (1949, p. 213).

Kuznets' position explicitly introduces ethical considerations. In his view, the concept of national income could not be totally objective and free of

Box 47
Illegal production in the 1993 SNA

"**6.30.** Despite the obvious practical difficulties in obtaining data on illegal production, it is included within the production boundary of the System. There are two kinds of illegal production:

a. The production of goods or services whose sale, distribution or possession is forbidden by law;
b. Production activities which are usually legal but which become illegal when carried out by unauthorized producers; e.g., unlicensed medical practitioners.

6.31. Both kinds of production are included within the production boundary of the System provided they are genuine production processes whose outputs consist of goods or services for which there is an effective market demand. The units who purchase such outputs may not be involved in any kind of illegal activities other than the illegal transactions themselves. Transactions in which illegal goods or services are bought and sold need to be recorded not simply to obtain comprehensive measures of production and consumption but also to prevent errors appearing elsewhere in the accounts, if the funds exchanged in illegal transactions are presumed to be used for other purposes. The incomes generated by illegal production may be disposed of quite legally, while conversely, expenditures on illegal goods and services may be made out of funds obtained quite legally. The failure to record illegal transactions may lead to significant errors in the financial account and also the external account of some countries.

6.32. Examples of activities, which may be illegal but productive in an economic sense, include the manufacture and distribution of narcotics, illegal transportation in the form of smuggling (often a form of own-account illegal production), and services such as prostitution.

6.33. Illegal production does not refer to the generation of externalities such as the discharge of pollutants. Externalities may result from production processes which are themselves quite legal. Externalities are created without the consent of the units affected, and no values are imputed for them in the System. Illegal production also does not refer to stolen output. The theft of legally produced output by employees or others needs to be clearly distinguished from illegally produced output which is sold to willing buyers on the market."

In practice (see chapter 5), illegal activities have scarcely been estimated. Some countries conduct calculations for smuggling of some products (livestock or coffee in Africa or in Latin America). In the last decade of the 20th century, increasing efforts are developed, in particular in the measurement of drug production and trade.

preconceived ideas (1941, p. 3). Therefore, following Pigou's view, he excluded – without intending to be systematic – "[. . .] products of illegal activities such as smuggling, racketeering, bootlegging and drug peddling [. . .]" (*ibid.*, p. 20) considering that their "[. . .] detrimental character is obvious enough to preclude any doubt that it was the basis for the legal prohibition" (*ibid.*, p. 19). National accounting practice had followed him, in an unwritten tradition, but the 1993 SNA tries to adopt a neutral attitude towards the delimitation of production. Therefore, in principle, illegal production is included (see Box 47), as is informal or underground production.

2.2. To adjust national income or GDP in the direction of economic welfare?

Kuznets thus initiated a long tradition of intermittent efforts, aimed at making national income not so much an indicator of welfare in the general sense, but of economic welfare, or even in a less ambitious terminology, of the set of goods

Box 48

The relationship between GDP and welfare measurement according to the 1993 SNA

The 1993 SNA restates, although in a more explicit way, what has been a constant position of the national accounting systems: GDP is not a welfare indicator.

1. There is "[...] a link between changes in aggregate production and consumption and changes in welfare. However, changes in the volume of consumption, for example, are not the same as changes in welfare. The distinction between the quantity of some good or service and the utility derived from consuming it is clear enough at the level of an individual good or service. For example, the quantity of sugar consumed by households is measured in physical units. It is measured quite independently of any utility that the households may, or may not, derive from consuming it." (§ 1.76).

2. "[...] total welfare depends on many other factors besides the amounts of goods and services consumed. Apart from natural events such as epidemics, droughts or floods, welfare also depends on political factors, such as freedom and security." (§ 1.77). The SNA analyzes the effects of an exceptionally severe winter and an influenza epidemic "[...] total welfare could fall even though GDP could increase in volume terms." (§ 1.78), then of the alleviation of harmful effects caused by natural disasters ("Given that the disaster has occurred, the extra production presumably increases welfare." [§ 1.79]), and finally of defense expenditures, including the case of war (§ 1.80).

3. Even though the consumption of goods and services increases by reaction to several "bads", the quality of life of the population is better off than what it would have been without it. Without using the expression "defensive expenditures" explicitly, the SNA rejects the idea that they should be excluded from final consumption. "Pushed to its logical conclusion, scarcely any consumption improves welfare in this line of argument" (§ 1.81).

4. Chapter XVI on "Price and volume measures" presents "the economic theoretic approach to index numbers" (§§ 16.21–16.30). "Assuming that a consumer's expenditures are related to an underlying utility function, a cost of living index may then be defined as the ratio of the minimum expenditures required to enable a consumer to attain the same level of utility under the two sets of prices. It is equal to the amount by which the money income of a consumer needs to be changed in order to leave the consumer as well off as before the price changes occurred." (§ 16.21.). This amount depends on the consumer's preferences and the initial level of income and expenditures of the consumer.

The text presents the relationships between the classic Laspeyres and Paasche indices and the underlying theoretic cost of living indices thus defined, depending on the period on which they are based. The Laspeyres index provides the upper bound to the theoretic index based on the first period, the Paasche index provides the lower bound to the theoretic index based on the second period (§ 16.22). If the preferences of the consumer are supposed to be homothetic, i.e, every indifference curve remains uniformly below or above the other, the two theoretical indices coincide and the Laspeyres and Paasche indices fix the upper and lower bounds. In the particular case where the consumer utility function is represented by a homogeneous quadratic function (homothetic), the Fisher's Ideal Index (geometric mean of the Laspeyres and Paasche indices) is equal to the theoretic index (§ 16.23).

The theoretic index is unknown; the Fischer index, like all symmetrical average of the Laspeyres and Paasche indices, or more generally like any index that assigns equal weight or importance to the two situations being compared (the Tornqvist index, for example, the weighted geometric average of price ratios, using as weights the arithmetic average of the fractions of the total value in the two periods) permits a better approximation to the theoretic index than the Laspeyres and Paasche indices (§§ 16.24–16.30).

This development of the 1993 SNA on the economic theory of indices does not mean that the change in volume of final consumption could correctly approximate the change in welfare, even

cont'd

Box 48 (cont'd)

when a good formulation of the price indices has been chosen. SNA (§ 16.21) recalls: "the value of the theoretic index is not the same for different consumers with a different set of preferences ...". Beyond the conventional nature of the choice of the consumer utility function in a particular case (§ 16.23), the obstacle of the aggregation of preferences remains, as well as the effect of externalities, and, for instance, the influence of interpersonal comparisons among consumers.

and services contributing to economic welfare, by means of reclassifications, additions and subtractions made on the basis of official compilations of national income, national product or final consumption. From their point of view, since the major take-off in national accounting during and after World War II, national accountants (Denison, Gilbert, Stone, etc.) have rejected the idea that national accounts had, or could even have had, as an objective to measure (economic) welfare [on the current position of national accounting see Box 48].

In fact, until the end of the 1960s, Kuznets' approach seems to have been totally eclipsed. National accounts, which are then in full expansion, are not questioned. The notion of growth seems to dominate almost exclusively. But progressively, it is criticized from different perspectives because it brings about negative elements (insecurity and congestion due to urban concentration, pollution) and a level of depletion of natural resources viewed as unsustainable.

Starting at the end of the 1960s and the early part of the 1970s, these concerns and questions were reflected notably in three types of work. Reflections on growth contrast the latter to a broader concept of development and put in question its future over the more or less long term. The Club of Rome focuses particularly on the risks of depletion in natural energy resources and launches the Zero Growth initiative (D.H. Meadows *et al.*, *The Limits to Growth*, Universe Books, 1972). To get away from too economic an approach, which gives a central importance to GDP measurement, works on social indicators try to develop a set of composite indicators to illustrate the principal aspects of the economic and social situation. Finally, researchers revive Kuznets' tradition and try to measure a meaningful aggregate of economic welfare.

2.2.1. Proposals for a monetary indicator of welfare

A.W. Sametz seems to have been the first (1968) to present proposals for the development of a "welfare output" indicator. William Nordhaus and James Tobin's ("Is growth obsolete"?, 1970) is the most famous study of this kind and presents an experimental "measure of economic welfare" (MEW) [see Box 49]. A wide range of research is, in fact, launched in the USA (NBER) to update the measure of economic and social performances. It will lead to numerous proposals of extension and modification of the accounts throughout the 1970s and beyond (Juster, 1970 and 1973; the Ruggleses, 1970 and 1973; Kendrick, 1976 and 1979; Eisner, 1971, 1973 then 1988 for all his results; see Eisner's 1988 bibliography for all the references). Nordhaus and Tobin's breakthrough initiates a wide-

Box 49

Nordhaus and Tobin's Measure of Economic Welfare for the USA

The following table is a re-arrangement of Nordhaus and Tobin's results.

	1929	1947	1965	1965	
	(in billion dollars at 1958 prices)			Index (1929 = 100)	Ratios to GNP
From Gross National Product to an adjusted Net National Product					
1. GNP	203.6	309.9	617.8	303	1
2. Consumption of fixed capital	–20.0	–18.3	–54.7		
3. NNP	183.6	291.6	563.1	307	0.91
Consumption/investment reclassification					
4. Public and private capital services					
a. Government	4.8	10.0	16.6		
b. Households	24.9	26.7	62.3		
5. Additional consumption of fixed capital	–19.3	–50.8	–92.7		
Additions					
6. Leisure					
a. Variant B	339.5	466.9	626.9	185	1.01
b. Variant A	339.5	466.9	626.9	185	1.01
c. Variant C	162.9	345.6	712.8	438	1.15
7. Household activities					
a. Variant B	85.7	159.6	295.4	345	0.48
b. Variant A	178.6	215.5	259.8	145	0.42
c. Variant C	85.7	159.6	295.4	345	0.48
Subtractions					
8. Reclassification of final expenditure as intermediate consumption and regrettable necessities					
a. Government intermediate consumption	–5.0	–6.4	–15.6		
b. Government regrettable necessities	–1.7	–14.4	–47.6		
c. Households	–10.3	–10.9	–30.9		
9. Disamenities of Urbanisation	–12.5	–19.1	–34.6		
10. Net national product adjusted (implicit)					
a. Variant B	589.7	853.2	1342.9	228	2.17
b. Variant A	682.6	909.1	1307.3	192	2.12
c. Variant C	413.1	731.9	1428.8	346	2.31
11. Consumption (MEW)					
a. Variant B	548.8	803.4	1243.6	227	2.01
b. Variant A	641.7	859.3	1208.0	188	1.96
c. Variant C	372.2	682.1	1329.5	357	2.15
12. Change in capital stock	40.9	49.8	99.3		

cont'd

Box 49 (cont'd)

From household consumption to the measure of economic welfare					Ratios to household consumption
13. Household consumption	139.6	206.3	397.7	285	1
Consumption/investment reclassifications					
14. Purchase of durable goods	−16.7	−26.2	−60.9		−0.15
15. Education and health expenditures	−6.5	−10.4	−30.1		−0.08
16. Durable goods services	24.9	26.7	62.3		0.16
Additions					
17. General Government consumption	0.3	0.5	1.2		
18. Capital services of General Government	4.8	10.0	16.6		0.04
19. Leisure					
a. Variant B	339.5	466.9	626.9	185	1.58
b. Variant A	339.5	466.9	626.9	185	1.58
c. Variant C	162.9	345.6	712.8	438	1.79
20. Household activities					
a. Variant B	85.7	159.6	295.4	345	0.74
b. Variant A	178.6	215.5	259.8	145	0.65
c. Variant C	85.7	159.6	295.4	345	0.74
Subtractions					
21. Reclassification of final expenditure in intermediate consumption	−10.3	−10.9	−30.9		−0.08
22. Disamenities of urbanisation	−12.5	−19.1	−34.6		−0.09
23. **Measure of Economic Welfare** = adjusted household consumption					
a. Variant B	548.8	803.4	1243.6	227	3.13
b. Variant A	641.7	859.3	1208.0	188	3.04
c. Variant C	372.2	682.1	1329.5	357	3.34

Explanatory notes to the table:

Data come from Nordhaus and Tobin tables 1 and 2 (p. 10 and p. 12), are completed by table A.5 (p. 33) for row 12 (with a slight modification due to some round offs). Rows 1, 2, 3 and 13 are data from the US official accounts of the time (they were revised several times since then).

For item names, the use of SNA terminology has been preferred.

Items of Nordhaus and Tobin's tables were reorganized in order to show the three categories of operations (consumption/investment reclassifications, additions, subtractions). The numbering of rows is proper to the table presented here.

Row 10 (adjusted national product), which does not appear explicitly in Nordhaus and Tobin's tables, has been calculated.

To estimate the value of leisure and of non-market activities (domestic activities) at constant prices, Nordhaus and Tobin retain two assumptions on the evolution of productivity: either it did not change (it is then deflated using the wage rate), or it changed on average as in market activities (it is then deflated using the consumer price index). Variant A follows the first assumption, C the second

cont'd

Box 49 (cont'd)

one, while B, which they prefer, is a combination (there is no productivity change for leisure, while the average change is applied for non-market activities).

Comments

Consumption/investment reclassifications: The treatment of purchases of durable goods (row 14) as investment expenditure and the inclusion of the services derived from them in consumption (rows 4b and 16), which is measured using consumption of fixed capital and an imputed net rent (opportunity cost of the immobilized capital) is classical for this type of analyses and does not present particular problems of principle but rather a debate concerning its practical appropriateness (see chapter 8). Expenditures on education and health (row 15) raise more sensitive questions (on the issue of human capital see chapter 8). Here the authors treat them as gross investment, both for households as for government, but they suppose first that the income that may be generated is already accounted for as factor incomes, second – an assumption that they admit to be extreme – "that no direct gains in satisfaction are produced by these categories of wealth" (p. 31). Thus nothing concerning them is to be found in rows 4a, 4b and 16 except an additional element of consumption of fixed capital (included in row 5).

Additions: See the text of the present chapter and Boxes 50 and 51.

Subtractions: See the text of the present chapter.

As for government, for the year 1965, Nordhaus and Tobin (table A.1, p. 27) deduct 14% from purchases of goods and services (including civil servants compensation), as intermediate purchases (row 8a) and 41% as "regrettable necessities" (row 8b). A very small part of expenditure (1%) goes to household consumption (mail services and leisure activities – row 17), and the remainder (44%) is treated as investment. In row 5, expenditures on education and health result only in additional consumption of fixed capital (see the above-mentioned explanation regarding household expenditures of comparable nature). NNP only includes services provided by public capital (rows 4a, 18) corresponding to civil infrastructures.

To estimate the "disamenities" of urbanization (row 9 or 22), the authors evaluate econometrically the income differentials presumably necessary to keep people within more densely populated localities (pp. 49–54).

ranging debate in which national accountants participate. However, this example is followed only in Japan where a committee of the Economic Council publishes in 1973, *Measuring Net National Welfare of Japan*, which shares many of these views. Several years later (1995) similar work will be carried out in Denmark on the measurement of a welfare indicator (WI).

Research that directly presents as its objective to elaborate an indicator of the change in welfare (MEW, NNW, WI) refrains, in general, from really looking for an alternative measure of production as a whole. Studies focus on a sophisticated measure of consumption. It is possible however to deduce a corresponding alternate measure of domestic product or national product, since none of them proposes to abandon the equivalence of the three approaches to domestic or national product. The adjusted net national product, which is implicit in Nordhaus and Tobin's study, is shown in row 10 of the table in Box 49.

If this type of work did not get widespread acceptance, either in the official national accounts services or in private organizations which could have worked on this topic on a regular basis, it is because it implies conventional choices that are so broad that they get close to arbitrariness and pose tremendous problems of interpretation, while disregarding certain essential aspects of development.

2.2.2. Household work and leisure activity and the interpretation of their estimated changes

Except in Japan, the results obtained are largely dominated by the valuation of household work and leisure activity, for which there are substantial measurement uncertainties (see Boxes 50 and 51), in current value and still more in volume, at constant prices (see the alternative calculations by Nordhaus and Tobin). Assumptions, whose reference is unknown, lead to results so different in absolute value and in variation terms, that the aggregates derived from them are meaningless.

The case of leisure is particularly thorny. There is no doubt that economic growth has brought over the long run an increase in the availability of market goods and services, though at the same time the work hours were reduced. From the point of view of economic and social history, this situation is the result of technical progress and productivity gains, collective bargaining and cultural choices, but is only very slightly related to individual trade-offs between work

Box 50

Household activities

The inclusion of non-market domestic activities of household members (the traditional "housewives work" extended to other members of the households) in an enlarged notion of production and consumption, does not represent for standardized national accounting (1993 SNA, § 6.16) a problem of principle, but serious issues of measurement. Studies to estimate the value of these services were implemented in very great number during the three last decades of the 20th century. They had been scarce and limited before (in Sweden, Lindahl *et al.* in the study published in 1937 covering the period 1861–1930; in the USA, Wesley C. Mitchell *et al.* in 1921 over the period 1909–1919, Kuznets in 1941 referring to 1929; in Norway also, in the estimates of national income from 1935 to 1943).

More recent studies, almost all of them concerning OECD countries, show that the value of unpaid labor, internal to households, is estimated as corresponding to between a third and two thirds of GDP (from 40 to 50% of GNP in the study of Nordhaus and Tobin). For the same country and the same period, estimates vary greatly, according to whether this labor is measured using the wages of specialists or general practitioners, paid domestic staff or by the amount that those engaged in those activities obtain or could obtain on the labor market (opportunity cost, method adopted in particular by Nordhaus and Tobin, before or after income tax). Moreover, their evolution in volume differs whether a change of productivity is estimated for them or not (see, for example, Box 49).. Nordhaus and Tobin present their results according to both assumptions but prefer the first one. The Japanese study follows them on this point (p. 99, introduction of a change in productivity), but not the Danish one (p. 92).

If consideration is taken of the difficulty of grasping short-term changes, since "time–use" surveys are not so frequent, and of the tendency to think that the very result of these activities should rather be measured using market prices for similar goods and services, it is easy to understand that it is not desirable to include all this in the central GDP but only in a satellite account (1993 SNA, §§ 6.17–6.22). Within the central framework, the SNA retains, in fact, the concept of production as an organized social activity (see Box 41).

Box 51
Leisure

Different from household activities, leisure is by principle excluded from production in national accounting based on the third-party criterion. If someone does something for himself, there is the economic production of a service if, and only if, in theory, this individual could hire another person to render him this service. This delineates, within domestic activities, an irreducible sphere of purely individual fundamental human activities, such as eating, drinking, sleeping or exercising, that is impossible for one person to perform for another. As it is always the case, there are fuzzy zones, for example, personal bathing (1993 SNA, § 6.16). This criterion, known as the third-party criterion, is old (Marshall already uses it in 1878). Later, Margaret Reid (1934), Oli Hawrylyshyn and Hill in the 1970s, have elaborated it.

In so doing, the 1993 SNA refrains from going as far as the neo-classical economic theory which, starting from the idea of a general trade-off between all possible time uses (within the limits of biological constraints), i.e. essentially between work, household activities and leisure, often uses the wage rate as a basis for the valuation of leisure time (the time dedicated to leisure is supposed to be worth the wages which one gives up by not being employed). *In fine* thus, the SNA rejects the idea of potential exchange with oneself.

Leisure is included in the measure of economic welfare (MEW) and similar works, but it entails serious problems. Its weight, roughly estimated by the product of the number of leisure hours by the average wage, is very large (the equivalent of the US GNP in 1965) and thus strongly influences the overall change of that indicator. Truly speaking, why not? Estimations at current prices can result from differing choices though (the 1970 Japanese estimate amounts approximately only to 9% of GDP, with a definition much more restrictive which excludes for instance the time devoted to social relations, resting, newspaper reading), and present tricky problems in the case of unemployed persons and pensioners.

Besides, and above all, the “constant prices” estimation leaves a considerable margin of uncertainty, depending on whether it is considered, for example, that the productivity of leisure does not vary (and is thus deflated by the wage rates) or that it varies on average as market activities (and is thus deflated by the price index of consumption goods and services). Nordhaus and Tobin test the two assumptions (see Box 49). In the first case (Variant A), the value of leisure at constant prices was multiplied by 1.85 from 1929 to 1965; in the second case (Variant C), the factor was 4.38. For household activities these factors were 1.45 and 3.45 respectively. So the MEW was multiplied by 1.9 with the first assumption, by 3.6 with the second one, and by 2.3 with a mixed assumption (Variant B, no productivity change for leisure and average change for household activities). Because of these difficulties, the Japanese study presents a Net National Welfare (NNW) including leisure and output from household activities and another one excluding these elements; the Danish study presents only one alternative, which only excludes leisure. Dan Usher (1973) presented the unconvincing idea that one should only take into account the change in leisure as compared to a benchmark year and not the total value of leisure, which would reduce its weight.

In fact, the aggregate monetary valuation of leisure time adds almost nothing – and what it adds is very doubtful – to the physical data which can be taken into account in social indicators, as Robin C.O. Matthews observed in his discussion (December 1970) of Nordhaus and Tobin’s paper (p. 88).

and leisure, for the most part heavily constrained by the prevalent institutional framework. Assigning a monetary value to leisure, in terms of exchange value, is this not wanting to treat as production what is by its very definition non-production? Unless production is understood as the creation of utility, but it is necessary in that case to go into a framework of cardinal utility and to calculate the surplus of the leisure holder (how much would it be necessary to pay him so that he agrees to give up one leisure hour, then a second hour, etc.?). With respect to leisure, it is possible to think that the borderline between economic welfare and welfare in the broad sense, that everyone avoids measuring, has already been, in fact, crossed.

With household work and leisure, the purpose was to add to consumption, as understood by national accounting, elements which contribute to welfare but that are not taken into account, either for reasons of opportunity (household work) or by principle (leisure). The search for a welfare indicator then leads researchers to wish this time to exclude part of final expenditure of national accounts from national aggregates.

2.2.3. Reclassification of final expenditures as "intermediate"

Nordhaus and Tobin, in their study, consider three groups of deductions. The first one raises no problem of principle but only of definition of boundaries. It comprises first the part of government non-market services, which, as they are used by market producers, should be treated as intermediate consumption (see Box 44 and row 8a of the MEW table in Box 49). Then, it covers some borderline cases belonging to household expenditures – mainly travel between home and work –, which can be treated by adopting a convention (rows 8c, 21 of the table).

Then, Nordhaus and Tobin, but also, for example, Eisner, follow Kuznets in the exclusion of expenditure of a collective nature (defense, police, law enforcement, etc.) often taken in the broad sense, which, in the case of Nordhaus and Tobin, includes health services and road maintenance. Qualified as intermediate (Kuznets, Eisner) or partly as intermediate, and partly as regrettable necessities (Nordhaus and Tobin), they have the character of "instrumental expenditures", and hence are not viewed as final. They form part "of the necessary overhead costs of a complex industrial nation-State" (p. 7) and they "yield no direct satisfactions" (p. 8).

This strictly individualistic point of view of research following the welfare approach is justified if its purpose is the measurement of individual final consumption. Nevertheless, national accountants question it, if the purpose is the measurement of product or national income itself. National accounting follows Hicks' approach (see chapter 6, the 1940 reference to Nero) and admits the existence of collective wants and needs that collective consumption intends to satisfy, the same that individual consumption does for individual wants and needs.

On a more technical level, national accounting considers as totally inadequate the term "intermediate" used in this case by Kuznets, Nordhaus and Tobin or Eisner, for whom the corresponding goods and services have apparently somehow vanished, since they are intermediate between something and nothing. For national accounting, the use of a product is final when it crosses the border between the economy, the domain of production and exchanges, and the individual or collective life, the domain where goods and services are used up to comply with certain individual or collective purposes. The terminology of national accounting is of course ambiguous and the borderline it draws between the two fields ill-defined.

From this point of view, all the products described as final by national accounting are means to comply with certain ends. These ends comprise states of health, food sufficiency, internal and external safety, the exercise of influence on others, spiritual well-being, with or without a religious component, etc. The consumption functions worked out by the statisticians evoke, though in a very imperfect way, the idea of the purposes which economic goods and services serve. Kuznets, Eisner, as well as Nordhaus and Tobin and many others tend to mix up the good or the service with the function, the end being pursued. Nordhaus and Tobin come then to write, "conceptually, the output of the defense effort is national security" (p. 8). This is as true as saying that the output from doctors, hospital workers and pharmacists is the state of health, or the output from religious book industry is spiritual elevation. Production, consumption and the effects of the use of the products should not be confused, even if the products are normally designed in order to facilitate the achievement of the ends that are pursued. Ethical choices fall in the domain of ends.

2.2.4. Externalities and defensive expenditures

From a welfare standpoint, a third type of deduction refers to that part of household final expenditure that is deemed not to contribute to an increase in welfare. This covers, according to related terminologies, the "inflated costs of urban civilization" (Kuznets) or the cost of the "disamenities of urbanization" (Nordhaus and Tobin, see row 9 or 22 of the table in Box 49), etc. It may consist of expenditures whose socially constraining character prevents those concerned from deriving satisfactions (cf. in Kuznets, the expensive membership of a top manager in a club or, in the Japanese study, ceremonial expenditure). Another form are expenditures which only compensate for actual or potential losses of welfare, these often being called defensive expenditures. However, instead of looking from the expenditure side in an analytical process, it is also possible to argue, as Nordhaus and Tobin do, in terms of an overall estimate of the part of income intended to compensate for the loss of welfare resulting from urbanization ("some portion of the higher earnings of urban residents may simply be a compensation for the disamenities of urban life and work", p. 13). What is involved is compensation for the negative "externalities" of economic growth (see Box 52). In a similar way, the most of public expenditure related to "regrettable necessities" is considered only a compensation for the increase in internal or external insecurity, etc.

This type of reasoning always supposes an implicit or explicit reference to a situation from which one seeks to assess, for certain aspects of individual and social life, the change in welfare. But which is the point of reference? "There is

Box 52

Externalities

Externalities are indirect effects, outside the market framework, derived from the production or consumption action developed by certain economic units, which have an effect on the welfare, profit or wealth of other economic units. These effects can be positive (external economies) or negative (external dis-economies). The former, for example the benefit for passers-by or for neighbors from the growing of a beautiful ornamental garden, evoke very little attention. Some of the latter, in particular those which result from pollution, occupy an ever growing place in the social concerns related to the environment.

Although authors like Kuznets or Stone have mentioned certain external effects, their exclusion from the field of phenomena recorded by national accounting was regarded traditionally as self-explanatory. A sign of the times, the 1993 SNA feels the need to provide an explanation for this rule (§§ 3.51–3.53). It develops on two levels. First (§ 3.52), that of the socio-economic and legal context in which relative prices and costs are determined. Even if one can highly dispute the wisdom of a policy which lets certain producers reduce their costs while polluting in all impunity, "[...] it does not follow that it is appropriate or analytically useful for economic accounts to try to correct for presumed institutional failures of this kind by attributing costs to producers that society does not choose to recognize". In addition (§ 3.53), the 1993 SNA raises the issue of the considerable technical difficulties related with the attempt "[...] to associate economically meaningful values with externalities when they are intrinsically non-market phenomena", and in addition consistent values among the various parties involved. The interpretation of accounts thus supplemented would present a problem: "[...] accounts including values for externalities could not be interpreted as representing equilibrium, or economically sustainable situations. If such values were to be replaced by actual payments, the economic behavior of the units involved would change, perhaps considerably". Lastly, "[...] it is not sufficient merely to introduce costs into the accounts of producers. It also would be necessary to introduce various other adjustments of questionable economic significance to balance the accounts".

Certain environmental economists particularly dispute this SNA position and propose to adjust national accounts and some other aggregates in order to take into account the relationship between the economy and the environment (see end of this chapter and chapter 8). Attempts to define a composite indicator of economic welfare gave place, in particular during the 1970s, to attempts at measuring the disamenities of urbanization (see Box 49).

then need to guard against the temptation to overstate the economic evils of our own age, and to ignore the existence of similar and worse evils in earlier ages" (quotation signed by Marshall 1890, *Principles of Economics, Ninth Variorum Edition*, Macmillan 1961, Volume I, Text, p. 722).

Finally, whether referring to collective public "regrettable" expenditures or to individual expenditures considered as "inflated costs of civilization and providing no welfare", one enters with these analyses into the field of ethical choices. What is genuinely final rather than instrumental? Nordhaus and Tobin recognize themselves that the distinction is very difficult to draw: "for example, the philosophical problems raised by the malleability of the consumers' wants are too deep to be solved in economic accounting" (p. 8).

Analysts are at liberty to define their options. Some have maintained, somewhat tongue in cheek, that only leisure has a final character, others have proposed to exclude tobacco and alcohol from positive consumption. It could be thought that only what contributes to eternal salvation matters, etc. Quite another thing is to require from statistics and national economic accounting for the final/intermediate distinction, the acceptance of a point of view that is not strictly . . . "instrumental" in the technical sense of the term.

The acquisition of consumption goods and services continually mixes products with a certain subjectively and/or objectively positive effect and others aiming at compensating for the negative secondary consequences of the former (alcohol and Alka Seltzer or more expensive medicine, tobacco and health care, household durable goods and repair of at-home accidents, automobile and repair of road accidents, etc.) or resulting from action by third parties or the constraints of social life. Trying to unravel all this in order to obtain a "net" net consumption and a "net" net national income is most probably hopeless at the macroeconomic level.

2.2.5. Monetary welfare aggregate and multiple social indicators

From all these efforts aimed at defining and measuring a composite monetary indicator of "economic welfare" – probably a meaningless formulation since it cannot avoid crossing the border between means and ends – the impression remains that many approaches which are significant at a microeconomic level (opportunity cost, cost–benefit analysis, etc.), or sometimes at sectoral level (for instance, alcohol or tobacco balances), lose their meaning in a global perspective. Hicks' conclusion (1975) regarding the impossibility of obtaining a welfare index within the strict framework of interpretation of a set of pure market values can be extended to the approach through pluses and minuses.

Kimio Uno, who has carried forward to recent years the estimates of NNW for Japan (*Environmental Options: Accounting for Sustainability*, Kluwer Academic Publishers, 1995), personally considers that the interpretation of the NNW in terms of welfare is unsound because it does not attempt to measure consumer surplus, which would be essential for the measurement of welfare. The term caused much confusion. An eminent economist, whom Uno does not mention by name, made fun of it using the nickname "*No-one (k)Nows What*" (*ibid.*, p. 304). Uno interprets the measure in terms of the cost of a set of goods and services related to the quality of life. He characterizes the result as an aggregate composite measure of the quality of life. Even with these reduced ambitions, the meaning is not clear.

It appeared to national accountants, through the *Economica* debate, and later attempts to adjust national product in the direction of welfare, that these attempts, if they were rigorously carried out, probably raised insolvable difficulties. If they were not, they led to solutions that were often conventional, sometimes arbitrary, and to results where no one knew what they actually were measuring, making their interpretation dubious, and which, in any case, implied at various stages, making ethical choices. Statisticians and national accountants therefore generally cast doubt on the idea that it would be possible to express through a single monetary aggregate all the elements that are believed to contribute to the economic welfare of a population. In their eyes, the use of multiple indicators is unavoidable.

This conclusion is broadly shared by the movement in favor of social indicators that develops at the end of the 1960s and in the first part of the 1970s. Far from encouraging the estimation of national product adjusted from a welfare point of view, this movement seeks to counterbalance the priority given to the use of GDP or GNP in the political or social debate by referring to a set of indicators covering the principal fields of social interest. The impulse does not come from statistical practitioners, but from the circle of advisers – in the broad sense – to politicians, trade unions and employers' organizations.

Thus understood, the movement in favor of social indicators takes place in a rather short period of time during which economic growth is called into question in favor of a more multidimensional and socially better balanced development, with economic and social policies still widely regarded as the principal instruments for this conception of development. It is thus not surprising that it is particularly active in Europe, in the United Kingdom and France especially, whereas the more far-reaching attempts to compile a monetary indicator of welfare from a decidedly individualistic point of view are carried out in the USA.

The issue then becomes fashionable and leads to reflection and studies both at national (in the above-mentioned countries, the USA, Canada, etc.) and international level (OECD, UN). It contributes to a new dynamism in social statistics and gives birth to comprehensive publications on the social situation (*Social Trends* in the United Kingdom, *Données Sociales* [Social Data] in France).

The social indicators movement will, therefore, durably leave its mark, but paradoxically not in the form of a set of social indicators that could have led to a certain international standardization. The United Nations 1976 publication, prepared by Stone, "*Towards a System of Demographic and Social Statistics*" (see chapter 4 of this book), with its long list of social indicators broken down by field, represents, to some extent, its swan song. Times have changed and unemployment is back, again focusing the attention on growth itself.

Quite apart from the change of context, the waning of the social indicators movement is explained by the lack of an integrating framework similar to that of economic accounting (see also chapter 4 on this point). However the effort to derive a small number of significant indicators and to combine them into a composite indicator does not disappear altogether. The Human Development Indicator designed by UNDP, which combines life expectancy, level of education and per capita GDP (measured in purchasing power parities, PPP, see chapter 9) is one of many that would be conceivable. It is also possible to try to take into account income distribution. For example, Sen uses the indicator $y \cdot (1 - G)$, where y stands for the average per capita income and G for Gini's inequality coefficient. This involves an explicit value judgment reflecting aversion to inequality. Then, the more evenly the incomes are distributed, the closer the above indicator is to the average per capita income.

The last decade of the 20th century sees a marked resurgence of interest in the topic of social indicators: "The new social indicators movement", observes Bernard Perret (2002, p. 3), "is both more modest and more dispersed, and is based on more diverse motivations and actors" (see his report).

Otherwise, attention has been increasingly directed towards the use of individual databases on persons and households, liable to take better account of the diversity of situations and their evolution over time. In this context the concept of life expectancy – a highly significant social indicator in itself – can be extended in order to take into account dimensions other than simple longevity, for example, quality-adjusted life expectancy, with an adequate leisure time and monetary income, expectation of time spent in the education system, in a remunerated employment, etc., as a function of certain socio-demographic characteristics (see in particular the work of Michael Wolfson and Geoff Rowe in *Statistics Canada*).

2.3. Environmental concerns and proposals for adjustments to the aggregates

The second part of the 1980s will see the beginning of a change in focus that again attracts attention to the idea of adjusting the national accounts aggregates. This time the accent is principally placed on issues related to the environment. These were not absent from Nordhaus and Tobin's analyses (they discuss [*op. cit.*, pp. 14–17] the relationship between growth and natural resources, and dedicate their appendix B to this topic, [*op. cit.*, pp. 60–70]). Unlike the Club of Rome, they were not particularly worried about the possibilities of substituting reproducible capital for market-type non-renewable mineral resources, but they underlined the risks of deterioration of non-appropriable natural resources having the nature of public goods and even more the danger of global ecological disasters rather than of local disturbances. While considering that unrecorded social costs of economic activity reduce economic welfare through the reduction of the environmental capital and should be deducted when calculating the MEW, they had made no adjustment for this purpose for lack of knowledge of the value of environmental capital.

The Japanese study of NNW on the other hand, deducts in its calculation the actual costs of environmental protection and the potential costs of eliminating untreated pollution (together equivalent to approximately 10% of the NDP for 1970). Later, the Danish study will do the same. In both cases, the issue is to take into account the welfare losses due to the decline in quality of environmental services (pure air and clean water, etc.).

The discussions in recent decades on the possible calculation of an environmentally adjusted NDP (see chapter 8) are no longer framed as attempts to define and measure a general indicator of the change in economic welfare. Experience has shown that such an indicator was, in general, dominated by estimates and uncertainties concerning leisure and household activities, and that its interpretation was vague. The purpose is no longer to assign a monetary estimate to the totality of the services rendered by non-market natural assets, which no one knows how to do. The objective is only, as is the case in the Japanese and Danish studies, to evaluate the loss of environmental services resulting from the decline in quality of the natural assets involved brought about by economic activity and in particular by pollution. Once estimated, the amount of losses can then be viewed from two different perspectives: either as an adjustment to be made to final consumption, from a partial perspective of appreciation in the evolution of welfare, or as a means of measuring the loss in value of these natural assets and calculating for them an equivalent to the consumption of fixed capital for produced assets.

In the approach based on adjusting consumption (see chapter 8 for the relationship between income and wealth), such a procedure gives rise to several objections. First, it hardly seems legitimate to subtract from the total flows of market goods and services entering into final consumption the estimated change in the flow of non-market environmental services which are not included in it. It would be justified to add the total flow of those services, were one capable of measuring it, to the total flow of market goods and services consumed. It would then be possible to infer the change in an extended consumption including environmental services. The second objection is that the methods called upon for estimating the loss of environmental services are situated within a framework of cardinal utility and lead to the calculation of a loss of consumer surplus whose combination with the monetary values of the market economy raises a serious problem.

The third criticism aims more specifically at the proposals for an adjustment of output from a welfare point of view, based on the assessment of the damage suffered (negative externalities) in terms of harm to health either as a result of the use of consumer goods (traffic accidents for example), or from the decline in the quality of the environment due to pollution. In this case, the rationale is to assess the damage in terms of what an increase in morbidity and mortality could represent. The usefulness of evaluations of this kind is obvious, in particular in drawing policies aiming at remedying such damages. On the other hand, the idea (proposal) of deducting the amounts thus evaluated from market consumption is based implicitly on the idea that the positive contribution of the products to welfare is entirely measured by their market value and that it is logical to deduct from them any possible negative effects, "bads" as opposed to "goods", linked with their production or use, in order to correctly measure the balance between satisfactions and dissatisfactions (or between utility and disutility, from the standpoint of cardinal utility). However, the increase in life expectancy or quality-adjusted life expectancy, for example, is not reducible to the value of consumption of food, medicine, etc. To deduct from consumption, at the global level, the value of morbidity or of losses of human lives due to road traffic or pollution seems nonsensical.

Again, in connection with the environment, a debate is going on, analogous to that which, around the measurement of welfare, opposed an approach favoring the calculation of a single monetary indicator to another approach giving preference to multiple indicators. The final decades of the 20th century thus witness the drawing up of sets of environmental indicators and later of indicators of sustainable development. At the same time, the framework of the issue of sustainable development, the interpretation of national income in terms of welfare from the point of view of sustainability or durability over the long term presents a new aspect in certain proposals (see chapter 8).

Outlook

National accounting measures final consumption, that is, the use of goods and services that are not utilized to produce other goods and services. It aggregates expenditures of this type expressed in current monetary values. It attempts then to measure their change over time independent of price movements (see chapter 9).

National accountants, with the exception of Kuznets, always clearly indicated that their measurement of consumption, and of capital formation, the base for future consumption, did not intend to estimate the level of the change in the standard of living, even less to estimate welfare, which depends on many other factors. This did not mean that the study of the change in consumption – of a household, a group of households or an entire population, or the comparison of such changes among households and groups, or internationally among countries – lacked any meaning concerning the relationships among various sets of goods and services. On the other hand, it meant that no assessment of the changes in welfare of a population could be expressed, in a rigorously quantitative way, by the changes in any national accounts aggregate as such. In other words, no aggregate could convey an intrinsic and necessary significance of this type. National accounting provided a complete set of detailed and aggregated measures, for the use of analysts interested in macroeconomic equilibrium or in the study of households, in the relationship between consumption and total product or between consumption and saving, etc. Users were free to go further and look for interpretations of the changes in national accounts, as specialists in climatology do with meteorological observations.

Hicks' attempt (1940) follows such an approach, when studying under which conditions the "real" change (later on, national accountants will say: in volume) in national income can be interpreted as a change in welfare, in the sense of a move for society as a whole from one satisfaction curve to another, above or below, according to the consumer choice theory, and although at the very most it is only possible to observe the prices and quantities of products in the situations to be compared (implicitly: sets of actual preferences themselves cannot be observed, nor aggregated; it is only possible to formulate assumptions about them). From this attempt, and from the long discussion that followed, it is only possible to conclude that, unless assuming very peculiar conditions that do not realistically reflect the states of the economy, it is not possible to translate the observed changes in the sets of goods and services, even strictly limited to market ones, into a measure of welfare, understood as a change in satisfaction or utility for society as a whole. Even the direction of the change, positive or negative, is, strictly speaking, dubious.

Moreover, a considerable part of household consumption corresponds to non-market goods and more frequently services provided in particular by government, whose acquisition does not result directly from consumers' individual choices – let us recall that in national accounts the decision-making center is the household – and as a consequence remains totally outside the scope of the above-mentioned analysis.

Neither the national accounting theory or doctrine, nor the economic theory in the rigorous sense of the *Economica* debate allows to consider the measure of the change in consumption, *a fortiori* in global expenditure, product or national income, as a measure of the change in welfare.

And yet, according to the striking formulation by Paul Dubois at the *Journées d'étude de comptabilité nationale* (National Accounting Discussion Seminar) in April 1972, at the point in time when the public discussion on national accounting and welfare is at its peak: "Practice favors what theoretical analysis rejects" (p. 31). Curiously, the above-mentioned practice concerns both practitioners (political leaders, applied economists, journalists, general public) as well as some theoretical economists.

The former use consumption or national income or even GDP – because it is the aggregate generally called upon as a measure of growth – as an indicator of welfare. Believing or pretending to believe that national accounting is indeed trying to account for the change in welfare, it is easy for them to show how it fails to do so (obviously!), since it does not take into account many elements which either contribute positively to welfare (household activities, leisure), or, reflecting an increasing awareness of the negative aspects of growth, contribute to reduce it (nuisance to people and goods and the natural environment).

From this trend of public opinion which leans on Kuznets' position, proceed the attempts, in fact scarce and which do not give way to regular statistical practices, which are carried out by economists – Nordhaus and Tobin being the most outstanding figures – to calculate a composite monetary indicator of welfare, or of a more modestly named economic welfare, or simply of the full set of goods and services that contribute to it.

Regarding theoretical economists, the models of optimal long-term growth that Dubois implicitly refers to are based on the maximization of a utility function for households centered principally or exclusively on their consumption. Within this framework, the change in net domestic product is interpreted in terms of change in welfare. It does not mean that these economists have solved the problems of interpersonal comparison of utilities, of aggregation of preferences, of income distribution over which attempts such as Hicks' had stumbled. The reflections on this type of problems are the field of a specialized branch of economics, the economics of welfare, which presents itself explicitly as normative and places itself at a very high level of abstraction, without searching any longer for any relationship to actual national accounting measurements. Theoreticians of optimal growth circumvent the problem by resorting to the simplifying assumption of a representative consumer granted with a global utility function. In so doing, the presumably insolvable problem is deemed nonexistent.

Within this theoretical framework, using a set of very restrictive assumptions (see end of chapter 8 and of its appendix), Weitzman (1976) attempts a kind of grand reconciliation, in which national domestic product is understood as a measure of both welfare and sustainable income of an economy, the latter being based on Hicks' definition of income to which economists so frequently refer (see appendix to chapter 8). This would provide a combination of various approaches: that which is aiming at a rigorous demonstration of the relationship between national income and welfare (section 1 of the present chapter), that which is trying to calculate a composite indicator for the change in welfare (section 2), and finally that which is looking for an environmentally adjusted national domestic product (end of chapters 7 and 8), all this within a theoretical long-term model which integrates at the same time the theory of consumer preferences and the theory of capital. Thus, both the "*goods*" and the "*bads*", which are missing in the national accounting estimates, are included in the arguments of the utility function, and all forms of assets, including natural assets of interest, are supposed to fall under the monetary measure of the model's extended concept of capital.

Explicitly or implicitly, the bases for a number of practical requirements addressed to statisticians and national account compilers are derived from this theoretical model. Contrary to the statement by Dubois in 1972, that "practice favors what theoretical analysis rejects", a whole stream of thought professes something akin to: "... National accounting practices must apply what the theoretical analysis of optimal growth concludes".

This change is paradoxical in many respects, since these injunctions are formulated when economic theory as well as the practice of measurement are trying to progress on issues about which a quasi infinite extension of the famous "what can be brought directly or indirectly into relationship with the measuring-rod of money" (Pigou) is attempted.

Tensions around these issues, which appear in the last decades of the 20th century, are more intense than those at the end of the 1960s and beginning of the 1970s, but to a great extent a similar scenario is being reproduced. On one side, a desire to show the increasing complexity of the world by means of estimates in monetary terms leading to the calculation of a comprehensive significant aggregate. On the other, a rejection of the pretension that such an approach is practicable, and a resort to systems of multiple indicators (social indicators of the 1970s, environment or sustainable development indicators of the 1990s, and again social indicators in the last decade) among which monetary indicators can also be found; such a dividing line can be changeable, and in particular even run across institutions, depending on the methodological frameworks favored and the functions fulfilled.

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Economic Council of Japan, *Measuring Net National Welfare of Japan, 1973* (see the present chapter, p. 292, for Kimio Uno's comment).

Peter Rørmose Jensen and Elisabeth Mølgaard. *On the Measurement of a Welfare Indicator for Denmark 1970–1990* (The Rockwool Foundation Research Unit, 1995).

The topic is in the air at the beginning of the 1970s and national accountants assume a very critical position towards these works. For France, see the report of the *Journées d'étude de la comptabilité nationale* [National Accounting Discussion Seminar], April 17 and 18, 1972, INSEE–AFSE ("Le nouveau système de comptes nationaux" [The New System of National Accounts], *Cahiers de l'Association française de science économique*, no. 2, 1974), with an introductory note by Paul Dubois, "Production, niveau de vie, bien-être" [Production, standard of living and welfare], pp. 29–38, and E. Malinvaud's summarized conclusions, pp. 48–50 ["Finally Mr. Malinvaud agreed on what seems to be one of the major conclusions of this seminar: national accounting does not give, cannot give, a measure of welfare not even of economic progress", p. 49]; also, Oleg Arkhipoff's theoretical argumentation ("Peut-on mesurer le bien-être économique national?" [Can national economic welfare be measured?] (*Les collections de l'INSEE*, no. 41 C, March 1976) focused on the impossibility of the aggregation of preferences: "[...] the idea of a numerical indicator representative of national welfare (of development, progress, etc.), is a nonsensical concept, contradictory in its very terms", p. 9. A UN working paper, prepared by Christopher T. Saunders, takes stock of the question: "Satellite accounts to be added to national accounts and balances to measure welfare" (document E/CN.3/477, February 17, 1976).

A series of studies, in particular of American researchers, are less oriented towards building an indicator of welfare than to "better measure economic activity contributing to social welfare" (Eisner, 1988, p. 1612). A comparative analysis of these studies with their principal quantitative results and an extended bibliography, is found in Robert Eisner, "Extended accounts for national income and product" (*Journal of Economic Literature*, December 1988, pp. 1611–1684). One can add a paper by Oli Hawrylyshyn, with balanced conclusions, "A review of recent proposals for modifying and extending the measure of GNP" (*Statistics Canada*, 1974), among which that of Usher (1973) on leisure (p. 42). On the "third-party criterion", see Alfred Marshall, *Economics of Industry* (1879; quoted from the 4th edition, 1909, p. 52, by Studenski, p. 20: "all other services which one person may be hired to perform for another"), Margaret Reid, *Economics of Household Production* (John Wiley, 1934) p. 11); Oli Hawrylyshyn, "Towards a definition of non-market activities"(*The Review of Income and Wealth*, March 1977, pp. 79–96), see p. 89; Peter Hill, "Do-It-Yourself and GDP" (*The Review of Income and Wealth*, March 1979, pp. 31–39), see pp. 34–35).

On the measurement of household activities, see for example Ann Chadeau and references "Measuring household activities: some international comparisons" (*The Review of Income and Wealth*, September 1985, pp. 237–253). The literature on the subject is considerable. A recent report, with many references (in particular to Luisella Goldschmidt-Clermont) is *Proposal for a Satellite Account of Household Production* (Eurostat, 1999) by a team of Finnish experts, main drafter Johanna Varjonen.

The United Nations published, in the *Handbook of National Accounting* series, two valuable compilations of almost 800 pages of contributions on household accounts (*Household Accounting: Experience in Concepts and Compilation*, 2000). Volume 1, *Household Sector Accounts*, includes in particular a chapter on the informal sector (Chapter II, pp. 57–168). Volume 2, *Household Satellite Extensions*, presents various types of works extending household accounts.

On the concepts of production and consumption, a simple presentation can be found in two articles by André Vanoli in *Economie et Statistique*, "Les notions de consommation élargie" [The extended concepts of consumption] (May 1978, pp. 55–63) and "Les tracés divers de la notion de production" [Various delineations of the concept of production] (September 1983, pp. 61–73).

Concerning the new social indicators movement during the last decade of the century, see the summary report by Bernard Perret prepared for the French Centre d'Etudes des Revenus et des Coûts (CERC), *Indicateurs sociaux, état des lieux et perspectives* [Social Indicators, State of the Art and Perspectives] (January 2002). Besides a review of ongoing works (pp. 2–17), this report contains an interesting discussion on the "undiscoverable theoretical foundation of the valuation of social welfare" (pp. 17–26), including in particular an analysis of the positions of Amartya Sen, John Rawls, Michael Walzer and Robert Putnam.

Experimental work in progress at Statistics Canada to develop an integrated microanalytic framework for socio-economic statistics is presented in a paper submitted at the 1998 IARIW Conference (Cambridge, UK) by Michael Wolfson and Geoff Rowe, "LifePaths – Towards an integrated microanalytic framework for socio-economic statistics". It concerns a prototype framework of overlapping generations. The idea is to estimate for various cohorts with certain characteristics (gender, etc.) the number of years spent or expected to be spent in certain situations, defined for example by an adequate level of income, of health conditions or of leisure time, separately for each situation or for a combination of them. The project is explicitly presented as a development and extension "after the computer revolution" of the ideas of the System of Demographic and Social Statistics proposed by Stone (see chapter 5, Box 31).

Chapter 8

Production, Income and Wealth

Contents

1. Flow accounts and wealth accounts: unsynchronized developments

It was not before the end of the 20th century that wealth accounts (stocks) began to receive, within international recommendations, an attention equivalent to that devoted to flows. However, except for some rare exceptions, the practice itself still remains strongly unbalanced today.

1.1. Many estimates of wealth before the national accounts era

Nevertheless, the interest of the evaluation of fortune or wealth had been perceived long ago (already by King). During the 19th century until World War I, or somewhat later, many estimates are carried out in the United Kingdom (from Beecke, 1800, to Stamp, 1914), in the USA (in particular with data collected simultaneously with population censuses from 1850 to 1922), and in France (from Girardin, 1853, to Colson, 1913, through De Foville, 1889). In Germany and in Italy (Corrado Gini in particular), studies concentrate on the thirty years preceding the war. Comparative tables of various estimates are drawn up by H. Mulhall for 1896 (covering twenty-two countries), by Josiah Stamp for the pre-war period (eighteen countries, with his estimation of the margin of error of the results), then by Gini for 1922 (fifteen countries). Gini estimates for the League of Nations (1925 Report) the decrease between June 1914 and June 1925 in the wealth of Italy and Belgium (one third) and France (more than 40%), and the increase in that of the United Kingdom (10%) and the USA (20%). They reflect the differentiated effects of the war.

A series of estimates for various countries can still be found at the eve of World War II. However, in 1938, Simon Kuznets notes (p. 72) that estimates of national wealth have recently lost part of their importance to the advantage of national income. He himself pleads for valuations of the components of wealth, but expresses his skepticism for the interest in global estimates. The circumstances of the emergence of national accounts and the influence of Keynesian ideas focus research work on flows. The need for extending studies to stocks is understood, but the response is delayed to later periods.

1.2. Slow take-off of integrated balance sheets

A first wave of attempts to measure national wealth, mostly without follow-up, occurs nevertheless in the first half of the 1950s. The 1957 IARIW Conference is dedicated to this topic. A review of isolated results for 18 countries is reported there (including those of Divisia, Dupin and Roy for 1954 in France). Tangible produced assets and land are included, as well as net financial assets on the rest of the world. Durable consumption goods are usually included, whereas military goods are always excluded. The Netherlands is then the most advanced country in the process towards complete balance sheets (for example, in 1952 accounts by sector are published for 1948 and 1949), but this effort is not pursued.

1.2.1. American and British efforts

An enormous endeavor is then carried out in the USA under the aegis of Raymond Goldsmith who had already published, in 1951, a long-term series of growth of renewable wealth covering the 1805–1950 period. The 1962 and 1963 monumental publications included sector accounts from 1945 to 1958, with some series going as far back as 1900. The coverage of tangible assets is very complete, and includes durable consumer goods, military assets and subsoil assets (the latter two being shown separately). By contrast, intangible assets are restricted to financial assets, even when some other elements (patented entities, trade marks) appear in the balance sheets of enterprises. Goldsmith develops the perpetual inventory method (PIM) (calculation of stocks of fixed assets according to their replacement cost, based on accumulated and revalued GFCF and CFC). In the United Kingdom, E.V. Morgan publishes, in 1960, complete accounts for 1953 to 1955, and Jack Revell (1967) completes, in Cambridge, a large research work covering 1957 to 1961. The latter also excludes intangible assets, but notes the problem arising from human capital. The subsoil assets are only indirectly covered, and to a limited extent.

1.2.2. The 1968 SNA remains incomplete

Thus, before the publication of the 1968 SNA, some fundamental attempts towards the development of wealth accounts have been carried out. However, concerning the treatment of non-financial assets, they remain based on the narrow concept of tangible capital. The limitation of this research to a couple of countries – most of the attempts at the beginning of the 1950s are not repeated – excludes the possibility to include balance sheets in the 1968 SNA except as *pro memoria* information. The concept of GFCF of the system remains restricted to tangible assets, including dwellings owned by households. The preparatory discussions turn down Stone's proposal regarding the inclusion of other household durable goods. This inclusion is indeed almost always associated with the extension of the concept of production to domestic activities within the household (see chapter 7).

Certainly it would be possible, though not in a very orthodox way, to disconnect the two issues. One would record the acquisition of these goods as GFCF and the services they provide (measured by their loss in value and an imputed interest applied to the residual value of their stock) both as output of a special industry, and as final consumption, similar to what is done in practice by those trying to estimate an indicator of change in welfare. But this process would not go as far as including household internal labor nor the process of transformation of goods and services bought by households into products concretely consumed by them (meals, laundry services, etc.). However, analysts of consumer behavior seem satisfied with the classification of purchases according to their durability, and the knowledge of the rates of ownership and replacement of durable goods. The 1993 SNA will thus confirm the former solution, while recommending a memorandum item in the balance sheets and referring the alternative treatment to a satellite account on household production.

The 1968 SNA (Foreword) considers within future developments the issue of demographic flows and stocks, and the possible treatment of research and development (R&D), education and health expenditures as investment. For the time being, only goods (tangible), including the services that are incorporated in them, can thus be subject to accumulation. The questions about growth factors and in particular the famous residual factor (after labor and tangible fixed capital inputs have been accounted for) do not yet influence the recording of GFCF in national accounting.

1.3. Estimates of human capital

The aforementioned questions and his own research on total factor productivity lead John W. Kendrick to undertake in the middle of the 1960s a vast study published in 1976 (*The Formation and Stocks of Total Capital*) referring to the USA, which includes in particular R&D and human capital. The concept of human capital stemmed far back with economists such as Petty, Smith, Say, Fisher, etc. Ernst Engel (in 1866), and later Vilfredo Pareto (at the turn of the 19th century) carried out the estimation of the money value of a man in order to evaluate the costs of German and Italian emigration. Later on, Corrado Gini made a symmetrical estimate regarding the contribution of immigration (1820–1930) to the wealth of the USA. L.I. Dublin and A.J. Lotka's book is a fundamental work with the eloquent title *The Money Value of a Man* (1930). At the beginning of the 1960s, the economists of education (Theodore W. Schultz, Mary Jean Bowman, Gary S. Becker) worked out the concept of investment in human capital.

Kendrick's book is the first systematic work dedicated to macroeconomic evaluation in this field, in terms of costs, as an extension of national accounts. The results are impressive. The value of the stock of human assets equals the value of all other assets in 1929 and 1948, and exceeds it by 15% in 1969. Among them, the tangible human assets (measured by the cost of physically rearing children until working age), are slightly greater than the intangible human assets in 1929, become lower than them by a quarter in 1948 and by more than a half in 1969. The educational assets, including the opportunity cost of time for those studying, represent nearly 90% of intangible human assets. The remaining part comes from the accumulation of half of the health expenditures and from costs related to mobility.

1.4. Obstacles to the integration of human capital

However, the possible inclusion of human capital thus understood in national accounting raises great difficulties. The measurement of investment and stock can strongly vary depending on the conventions adopted to measure costs (for example regarding the estimate of an opportunity cost for the time of students or for the breakdown of health expenditures between investment and current consumption), and the depreciation method selected. The variation is even greater for the difference between these estimates of cost and the present value of future incomes, the latter being closer to the theoretical approach. Moreover, if human capital is to be treated in full parallel with the rest of capital, the issue of the current maintenance expenditure of this capital arises, which, in all logic, would have to be considered as intermediate expenditure. Household final consumption would then consist of what remains from expenditures in the traditional sense once having deducted what constitutes GFCF (education expenditure, a part of health expenditure, rearing children until working age expenditure, etc.) and what is necessary for the current maintenance of human capital.

The latter aspect is very troubling. Pigou and Kuznets reject such a deduction which Gini considers as necessary (Mastrodonato, pp. 24–25). Kendrick hesitates. He notes that most economists, but not all, think that what is used for maintenance is a source of satisfaction and thus should not be excluded from final consumption from the point of view of welfare; but the same can also be said of part of what goes to investment. Finally, he does not deduct maintenance expenditures in his principal estimate of income, but he does it in order to calculate the respective rates of return on human and nonhuman capital in a coherent way (1976, p. 32). He finds them fully similar (*ibid.*, p. 7). Maintenance expenditures are estimated using the 1960 Social Security Administration poverty budget, extrapolated backwards and forwards to take into account the increase over time in the volume of the minimum subsistence level (it seems to echo the subsistence wages of the classical economists). The difference between the rates of return on human capital, before and after maintenance costs are deducted, is large. The first is estimated as twice the second in 1929, and as 1.7 times in 1969.

Taking into account maintenance expenditures does not affect Kendrick's estimation of stock since the latter is based on the accumulation of capital costs net of CFC. Nevertheless, it has a strong incidence when this stock is estimated using the present value of future returns, if, as the costs of subsistence are not deducted from the latter, the rate of discount (rate of return on capital) used is not sufficiently high. Thus, a subsequent Swedish study (1997), using this method, estimates the value of human capital in Sweden as six (1990) to ten (1967) times the total value of the tangible capital of the market sector, with a discount rate of 5.5%. An earlier American study (1979) had concluded that a discount rate of about 20% was required to get an estimate close to Kendrick's for the same year 1969. The authors did not observe that Kendrick's rate of return, before deducting maintenance costs from income, was precisely within this range.

1.5. The issue of intangible investment

The complexities of human capital and its potential consequences in terms of a drastic reorganization of the SNA explain why national accountants never envisaged treating them, in their full extension, within the national accounts central framework. Leaving aside the thorny problem of tangible human capital, it is the intangible or intellectual investment that increasingly attracts attention. Kendrick treated what had to do with education, health and mobility, within the framework of human capital and separately what has to do with R&D. In the 1980s, the point of view widens. The changes under way result in a renewed vision of the business world and of the processes of the development of production and markets, centered on innovation, partial dematerialization and communication.

In this context, on would expect the revision of the SNA to decisively be geared towards the extension of the concept of GFCF beyond that of the formation of reproducible tangible assets, but that is not exactly the case. The extension is accepted rather easily for software. The debate is somewhat more painstaking for literary, artistic and entertainment originals, which need to be distinguished from the literary and artistic copyrights which guarantee them. A certain effort is required to convince some European experts that the expenditures associated with the production of a movie represent an investment. Uncertainty on future receipts troubles them, but any investment involves a risk. The discussion becomes more complex when referring to expenditures associated with mineral and oil exploration. Here again, uncertainty generates uneasiness, and it is necessary to clarify a frequent confusion between the value of exploration expenditures and that of the reserves possibly discovered. The latter (see below in this chapter) is based on the estimate of the resource rent once all costs have been taken into account, including the depreciation of the exploration expenditures. The possibility of any double counting is thus excluded if this calculation is carried out correctly.

Although, in the end, it is decided to extend GFCF to cover the aforementioned expenditures, the resistance to the idea of including R&D expenditures in GFCF is extremely strong. So strong indeed, that after a first favorable decision of the Expert Group in March 1988, it unfortunately changes its mind in December 1990, and among the present members only the French expert takes then a definitely positive position. The fierce opposition of most of the European countries, except France, is at the origin of the regrettable reversal of the Expert Group (see Box 53). Beyond bold conservatism, discussions show that national accountants (it seems that most of them did not follow the public discussion on intangible investment) are in general reluctant, even at that time, of getting rid of a certain idea of investment dating back to the 19th century. In this context, a rigid distinction between goods and services was made, the latter not being capable, in principle, of directly entering into GFCF, but only through their incorporation into goods. The barrier gave way though, whenever the service activity led to the constitution of "visible" assets (discoveries of subsoil resources, physical support of a piece of software or a movie, etc.), but not when this immediate visibility was not verified (R&D). The barrier also yielded with the introduction of work-in-progress for services, because it challenged certain characteristics traditionally attributed to services such as production on order, simultaneity of production and consumption, absence of storage.

Box 53

Arguments behind the European opposition to the inclusion of Research and Development Expenditures in capital formation

[Taken from "La révision du Système de comptabilité nationale des Nations Unies (SCN)" [The Revision of the System of National Accounts of the United Nations (SNA)], a lecture by André Vanoli at the 4th Conference of the Association de Comptabilité Nationale, March 6, 1991, supplement to *Courrier des Statistiques* No. 58–59, October 1991. Text reviewed and completed in November 1993 for the French National Council for Statistical Information.]

"None of them aims [. . .] at demonstrating that R&D expenditures meet the definition of intermediate consumption (goods and services which are used up in the production process of a period and thus constitute a current production expenditure). Everyone admits that they are incurred, particularly by businesses, with the intention to increase future income. If not, there would be no reason to bear that cost, since current output is not increased.

The arguments given try to show why these expenditures should not be treated as GFCF.

1. It would represent a move towards the integration of human capital; but it was decided not to integrate this one in the system, therefore .... This parallel is totally irrelevant. Investment in human capital refers to expenditures that transform the individuals themselves, its effect is attached to them. It is not the case of R&D expenditures. Results of R&D are external to individuals; they are appropriable and transmissible as such, and do not require that individuals be "transmitted" at the same time.
2. R&D results would have a random nature. It is true that not all R&D programs succeed; in a way it is so by definition, in the same way as not all mining explorations are successful.

   But, here again, from the point of view of the national economy and its broad industries – which is that of national accounting – R&D expenditures statistically succeed, so that it is all the research that contributes in a certain way to the fact that, on average, a certain proportion of it is successful. Moreover, it has also to be noted that a relevant part of tangible investment in certain countries does not succeed, in the sense that certain investments are never completed, or never used in a production process. And, of course, the actual profitability of the traditional GFCF is often lower than what was originally expected.
3. Assets associated with R&D would not have a clear nature, they would not be identifiable. That they indeed exist if research succeeds ("and yet it does move") is indisputable, since one can protect their property by patenting them, sell the patents, or transfer the right of their use to others. Naturally, these assets have certain characteristics different from tangible assets, although they also include generally tangible components, prototypes for example, but to require for them to have all the characteristics of tangible assets would be like answering the question about intangible investment even before posing it.
4. The estimate of consumption of fixed capital would be particularly difficult in the case of R&D. It is true that it only concerns obsolescence, not physical wear and tear. But often, obsolescence is nowadays the main factor that determines the service life even of tangible equipment. After observing that estimates of the service life of the latter vary often considerably among the OECD members, one can seriously doubt that the case of R&D assets would have been more complex.
5. Enterprises seldom capitalize R&D expenditures in their accounts. It is true that accounting standards set restrictive conditions for recording them in the balance sheet. This attitude, which may evolve, is linked to the well-known rule of prudence and I am not, in principle, upset by the use of this rule at the microeconomic level. I do not believe, though, that it must be necessarily followed at the level of industries or of the whole economy, where statistical regularity makes sense.
6. Lack of statistical data was sometimes mentioned, and thereby practical difficulties. When one knows the existence of recommendations made by the OECD long ago (Handbook known as the

cont'd

Box 53 (cont'd)

Frascati's manual) and the series of surveys carried out on this basis in all the countries for which the R&D activity is significant, it is surprising to see this argument called upon, sometimes by countries whose statistics on services, in addition, are not quite up to the mark [...].

Of course, as opponents to the R&D inclusion were conscious of the weakness of their position at the conceptual level, the proposal was eagerly made to have a satellite account for R&D, a solution that allows the issue to be re-examined in the future [...]. May I recall that the introduction of the 1968 SNA said (p. 15): "There is an area in urgent need of clarification, but this can be done on the basis of experience, which though growing, is not yet very great". A quarter of a century later, we are still at the same point. May I add that having proposed myself, 25 years ago, the concept of satellite account, I cannot but feel somewhat annoyed by its use as an alibi."

1.6. Military durables

By contrast, there was in Europe a definitely more consistent minority in favor of the inclusion in GFCF of all military durables, including destructive military armaments, the justification being that "they are there", whereas in the former versions of the SNA all goods, except dwellings for the families, included within military expenditures were treated as current consumption. The Expert Group did not go as far, but decided, with a very narrow majority (see appendix to chapter 3), that durable goods of the same type as those used in civilian production, other than services of internal security, would be treated as GFCF: airfields, docks, aircrafts or ships of transport of troops, computers, barracks, schools, hospitals, etc.

Such a decision was not self-evident, even if the former treatment relied on a practice considered as self-explanatory, and lacked a well-specified conceptual basis. In 1945, Stone (p. 77) only points to the need of avoiding large fluctuations in capital formation, which would then result from expenditures in war times. It is true that Kuznets in *National Product in Wartime* (NBER 1945, Part I), treats military durable goods as capital formation in one of his alternatives, but on the other hand, according to *Government Product and National Income* (1951), completely excludes military expenditures from net government output outside the context of a fight of society for its survival.

The concept of service activity inevitably takes a particular character in the case of defense. In the event of war, military operations, whose destructive character is obvious, cannot be analyzed in terms of a process of production. In peacetime, it consists of assembling a series of means, with deterrence purposes or aiming at the preparation of possible war operations. Their respective service lives are of no importance. A country allocates an amount of resources to its defense. To divide it between current consumption and saving hardly represents any interest for a general economic analysis, even if a defense satellite account should carry out a more complete *ad hoc* analysis. It would have been sufficient to make provision, as in the past, for an adjustment entry whenever a good is actually moved from a military use to a civilian one.

As for the USA, it decides, at the time of a revision of its accounts (1999), to go further than the SNA and include in GFCF all acquisitions of military durables, including those which the 1993 SNA (§§ 6.170 and 10.65) excludes, i.e. weapons of destruction and the equipment intended to launch them (silos with missiles, warships and fighter aircrafts, tanks, missile carriers, launchers, etc.). The Bureau of Economic Analysis (BEA) follows on this point the advice of a group of experts set up by the Committee on National Statistics of the National Research Council. Many of them consider as "arbitrary and conceptually inconsistent" the distinction made by the SNA, and that "weapons should technically be seen as providing a national defense service" (p. 19 of the report, 1998). The SNA solution also takes into account the mentioned weapons when estimating the value of national defense services, but treats them as intermediate consumption. As suggested in the previous paragraph it is the very concept of national defense service that is questioned.

1.7. An incomplete concept of GFCF

At the turn of the 20th century, the concept of GFCF in national accounting is thus in a transitory and ambiguous state. A lock has been sprung. The intangible or intellectual investment is recognized, but only timidly. R&D expenditures should have been classified as investment. On the other hand, there hardly exists a realistic possibility to insert the concept of human capital within the integrated central framework. Strong conventions, very close to arbitrary, would be in effect necessary to distinguish capital expenditures, intermediate maintenance expenditures and strictly final consumption (see above). The results of the accounts thus disrupted would no longer be appropriate for some of their principal uses. The use of a satellite account, highly desirable in this case, is unavoidable. On the other hand, education expenditures should be treated as GFCF as well as, if proved to be realistic, part of health expenditures. Other possible components of capital expenditures, which have often been discussed (constitution of sales networks, investment in advertising campaigns for example) depend on prior accounting and statistical progress.

The problem is still complicated by the phenomena increasing the value of businesses, which do not result from their investment expenditures but from their activity itself (clients, trademarks, etc., making up "goodwill") and that could be regarded, if regularly measured, as outcomes of their production activity. In addition, businesses acquire assets of a new type, which are not produced and are not comprised as GFCF of national accounting (see further). Thus, categories tend to blur.

1.8. Development of the accounting framework

National accounting, though still stumbling over the concepts of investment and assets, shows, nevertheless, substantial progress in the development of its accounting structure (see chapter 3) by presenting flows and stocks in an integrated framework, which makes it possible to improve the presentation of the relationship between saving and wealth and, therefore, of the relationship between income and wealth. These relationships had remained vague for a long time, as the flow accounts ended, in the best case, with the financial accounts. Researchers had compiled balance sheets, not intending, however, to narrowly link their annual changes with the flow accounts. The 1968 SNA itself just mentions formally the revaluations in its first chapters. The situation starts to change when the UN issues, in 1977, provisional guidelines on balance sheets prepared with the assistance of J.R.S. Revell. Taking stocks of the 1968 SNA, these guidelines undertake a broad exploration, though still incomplete, of all that can influence balance sheets without appearing in the 1968 SNA flows. It reconciles these two approaches, hence the expression "reconciliation accounts", applied at that time to a highly heterogeneous set of elements covering revaluations as well as unforeseen obsolescence, uncompensated seizures or discoveries of subsoil resources less their depletion.

A few countries start then to prepare integrated balance sheets. In 1980, France publishes its results for 1971, 1972 and 1976 (Annie Fouquet, Alain Benedetti, Georges Consolo *et al.*). This endeavor will continue, with the construction of a series going back to 1970 and published in 1984. However the regular publication simultaneous with that of the annual flow accounts will only be initiated in 1994. The Japanese carry it out earlier, from 1978 with a series beginning in 1965. The French devote substantial reflections to the problem of "reconciliation". The revised version of the SECN (June 1987) characterizes most of the so-called "reconciliation" entries as representing net creation of value outside the production processes.

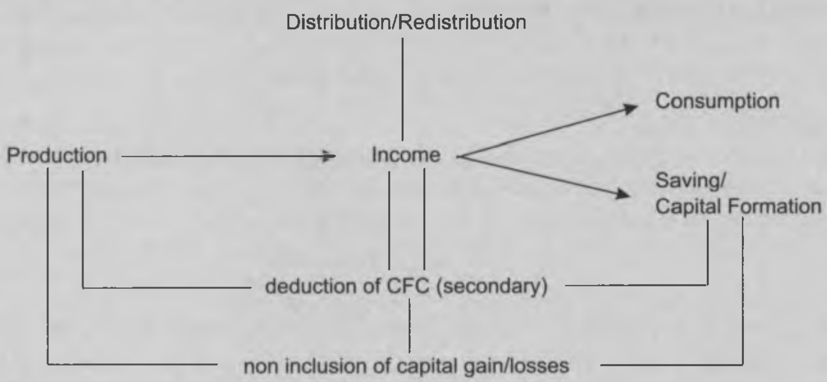
The 1993 SNA completes the system (see Box 54) and systematizes the identification and analysis of the corresponding elements. Because of their importance, the depreciative status attached to the term "reconciliation" is removed to upgrade them to flows (*other flows* as compared to transactions) recorded in two specific accumulation accounts. The "other changes in volume of assets" account records changes in the substance of institutional sectors' net worth, which result neither from production activity nor from flows of primary income, capital transfers, or changes in the prices of assets. The revaluation account aims at finally showing the real holding gains/losses due to specific price changes compared to the changes in the general price level (see Box 55).

The links between saving and change in net worth are thus specified, whereas previously, saving appeared somewhat "up in the air". In technical terms, national accounts (net) saving is equal to the change in the real net worth *less* net capital transfers received, *less* net other changes in volume of assets, *less* real holding gains/losses. In order to visualize this rather austere definition, it is useful to complement the second diagram of Box 54 with the last rows of the table in Box 55. In fact, the change in the real net worth is equal to the change in the net

Box 54

Production, Income, Wealth: From the traditional truncated sequence of accounts to the complete framework of the 1993 SNA/1995 ESA

Since their emergence at the beginning of the 1940s until the beginning of the 1990s, national accounts look essentially in practice as a directed, significant but truncated, sequence which goes from production to income and its uses, as shown in the following diagram.


Distribution/Redistribution
Production
Income
Consumption
Saving/
Capital Formation
deduction of CFC (secondary)
non inclusion of capital gain/losses

Traditional truncated sequence

For most compilers and users, national accounting is limited to this basic scheme, although national accountants have, in the back of their mind, the idea that the system should be complemented by balance sheets. On a purely instrumental basis, some countries soon carry out estimates of stocks of fixed assets based on the perpetual inventory method either for the purpose of the compilation of CFC, or for productivity studies and growth accounting. If not, CFC is based on business depreciation allowance adjusted in the best possible way. Later on, the perpetual inventory method tends to generalize.

In this diagram, saving appears linked to current transactions, of which it is the balance. Its use for capital formation (non-financial and financial) is shown. On the other hand, its linkage to the change in net worth does not appear, as it is influenced by other elements beyond (net) capital formation.

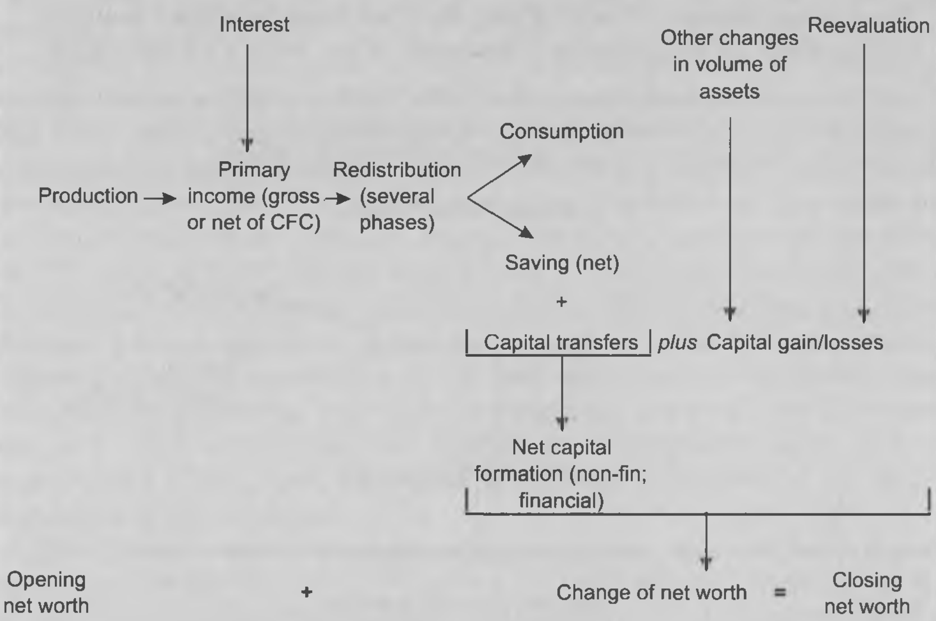
In parallel a more complete scheme is gradually worked out, and emerges with the 1993 SNA. The latter makes it possible to more explicitly ask a number of questions that had been disguised until then, concerning, in particular, the interpretation of national accounting concepts in relation to economic theory. To help readers not trained in national accounting, the traditional, but fuzzy, expression "capital gains/losses" usual in economic literature has been used as an equivalent to the contents of the two new accumulation accounts of the 1993 SNA. This equivalence is only approximate though.

The diagram thus supplemented (see p. 314) shows that saving can be seen from two perspectives. Either, starting from the left, it is the balancing item of current accounts (current transactions); or, from the bottom line at the right, it results from the change in net worth once the other changes in volume of assets, revaluations and capital transfers have been deducted.

As saving (net) is, with final consumption, one of the two components of income, the definition and the measurement of the latter will depend on the measurement and definition of production and consumption of fixed capital, and on the border line between the elements classified in the current accounts and those appearing as capital gains/losses – in the broad sense – and capital transfers recorded in the accumulation accounts.

cont'd

Box 54 (cont'd)


Interest
Other changes in volume of assets
Reevaluation
Consumption
Production
Primary income (gross or net of CFC)
Redistribution (several phases)
Saving (net)
+
Capital transfers
plus Capital gain/losses
Net capital formation (non-fin; financial)
Opening net worth
+
Change of net worth
=
Closing net worth

Accounting framework 1993 SNA/1995 ESA, without relations with the rest of the world

In practice however, by the end of the century, there is only a rather limited number of countries that compile complete accounts. The truncated sequence (from production account to financial account included) remains the dominant perception of the majority of producers and users of the accounts. In addition to the paucity of results that it presents, this scheme often leads to reasoning within too narrow a framework.

[The two diagrams are extracted from André Vanoli, "Comptabilité nationale et concepts de production, de revenu et de capital: une revue critique" [National accounting and concepts of production, income and capital: a critical review] in E. Archambault and M. Boëda (eds.), *Comptabilité nationale, Nouveau système et patrimoines* [National Accounting. New System and Balance Sheets], *Economica*, 2001, pp. 25–49].

worth (bottom of the second diagram) *less* the neutral holding gains/losses (row before the last of the table, and explanation of the text of Box 55). A similar identity is established by taking into account the change in nominal net worth and nominal holding gains/losses.

A significant difference between national accounting and business accounting is perceivable. The latter retains a concept of surplus that, as it covers both current surplus and exceptional operations, is equal to the change in the net value of the business. National accounting has nothing equivalent to this total surplus. Its income (balance of current accounts) can only be compared, through many differences due to various reasons, to the current surplus of business accounting. From there derives a certain complexity in the relationship between income and change in net worth, as compared to the current or theoretical views.

Box 55
Assets and liabilities accounts of the 1993 SNA

The following table (Table 2.7 of the 1993 SNA) comprises an aggregated presentation for a fictitious national economy as a whole, of the links between accumulation accounts and opening and closing stocks of assets and liabilities. The capital account and the financial account are the traditional ones. The specific content of the capital account has obviously been modified in order to take into account the enlargement of the concepts of GFCF and changes in inventories. Moreover, acquisitions and disposals of valuables are now shown, an innovation of this version of the international System.

The principal innovation consists of the *other changes in volume of assets account*. The headings, unusual for some, reflect the boundary drawn by the SNA between economic assets ["... entities: a) over which ownership rights are enforced by institutional units, individually or collectively; and b) from which economic benefits may be derived by holding them or using them, over a period of time", 1993 SNA, § 10.2, see also § 10.3] and other types of assets. The distinction is particularly significant for natural assets (see 1993 SNA, §§10.9–10.12). These headings also reflect one of the SNA's essential characters: the distinction between produced assets, for example machineries, and non-produced assets, as for instance subsoil mineral resources.

It is not surprising to see here the mention of (item K.3) the "economic appearance of non-produced assets", corresponding for example to the discovery of an exploitable oil deposit or, in a somewhat more sophisticated way, to the need for uncovering the existence of intangible assets on which transactions take place (purchase/sale of patents or acquisition/disposal of a company showing a value paid in excess of the total net value of its assets and liabilities, separately identified), whereas the corresponding value has not been recorded in production, either because of the nature of what is the object of the transaction (goodwill for instance), or as a consequence of a shortcoming of national accounting or business accounting (treatment of R&D expenditures, for instance).

It is more surprising to note the presence of item K.4, "Economic appearance of produced assets". It refers to goods that fit the definition of production in national accounting but are still not shown in the balance sheets when transactions on these assets are recorded. This is the case for valuables and historic buildings. "These valuables and historic monuments have not already been recorded in the balance sheets for any of several reasons: they antedate the accounts, they were originally recorded as consumption goods or, if structures, they have already been written off" (§ 12.23; see §§ 12.23–12.25).

Item K.5 speaks (almost) for itself. The exploited halieutic resources, for example, constitute an economic asset according to the SNA definition, but they are not produced, unlike those originating in fish breeding.

Item K.6 is symmetrical to items K.3 and K.5.

Items K.7 "Catastrophic losses" and K.8 "Uncompensated seizures" also speak for themselves. They refer to economic effects of non-economic phenomena.

On the contrary, the items that follow are cryptic. It would be wrong however to take them as simple elements of reconciliation between the change in two successive values of net worth and the flows recorded up to this point. They cover flows that are specified and significant, even if some of them are possibly difficult to measure. Item K.9 includes the effect of unforeseen obsolescence, the abandonment of not yet completed productive equipment, exceptional inventory losses, etc. K.10 will show allocations and cancellations of Special Drawing Rights or the involuntary writing-off of bad debts by a creditor (the cancellation of a debt by mutual agreement is recorded as a capital transfer). Examples of flows to be recorded under K.12: what is linked to the reclassification of an institutional unit from one sector to another (from households to non-financial corporations, for example) or what concerns the monetization/demonetization of gold (§ 12.61). The gold in question changes from a category of assets to another (from inventories or valuables to item F.1, Monetary gold and SDRs, or reciprocally).

cont'd

Box 55 (cont'd)

Assets and liabilities accounts (example for the total economy)[1]

			Non-financial assets		Financial assets/liabilities	
			Produced assets	Non-produced assets	Financial assets	Liabilities
		Opening stocks	6,047	3,875	6,792	6,298
III.1 Capital account	P.51	Gross fixed capital formation	354	22		
	K.1	Consumption of fixed capital (–)	–222	0		
	P.52	Changes in inventories	28	0		
	P.53	Acquisitions less disposals of valuables	10			
	K.2	Acquisitions less disposals of non-produced non-financial assets		0		
III.2 Financial account	F.1	Monetary gold and SDRs			–1	
	F.2	Currency and deposits			119	132
	F.3	Securities other than shares			138	123
	F.4	Loans			244	217
	F.5	Shares and other equity			44	43
	F.6	Insurance technical reserves			42	42
	F.7	Other accounts receivable/payable			61	52
III.3.1 Other changes in volume of assets account	K.3	Economic appearance of non-produced assets		24		
	K.4	Economic appearance of produced assets	3			
	K.5	Natural growth of non-cultivated biological resources		4		
	K.6	Economic disappearance of non-produced assets		–9		
	K.7	Catastrophic losses	–9	–2	0	0
	K.8	Uncompensated seizures	0	0	0	0
	K.9	Other volume changes in non-financial assets n.e.c.	1	0		
	K.10	Other volume changes in financial assets and liabilities n.e.c.			3	–2
	K.12	Changes in classification and structure	–2	0	2	0
III.3.2 Revaluation account	K.11	Nominal holding gains/losses[2]	126	154	84	76
	K.11.1	Neutral holding gains/losses[2]	121	78	136	126
	K.11.2	Real holding gains/losses[2]	5	77	–52	–50
		Closing stocks	6,336	4,068	7,528	6,981

[1] Differences between data on individual items (K.11.1 and K.11.2) and totals of holding gains/losses may not be entirely consistent due to rounding errors.

[2] Holding gains/losses, when:
(+) and applied to assets, are gains; (+) and applied to liabilities, are losses;
(–) and applied to assets, are losses; (–) and applied to liabilities, are gains.

The *revaluation account* "records the positive or negative holding gains accruing during the accounting period to the owners of financial and non-financial assets and liabilities" (§ 12.63). These developments of the 1993 SNA systematized the distinction introduced before by several analysts within the effect of the specific price change of a particular asset or liability (nominal holding gains/losses), between what is analyzed as equivalent to the change in the general price level (neutral holding gains/losses) and what represents a gain/loss in relative value (real holding gains/losses).

cont'd

Box 55 (cont'd)

As national accounting is evolving, the contents of the accumulation accounts could be modified in the future. It would be so, if the imperative rule concerning the exclusion of holding gains/losses from output and income were modified in the sense of allowing the inclusion of *real* holding gains/losses – the only one concerned here –, if not in output, at least in income.

Other changes in the treatments of the 1993 SNA/1995 ESA could affect in particular items K.3 to K.6 of the other changes in volume of assets account. Thus the inclusion of R&D expenditures in GFCF would lead to a reclassification of the corresponding assets from the category of non-produced assets to that of produced assets. Some countries are in favor of treating the discoveries of nonrenewable mineral resources as output and GFCF (see further in this chapter and Box 62). The proposal has been made (Vanoli 2001) to remove the distinction between foreseen and unforeseen obsolescence, etc.

Account III.3.1 would also be influenced by the explicit inclusion in the balance sheets of the net equity equivalents of pension rights corresponding to unfunded pension schemes. Their variation could be recorded in III.3.1 in the household accounts with a counterpart in the accounts of the social protection schemes representing the change in the present value of their future commitments.

Concerning the compilation of holding gains/losses, only limited applications are available for the time being. Experience will lead to a further study of certain aspects of this issue. The concept of change in the general price level is not evident and thus also the choice of the general price index to be used for the estimate of the neutral holding gains/losses: price index of national expenditure, gross or net, total or only market-type household consumption price index, price index of flows only or a combination of flows' and assets' prices? In a closed economy, what is in principle the global relationship between real holding gains and losses? Is it well founded that they compensate each other, as indicates the idea that spontaneously crosses one's mind? In a dynamic economy, does a positive balance of real holding gains reflect overall positive expectations? Should the stability in the general price level be understood as a level actually declining, as a consequence of the effect on prices of the average increases in global factor productivity? This list of questions is undoubtedly incomplete.

For a more complete presentation of the other changes of volume of assets account, see the 1993 SNA, Chapter XII.A (§§ 12.4–12.62), 1995 ESA, Chapter VI (§§ 6.14–6.34). On the revaluation account, 1993 SNA, Chapter XII.B (§§ 12.63–12.115 and Annex "The definition and measurement of holding gains"), 1995 ESA, Chapter VI (§§ 6.35–6.58).

2. Complex relationships between income and change in net worth

2.1. Greater difficulties in estimating wealth

National accounting finds, in any event, more difficulties in the estimation of wealth (stocks) than of flows (with the essential exception of consumption of fixed capital). Historically, in the 19th century and in the first decades of the 20th, interest focuses on wealth as such, i.e. on the magnitude of the fortune, mostly that of private individuals, which determines the terminology then used. One of the methods of measurement, the estate multiplier method, is based on the direct estimate of total fortunes starting from estate duty data, by means of complex and very controversial methods of extrapolation to the total population. This method, known as "personal", rests on the idea of the aggregation of individual fortunes. The principal method, known as "real", starts from various types of assets and liabilities and aggregates them. One of its modes of implementation, which has become totally obsolete since then, consisted in capitalizing the various types of income perceived by means of estimated rates of return (19th century novels often characterize personal fortune by the amount of rent). Gradually, the direct estimate of the value of the various types of assets, a method often known as "objective", becomes the dominant approach. It is based on various sources. "Wealth inventories", which cover primarily tangible assets and are for a long time associated with population censuses in the USA or specifically carried out, are scarcely disseminated elsewhere or disappear. Japan performs such inventories on a quinquennial base from 1905 and still in 1955, 1960, 1970, and 1983, then seems to give up. Only Korea continues to carry them out approximately every ten years (the last one dates back to 1998). Countries with centrally planned economy carried out yearly surveys intended at assessing fixed assets; some still do.

Surveys addressed to economic agents regarding their wealth as a whole, both their assets and liabilities, are considered to be unrealistic. By contrast, more limited surveys, but sometimes with broad coverage (surveys on household financial assets) are implemented in the last decades of the 20th century and their information is used, in combination with other statistical data.

The analytical approach followed by national accounting is appropriate, in principle, to determine the economic wealth of non-entrepreneurial households (leaving aside, for example, the intangible capital represented by social relations), each balance sheet being the sum of a set of assets and liabilities, which are identifiable in principle. By contrast, for enterprises (and thus indirectly for households of individual entrepreneurs), the sum of the individualized assets (and all of them are not) less the liabilities by types, does not correspond in general to the global value of an enterprise. This is a growing concern from a potential purchaser perspective.

Business accounting is not better off, otherwise it would be sufficient to refer to it. The value of assets, as recorded, depends in general on their original value, and intangible assets are only partially included. In the event of acquisitions by, or mergers with, other enterprises, an estimate of the value of the enterprise as a whole, covering both its tangible and intangible elements, must be carried out, in which the quotations for corporations listed on the stock exchange have also to be taken into consideration. At the 1957 IARIW Conference, Tibor Barna (p. 43), and the Dutch (p. 142) underline more generally the importance of expert assessments and the interest of their use for statisticians. In practice, such an approach is not available for national accounts. It seems never to have been explored.

National Accounting cannot guarantee that its estimate of net worth correctly reflects the present value of future flows of economic benefits, *a fortiori* of flows that will actually materialize. Organized markets, in particular financial markets, are themselves dependent on imperfect expectations. Moreover, most non-financial assets do not change hands during an annual accounting period, which caused Hicks to say (1961, p. 19): "the values of the goods which enter into the capital stock are characteristically imputed values". In some cases (subsoil resources), given the lack of markets for the assets themselves, it is necessary to resort to the compilation of the present value of expected flows of resource rent.

Although this method is that which best complies with the theoretical definition of the value of an asset, paradoxically, it is recommended to use it in practice only if the estimate cannot be made differently (Goldsmith, Revell, 1993 SNA), because of the large margins of inaccuracy attached to its compilation.

2.2. Critical measurement of consumption of fixed capital

A second major problem is the measurement of consumption of fixed capital (CFC), which is necessary to go from gross income to the estimation of true income, that is, net income. At the beginning, national accounting finds itself at bay to differentiate itself from business accounting. For a long time, this is obvious in the terminology: provisions for depreciation in Stone (1945) and in the Standardised System before the 1968 version, "amortissements" in the French CNF before the 1976 SECN. That accounting and fiscal practices do not correspond to the economic concept of CFC is well known, but the lack of something better leads in practice to use depreciation from business accounting, while trying to adjust it, until the estimation of series of fixed assets values allows an autonomous calculation based on assumptions on service life, mortality and depreciation distribution methods (see Box 56).

The theoretical concept of CFC itself is intensively debated around the topic "What is meant by maintaining capital intact?". Pigou (4th edition, 1932) attempts to distinguish normal physical deterioration and normal accidental damage, which should be compensated for in the estimation of income, from exceptional losses due, for example, to an earthquake or a foreign aggression. These destructions "by act of God or the King's enemies", which much later will be considered as "other changes in volume of assets", must not be taken into account in the estimation of income. But Pigou also proposes not to retain the losses in the value of capital due to changes in demand, to inventions or to foreign competition that puts pressure on prices. Friedrich von Hayek (*Economica*, August 1935) challenges this position. He introduces a distinction between foreseeable obsolescence (the risk probability must be taken into consideration for the measurement of income), and obsolescence resulting from completely unforeseen and unforeseeable changes. National accounting will follow Pigou by including in the calculation of CFC normal rates of accidental damage, measured using net insurance premiums of insurable risks. On the other hand, it will follow Hayek (and Hicks, 1939, 1942) by including normal obsolescence (foreseeable) but not the unforeseen obsolescence, which is recorded as "other changes in volume of assets".

In contrast with previous versions, the 1993 SNA (§§ 6.179–6.183) tries to establish the concept of CFC on a theoretical definition of the value of fixed assets. "The value of a fixed asset to its owner at any point of time is determined by the present value of the future rentals (i.e., the sum of the discounted values of the stream of future rentals) that can be expected over its remaining service

Box 56
Measurement of consumption of fixed capital and stocks of fixed assets

Consumption of fixed capital (CFC) represents the decline in the current value of the stock of fixed assets held and used by producers during one period, as a result of physical deterioration, expected normal obsolescence and normal accidental damage (1993 SNA, §§ 6.179, 6.187).

CFC is not generally observable; second-hand markets for equipment goods are rare and their prices raise tricky problems of interpretation. Moreover, the change of these prices can also reflect phenomena of unforeseen obsolescence or, more generally, revisions of expectations that the SNA treats, explicitly or implicitly, as capital gains/losses and not as CFC.

The measurement of CFC results from a modeling procedure, traditionally carried out within the framework of the perpetual inventory method, and embedded within the estimate of stocks of fixed assets, the latter being required themselves for the study of production factors and productivity.

The analysis starts from long series of GFCF at current prices for each type of equipment goods, each industry and possibly each institutional sector. Using price indices of the corresponding new equipment goods, these series are expressed at prices of a given year, which is used as a base for the accumulation model that is implemented.

Each year's investments represent gross additions to the stock of a certain category of assets. Retirements are calculated using observed and/or estimated service lives and a selected mortality function (which provides a probable distribution of the time of retirements from the capital stock of equipment of a given type invested during a given year). INSEE for example, based on research by Jacques Mairesse (1972), retains a lognormal mortality function (a left-skewed distribution) [About the most common mortality functions and the corresponding survival functions, see, for example, *Measuring Capital*, OECD 2001, §§ 6.49–6.67].

The *gross capital stock* at a certain date is obtained by cumulating the values of entries (GFCF) reduced by retirements over all the periods prior to this date for which there remain equipment in stocks. In practice, the exercise starts with the gross capital stock of the previous year, which gives:

$$\text{Gross capital stock (n)} = \text{Gross capital stock (n} - 1) + \text{GFCF (n)} - \text{Retirements (n).}$$

That is the stock of equipment still in use valued at the value of new assets of the same type, irrespective of their age.

To calculate *consumption of fixed capital*, the most widespread method uses, in addition to service lives and a mortality function (see above), a depreciation function, which simulates the price changes of the assets of a certain type, according to their age. Among the depreciation functions which have been investigated, the straight-line depreciation method (the CFC is a constant value that results from the division of the initial value of an asset by its service life) and the geometrical depreciation method (the CFC decreases over time and is calculated as a constant fraction of the remaining value at the beginning of each year once depreciation has been deducted) are the most used. [On the principal methods of depreciation, see the 1993 SNA, §§ 6.193–6.197, *Measuring Capital 2001*, *op. cit.*, §§ 7.19–7.26, and Mairesse's discussion, 1972, pp. 32–35].

INSEE, since Mairesse, calculates CFC coefficients, which express the annual rate of depreciation of an investment, using retirement coefficients resulting from the selected mortality function and the straight-line depreciation assumption. A retired asset in a given year is considered "used up" (physically and economically, since expected obsolescence is taken into account) steadily during all its existence (by one fourth, for example, if its retirement is deemed to occur in the fourth year). For a given asset and industry, the CFC for a given year is obtained by multiplying the vector of the series of the corresponding investments by the vector of the relevant CFC coefficients (*m* is the maximum service life retained for a given asset in an industry):

$$\mathrm{CFC}_n = \sum_{i=0}^{m} \mathrm{GFCF}_{n-i} * \mathrm{C}_i$$

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Box 56 (cont'd)

Finally, the *net capital stock* at a given date is obtained by cumulating the values of entries (GFCF) *less* those of the CFC. Based on the previous year net capital:

$$\text{Net capital stock (n)} = \text{Net capital stock (n} - 1) + \text{GFCF (n)} - \text{CFC (n)}.$$

It represents the stock of equipment still in use valued at their value after depreciation (after CFC in terms of national accounting).

Values at current prices (average prices of the year for retirements and CFC, year end prices for gross capital and net capital) are deducted from values at constant prices using the GFCF price indices.

Most OECD countries use methods very similar to those of INSEE, indicates *Measuring Capital* (annex 2). However the US Bureau of Economic Analysis replaces a linear depreciation method by a geometrical one for most assets in 1996. The new method does not use a mortality function, therefore it does not calculate explicitly a gross capital stock in the process (see *Measuring Capital, op. cit.*, § 7.4 and annex 2). In 1972, Mairesse noted (p. 34) that the combined use of a lognormal mortality distribution and the assumption of a straight-line depreciation led to estimates of net capital and depreciation relatively close to those obtained by the (direct) application of a geometric depreciation method to the series of annual investments.

*

In the last years of the 20th century, the US Bureau of Labor Statistics and the Australian Bureau of Statistics start to use an alternative method, always in a perpetual inventory approach, to estimate net capital stock and CFC. CFC is obtained indirectly from the estimation of net capital stock for two consecutive years:

$$\text{CFC (n)} = \text{GFCF (n)} - [\text{Net capital stock (n)} - \text{Net capital stock (n} - 1)].$$

In this method, net capital stock is not calculated by formulating an assumption on a depreciation method. In addition to series of investment, observations and estimates of service lives, and retirement profiles (mortality function), the starting point consists of the formulation of assumptions on the (physical) *efficiency profiles* of the several types of assets according to their age and on the discount rate. An *age–efficiency profile* represents the sequence of rentals (productive services rendered by a particular type of asset) expected each year during the service life of the aforementioned asset.

According to the theoretical formulation of the value of an asset, this discounted sequence corresponds to the initial value of this asset for an investor. At any time during the service life of the asset, its value corresponds in theory to the present value of the rentals (services) still to be provided by the asset. Given an *efficiency profile* and a discount rate, it is possible to obtain a single sequence for the price of the asset, i.e. a profile of price according to the age. This *age–price profile* is precisely what the traditional method seeks to approximate by choosing a depreciation method. Thus the latter depends implicitly on the combination of the *efficiency profile* of the asset and a discount rate. This alternative method renders these two assumptions explicit.

By doing so, it integrates a calculation, for each asset, of the stock of capital in terms of *standard efficiency units* which is used then to calculate a volume index of capital services, because, as says *Measuring Capital* (§ 4.29) "[. . .] there is now a general agreement that a volume index of capital services is a better way to represent the inputs of capital into the production process than the gross or net capital stocks which have usually been used for this purpose in the past" (see the argumentation on this point of *Measuring Capital*, § 9.7, box 4).

For a particular asset, its stock in terms of *standard efficiency* units is obtained by applying to each annual investment vintage the age-efficiency coefficients according to its age, which derive

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Box 56 (cont'd)

from the age-efficiency profile retained (i.e. the estimate of the sequence of expected rentals services, at constant prices resulting from the use of this asset in production). Productivity analysts who follow the current of the American economist Jorgenson call this stock *productive stock* (see *OECD Productivity Manual* 2001), an expression that *Measuring Capital* rather avoids (note 1, § 2.24). As the concept of standard efficiency unit is based on a notion of physical efficiency, specific to each piece or type of equipment, the units to be aggregated are not these stocks of standard efficiency units, but the flows of capital services calculated for each type of asset. The volume indices for capital services (these are supposed to be proportional to the stocks of the different assets) take the user costs of the various assets (see hereafter) as weight factors. At the turn of the century, three countries – the USA, Canada and Australia – publish measures of capital services within the framework of their official statistics program. [On the explicit approach in terms of capital services, see *Measuring Capital*, OECD Manual 2001, §§ 2.23–2.29, §§ 4.27–4.29, for a brief presentation, then §§ 6.72–6.81, 7.11–7.18 ("Age-efficiency profiles, asset prices and depreciation"), Chapter 9 ("Capital services") and in annex 2 the methodology of the Australian Bureau of Statistics; see also the *OECD Productivity Manual 2001*, Chapter 5, "Capital input".]

*

There are few empirical observations on the age–price profiles, starting from the prices of existing equipment. Most of them are American studies. The main conclusions that can be drawn from their scattered results are summarized in *Measuring Capital* (§§ 7.5–7.10). This handbook then scrutinizes the age–efficiency profiles which both seem plausible and generate price profiles that are coherent with those observations (§§ 7.11–7.17), to conclude finally (§ 7.18) that there is an infinite number of efficiency and depreciation profiles, which are compatible with them (see also *OECD Productivity Manual*, § 105). *Measuring Capital* also notes (§ 9.9) that there is little empirical evidence on the way the various assets loose their productive efficiency with age.

*

Growth accounting and productivity studies are based on the results of very elaborate statistical observations and, at the same time, on strong theoretical assumptions. "The assumptions [of the production model] are somewhat controversial, but while they are not always precise representations of reality, the model-based approach represents a consistently grounded framework which, in turn, facilitates the exposition of complex issues" (*Measuring Capital*, § 9.6). For the presentation of the assumptions and the interpretation issues that they raise, see also *Measuring Capital*, §§ 9.17–9.21 and the *OECD Productivity Manual*, §§ 105 and 107–113, and Chapter 10, "Interpretation of productivity measures", (in particular §§ 184–186, 190).

The choice of the interest rate used in the formula to compute the user cost of capital is a particularly difficult issue. Using the same notation as *Measuring Capital* (§ 9.14), the user cost of an asset is given – disregarding the effect of taxation – by $V_t(d_t + r_t - \Delta p_t)$, in which V_t represents the market value of a new asset at constant prices, d_t the "depreciation rate", r_t the interest rate and Δp_t the price change of two equivalent new capital goods between two periods (see *Productivity Manual*, §§ 99ff, for the most current notations in productivity studies). The rate r may be calculated in an endogenous way or be chosen from the market interest rates.

In Hall and Jorgenson's endogenous method (1967), followed by the US Bureau of Labor Statistics and the Australian Bureau of Statistics, the assumption is made that, in national accounts results at current prices, the income derived from production which is not labor income (including in labor income also an estimate for self-employed persons) represents the total value of capital services (while labor income is interpreted as the value of labor services). The *Productivity Manual* (§ 110) as well as *Measuring Capital* (§ 9.18), underlines the assumptions which are required. "While this approach is quite common and easy to implement, it requires that the underlying production function exhibits constant returns to scale, that markets are competitive and that the

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Box 56 (cont'd)

expected rate of return [on capital] equal the *ex-post*, realised rate of return" (*Productivity Manual*, § 110). *Measuring Capital* moreover insists on the practical problem posed by the need to artificially split self-employed persons' mixed income between a labor income and an operating surplus. The different methods which can be used are equally plausible, but seldom give similar results.

Using the alternative method, in which the chosen *r* is a market interest rate, it happens that the above assumed identity between the total value of capital services and non-labor income generally does not hold, which poses difficult problems of interpretation requiring econometric analyses (*Productivity Manual*, § 111).

Empirical comparisons of the two methods have shown significant differences in the user cost estimates (*Measuring Capital*, § 9.21; *Productivity Manual*, § 112). Both handbooks indicate that no strong conclusion has been reached on the matter, a situation that much speaks [according to them] for solutions depending on data availability.

The discussion relating to the determination of *r* is significant for the interpretation of measures of factor input and productivity regarding the distinction between embodied and disembodied technical progress in equipment goods (capital) and intermediate products (but this general question is also relevant for labor), and the existence of factors of productivity growth not related to technology (*Productivity Manual*, §§ 181–191). If labor and capital were correctly measured, the effects of embodied technical progress would be reflected in the measure of each factor contribution to output, and not in the term of change in multifactor productivity. This term would record on the other hand the effects of disembodied technical progress (§ 184), as well as the spillover effects, which are costless additions to overall productivity (§ 185). "Conceptually and following the distinction drawn by Jorgenson (1995 a) [ref. *Productivity Volume 1: Postwar U.S. Economic Growth*, MIT Press], the productivity term A reflects all the effects on output growth that are *not* investment, where investment is understood as the commitment of current resources in the expectation of future returns, implying that these returns can be internalized by the investor" (§ 186).

*

The afore-summarized discussion would undoubtedly have had no place in a national accounting history written a few decades ago. In fact, measurement of labor and capital inputs, changes in productivity and growth accounting were considered to belong to the field of analysis, using, among others, national accounts results, but not to the field of statistical observation. The theoretical assumptions adopted by analysts did not call for a discussion by national accountants as such.

From 1997 to 2000 however, during discussions by the task force known as the Canberra Group, which significantly contributed to the preparation of the *Measuring Capital* handbook, the proposal is made, under the very strong pressure of the Jorgenson–Triplett current, to introduce into the SNA a production account which would be in close connection with the theoretical concepts and the methods of measurement of productivity analysts. This is reflected in "The research agenda for capital stocks and flows" which appears as annex 4 of *Measuring Capital*. The principal idea is to record in a production account, grouping the present production and generation of income accounts of the 1993 SNA/1995 ESA, inputs of capital services alongside with compensation of employees (probably extended to self-employed and labeled then as "labor services") and intermediate consumptions. From such a standpoint, the concept of value added would be relegated to a second level (the proposal mentions that it would be possible to show it, if required, by splitting this new production account into two sub-accounts). Moreover "the balancing item of the revised production account would be very different from the existing net operating surplus, being much closer to the economic concept of pure profit" (by referring to what has been said before about the choice of the rate *r* for the calculation of the user costs of capital, it is easy to get some feeling of the subjacent difficulties).

Here is a beautiful topic to be debated for the years to come! Up to now, national accounting,

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Box 56 (cont'd)

while paying attention to economic theory, resists, as much as possible, adopting *a priori* theoretical choices prejudging the interpretation of results. Thus, by measuring output, goods and services flows and components of value added and of primary incomes, it does not choose a particular production function or a theory on the primary distribution of income derived from production. It is certainly obliged, due to the lack of sufficient observations, to model the calculation of CFC, and encounters serious problems when, factoring the breakdown between volume and price for equipments goods, or the change in stocks of assets, it meets the point of confluence of the past, present and future. But it avoids retaining *a priori* theoretical assumptions like those indicated in the aforementioned example (see quoted text of § 110 of *the Productivity Manual*). It is, moreover, conscious of the ambiguities that conceal the use of the term "capital" to qualify at the same time equipment goods (in a broad sense), technical factors of production and capital as an abstract economic value, with the underlying social realities.

life." (1993 SNA, § 6.182). This formulation in terms of rentals, familiar to productivity analysts jointly with the expressions of user cost of capital or of capital services (see Box 56 and chapter 9, section 6), has the advantage of showing that CFC is only a part of these rentals, the other part corresponding to the interest on immobilized capital. It is thus not equivalent to the totality of "the intermediate consumption of such fixed goods", as wrote Kuznets (1941, p. 41) whose interpretation was implicitly followed by national accounting.

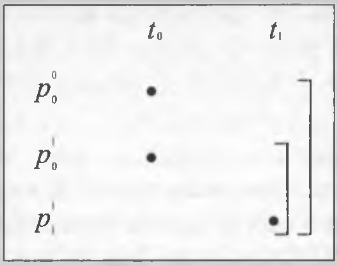
However, this formulation is not specific enough in terms of national accounting and may cause ambiguity. Following national accounting terminology, the value of a fixed asset is, in theory, the present value of the sequence of gross operating surplus net of taxes expected from its use, plus its expected possible residual value. It should be kept in mind, however, that neither national accounting nor business accounting can observe gross operating surplus attributable to a particular fixed asset or even to a specific category of assets among all those used by a business. The neo-classical model of productivity analysis postulates, under its theoretical assumptions, that the rate of interest on capital is the same for the various types of assets.

CFC is the difference between the value of an asset, thus understood, at the beginning and the end of the accounting period, net of changes in value which do not result from normal elements of wear and tear, obsolescence and accidental damage. The 1993 SNA, however, does not say anything about the changes in the sequence of expected results originating in changes in businesses' expectations and which can be greater than what is usually termed unforeseen obsolescence. Hicks had perceived this point (*Economica*, May 1942). According to him, the initial value of the asset to be taken into account for the "maintaining capital intact" purpose was not what had been actually assigned to it in the expectations, but the one which would have been assigned to it if the facts which occurred during the current year had been anticipated, including among those the value (it is always an expectation) assigned to the asset at the end of the year (see Box 57). This correction of the initial value of the asset, which can include unforeseen obsolescence, is in principle, in terms of the 1993 SNA, another

Box 57

Consumption of fixed capital and revision of expectations

Hicks' position, as he states it in 1942, can be visualized by the diagram below where t_0 and t_1 indicate the end of period 0 and period 1 respectively, p_0^0 is the initial estimated value of an asset with the information available at the end of period 0 (beginning of period 1), p_1^1 is the estimated final value of this asset with the information available at the end of period 1, and finally p_0^1 is the initial value estimated according to information available at the end of period 1 (here the case where p_0^1 is smaller than p_0^0 is represented, but the change may be positive, negative or zero).



By assuming here an unchanged general price level and in the absence of catastrophes, national accounting measures CFC by $p_1^1 - p_0^1$, whereas the relative price change of the asset is $p_1^1 - p_0^0$.

The distance $p_1^1 - p_0^1$ represents the effect of the normal elements of wear and tear, obsolescence and accidental damage.

The distance $p_0^0 - p_0^1$ represents the effect of unforeseen obsolescence, or more generally of the revisions of expectations. It indicates the amount by which the value of the asset considered at time t_0 has been overestimated, which has influenced the income compiled for period 0 (of an amount which can itself deviate from $p_0^0 - p_0^1$, since by recurrence the initial value of the asset, if existing at the beginning of period 0, has also been revised, etc.).

change, positive or negative, in the volume of the considered asset, therefore not an element of CFC. At the turn of the century, another treatment is proposed (Vanoli, 2001, IV.2) which would include in the CFC, then differently termed, the positive or negative effect of the revision of the sequence of expected surpluses (excluding the consequences of non-economic phenomena, such as catastrophes of various types), and thus of unforeseen obsolescence. This effect would be thus taken into account in the measurement of *ex-post* income.

Another latent difficulty is that CFC refers only to fixed assets, which are, in the SNA, only produced assets. Recent developments of non-produced intangible assets (contracts of exclusive use of the services of professional athletes for example) require a specific analysis. As soon as an institutional unit acquires such a non-permanent asset, would it not be advisable to record a flow similar to the CFC of produced assets, since the absence of such an entry would lead to an over-estimate of its net operating surplus? The response to this question is more complicated than what common sense immediately suggests.

It is indeed necessary to distinguish several scenarios. The first case is that of intangible assets wrongly treated as non-produced, but that national accounting should treat as produced. This is the R&D case, whose outcomes only appear in balance sheets when transactions on patented entities are recorded. The extension of GFCF to R&D expenditures would lead to the estimate of a CFC for the corresponding assets.

Then, there is the case of non-produced assets, again only identifiable at the time of transactions (for instance, goodwill, transferable contracts concerning sportsmen), which could be regarded, in principle, as an output of the production activity of an enterprise reflected in the increase in its goodwill (intangible components of its global value) not separately identifiable as time passes by. This analysis applies to Nestlé as well as to Turin's Juventus. In practice, however, it seems hopeless to try to observe such creations of values when they actually occur. Most probably, national accounting will have to continue treating these intangible assets as non-produced ones. The logical recording of a flow, similar to CFC, for the purchaser of such an asset, would then bring about an underestimation of NDP, since the production of this asset has not been recorded in the seller's accounts and a capital gain is entered (other change in volume of assets according to the 1993 SNA) at the time of the transaction.

A third scenario is more complex because it concerns contracts of use of permanent non-produced assets, such as the radio spectrum for mobile phones. At the turn of the century, how national accounting should represent the transactions taking place between government and operators is the subject of intense debates. If operators are viewed as acquiring intangible assets, then the question of the possible depreciation of these assets arises again; if it is not considered their net income would be overestimated. But the underlying physical asset is not modified by these uses and its owner, government, finds it unchanged at the end of the contracts. For the economy as a whole, the use of the radio spectrum does not reduce its substance. They do not wear out. The situation is similar to that of long-term land rent contracts, a permanent asset under normal operating conditions for which no CFC is recorded. Such an analogy would thus rather result in treating the relationship between government and operators like a relationship between the landowner and tenants, giving rise to rentals payments to be treated like land rents. As the particulars of the contracts are diverse, payments taking place at different times would be transformed, being the case, into flows of rents, making use of financial accounts, if required. If the license were transferable, an intangible asset would moreover have to be recorded (on the problem of the exploitation of deposits of nonrenewable resources, see section 3 of this chapter).

Much inaccuracy and uncertainty thus weigh on concepts and valuation of assets and CFC (and even concerning the latter on terminology, see Box 58). CFC does not result from direct statistical observations but from the modeling of observed elements and many assumptions. From there derives the uneasiness of national accounting, which recognizes that, in principle, balancing items and aggregates should be net of CFC, but in general emphasizes gross aggregates. Efforts for an improved observation of relevant variables (economic service lives, age–efficiency profiles of assets, etc.) have been insufficient and results very slow to be obtained. From there derives the impression that the estimates

Box 58

Vocabulary: Consumption of fixed capital and depreciation

National accounting has gradually freed itself from business accounting terminology. From "*provisions for depreciation*" in English and "*amortissements*" in French, it went to "consumption of fixed capital" with the 1968 SNA so as to avoid the ambiguity of business accounting, which mostly uses historical costs and not revalued prices.

At the beginning of the 21st century, this expression is at its turn questioned by some national accountants, but this time in order to get closer to the terminology used in economic literature. *Measuring Capital* (OECD, 2001) writes in the introduction of Chapter 7, dedicated to the measurement of CFC: "[...], as it is defined in the 1993 SNA, consumption of fixed capital is in fact identical with depreciation as this term is widely used in economic literature. In this chapter the two terms are used interchangeably with the understanding that depreciation is the concept understood by economists and not depreciation as measured by commercial accountants." (§ 7.1)

It is true that the drafter of the pages of the 1993 SNA dedicated to CFC drew his inspiration from Jorgenson's and productivity analysts' literature by defining CFC as "[...] the decrease, between the beginning and the end of the current accounting period, in the present value of the remaining sequence of rentals [of the fixed assets]" (§ 6.182). It has been indicated in this chapter that the formulation thus borrowed from these economists was not specific enough in terms of national accounting and could cause ambiguity, and that it was better to speak of sequence of expected gross operating surpluses, net of taxes (see p. 324).

In all events, this quote from *Measuring Capital* can surprise. Indeed, economists specialized in growth accounting and productivity studies, whom this handbook keeps in mind, do not call depreciation what national accounting defines as CFC, but something more limited which excludes, for example, obsolescence. In the formulation of the user cost of capital used by this handbook (§ 9.14) [see Box 56], $V_t(d_t + r_t - \Delta p_t)$, $V_t d_t$ is the cost of the depreciation or the loss in value of the asset because of its aging, while Δp_t, which includes obsolescence, is considered as nominal holding gain/loss (§ 9.15).

The *Productivity Manual* specifies that $V_t d_t$ ($q_t d_t$ in its notation) reflects the efficiency loss of the asset, and also the fact that its expected service life has declined one period (§ 101). Depreciation thus corresponds to the comparison, in the same year, between the prices of two fixed assets which only differ by the fact that one is one year older than the other (§ 103). The term of capital gain or loss (Δp_t ($q_t - q_{t-1}$) in its notation), is a change of value independent of the age effect. It is the comparison of prices of two new identical assets in two successive periods (§ 102). The *Productivity Manual* correctly notes that the concept of CFC is broader than that of depreciation in the afore-defined sense.

The CFC of national accounting corresponds – in the absence of unforeseen obsolescence – to $V_t(d_t - \Delta p_t)$ and not to $V_t d_t$. It should also not be forgotten that the effects of taxes must be taken into account since national accounting has to think logically in terms of the sequence of expected gross operating surpluses after taxes (if not the investor would, for sure, become impoverished). This is only exceptionally done in productivity calculations (see *Productivity Manual*, § 104).

A change of terminology could prove to be desirable if, after thoughtful consideration, the conclusion is that the CFC expression is not well adapted to its object. Such consideration must also raise the issue of the possible inclusion of unforeseen obsolescence, by giving to the latter a broad meaning and allowing it to be positive in certain cases (see Vanoli 2001). Without this inclusion, CFC would not correspond to the total change in price of a given asset over time, such as would be observed if there were an actual possibility to do so. This change would truly measure depreciation (net loss of value) of an asset, but it does not correspond either to the CFC of national accounting, or to the depreciation of the productivity analysts. It is not sure that the terminology of the latter is perfectly adequate on this point.

Another aspect of the terminological difficulties comes from the fact that authors sometimes

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Box 58 (cont'd)

use "consumption of capital" without specifying "of fixed capital". This slip is even to be found in the 1993 SNA, but in a context that normally excludes any risk of ambiguity. This risk is due to the fact that the term capital evokes as well the abstract financial capital as the concrete "physical" capital. The former is not consumed by the use of the second in the production process, but only if someone consumes (in the sense of final consumption) more than his/her income. Financial capital can also be reduced due to capital losses.

of CFC are not very homogeneous among countries and reflect rather badly the economic evolution, in particular the increasing importance of obsolescence which is only taken into account with delay. Keynes was well-founded to write (*General Theory*, end of Section I, Chapter VI): "It remains true, however, that net income, being based on an equivocal criterion which different authorities might interpret differently, is not perfectly clear-cut". He was joining Pigou ("Net income and capital depletion", *Economic Journal*, June 1935, pp. 235–241) for whom "Net income is not a precise entity given in nature", p. 240).

2.3. Capital gains and losses: the treatment of interest

The relationship between income and wealth still raises, however, other difficulties, in particular those regarding capital gains and losses. The problem concerns all assets and liabilities, and since its early days national accounting (for example, Kuznets 1933, 1941) excludes them from the estimate of income. The 1993 SNA takes up their long-neglected recording in its two new accumulation accounts.

On a highly significant point, national accounting has been inconsistent with its principles by recording, as current transactions, flows of nominal interest i.e. interest in the current meaning of the term (the 1993 SNA even specifies that amounts resulting from indexing the principal of a financial claim should, in this context, be assimilated to nominal interest). This interest may include an important component to compensate for inflation. Current accounts will record as positive income for the creditor what in reality is a nominal capital loss for him (reciprocal recording is done for the debtor). This treatment was strongly criticized in countries experiencing high inflation, in particular in Latin America or Israel, but also in Europe and North America, in the years of two-digit inflation following the first oil crisis.

The alternative solution then suggested, formulated in terms of recording real interest, i.e. adjusted according to the inflation rate, was turned down in particular because it would have resulted in recording a real capital loss (creditor) or gain (debtor) within current transactions, in case the amount of nominal interest was lower than the sum which would have been necessary to completely protect the asset against inflation (i.e. when the "real" interest was negative). National accounting thus persisted in a treatment, in obvious contradiction with its rule of principle (the exclusion of capital gains or losses from the estimate of income) in particular because the proposed alternative solution – though representing a more satisfactory analysis in itself – might in some cases infringe this rule. Indeed, in the event of a negative real interest, real capital gains/losses are still recorded, even if it is an amount obviously lower than the nominal capital gains/losses implicitly accounted for within nominal interest.

On this issue, the Expert Group that prepared the 1993 SNA did not achieve radical progress, due in particular to the fact that the discussion was held almost until its end in terms of recording either nominal interest or real interest. Bad traditional reasons ("Flows should be recorded as they happen", see on this topic the discussions brought forward in chapter 4), combined with a low importance attached to the issue in a period of very reduced inflation for most developed countries, an insufficient preparatory work in countries experiencing strong inflation, for example in Latin America ("we have discussed it for so many years and never could reach a common solution", said an expert of this area at a meeting of the Group), and with an ambiguous position of the IMF (conscious of the problem of principle, but not worried due to the fact that the traditional treatment resulted in an exaggerated apparent measure of public deficit in countries with high indebtedness and high inflation) led to keeping, alas!, the accounting of nominal interest as the principal basis of recording.

The 1993 SNA, however, opens the door for a better solution by introducing a possible alternative treatment for situations of "significant" inflation. It consists of recording as interest, in the current accounts, the difference between nominal interest and the component of protection against inflation that it *actually* contains. Interest is then positive or zero, but not negative (the actual compensation against inflation is at most equal to total nominal interest: in the event of insufficiency of the latter, compensation is not complete). Indeed, if actual compensation against inflation is lower than the amount that would have been necessary for a total protection of capital (i.e. if the latter is higher than nominal interest), the creditor undergoes a real capital loss and the debtor enjoys a gain, which should be shown in the revaluation accounts of the SNA. Primary incomes, saving, net lending/net borrowing of creditor and debtor institutional sectors can thus be substantially modified and become economically more significant as compared to the situation in which nominal interest is taken into account (see 1993 SNA, Chapter XIX, Annex B). Interest thus defined, positive or zero, resembles for income from loans/deposits what dividends are, positive or zero, never negative, for income from shares in the SNA current accounts (see a full discussion of the issue in Box 59).

2.4. Capital gains and losses: should they be included in income?

Direct recording in the current accounts of real interest, possibly negative, would not become possible unless the rule regarding holding gains/losses (gains or losses in capital resulting from changes in prices) were modified to take into

Box 59

Interest and inflation: illustration of various methods of recording

By way of illustration, let us consider the case of a loan of 1000, granted without indexing and with a high nominal interest rate. Let us suppose that the interest rate is 25% and the inflation rate 30%. Nominal interest payable at the end of a year is 250, an amount obviously insufficient to entirely compensate for the effect of inflation (at least 300 would have been necessary).

National accounting, including the 1993 SNA in its central solution (the only one retained in the 1995 ESA), records 250 as nominal interest in the current accounts. This amount enters then as income of the lender whereas it is even insufficient to completely compensate him for the real loss in value (in purchasing power) of the capital he has lent. As for the borrower, his income is seemingly symmetrically reduced by 250, seemingly only, since the real value of his liability decreases by more than this amount. As a consequence of this form of recording, the lender's net lending is overestimated by 250, just as the debtor's net borrowing. In this way, for example, the deficit of heavily indebted general governments in countries with significant inflation is traditionally overestimated by national accounts.

To avoid taking as income amounts that are not so, analysts of the economy reason in terms of so-called real interest. The real interest rate is the difference between the nominal interest rate and the rate of inflation (–5% in the example). Following this approach, national accounting would record a real interest received by the lender and paid by the borrower of –50. It is thus the lender who would pay 50 to the borrower. It is easy to see that this amount corresponds to the real loss in value of the lender's asset and to the symmetrical real loss in value of the borrower's liability (250 – 300). It is a capital gain (borrower)/loss (lender), a holding gain/loss in the 1993 SNA terminology.

This treatment would not pose any problem in national accounting if it had been decided to include in the current accounts and thus in the calculation of income, the real holding gains/losses, that is, if the rule of excluding capital gains/losses were abandoned. In the given example, there would be a real interest of –50 received by the borrower/paid by the debtor. The effect on income and net lending of the lender would be –50 instead of +250 in the traditional treatment (+50 instead of –250 for the borrower). Since real holding gains/losses would have been recorded in the current accounts, the contents of the revaluation account of the SNA would be appreciably modified. Only what the SNA calls neutral holding gains/losses, i.e. the effect of the change in the general price level (see Box 55) would remain, that is, in this concrete case +300 for the creditor (it is the revaluation of an asset) and –300 for the debtor (it is the revaluation of a liability). Of course, in such a context, the accounting for dividends, for example, would also need to be modified, the holding gains/losses on shares being then recorded in the current accounts.

The alternative treatment presented in Chapter XIX Annex B, of the 1993 SNA (worked out by Vanoli), proposes simply a solution which takes into consideration the constraint imposed by the traditional rule of excluding capital gains/losses from the current accounts. The real interest (–50 in the former concrete case) thus does not enter into the current accounts. These record the difference (i.e. 0 here) between the nominal interest and the component of *actual* compensation against inflation that it contains. This element cannot be greater than the total nominal interest itself. If the *required* compensation (the one taken into account in the real interest method) is higher than the *actual* compensation, a real capital gain/loss is to be recorded in the revaluation account [in our case, –50 (creditor)/+50 (debtor)]. The revaluation account records a neutral holding gain/loss of +300/–300.

Additionally, Chapter XIX Annex B considers – by analogy with the explicit case of indexing the principal of the claim/liability – that the payment of nominal interest corresponds partly to an implicit price adjustment mechanism of the principal. In the given example, a nominal holding gain of 250 for the lender is recorded (a nominal loss of 250 for the borrower). If the interest payable was equal to or higher than 300, this nominal gain/loss would be equivalent to the neutral gain/loss (300) and there would be no real holding gain/loss. Positive interest would not be recorded in the

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Box 59 (cont'd)

current accounts unless nominal interest were higher than 300. To avoid a possible confusion with real interest, the interest according to the meaning of Chapter XIX Annex B of the 1993 SNA is called in a neutral way interest "prime" ("prime" being taken as a simple mathematical notation).

An interesting, though non-obvious, aspect of the analysis of Chapter XIX Annex B refers to the financial account. In all cases, the payment of nominal interest leads to a reduction in the financial assets (liquid assets) of the debtor and an increase in the assets of the creditor. Since this amount is not recorded in the current accounts, the question arises what this payment (250 here) stands for. It is analyzed as an anticipated repayment of a part of the real initial value of the loan, recorded under the "loans" item of the financial account (assumption being made that there is no repayment in nominal terms of the loan during the first year). In the particular example mentioned above, 19.23% of this value is repaid (250/1,300 since the initial real value of 1,000 is equivalent to 1,300 in current monetary terms).

The analysis of the previous paragraph also holds in the case in which real interest would be entered in the current accounts. The amount considered as an anticipated repayment of a part of the initial real value of the principal is this time equivalent to the sum of nominal interest and the capital loss undergone by the creditor, that is, 300 (250 + 50).

Hill, in *Inflation Accounting* (1996), does not accept the approach of Chapter XIX Annex B of the 1993 SNA. He considers that there can be no nominal holding gains/losses, even in the event of explicit indexing, *a fortiori* in the event of implicit indexing, for a financial asset/liability whose nominal value is unchanged (see his arguments in *Inflation Accounting* pp. 13, 58, 88 and Vanoli's answer in "Interest and inflation accounting" 1999, p. 288). Hill, within the framework of real interest accounting (he believes it is compatible with the current rules of national accounting because he disputes that it can result in recording capital gains/losses in the current accounts) does not share either the analysis presented above, in terms of an anticipated repayment of a part of the initial real value of the capital.

This leads him to include a real holding gain/loss in the revaluation account, equal but with an opposite sign to the neutral gain/loss (–300 for the creditor, +300 for the debtor). He considers then that the debtor pays to the creditor a capital transfer corresponding to his real holding gain (real holding loss for the creditor). In addition to the peculiar character of recording such a transfer, combined with that of a real holding gain/loss as a revaluation whereas the method of real interest precisely consists of including it in the current accounts – an aspect that Hill disputes –, this treatment presents the drawback of keeping the balancing item of the capital account (net lending/net borrowing) unchanged as compared to the traditional SNA, whereas in general it has been agreed to find it biased.

The table on p. 332 makes it possible to visualize, by following in a simplified way the accounting presentation of the 1993 SNA, the characteristics of the four solutions under discussion.

This table also illustrates, by using the significant case of interest, the articulation between current accounts and accumulation accounts *taken as a whole*. Without the revaluation account, in which the holding gains/losses are recorded, it is impossible to have an overall view of each treatment either to understand it well, even less to correctly compare it with the others. In particular, it emerges from the table that real interest, when negative, actually corresponds to the part of the full compensation for inflation (this compensation is measured by the neutral holding gains/losses i.e. the minimum amount which the creditor should receive to maintain the real value of his capital intact) which is not covered by nominal interest (–50 = 250 – 300). When nominal interest is greater than the neutral holding gains, real interest is positive and equal to interest "prime". Thus, if the interest rate was 35%, nominal interest would be 350, real interest and interest "prime" would be +50, and real holding gains/losses (second column) would be zero (nominal holding gains/losses compensating exactly neutral holding gains/losses). In this column on the "loans" row, one would enter –300 and +300.

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Box 59 (cont'd)

A synoptic presentation of the proposed treatments with rate of interest lower than inflation rate

	Nominal interest		Interest "prime"		Real interest (1)		Real interest (2)	
	C	D	C	D	C	D	C	D
	R-U	R-U	R-U	R-U	R-U	R-U	R-U	R-U
Interest	+250	−250	0	0	−50	+50	−50	+50
Income/Saving	+250	−250	0	0	−50	+50	−50	+50
	A-L	A-L	A-L	A-L	A-L	A-L	A-L	A-L
Capital transfers	0	0	0	0	0	0	+300	−300
Net lending/Net borrowing	+250	−250	0	0	−50	+50	+250	−250
Financial transactions								
Cash	+250	−250	+250	−250	+250	−250	+250	−250
Loans	0	0	−250	+250	−300	+300	0	0
Holding gains/losses								
Nominal	0	0	+250	−250	n.a.	n.a.	0	0
Neutral	+300	−300	+300	−300	+300	−300	+300	−300
Real	−300	+300	−50	+50	n.a.	n.a.	−300	+300
Balance sheets								
Cash	+250	−250	+250	−250	+250	−250	+250	−250
Loans	0	0	0	0	0	0	0	0

Explanatory notes to the table:
(C) Creditor; (D) Debtor; R – U: Resources – uses; A – L: Δassets – Δliabilities or assets – liabilities; n.a., non applicable.
The column Nominal interest presents the traditional treatment of NA in the 1993 SNA; the column Interest "prime" shows the possible alternative treatment of SNA Chapter XIX annex B; the third column, Real interest (1), shows the coherent treatment of the real interest approach according to the analysis in the present box; in the last column appears the treatment of real interest followed by Hill in *Inflation Accounting* (1996).
Change in cash, neutral holding gains and items in balance sheets are identical in all the treatments. The first, second and fourth double columns are taken from "Interest and inflation accounting", (Table 3, p. 294). The third double column was prepared for the present text.

An example concerning a case of explicit indexing of a loan is also presented in Table 3, p. 294 of "Interest and inflation accounting". It is not reproduced here in order not to overcharge the box, although it is recommended to begin with the analysis of explicit indexing mechanisms to interpret the situation of high nominal interest.

The issues raised by the treatment of interest in relation to inflation are difficult and controversial. One can refer to *Inflation Accounting* (in particular pp. 13 and 16, Chapter 5, "Asset prices, holding gains and indexation" and Chapter 7 "Income accounts"), to Annex B, Chapter XIX of the 1993 SNA, and to "Interest and inflation accounting" (in particular pp. 279–295 in which the revaluation of financial instruments denominated in foreign currency, the explicit indexing of financial instruments in national currency – quantified example in Table 1, p. 289 –, and the protection against inflation through high nominal rates of interest – quantified example in Table 2, p. 292 – are examined case by case).

account real holding gains/losses for the measurement of income. Economists have often wished this, in particular regarding the real gains/losses occurring in the financial markets, at least on a complementary basis. Thus Robert Eisner ("Extended accounts for national income and product", 1988, pp. 1624–1625) widely recommends it and interprets in this sense Hicks' concept of income (*Value and Capital*, 1939). He nevertheless correctly observes that these gains can experience marked fluctuations from one year to another and include transitory components, which are larger than usual incomes. He favors showing them separately, as well as the alternative aggregates that take them into account.

2.4.1. Questions about the treatment of non-distributed income to shareholders

A closely related problem is posed by the proposal sometimes made to assume that the full income of corporations is paid to their shareholders, who instantaneously reinvest the actually undistributed part of it. Haberler and Hagen ("Taxes, government expenditure and national income", 1946, p. 4) evoke this solution, both for shareholders and, in the case of public institutions, for citizens, while considering that it is more convenient, in general, to assign undistributed income to the corporation or to the public institution itself. Although hardly considered for half a century, such a treatment is proposed by Danish national accountants in 1998 (published in 2000). This would undoubtedly change in a very substantial way the structure of the distribution of primary income, saving and net lending/net borrowing among institutional sectors, including the balancing items of the rest of the world account regarding investment income. Such a treatment has been applied for a long time to foreign direct investment income by the Balance of Payments of the IMF and was adopted in this context by the 1993 SNA. In each period, holding gains/losses would then be restricted for shareholders to the difference between the change in the market capitalization of their shares and the corresponding undistributed earnings.

The proposal requires attentive examination, particularly in the framework of the transformations of the financial markets that occur at the turn of the century. It privileges the approach of the shareholder as the owner of an ownership right, in contrast with the approach through actual economic control (the latter is the basis of the treatment adopted for foreign direct investment). In spite of the increasing intervention of institutional investors, such as pension funds, the traditional representation by national accounting of the relationship between corporations and portfolio investors seems to remain essential for economic analysis.

This is different from the issue of life insurance corporations that invest and manage their reserves on behalf of policyholders. The income resulting from these investments is assigned to the latter, according to rules fixed by regulations or contracts, once management costs have been deducted. As is the case in similar situations of collective management of financial investment, a relationship between investors and providers of administrative services is at stake, not one between shareholders and corporations of which they hold shares. On the other hand, earnings from collective investment, life insurance or other forms, can comprise realized holding gains, which should not be included in income, in the sense of the SNA/ESA, but which cannot easily be isolated in practice.

2.5. Importance of the other accumulation accounts

The discussion of the relationships between production, income, saving and wealth shows that it is not possible to understand them well without the analysis of the other changes in volume of assets not originating from saving or capital transfers, and without the analysis of revaluations. The issue of the relationship between the (net) current income of national accounting and the concept of income in economic theory can thus be better stated. The last decade of the century witnesses many discussions on this topic. The question is sharply debated in the last decade of the century, each participant following different points of view concerning more generally the relationships between economic theory and national accounting (see chapter 10). Between the empiricists on one side, for which there is no bridge whatsoever, and those that consider that the concept of (current) income of national accounting is in principle the very same as the theory, in the sense of Hicks, are those who consider that various interpretations of a theoretical concept can exist (cf. the problem of real holding gains/losses), and that the national accounting approach involves autonomous aspects (cf. the role played by the concept of production) with respect both to economic theory and to business accounting. Therefore, the relationship with various interpretations of the theoretical concept of income brings into play, besides income as measured by national accounts, elements recorded in the other accumulation accounts (on these interpretations, see the appendix to the present chapter, “Hicks’ concept of income and national accounts: interpretation issues”).

The discussion of the issues for which the other accumulation accounts must be used (see for example the appendix to chapter 10) is made more difficult by an insufficient perception, probably by most national accountants themselves, and certainly by most economists, of national accounting as a complete accounting framework. From there originates a frequent tendency to go on thinking within the traditional truncated framework (see Box 54).

Much time will undoubtedly be necessary before national accountants themselves better work out the implications of their accounting framework, completed at last, but certainly still not in its final state. For instance, new thinking about provisions in business accounting, in particular provisions for bad debts, is undoubtedly desirable (on these claims see Box 60).

3. The debate on the environment

From the standpoint of the relationship between income and wealth, the debate on the environment focuses again on the issue that had been insufficiently settled

Box 60
Debt forgiveness and writing-offs of bad debts

In connection with bad debts, it is interesting to note that the treatment of debt forgiveness was modified in the 1993 SNA in connection with the introduction of the other new changes in the volume of assets account. The 1968 SNA regarded write-offs of bad debts as financial transactions (§ 7.107) with a counterpart in current transfers (Table 7.1). The 1993 SNA/1995 ESA distinguishes the cancellations of debt, which are part of an agreement between the parties concerned, and the writing off of debts considered to be irrecoverable by creditors. Only the former are regarded as giving rise to transfers (of a capital nature, since a transfer of wealth is clearly involved) and entries in financial transactions (1993 SNA §§ 10.139 and 11.23). The other ones are recorded, when the creditors recognize them, in the other changes in volume of assets account of the units in question (§§ 10.140 and 11.23), i.e. like a capital loss of the creditor similar to an uncompensated seizure. As long as there is no debt forgiveness or writing off of bad debts, national accounts do not record the provisions that creditors can constitute.

concerning the extraction of natural resources and investigates how to take into account the qualitative degradation of non-market natural assets.

3.1. Treatment of the extraction of market natural resources

Market natural resources are those whose extraction enters a market process (or the own consumption of a marketed resource). They can be either nonrenewable on a human scale (oil, ores) or renewable (forests, fish).

3.1.1. Non-renewable resources

All versions of the SNA have recorded the value of resources extracted from the subsoil as output at the time of their extraction.

This value then enters GDP, NDP and NI. The value of discovered resources does not enter output at the time of the discovery. No flow of CFC or disposal of assets is recorded at the time of the extraction. The 1993 SNA keeps that, but records the discoveries and extraction of these non-produced assets in the *other changes of volume of assets* account. The truth is that the severe criticism addressed to national accounting, at the beginning of the 1970s, in connection with this treatment, came up too late into the preparation of the 1993 SNA for the examination of this issue to be carried out in depth. The founders of national accounting had not really been disturbed by the issue, of which they were aware of course. Kuznets (1933, p. 20) notices that mining income can comprise significant elements of gross income. However, in 1949 ("National income and economic welfare", p. 201), he rejects the idea of deducting provisions for the extraction of natural resources, arguing that the assumption of technological continuity is assumed and it is not possible to conveniently reflect either the depletion of natural resources, or the addition to the stock of knowledge. For Stone (1945, p. 60), the provisions for a decrease in resources are meaningful for an enterprise, not for the community as a whole since free gifts of nature are in question.

Box 61

Estimating the resource rent and the value of nonrenewable resource deposits

Transactions on the overall property of a deposit or a mine are extremely rare and non-representative; therefore, the value of the deposits of subsoil mineral resources must be estimated in an indirect way.

For this purpose, it is usually agreed that it is necessary to start by estimating the additional net receipts (qualified as rent, economic rent, resource rent) which the exploitation of a deposit will provide during the total period of extraction, and then bring these receipts, since they will be spread out over a certain number of years, to a discounted value at the time when the balance sheets are compiled (see for example the 1993 SNA, § 13.60, 1995 ESA, § 7.41).

Estimating the rent

Additional net receipts (rent) is understood as the difference between the prices of the raw material after extraction ("well head" or "pit head") and the sum of the costs (of exploration, development and extraction), including the normal remuneration of the invested capital. Additional net receipts are also called expected net returns resulting from the commercial exploitation of those assets (see the SNA and ESA paragraphs referred to above).

As the development of this topic is new in national accounting and as it questions some of the treatments that have been previously accepted, great care is required in the wording, in order to avoid any prejudgment within the proposed answers. Indeed, sufficient caution is not always taken. National accountants easily speak of the rent as a part of the operating surplus of mining and quarrying activities, as it is the case in the current SNA/ESA, but which seems to exclude, a priori, a treatment of the extraction of non-renewable resources in which the rent would not appear any longer in the gross value added of the extraction industry. According to such a treatment, this industry would buy from its owner the resource in the ground at a price precisely measured by the rent, which would then represent an intermediate consumption for the mining and quarrying activity.

Another example of insufficient precaution in the use of terms, is the immediate application to the mentioned rent of the usual theoretical definition of economic rent, as an excess return to a given production factor. This definition is recalled, for example, in the World Bank *World Development Indicators 2000* ("3.15 Toward a measure of genuine savings", p. 171, first column). The use of this definition seems to neglect the fact that neither labor nor capital was employed to create the mineral resource itself. For its owner, the resource as such is a gift of nature; the rent does not remunerate any factor of production, because none of them has been invested in the creation of the resource. The term "income" itself is to be handled cautiously in this context, if one does not want to seem to be excluding a priori a treatment in which the owner would sell an asset by portions (the sale of an asset is not recorded in national accounting as income). A fairly neutral formulation is used in *Expanding the Measure of Wealth: Indicators of Environmentally Sustainable Development* (The World Bank 1997). The economic rent of a natural capital "represents the inherent surplus value in the extraction or the harvest of a resource" (p. 30). One often also refers to the intrinsic value of the resource. There is a general agreement, though not always satisfactory conclusions are derived, on the need of carefully distinguishing in all these analyses the owner, the prospector and the extractor.

In terms of the 1993 SNA/1995 ESA, the rent is measured by the difference between the output of the extraction industry at basic "well head" prices, and the following terms: intermediate consumption, compensation of employees, net taxes on production, except taxes on products, which are not specific of the extraction industry, consumption of fixed capital and normal return to fixed capital [see, for example, *Accounts for Subsoil Assets – Results of Pilot Studies in European Countries* (Eurostat 2000), pp. 23–27]. The Eurostat study specifies (p. 24) that the fixed assets in question include the intangible assets corresponding in the SNA/ESA to exploration expenditures.

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Box 61 (cont'd)

Logically, this expenditure should be written off over the total extracted quantities, a process that can be difficult to follow in practice. This formulation shows that the specific taxes on the extractive industry are part of the rent. They often constitute most of it. The principal difficulties implied in the measurement of the rent refer to the estimate of the net stock of fixed capital of the extraction industry and the choice of a normal rate of return to fixed capital, which should be approximated at best in a way specific, if possible, to the extraction industry.

The breakdown of the rent between the owner (government in the more frequent case) and the extractor is a very significant piece of information. As it is easier, in principle, to know with precision the amount of rent going to government (easier does not always mean easy) than to calculate the entire rent, the share of the rent going to extractors, obtained by difference, is only known in a very approximate way and can fluctuate appreciably. (On the breakdown of the rent related to oil and natural gas, see the above mentioned study by Eurostat, p. 41, for figures concerning the Netherlands, the United Kingdom and Norway; in the Netherlands, where results are more regular, the estimated share corresponding to extractors fluctuates between 3 and 18% depending on the year over the period 1990–1998).

To eliminate strong variations in the amount of the estimated rent (and thus of the value of stocks derived from it), because of considerable fluctuations in the prices of raw materials, prices moving averages calculated over a period corresponding to a few years (five for example in the estimates by the World Bank) are frequently used.

Valuing stocks

The present value method is used to calculate the value of deposits at a given time by discounting the series of annual expected rents on the total period of extraction by means of a discount rate. The following formula (see for example, *Eurostat 2000*, p. 28) expresses the calculation of the current value V_t of a deposit at the beginning of period t:

$$V_t = \sum_{i=t}^{t+n} \frac{R_i}{(1+r)^{i-t+1}},$$

in which R_i represents the resource rent of period i and r the discount rate.

At constant prices, this value requires strong assumptions regarding the schedule of extraction of the resource, i.e. the distribution of the rent over time, as well as the discount rate. The choice of the most adequate rate is a topic of intense discussions (private, public or social rate, based rather on national or international considerations, etc.). Thus, *Expanding the Measure of Wealth*, from the standpoint of sustainability, chooses the social rate of return on investment, defined in the literature on growth (it is the sum of a pure rate of time preference r and the product of the growth rate of per capita consumption c times the elasticity of the marginal utility of income u: $\mathrm{SRRI} = r + uc$). Such a rate should be higher for developing countries, with a high rate of growth, than for industrialized countries and on the contrary lower for the poorest-performing developing countries, but finally for cross-country comparisons that the study presents, it uses a single 4% discount rate. One strong view was expressed in the London Group on environmental accounting, based on the international character of oil prices, in favor of selecting a single international rate according to the financial conditions of the oil industry. *Eurostat 2000* (p. 29) retains a rate selected from the government's point of view and close to the average current rate of return on government bonds.

As it is a difficult exercise to forecast a schedule of extraction as well as changes in the relative prices of the unit rent, in particular in the case in which analysis is not made at constant unit resource rent, practical attempts of estimation, which have multiplied in the last decades, resort to considerable simplifications.

One of them, known as the "*net price method*", rests on the Hotelling rule that, in the framework of the search for an optimal path for the extraction of a resource, recommends that the net price

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Box 61 (cont'd)

(the relative price) of a non-renewable resource should increase at the same pace as the discount rate (equal to the interest rate). In this case, the effect of discounting is exactly offset by the (expected) relative price increase of the resource. There is then no need to explicitly forecast either future unit rents, or extraction profiles, or to choose a discount rate. As it has the advantage of simplicity (in order to estimate the value of a deposit, at a given time, it is enough to multiply the current unit rent by the total quantity in stock), the net price method has often been used (works of Repetto and the World Resource Institute, in the 1980s) or tested as an alternative measurement (for example, work for the London group, in particular that of Alice Born about Canada). At the end of the century however, it is considered that facts hardly provide elements in support of the net price method, which represents an oversimplification of a theoretically sophisticated model (on the Hotelling model and following refinements, see for example, Sylvie Faucheux and Jean-François Noël, *Economie des ressources naturelles et de l'environnement* [Economics of Natural Resources and the Environment], Armand Colin, 1995, Chapter 3, "La théorie des ressources épuisables" [The theory of non-renewable resources], pp. 89ff.)

Another simplification process, sometimes called the *simple present value*, is to assume that both the unit rent and the extracted quantities will in the future be constant and equal to those of the current period. Total annual rent is in consequence assumed to be constant and equal to that of the current year. Only discounting is thus required. The World Bank also considers a *constant revenue assumption* that, by combining rising unit scarcity rents and declining quantities extracted, leads to a longer period of extraction and to a value of the stock appreciably higher than what results from the simple present value method, but lower than that obtained with the net price method.

Expanding the Measure of Wealth wisely concludes "Because real mines do not behave like textbook mines, the problem of valuing subsoil assets is inherently one in which there are no good solutions, only 'less bad' ones." (p. 33).

(On the evaluation of deposits, see *Eurostat 2000*, pp. 28–30; *Integrated Environmental and Economic Accounting. An Operational Manual*, United Nations, 2000, pp. 116–123; *Expanding the Measure of Wealth*, Box p. 33; and Mundhati Kunte, Kirk Hamilton, John Dixon, Michael Clemens, *Estimating National Wealth: Methodology and Results*, The World Bank, 1998).

Towards the end of the century, on the other hand, most are convinced that something should be done, but opinions strongly diverge. The principle of valuing the resources as such by rent (beyond exploration, development and extraction costs) is accepted, even if measurement difficulties are considerable (see Box 61). Divergences concern the accounting treatment to be applied (see Box 62).

The official US position only admits a symmetrical treatment of discoveries and extractions. Extractions correctly give rise to a negative entry only if the discoveries are included in output and capital formation. This treatment was applied earlier in several countries by Repetto and the World Resources Institute, and was then almost unanimously criticized.

Other participants in the debate do not question the non-produced character of the natural resources under examination, but positions can evolve. However, some (in particular Anne Harrison and Peter Hill, 1994, 1995) assimilate them to fixed assets, due to the fact that the depletion of a deposit extends over time. Therefore, they treat them strictly in the same way as produced fixed assets. The value of the output of mining is not modified and thus GDP is unchanged. The depreciation of capital (change in the present value of the series of future rents) during the accounting period is assimilated to a CFC. The remainder of the rent

Box 62
How to record the extraction of non-renewable resources?

The value in the subsoil, before extraction, of the resource extracted during one year, is estimated by the rent obtained in selling (in the sense of sale to the extractor) this part of the resource by its owner (see Box 61), who might himself also be the extractor.

The value of the rent is, in the 1993 SNA/1995 ESA, an undifferentiated component of GDP and NDP. The latter includes, then, as (net) income the value obtained from selling a certain quantity of nonrenewable resources. This value is then recorded as property income of the owner. The inclusion of the rent, in NDP, or even in GDP, was questioned because it corresponds to depleting a nonrenewable natural resource. As this problem was not discussed in the context of the preparation of the 1993 SNA, it was only expected to be included in the new accumulation account ("Other changes in volume of assets"), item K.6, exhaustion of natural stocks, without, therefore, affecting the traditional measure of GDP/NDP.

The UN 1993 provisional handbook titled *System of Environmental and Economic Accounting* (SEEA) records the depletion of natural resources as additional costs in order to calculate a net domestic product adjusted for the environment, but without proposing any specific treatment for this purpose.

The text of the present chapter briefly describes the principal solutions that have been suggested. The synoptic table on p. 340 specifies, in terms of accounting treatment, their incidence on the main components of national accounts in the case of subsoil resources.

The table calls for some additional comments. Solutions (2) and (5) show stronger differences. (2) underlines the distinction between produced assets and non-produced assets. For (2), the exclusion of the total amount of the resource rent from GDP and NDP would be the correction of an anomaly. This rent should not have been included there because it represents the value of the sale of an asset (by the owner to the extractor). In national accounts the sale of an asset is recorded in the capital account.

For (5), since the discovery of the resource was not recorded as capital formation, its depletion cannot appear there either. One cannot avoid suspecting that this reasoning is partly influenced by the NIPA (see chapter 2 and Box 7), whose accounting framework is incomplete and does not include what the SNA introduced under the heading "Other Changes in Volume of Assets". There is no place in the NIPA to record the discovery other than in output and capital formation, and thus no other way to show a deposit appearing as an asset. The reasoning goes further, however, and seeks to prove that it is the discovery, etc., which creates the value of the asset, and not the asset itself which results from geologic processes going on for millions of years.

There is a fundamental opposition between the idea, at the basis of (2), that no factor of production has been committed in the creation of the nonrenewable resources, a "gift of nature", and the thesis of (5) according to which the value of this resource is created by economic activity (the fact that prices are determined by economic exchanges is not under discussion here). A significant difficulty for (5) is that the value of the deposit belongs to the owner (in general, though not always, government), not to the prospector. Part of the rent goes in general to the extractor (see Box 61) according to the terms of the contracts agreed with the owner. The issue refers thus to sharing property benefits. The prospector is remunerated for his services. It is difficult to imagine through which conceptual and accounting mechanism national accounting would assign to the prospector the output of the economic value of the deposit, which would later appear in the owner's assets.

A curious treatment that tries to overcome these difficulties is proposed and circulated, in the last months of year 2000, within the London Group on Environment Accounting, dedicated then to the revision of the SEEA. The value of discoveries and revisions of previous estimates would actually be considered – except for a symbolic value of the resource in the ground before its discovery – as the result of economic activity, though without influencing the value of output, nor that of GDP or

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Box 62 (cont'd)

capital formation. Discoveries and reassessments would be seen as similar to a negative CFC .... Actually, it is difficult to see how – since they would no longer be regarded as the appearance of a non-produced asset – they could escape the treatment given in (5) as output, except of course if the concept of production itself were eliminated, preserving only the income–capital relationship. Then the creation of produced assets would also be viewed as a negative CFC.

Synoptic presentation of main proposals for the treatment of the depletion of subsoil resources

	1993 SNA/1995 ESA	Rent as proceeds of sale of non-produced assets		Decrease in reserve value, similar to a CFC	
		totally	partially		
			Breakdown of rent		
		Discoveries and reassessments			
		in other changes in volume of assets (capital gains) – as in 1993 SNA			in output and capital fomation
	(1)	(2)	(3)	(4)	(5)
Current accounts					
GDP	includes rent	excludes rent	excludes part of rent	includes rent	includes rent includes discoveries, etc. (+ or –)
NDP	includes rent	excludes rent	excludes part of rent includes part of rent (income element)	excludes part of rent (depletion element) includes part of rent (income element = positive effect of un-discounting)	excludes part of rent (depletion element) includes part of rent (income element) includes discoveries, etc. (+ or –)
Property income going to the resource owner	includes rent	excludes rent	includes part rent (income element)	includes rent	includes rent includes discoveries, etc. (+ or –)
Capital account					
Capital formation	includes exploration expenditures excludes discoveries, etc. (+ or –)	ditto ditto sale of non-produced assets (total rent)	non specified implicit sale of non-produced assets (part of rent)	ditto ditto flow similar to a CFC	ditto includes discoveries, etc. (+ or –) flow similar to a CFC
Other accumulation accounts					
Discoveries and reassessments of exploitable quantities	economic appearance of non-produced assets (other changes in volume of assets)	ditto	implicit	ditto	in capital formation
Depletion of reserves	economic disappearance of non-produced assets (other changes in volume of assets)	sale of non-produced assets (total rent) in capital account positive effect of un-discounting in revaluation account	sale of non-produced assets (part of rent) in capital account	treatment similar to a CFC	treatment similar to a CFC
Revaluation account	effect of changes in unit rents and in discount rate	includes the positive effect of un-discounting	as in 1993 SNA	as in 1993 SNA	as in 1993 SNA

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Box 62 (cont'd)

Explanatory notes to the table:
Column 1: 1993 SNA/1995 ESA; column 2: André Vanoli's proposal (July 1997); column 3: Salah El Serafy's proposal (1989); column 4: corresponds to a certain state of the positions of several experts (Anne Harrison, Peter Hill); column 5: reflects the views of Robert Repetto and the US Bureau of Economic Analysis. These positions are likely to evolve. See the references in the annotated bibliography at the end of the chapter.

The headings which appear at the top of the table, and which correspond to columns 2 to 5, characterize the principal elements which differentiate the proposed solutions (see the main text of the present chapter): sale of assets or analogy with a CFC, breakdown or not of the resource rent, inclusion or not of discoveries and reassessments of reserves (reassessments can be positive or negative, since they have an effect on the economically exploitable quantities) in output and capital formation.

Position (4) favors in its analysis the income–capital relationship, however without giving up the distinction between produced and non-produced assets. Summarizing, it says that since a discovery gives place to the appearance of a non-produced asset, the latter should be looked at as any other type of capital. The progressive depletion of the resource must be measured by the reduction of the asset value, that is, its depreciation, and not by the total amount of the rent. The loss in value of the asset is indeed equal to the difference between the value in the ground (unit rent times quantity) of the quantities extracted during a period and the effect of un-discounting, with one factor $1/(1+r)$ less. This last effect is positive since each annual portion still to be extracted sees its value multiplied by $1+r$ (r being the discount rate) as time passes by. Eurostat 2000 qualifies this effect of "revaluation due to time passing" (pp. 30–32). To describe it in the table above the neologism "désactualisation" (un-discounting) has been used.

The analysis in (2) considers that the value of a non-produced asset in the sense of the 1993 SNA is a non-produced value (it appears, therefore, in the "other changes in volume of assets" account) measured by the sequence of the expected resource rents that are discounted to make them homogeneous at a given time. The simple passing of time, the "un-discounting", is not enough to generate an income to be included in output in the sense of the 1993 SNA, thus transforming part of the rent, viewed and measured at the beginning as an "extra" receipt, in a normal capital income (measured by the product of the initial value of the stock by the discount rate assimilated to the rate of return on capital). (2) views the sequence of total annual rents as the spreading over time of the receipts of the capital gain which a discovery represents, and treats, then, the effect of "un-discounting" as a revaluation in the SNA sense.

Solutions (3) and (4) are close to each other regarding the income–capital relationship as they closely follow Hicks. They diverge on a significant point however. (3) considers the part of the rent corresponding to the depletion of the resource as a sale of assets. On this point, (3) is closer to (2) than to (4). That enables it to include in property income, going to the owner, only the part of the rent analyzed as an element of income. As (4) records on this line the whole rent (royalties, specific taxes, etc.) payable to the owner, this one receives a current income that includes all or most of what (4) precisely treats in a way similar to a CFC. But as the CFC is recorded in the accounts of the extractor, this one sees his (net) income and his saving reduced while those of the owner are increased. It is not clear how their respective accounts are balanced.

Solutions (4) and (5) are often presented from the standpoint of sustainability. In (5), indeed, NDP is higher than in the SNA if discoveries and reassessments are greater than the value of depletion, NDP is lower than in the SNA in the opposite situation. Sustainability is analyzed according to the balance between discoveries and depletion. A practical disadvantage, beyond the conceptual debate itself, is that GDP and NDP can undergo strong irregularities if discoveries and extractions do not follow similar temporal profiles.

Within the framework of type-(4) solutions, certain analysts seek a close conclusion in terms of sustainability via the lifetime to be used in the calculation of a depletion similar to a CFC. The lifetime of the reserves is calculated by dividing the closing stock, not by extraction alone, but by the balance between extractions and additions. The calculated lifetime can greatly increase, and may even become infinite, notes *Eurostat 2000* (p. 32), when additions equal extractions. A justification that has sometimes been given is that discoveries increase the potential permanent income, which is likely to bring back a possible negative depletion, if discoveries and reassessments are greater than extraction.

In fact, as the prospecting policy of oil companies, or of government holders of important reserves, is to adjust as much as possible, and in a very logical way, the effort of research to the near future needs, it is doubtful that the comparison between discoveries and extractions can be significant within a long-term perspective, which is precisely the horizon of sustainability.

Box 63
The World Bank concept of "Genuine saving"

The World Bank defines the genuine rate of saving (the expression "genuine saving" is often considered inadequate) as "the true rate of saving of a nation after accounting for the depreciation of produced assets, the depletion of natural resources, investments in human capital and the value of global damages from carbon emissions" (*Expanding the Measure of Wealth*, pp. 1–2). Introduced in a 1995 report (*Monitoring Environmental Progress*), and following pioneering research by D.W. Pearce and G. Atkinson ("Capital theory and the measurement of sustainable development: an indicator of weak sustainability", *Ecological Economics* 1993, no. 8, pp. 103–108), the concept, with a still incomplete coverage, tends to estimate the change in the total wealth of a nation, including produced assets, all types of natural assets and human resources.

There is nothing special concerning the depreciation of produced assets (CFC in SNA terminology). Natural resource depletion is measured by the product of unit rents (see Box 61) times the quantities extracted, for a series of non-renewable subsoil resources. For forests, the unit rent is applied to the quantities commercially exploited beyond natural growth. No estimate could be made for ecological functions (biodiversity, carbon sequestration, etc.). For various reasons, soil degradation, the value of extracted fossil water and net depletion of fish stocks could not be estimated.

The value of damages due to pollution is calculated only for carbon dioxide (as the marginal social cost by emitted ton; it is a treatment cost). Considering that the effects on output and produced assets are already taken into consideration by national accounts, the World Bank is interested in the consequences in terms of welfare and wishes to assess the willingness to pay for avoiding additional mortality and morbidity (see a discussion of this point in chapter 7, p. 295), but "[...] because these marginal damage figures are locale-specific, no general treatment of pollution emissions is attempted" (Hamilton and Clemens, 1999, p. 341).

As the evaluation of human capital is rather tricky, the Bank, in a first approximation, simply treats current expenditures in education as investment (equipment expenditures are already in GFCF in national accounting).

Finally, genuine saving is calculated as:

Net saving
+ current education expenditures
– energy resource depletion
– mineral resource depletion
– net forest depletion
– carbon dioxide damage

The results corresponding to 1998 for a large number of countries appear in *World Development Indicators 2000*, pp. 168–170 (expressed as GDP shares for gross saving, CFC and the five above mentioned adjustment terms). For countries rich in oil and less developed in other fields, energy resource depletion, calculated as indicated above, represents a significant share of GDP, often higher than 10%, up to 30.8% for Saudi Arabia, 32.2% for Turkmenistan and 37.6% for Kuwait.

[References: *World Development Indicators 2000*, pp. 168–171, *Expanding the Measure of Wealth. Indicators of Environmentally Sustainable Development* (1997) Chapters 1 and 2; Kirk Hamilton and Michael Clemens, "Genuine savings rates in developing countries", *World Bank Economic Review*, Vol. 13, no. 2, 1999, pp. 333–356].

Besides emphasizing the perception and the attempts to measure changes in wealth understood in a broad sense, the concept of genuine saving has the advantage not to focus the analysis on the calculation of an adjusted NDP. Formally, this approach can be paralleled with the proposal made by Vanoli (1995), regarding the degradation of non-market natural assets, to record a kind of capital transfer received from nature in order to account for the fact that the economy consumes a part of it (see text of the present chapter).

is regarded as return on capital (product of the value of the reserve times the discount rate) and remains included in NDP.

Others consider that the extraction of natural resources is similar to a reduction in inventories, but not every one values it in the same way. Salah El Serafy (1989) also divides the rent into two parts and only treats as reduction in inventories (and thus reduction of the value of output and GDP) the fraction that is required to guarantee a permanent flow of income. Pigou (1920, p. 39) suggested also a division of royalties on the basis of the effective use made of it (increase or not of capital).

Vanoli (1995, 1997, 2001) proposes treating the whole rent as a reduction in the value of inventories, and reducing GDP by an equivalent amount. The distinction produced/non-produced asset is then preferred all along.

In order to calculate a "genuine saving" (see Box 63), the World Bank, in the publications previously quoted concerning the measurement of rent (*World Development Indicators 2000, Expanding the Measure of Wealth 1997*, see Box 61), deducts from gross saving, among other items, in order to take account of the depletion of natural resources, the whole value of the rent (unit rent multiplied by the extracted or harvested quantities).

This is a complex debate, with possibly strong practical implications (to change GDP or not, and in any case NDP) and with various theoretical references (assimilation or not of natural capital to whatever common type of capital, economic concept of rent, etc.).

3.1.2. Renewable resources

The case of non-cultivated renewable resources is somewhat different since the reserve can be of infinite duration if the physical extraction does not exceed natural growth. It is agreed to consider that in this case the intrinsic monetary value of extracting this resource is zero. The whole value of the sale of extracted quantities is treated like output of the industry that exploits them (forestry, fishing, etc.), even if this activity generates a rent (possible situation if the extraction, though lower than the growth of the resource, increases because of a faster growth of demand than that of the capacity of exploitation).

When physical extraction exceeds natural growth, the stock decreases. The level of exploitation of the relevant resources is not sustainable. The resource acquires an intrinsic money value that is no longer zero. The treatment of the rent, which should normally appear, is not obvious. Continuing with the analysis in terms of non-produced value, Vanoli (1995) proposes to treat it in the same way as the rent of nonrenewable resources. From the point of view of sustainability, the World Bank, in its calculation of genuine saving, only deducts for forests the rent on the excess of cut-down quantities as compared to annual growth (Hamilton and Clemens, 1999, p. 339).

The analysis turns complicated because an excess of resource extraction might coexist with the disappearance of any rent. The case is frequent in fishing in those zones where, because of the pressure of strong demand, the fishing capacity has developed too much, bringing about simultaneously increasing costs and scarcity of the resource. For this reason and because of the lack of data, *Expanding the Measure of Wealth* excludes fish from its analysis.

It has been proposed to measure the value of net depletion of a renewable resource by the cost for the economy to regenerate the asset under consideration up to the level prior to the excessive extraction. This cost could be estimated in theory, though not without difficulty, by the present value of the loss of income due to the limitation of or abstention from extraction during the period of regeneration of the resource (see the proposed accounting treatment in terms of national accounting, including the comparison between the value of depletion thus calculated and the possible rent, as well as the recording method for the regeneration of the resource, in Vanoli 1995, pp. 131–133).

3.2. Taking into account non-market non-monetary natural assets

3.2.1. From physical to monetary recording

The possibility of taking into account non-market natural assets (air, water, etc.) raises still more difficult questions. Their complete valuation in monetary terms being out of question, works were principally directed in the 1980s towards their physical knowledge. Centered initially on materials–energy balances or on accounts of natural resources describing stocks and flows (in Norway for example), they open in France to a wider perspective with the development of an ambitious overall system of accounts “du patrimoine naturel” (of natural wealth), conceived mostly by Jean-Louis Weber, and published in 1986 with the first applications on wild fauna and flora, forests and inland waters. This effort slows down, for lack of means, while the pressure grows in various forums (the World Bank, the United Nations in particular) for monetary estimates in order to calculate a GDP or rather a NDP adjusted for the environment (often unfortunately called “green GDP”). The purpose of such estimates is not the valuation of the assets as such, but of the damages caused by economic activity, either to economic transactors or to natural assets whose qualities and functionalities are thus reduced.

3.2.2. Conflicts around the SEEA: valuation methods

The methodological proposals are worked out at the margin of the preparation of the 1993 SNA in an atmosphere of conflict. They lead to the publication of a provisional handbook of *Integrated Environmental and Economic Accounting* (United Nations 1993), known under the SEEA acronym (System of Environmental and Economic Accounting), which is presented as a satellite type of account. The SEEA is a remarkable conceptual development leading in particular to the ambitious construction of a vast accounting framework made up of many variants (see Box 64, where its principal drafters are also presented). While

Box 64

An outline of the United Nations handbook *Integrated Environmental and Economic Accounting* (SEEA 1993)

This *System of Environmental and Economic Accounting Handbook* is known under its English acronym as (SEEA). Its principal drafters were Peter Bartelmus and Jan van Tongeren (UN) and Carsten Stahmer (German consultant).

For the sake of illustration, the data reproduced here may be regarded as referring to the principal version (SEEA version IV.2, Table 4-6). Figures in the table are only indicative. *Environmental costs* in this version are estimated according to *maintenance costs or maintenance values*.

Calculation of environmental costs

Columns 1 to 4 refer to production and consumption, columns 5 to 13 to several categories of non-financial assets. Compared to the 1993 SNA, those are extended in order to cover natural assets considered as non-economic by the latter, as it is the case of air for example.

The SEEA primarily describes the costs of using non-produced natural assets that do not appear in national accounts (rows 4 to 9, columns 6 to 13). Depletion costs of natural assets are to be found in rows 4 and 5. For renewable assets (column 7 for example), they are calculated insofar as the depletion rate exceeds natural growth. In theory, these costs can refer to the depletion of natural assets (fish in the ocean for example) located in the rest of the world. They would then be registered in row 5. They can also refer to natural produced assets (animals, forests, for example) whose value of ecological depletion exceeds the market value of net depletion.

For land, landscape and ecosystems (row 6), recorded costs can refer to soil erosion of cultivated land (column 12) or to destruction of ecosystems of non-cultivated areas (column 13).

The degradation costs of discharging residuals into the natural environment (rows 7 to 9) are associated with environmental media (water column 9, air column 10, soil column 11), which are the direct recipients of the residuals generated by economic activities. Cross-border flows can intervene, the corresponding costs being recorded as negative exports (row 8, column 14) in case of degradation by domestic residuals of natural assets located in the rest of the world, or as negative imports (row 9, columns 9 and 15) in case of degradation of domestic natural assets caused by residuals coming from abroad. Rows 12 and 13 refer to residuals, which are treated, stored, recycled or re-used. As they are only recorded in physical terms, no money value appears for them in these rows. The value of recycled materials or the costs of treatment, storage, etc., are recorded in row 2.

The restoration (reconditioning) of natural assets by government appears in row 10, column 4 (and columns 9 and 11 for the assets involved in the numerical example). For restoration by other sectors, only net flows (emissions less internal treatments) are recorded in row 8.

Finally, using row 11 the environmental costs due to individual final consumption (column 2.1) are transferred to industries or to the discharge in nature of discarded fixed assets (column 5) [an arbitrary transfer in the case of households due to the fact that their final consumption is not a productive activity in the sense of the SNA].

Columns 1 to 3 record for each row 4 to 8 the environmental costs resulting from the covered activities.

Calculation of an adjusted NDP

Rows 15 to 19 show how, starting from estimated costs, the SEEA proposes to convert NDP, as understood in the SNA (row 19) into an environmentally adjusted domestic product, "eco value added" or "eco domestic product" (EDP) for short (row 15). The latter is obtained by subtracting the sum of the costs recorded in rows 4 to 11 (16.8 for column 1 and 65.2 for column 2, in all 82) from row 19. This is done step-by-step, first in row 18, under the odd denomination of "eco margin" (imputed costs estimated at their market value), and second, in row 16 (the difference between the previous estimate of costs and the estimate at maintenance or protection costs). This breakdown is secondary for the understanding of the SEEA.

cont'd

Box 64 (cont'd)

SEEA matrix: environmental costs at maintenance values (version IV-2) – numerical example

	1. Domestic production of industries		2. Final consumption		3. Non-financial assets (Uses and stocks of assets)									4. Exports	5. Total uses
	Agriculture, forestry, fishing ISIC 0	Other industries ISIC 1–9	2.1 Individual consumption	2.2 Collective consumption	3.1.1 Produced assets of industries		3.2 Non-produced natural assets								
					3.1.1.1 Man-made	3.1.1.2 Natural (living biota)	3.2.1 Wild biota (living)	3.2.2 Subsoil assets	3.2.3 Water	3.2.4 Air	3.2.5 Land including ecosystems				
											3.2.5.1 Soil	3.2.5.2 Areas			
												Cultivated	Uncultivated		
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**
1 **Opening stocks (1)**					991.3	83.1	65.4	261.9	12.0			1366.7	50.4		
Use of products of industries (2.1)															
2 Domestic production (2.1.1)	8.1	176.0	148.7	42.5	61.8	1.4		2.7				4.6		71.6	517.4
3 Imports (2.1.2)	1.1	38.8	26.3		6.2	0.0								2.1	74.5
Use of non-produced natural assets (3.1)															
Depletion of natural assets (3.1.1)															
4 Domestic origin (3.1.1.1)	4.8	12.7	0.7			–0.9	–3.7	–8.9	–4.7						0.0
5 Foreign origin (3.1.1.2)	0.0	0.0													
6 Use of land, landscape, etc. (3.1.2)	5.5	3.5	0.8									–7.7	–2.1		
7 Discharge of residuals (3.1.3)															
8 Domestic origin (3.1.3.1)	6.2	27.1	15.6		5.1	0.0			–14.3	–20.4	–14.6			–4.7	
9 Foreign origin (3.1.3.2)									–1.6	0.0	0.0				–1.6
10 Restoration of natural assets (3.1.4)	0.0	0.0	0.0	–5.0					3.0		2.0	0.0	0.0		
11 Shift in enviromental costs (3.1.5)	0.3	21.9	–17.1		–5.1	0.0									
Treatment of residuals (3.2)															
12 Domestic origin (3.2.1)															
13 Foreign origin (3.2.2)															
14 **Use of produced fixed assets (3.3.1)**	3.5	22.8			–23.0	–3.3									
15 **Eco value added/EDP (4)**	8.7	176.4													
16 Adjustments due to market valuation (4.1)	–10.7	–50.5	0.0	5.0		0.9	1.6	0.9	15.1	20.4	12.6	1.1	0.5	4.7	1.6
17 Eco value added/EDP at market values (4.2)	19.4	226.9													
18 Eco-margin (4.2.1)	–6.1	–14.7													
19 Net value added/NDP (4.2.2)	25.5	241.6													
20 **Gross output of industries (5.1)**	38.2	479.2													
21 Other accumulation of non-produced assets due to economic decisions (6.1.2)							0.0	27.8	0.0			3.4	–3.4		
22 Other volume changes due to natural, multiple causes (6.2)					–25.3	0.0	1.3	0.0	0.9			–4.3	–2.0		
23 **Revaluation due to market price changes (7)**					138.1	12.6	11.1	28.9	1.2			357.5	11.8		
24 **Closing stocks (8)**					1149.1	93.8	75.7	313.3	11.6			1721.3	56.2		

cont'd

Box 64 *(cont'd)*

It is easy to see that the total value of production is not modified (row 20), while extra costs are charged. The latter totally reduce value added, a procedure that was strongly criticized (see the main text of this chapter).

The bottom rows (21 to 23) provide the elements of other accumulation accounts to complete the transition from opening stocks to closing stocks of the different types of assets. Neither for air, nor for soil (as an asset distinct from land), it is considered possible to calculate a total stock.

Other versions

A version IV.3 estimates environmental costs at market value (as row 18 of the table) and at contingent value (prices which households would be willing to pay so that the environmental degradation might be avoided). In this case, the difference between these two evaluation procedures appears in row 16. This version, closer to the evaluation methods recommended by economists at the microeconomic level, is "floating" as these methods do not seem to be able to provide estimates at the aggregate level and as, seen from the demand side, they are not compared to the approach using maintenance costs.

Versions V.1 to V.3 introduce a production for households as consumers and three successive procedures for the estimation of environmental costs (market values, maintenance costs and contingent values).

One version (V.4) is dedicated to the evaluation of disposal services [discharge of residuals] and the productive services of land provided by natural assets to producers, then a version (V.5) includes the services provided by the environment to consumers (in terms of change only).

These various versions are set side by side, without any analysis of their interrelations (for example between IV.2 and IV.3 or between V.4 and V.5) [see Vanoli 1995, pp. 123–127].

[References to the SEEA: comment of version IV.2, §§ 298–319; of version IV.3, §§ 320–331; of versions V.1 to V.3, §§ 336–355; of version V.4, §§ 361–365; of version V.5, §§ 366–368. The United Nations published in 2000 a SEEA implementation handbook: *Integrated Environmental and Economic Accounting. An Operational Manual*. See, in particular in its Chapter IV, "Accounts of selected resources", developments on accounts for forests, subsoil assets, soil degradation, renewable water resources, and emissions of residuals into the air. For some critical references concerning the SEEA, see the Annotated Bibliography at the end of the present chapter].

trying to reflect many approaches and points of view, the SEEA aims primarily at the conceptual presentation of environmentally adjusted aggregates. Several pilot experiments will follow. Before as after its publication, the SEEA gives rise to very animated debates. One of its merits is precisely to provide the framework for such discussions. By the end of the century it is in a process of revision.

On one hand, the valuation methods are discussed. They are mostly based on the valuation of actual or potential costs, which have or would have made it possible to repair or prevent the degradation of natural assets (maintenance or protection costs), or on the estimation of the willingness of the economic transactors to pay or to receive in order to avoid or accept the loss of environmental services that they undergo or could undergo because of this degradation. The first method, rejected by certain economists for its lack of theoretical foundation, is, in general, considered to be the most interesting for the macroeconomic study of the relationship between the economy and the environment. It poses, nevertheless, so many conceptual (in particular with respect to the state of reference) and practical problems, that it may discourage any country from ever carrying out a complete macroeconomic evaluation of the annual value of the damages to natural assets.

The second method, known as the contingent valuation method, rests on the reconstitution, based on surveys on the willingness to pay or receive, of a demand curve from which it is possible to estimate, as these environmental services have a zero price, the change in the consumer surplus resulting from the reduction in available quantities or qualities. Once again the issue of welfare arises, in this case within a cardinal framework and interpersonal comparison of utilities. Applied usefully at the micro level (on a specific problem, in a given location and for a limited population), the method is generally considered not to be applicable at the macroeconomic level because of theoretical and practical reasons. The same considerations are, in general, also relevant concerning other methods trying to indirectly value environmental services from the demand side: for instance, the travel cost method which estimates how much visitors spend to gain access to certain sites, the hedonic pricing method applied to buildings in order to estimate the price of characteristics linked to the environment, etc.

3.2.3. Conflicts around the SEEA: possible adjustments to aggregates

Confrontations also concern the possible adjustment of the aggregates. The SEEA reasons in terms of supplementary costs, unaccounted for in market relations, which should be deducted from the value kept unchanged of output valued at market prices. Value added and net domestic product are then reduced by the same amount. By doing so, additional costs would be introduced, without any modification either in the level, or in the relative price system, a procedure that is very often viewed as irrelevant. In reaction, Harrison (1989, pp. 21–22) proposed ... to increase GDP, though leaving NDP unchanged. Actually, aiming at decreasing NDP at current prices for this reason seems looking for a symbolic effect. The actual possible internalization of the costs of using non-market natural assets would involve changes in relative prices and relative quantities, which could be appreciated only by modeling the results that depend in particular on assumptions concerning the level of employment and the existence of alternative techniques. Such an approach, if retrospectively applied, is not liable to provide an alternative accounting description to replace the current one as it describes a different state of the economy. By contrast, if prospectively applied, the modelization of a state of the economy, under the constraint of the respect of certain environmental standards, can provide very fruitful lessons.

The European Union, while promoting studies following diverse orientations, seems mainly moving in this latter direction rather than in the retrospective adjustment of aggregates, with research work in particular at the Center of Economics and Ethics for the Environment and Development (C3ED) of the University of Versailles at Saint-Quentin-en-Yvelines. In this context Martin O'Connor develops the heuristic concept of the Monetisation Frontier (*Natural Capital*, 2000). A summary of it is to be found in *Greening National Accounts* (O'Connor, Steurer and Tamborra, 2001, pp. 4–5): "This concept proposes that the ability to put money values on non-marketed environmental functions and services *decreases* [emphasis by the authors] with increasing importance or scale of the issue (such as global climate stability or a nation's diversity of species) and with the values involved (such as values of existence and non-use and the cultural and ethical aspects being involved)." [See chart in O'Connor, December 2000, p. 9.]

Frequent opposition is thus found again (see chapter 7, about welfare measurement) between those who would like to push back, *quasi ad infinitum*, the monetisation frontier (see, for example, later in this chapter, the orientation of *Nature's Numbers*) and those who, conscious of the inescapability of this limit, even if it is not strictly settled once and for all, try to clearly distinguish, as a matter of principle, what is the subject of deliberation (in the social and political debate) and what can be treated by economic analyses (see, for example, *Natural Capital*, pp. 6–8, 17–20; see also at the end of chapter 7, the discussion relating to multiple indicators).

On the basis of several methods suggested since the 1980s, two principal approaches emerge. One consists of changing the frontier of the economic system by including in the field of monetary valuation certain categories of environmental assets. For market natural assets, it is basically a proposed change of treatment within the central framework of national accounting (see for example Box 62). For those non-market natural assets, which are considered because of their degradation and its possible consequences on public health, the proposed displacement of the frontier is more problematical (see chapter 7).

The other approach consists of adjusting the economy itself. The result is a "greened" economy with modes and levels of production and consumption that respect specific environmental performance standards. The monetisation frontier might not be modified at all. The changes in natural capital are then quantified in non-monetary terms by means of indicators representing the state of the environment (levels of the fish stocks for example) and of pressures on the environment (quantities of emitted pollutants). The objectives of environmental policies are laid down in reference to such indicators (see *Natural Capital*, p. 10).

The second approach is in particular the topic of research, which associates German, French and Dutch economists and statisticians under the seal of "green stamp" [see in the Annotated Bibliography references to the 1997 Report, published by R. Brouwer and M. O'Connor]. The Dutch statistician Rufie Hueting, a pioneer in integrating the analysis of the effects of economic activity on environmental functions (sources of materials and energy, sink for all kinds of residuals, provider of services, support of life, etc.) with the political responses in terms of sustainability, tries though not convincingly, to associate the measurement of the consequences of the standard-related constraints, and the adjustment of an *ex-post* NDP. Partly at least by reaction, the NAMEA project, that combines national account monetary data and environmental data in physical quantities without confusing them, is also developed in the Netherlands (see chapter 4).

Concerning retrospective macroeconomic accounting at current prices, in case it were possible to estimate each year the total value of natural assets degradation (i.e. the annual consumption of these assets), a good way to represent things would be – keeping NDP unchanged – to increase accordingly the value of final consumption (and consequently reduce saving) as the counterpart of a kind of capital transfer, involuntary in fact, actually received from nature (see Vanoli, 1995, pp. 119–120 and annex 2). Thus it would be clear that we consume a part of natural assets.

Regarding the World Bank, it attempts to promote the valuation of an extended list of assets (see *Expanding the Measure of Wealth*, quoted in several boxes of the present chapter) and to calculate a genuine saving (see Box 63).

3.3. Return to the interpretation of net domestic product in terms of welfare and sustainability

In the discussions on monetary accounting of the environment, reference is often made to a theoretical paper by Martin L. Weitzman (1976), who seeks to justify a possible interpretation of net domestic product in terms of both welfare and sustainability. His reasoning framework is very strict: the economy moves along a competitive path, the representative consumer maximizes his intertemporal utility, the capital market is competitive with perfect anticipations, the concept of capital is generalized so that all sources of economic growth are supposed to be identified and attributed to one or another form of capital (p. 157) [at the end of the appendix to the present chapter, see a development of this analysis by Weitzman and Löfgren where technical progress is reintroduced]. These "idealized" conditions (*Nature's Numbers*, p. 188) leave aside, among others, the problems of interpersonal comparison of utilities, of distribution of income and wealth, and of the non-market, non-monetary character of most natural assets and the benefits derived from them.

Some researchers place themselves in such a context to build a step-by-step adjustment to net domestic product in order to approximate as much as possible its ideal significance (*Nature's Numbers* for example), in continuation of "Is growth obsolete?" (see chapter 7). Others consider that such idealized conditions, if they are required to interpret NDP retrospectively in terms of welfare and sustainability, confirm that it is a dead end, and, as a consequence, no single economic indicator can represent the full range of complex phenomena linked to these two ideas, all the more so when trying to take environment into account.

Outlook

The issues discussed in this chapter (see also Box 65) illustrate the limits of a purely empirical approach as well as the difficulties of an approach when it is completely based on theory. For a long time – and it is still the prevailing situation in actual national accounts at the end of the century – the conceptual and practical framework of national accounting remains truncated. It does not include balance sheets, or only exceptionally, or balance sheets are compiled from time to time, but are not integrated in the regular compilation of the accounts. Gross fixed capital formation narrowly defined is estimated. Many discussions take place early, especially among economists (since Pigou, Hayek, Hicks) on the topic of maintaining the capital intact, but the compilation of the depreciation of assets, which becomes consumption of fixed capital, is delayed. Reflections, well illustrated by Stone (1945, pp. 59–61), are developed in reference to the interpretation of business accounting practices. The compilation of stocks of fixed assets, which develops rather early to cope with the needs of growth analysis and is used as a basis for the estimation of the CFC, frees national accounting from business accounting on this essential point. Stocks are no longer calculated by adding up heterogeneous historical values, but after revaluation of these, mostly using the perpetual inventory method.

The difficulty of determining the "true" value of a firm or an economy

National accounting has, in particular on this subject, a more economic approach than business accounting, which depends more on legal rules and fiscal considerations. However, both can only record as gross capital formation what is observable. To the difficulties of observation should be added, for national accounting as well as for business accounting, the burden of tradition. From there derives the excessive slowness with which the field of the GFCF is extended to the formation of intangible assets, in spite of the on-going intense debate surrounding the topic of intangible investment, whereas the structural characteristics of

Box 65
Vocabulary: Capital – Wealth – Patrimony

These three terms can be regarded as synonyms or, contrarily, not covering identical fields. As the English term directly corresponding to "patrimoine" [patrimony] is not used with the extension that the word received in the French terminology of national accounting, the English equivalent of the expression "comptes de patrimoine" is to be sought in "wealth accounts", although at the technical level of English-speaking national accounts compilers, the terms "balance sheets" ("bilans" in French) are used. However nobody would say that he is trying to measure balance sheets, but to measure wealth, whereas in French one can say at the same time that one is trying to build "les comptes de patrimoine" [patrimony accounts] and to measure the "patrimoine". Wealth and "patrimoine" appear, in this context, as equivalent.

By choosing the term "patrimoine" French national account compilers however had in mind that it could cover a broader concept than wealth, if the latter is taken as a set of assets necessarily estimated in monetary value. Thus "les comptes du patrimoine naturel" [the accounts of natural patrimony] were designed to include elements considered, at least to some extent, impossible to be measured in terms other than physical (most of the water for example), or even to be completely measured in physical terms (the air). In a similar way, "le patrimoine culturel" [the cultural patrimony] contains elements for which one can consider a monetary value and others which have only "physical" existence, "le patrimoine linguistique" [the linguistic patrimony] for example. To refer to the parts of "le patrimoine" beyond the concept of wealth, English would rather employ the term "heritage" (natural heritage, cultural heritage).

However, when referring to physical persons, "le patrimoine" as defined and calculated by national accounting in France is a close equivalent to the concept of wealth or fortune. The latter word is generally only used for the private fortune of physical persons, although Divisia, Dupin and Roy in 1954 titled their book *Fortune de la France*. For businesses, in particular for corporations, one generally prefers to use the term capital.

The capital of a company is then defined as its global equity. It is the maximum amount that a potential purchaser would be willing to pay subject to possible discussions on its evaluation. In the case of an unincorporated enterprise, the capital is part of the wealth of the entrepreneur's household. For a corporation, it is legally a common asset of its shareholders, which is, with uncertainties and fluctuations, estimated by financial markets through the quotation of shares, if the company is quoted. Viewed from this perspective, the capital of a company is a certain amount of abstract economic value, in terms of business accounting its equity, in terms of national accounting its net worth.

At the same time however, this capital has a "concrete" counterpart, in terms of land, tangible and intangible fixed assets, possibly shares and other equity, and current assets (inventories, cash) etc., from which it is necessary to subtract liabilities (towards third parties).

This double nature of capital is at the origin of a good deal of ambiguity. For the neoclassical economic theory, growth accounting, and frameworks for the analysis of productivity, the term "capital" is used in its concrete meaning as a stock of equipment goods, in a more or less broad sense or, as it is usually said in English, capital goods. In this context, one speaks of the substitution between capital and labor, or between factors of production, in the sense of substitution between equipment goods and labor, not in an immediate sense as substitution between capital, understood as an abstract economic value, and labor, even though, from this point on, the accumulation of equipment goods (concrete capital) implies the accumulation of abstract owned or borrowed capital.

Within this framework, analysts speak of capital services in the physical sense of the productive services derived from equipment goods (as of labor services in the physical sense of the productive services derived from employees) and of the rentals of equipment goods in the sense of the prices of the physical productive services provided by this equipment. The use of the term "services" in the sense of "productive services" derived from production factors, whereas it is usually used

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Box 65 (cont'd)

to indicate a part of the result of the production process (services as opposed to goods), is not devoid of ambiguity. Theoretical economics does not distinguish, in this second sense, goods from services, but speaks only of goods. Applied economic analysis is thus led to designate services in this second sense by saying "non-factor services". Though this terminology has been used in the balance of payments, it has never been the case in any of the successive versions of the harmonized national account system. In the context of the national account distinction between goods and services, a term other than "services" should be used when referring to the "effects of the productive efficiency of factors", in the sense of "productive services".

One might object, from the standpoint of the analysts of productivity, that the term "services" in "productive services" refers to the utilitarian effect. There then would be, on one side, productive utilitarian effects, on the other, at the truly final stage (i.e. after all transformation of goods and services into other goods and services) consumption, derived from the use of economic goods in order to draw satisfactions from them. It is in this sense that Fisher (1906) defines income as [consumption] services of capital (see appendix to chapter 7).

Return on capital, defined as an abstract economic value, is not in an immediate, mechanical way, identifiable with the physical contribution of equipment goods to production. The same occurs for the compensation of labor. The distribution of value added, such as it is observed *ex post*, results from both the physical contributions of factors (they differ according to the nature and the efficiency of the equipment and the employees – that the interested parties themselves can only appreciate in an approximate way) and the individual bargaining and social struggles for the primary distribution of income. From this point of view one can recall the history of the labor movement or refer to the remarkable vogue, in the last decade of the century, of the "creation of value for the shareholder" topic that expresses a pressure to increase the productivity and the profitability of firms and to achieve a distribution which would be more favorable to the holders of the abstract capital.

In the framework of the Cambridge theory of capital, Thomas K. Rymes (*On Concepts of Capital and Technological Changes*, Cambridge University Press, 1971; "On capital and productivity: Harrosian and Keynesian measures", paper with René Durand submitted to the 26th IARIW Conference in Cracow, 2000), analyzes the return on abstract capital as the remuneration of *waiting*, saving instead of consuming inmediately. Waiting is considered as a genuine primary factor, which is not the case of capital goods. This remuneration is not identifiable with a component of the physical productivity of equipment, i.e. to the equipment net rentals – once CFC has been deducted – (the $V_t r_t$ term in the formula defining the user cost of capital, see Box 56) that the analysts of productivity impute (see the same Box 56 for the methods they use to determine the rate r). From a similar point of view Frisch and Aukrust distinguished real capital and financial capital and went even so far as to consider the latter's income as a transfer resulting from the distribution of real income derived from the former (see Box 25 in chapter 4).

National accounting prudently speaks in a neutral way of *property and enterpreneurial income*, or of property income, when discussing gross or net operating surplus (on the questioning of this neutrality, suggested by the research program of *Measuring Capital*, see also Box 56).

The connotations of the term "capital" in the economic theory (without forgetting the Marxist sense of capital as a production relationship) explain partly why the terms "patrimoine" [patrimony] or "wealth" are considered as having a broader sense. They include elements (the non-market natural heritage) to which it appears difficult to directly apply the theory of capital as such. Many economists however prefer to speak of capital in all cases (produced, human, natural capital). The choice, or hesitation, is then often between the words "capital" and "resources".

Expanding the Measure of Wealth provides a good illustration of this issue in particular with respect to human resources, one of the "three major capital components that determine a nation's wealth", with produced assets and natural capital. Human resources include "raw labor, human capital and the elusive, but important element known as social capital" (p. 19). The distinction

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Box 65 (cont'd)

between raw labor and human capital is explained by the fact (p. 21) that human capital is generally considered to be the product of education. Human resources cover what results at the same time from education and raw labor [Kendrick calls human capital the union of these two, see p. 306].

A chapter of this World Bank study (pp. 77–93) is dedicated to social capital (Chapter 6, "Social capital: the missing link?"). The idea is that the three types of capital that are traditionally analyzed (natural, produced, human) "determine only partially the process of economic growth because they overlook the way in which the economic actors interact and organize themselves to generate growth and development. The missing link is social capital" (p. 77). [The study attributes to J. Coleman the introduction of these terms into the sociological literature in 1988; Pierre Bourdieu however used it before, though in a more specific meaning, to designate the network of social relations of individuals and families.] Since 1996, the World Bank has organized reflections on this topic (pp. 90–91). See also, *The Well-being of Nations: the Role of Human and Social Capital* (OECD, 2001) and the report by Bernard Perret on social indicators (2002, pp. 16–17 and 23–25).

It is possible to bring together the concept of social capital thus defined and the observation by the analysts of productivity that, beyond the change in the volume of production factors (labor and capital in the general sense of equipment goods) and assuming that they are correctly measured, the change in multifactor productivity registers the effects of disembodied technical change and spill-over effects, i.e. of explanatory elements of growth which are not investment (see Box 56).

Recently, in common parlance, French media often use the term "richesse" [wealth] to indicate a flow and not only a stock. For instance, they speak of wealth per capita to mean GDP per capita. This trivial use of the term is a source of confusion and should be avoided.

production, commercialization and consumption processes themselves evolve rapidly.

For traditional reasons (the non-economically representative character of the aggregation of values at historical cost and consequently of the calculation of depreciation, changes in inventories and net surplus) and due to the difficulty of estimating and recording new types of investment and assets whose importance is increasing, the net assets of business accounting (total assets less total liabilities) are far from correctly reflecting the magnitude and evolution of the value of businesses.

As compared to business accounting, national accounting is closer to an economic estimate of the value of fixed assets. However, the limited extent of those which are accounted for, compared to those that are potentially countable (R&D assets, in particular), and the obstacle that represents the existence of assets that are probably non-observable, except when global transactions on firms occur ("goodwill" in the most general sense), all this combined with a tendency towards the acceleration of technical and economic obsolescence, lead to a situation in which national accounting is unable to provide an estimate of the net change in the stock of capital, which could actually correspond to the global base for production and consumption in the future. As is the case for business accounting with respect to the "true" value of a firm, for national accounting it is difficult to estimate the "true" value of a national economy. The market does not reveal it entirely. Looked at by type, assets, once installed, are scarcely the object of second-hand transactions. As going concerns, only part of the corporations' shares is negotiated on financial markets; their quotations, when they exist, are generally considered to insufficiently represent, at a given time, the true "objective" value of firms, if such a concept does have a true meaning. However, this is the value that most directly corresponds to the idea of expectation of future economic perspectives, but it is generally influenced by relatively short-term considerations.

Impossibility to rigorously measure capital ...

Economic theory, as it is not submitted to the hard constraints of the feasibility of observation, can more easily try to establish close connections between the past – it bequeaths a stock of accumulated assets which can be supposed exhaustive –, the present – the time of action and decisions –, and the future – capital formation is forward looking, and investors' valuation of assets in relation to what they expect. It is from this point of view an inspiring reference for statisticians and national accountants who muddle around.

The theory of capital, when defining its value by its discounted expected benefits, moves, nevertheless, in a kind of permanent present. It can project trends, take risk into account in the form of probability distributions, but not the essential uncertainty of the future. The guidance it can provide to practitioners of *ex-post* observation is limited. Though rather widely accepted for new investment, even if one can discuss it in imperfect markets with partial expectations, it does not have any complete practical correspondence to observable facts in the absence of generalized markets for existing assets. When trying to apply it directly, for lack of any alternative, to estimate the value of the oil deposits for instance, it is possible to obtain series of results that can strongly diverge according to the assumptions that have been selected (see Box 61).

Of course, one is very far from being able to estimate the stock of capital as, in theory (Fisher, Samuelson – see the appendix of the present chapter), the present value of all future consumption possibilities.

... as well as to rigorously measure income

From the impossibility of a rigorous measure of capital and its changes, follows the impossibility of a rigorous measure of income. Hicks' definition, as the maximum that someone can consume during a period while expecting to be as well-off at the end as one was at the beginning, gave rise to many interpretations (see the appendix of the present chapter). The formulation is close to the careful rule of wealth management of a good father ("not to consume one's capital"), but it is more difficult to apply to a national economy as a whole. Attempts of interpretation of Hicks' definition, in terms of long-run sustainability, have only increased the difficulties. They stress the possibilities of long-term consumption, within a framework extending the concept of capital to non-market natural assets, and moreover, a wish to take into consideration the needs, if not of intragenerational equity, at least of intergenerational one.

Views of social philosophy and ethics are in contrast; they diverge, in particular on the issues of substitutability between produced capital and natural capital, in particular for the fraction of the latter denominated "critical natural capital", on the frontier of monetisation and on the respective roles of economy and politics.

On the technical level, the limits, which seem insuperable for compiling an aggregate in monetary value that would respect long-term sustainability criteria, primarily result, from scientific characteristics and uncertainties concerning global environmental phenomena, and from the uncertainty of the evolution of technical progress. On this last point, it is interesting to notice that when Weitzman introduces technical progress (1997) into his former model (1976), he concludes that it is likely to lead to a sustainable NDP appreciably higher than the one resulting from the interpretation of Hicks' definition in terms of a stationary state (see the appendix to the present chapter).

Tensions between what theoretical analysts explore and what statisticians and national accounts compilers try to measure in real economies can also be illustrated in connection with the concept of human capital. Easily introduced in theoretical economic models, it resists its introduction into the framework of the integrated conceptual model of actual national accounting. The latter, as is the case of business accounting, only defines and measures non-human capital. When, on a complementary basis ("satellite"), it seeks, too rarely, to provide a monetary estimate of the stock of human capital (Kendrick especially), it proceeds in terms of the summation of costs incurred in its formation. This approach and that of the theory of capital (present value of expected income) could not be reconciled (see section 1 of this chapter) by understanding human capital in a global sense (physical and intangible), whereas the theory of education addresses it in terms of the relationship between additional expenditures on education and expected differential incomes.

Basically, the uneasiness of the statistician, as observer of the present, is due to the ambiguous status of the theoretical definition of the value of a capital as the present value of the future benefits that are expected from it. The interest of this concept for economic analysis is hardly debatable. However, to avoid depending closely on *a priori* assumptions, it would be necessary to be able to compile again, afterwards, the value which would have been assigned to an asset if one had actually known, at the time of its acquisition, the future actual economic history (see a small illustration of this idea in Box 57). From these discrepancies between the expected values and those that experience reveals derive the difficult problems of capital gains and losses. The value of an asset would then be calculated *ex post* as the present value of the benefits that would have been actually derived from it. Measures carried out by observers would thus rest on the future ... once it has changed into past. But future becomes past only by passing through ... the present. This could appear a simple play on words, if one did not have in mind that certain analysts or even some national accountants sometimes give the impression of forgetting that what one seeks by anticipating the future are series of successive presents and that without present there is no future.

The volume–price factoring of investment and capital stocks (see chapter 9), so crucial for measures of growth and productivity, illustrates the problems and the difficulties that result from this intermingling among past, present and future.

Annotated bibliography

The May 1948 issue of *L'actualité économique et financière à l'étranger* [Current Economic and Financial Events Abroad], entitled "La Fortune Nationale" (The National Fortune) contains an invaluable series of articles on the concepts of wealth and national capital and their practical applications (with an introductory note by François Perroux on "Les comptes de la nation et le capital national" [National Accounts and National Capital], pp. viii–xxiv). The paper by W. Winkler, "La fortune nationale" [The national fortune], pp. 209–226 (with abundant bibliography), taken from *Handwörterbuch der Staatswissenschaften*, 1928, presents a list of the estimates of the national fortune at different times before World War I, for the German Empire (p. 213), Austria–Hungary (p. 215), Great Britain (*ibid.*), France (p. 218), Italy (*ibid.*) and the USA (p. 220). The comparative table by Mulhall is on p. 221, that by Stamp on p. 222, and those by Gini on p. 223. The reference to Kuznets is in this volume, p. 72 "L'évaluation de la fortune nationale" ("The evaluation of national wealth"), translated from *Studies in Income and Wealth*, Vol. II, NBER, 1938).

Papers submitted to the 1957 IARIW Conference are to be found in Raymond Goldsmith and Christopher Saunders (eds.), *The Measurement of National Wealth*, *Income and Wealth* Series VIII (Bowes and Bowes, 1959). Synoptic tables prepared by Th.D. van der Weide synthesize, for 18 countries, estimates by type of assets and valuation methods (pp. 7–32, sources pp. 33–34). On the experience of the Netherlands at that time, see "The preparation of a national balance sheet: experience in the Netherlands" (pp. 119–146). It is one of the few papers of this collection issued from a central statistics office. A general paper by Tibor Barna deals with "Alternative methods of measuring capital" (pp. 35–59). It clearly distinguishes financial capital, representing ownership rights on the value of assets, and capital as a factor of production in the sense of the economic theory (p. 35). The estimate of 1954 for France is in Volume 3, *Fortune de la France* [France's Wealth] with the collaboration of Gaston Matthys, Divisia, Dupin, Roy. *A la recherche du franc perdu* (In Search of the Lost Franc) (Société d'édition de revues et de publications, 1957, p. 40) presents a discussion of the issue of military assets; estimate of the material damages caused by the two World Wars, p. 61; comparison pp. 57ff, with Clement Colson's estimate for 1913. The latter carried out estimates for 1900, 1913 and 1925 (*Cours d'économie politique*, Livre III, 1927).

Great American works at the beginning of the 1960s: Raymond Goldsmith, *The National Wealth of the United States in the Postwar Period* (NBER/Princeton

University Press, 1962); Raymond Goldsmith and Robert E. Lipsey (and Morris Mendelson for Vol. II), *Studies in the National Balance Sheet of the United States*, 2 volumes (NBER/Princeton University Press, 1963); *Measuring the Nation's Wealth*, Vol. 29 of *Studies in Income and Wealth* (NBER/Columbia University Press, 1964) is a report of the Wealth Inventory Planning Study, directed by John W. Kendrick (with, in particular, David J. Hyams and Joel Popkin) and presented to the Joint Economic Committee of the Congress of the USA. It represents a far-reaching exploration of the problems and methods for compiling complete wealth accounts. Among the numerous annexes: "Historical censuses and estimates of wealth in the United States" (pp. 177–218) and "Wealth surveys in Japan" (pp. 277–290).

The book by Jack Revell is titled *The Wealth of the Nation. The National Balance Sheet of the United Kingdom, 1957–1961* (Cambridge University Press, 1967); short historical background pp. 3–4, and, in particular, the reference to E.V. Morgan, *The Structure of Property Ownership in Great Britain*, 1960.

On human capital, the short historical background of the text is based on Kendrick (p. 2) and especially on Antonio Mastrodonato, *I Capitali umani* [Human Capital] (CDAM, Padova, 1991). § 1.3 (pp. 9–14) lists "scientific estimates of the money value of a man, from William Petty to today" (in Italian). It includes a very extensive bibliography.

From economists of education: T.W. Schultz, "Investment in human capital" (*The American Economic Review*, March 1961, pp. 1–17); Gary S. Becker, *Human Capital. A Theoretical and Empirical Analysis with Special Reference to Education* (NBER/Columbia University Press, 1964); Mary Jean Bowman, "Principles in the valuation of human capital" (*The Review of Income and Wealth*, September 1968, pp. 217–246; § III is dedicated to the estimate of gains and losses of human capital due to migrations; on this topic, see Mastrodonato's Chapter 4, pp. 131–193).

John W. Kendrick's book *The Formation and Stocks of Total Capital* (NBER/Columbia University Press, 1976). John W. Graham and Roy H. Webb, "Stocks and depreciation of human capital: new evidence from a present-value perspective" (*The Review of Income and Wealth*, June 1979, pp. 209–224), compare their results with Kendrick's. The present value of future earnings method is also used by Sofia Ahlroth, Anders Björklund, and Anders Forslund, "The output of the Swedish education sector" (*The Review of Income and Wealth*, March 1997, pp. 89–104).

The discussion during the preparation of the 1993 SNA, on intangible investment, in particular R&D and the possibility of investing in, or even storing services, is summarized (pp. 10–12) in "La révision du système de comptabilité nationale des Nations Unies" [The revision of the United Nations system of national accounts] by André Vanoli (supplement to *Courrier des statistiques*, no. 58–59, October 1991) completed for the *Conseil national de l'information statistique* [National Council for Statistical Information] (CNIS) in November 1993. Pierre Muller in an INSEE internal note illustrates the French open-minded attitude: "L'élargissement du concept de FBCF et ses conséquences pour les comptes nationaux" [Broadening the concept of GFCF and its effects on national accounts) (March 1990).

The report of the American expert group that has been quoted regarding the treatment of military equipment is *Measuring the Government Sector of the US Economic Accounts*, edited by Courtenay M. Slater and Martin M. David (National Academy Press, Washington, 1998). BEA's treatment is described in "Preview of the comprehensive revision of the national income and product accounts: recognition of government investment and incorporation of a new methodology for calculating depreciation" (*Survey of Current Business*, September 1995, pp. 33–41, see p. 36).

On the beginnings of balance sheets accounts at INSEE, see the work by Annie Fouquet, Alain Benedetti, Georges Consolo *et alii*, *Les comptes de patrimoine. Une première expérience. 1971–1972–1976* [Balance Sheets. A First Experience, 1970–1971–1976] (Les collections de l'INSEE, C89–90, 1980; bibliography covering in particular the 1960s and 1970s). It starts with "Quelques réflexions sur la notion de patrimoine" [Some reflections on the concept of wealth] (pp. 7–20) by André Vanoli. The SECN (May 1976) introduced the balance sheets within its accounting framework (see chapter 7). A series 1970–1979 is published in March 1984 by INSEE and the Bank of France in *Dix ans de comptes de patrimoine 1970–1979* [Ten years of Balance Sheets 1970–1979] (Les collections de l'INSEE, series C, no. 116).

Within the international recommendations, see: the 1968 SNA, *pro memoria* (§§ 2.83–2.92); "Provisional international guidelines on the national and sectoral balance-sheet and reconciliation accounts of the system of national accounts" (*Statistical Papers*, Series M, no. 60. UN, 1977); the 1993 SNA (in particular Chapter 12 on the "other changes in volume of assets" account and the revaluation account, Chapter 13 on balance sheets); the 1995 ESA (in particular Chapter 6, "Other flows" and Chapter 7, "Balance sheets").

On the topic of maintaining the capital intact, Pigou's Chapter 4 (1932) was translated in the issue of the AEFE, *La Fortune Nationale*, which was referred to at the beginning of this bibliography ("What is meant by maintaining capital intact", pp. 91–93). In the same issue, translations of articles by F.A. Von Hayek "The maintenance of capital" (*Economica*, August 1935 – AEFE, pp. 95–113); "The maintenance of capital: an answer" (*Economica*, August 1941 – AEFE, pp. 115–117) and of J.R. Hicks "Maintaining capital intact: a further suggestion" (*Economica*, May 1942 – AEFE pp. 119–122). Stone (1945) discusses the problem (pp. 59–61). The paper by Hicks (1961) which is quoted is "The measurement of capital in relation to the measurement of other economic aggregates", in F.A. Lutz and D.C. Hague (eds.), *The Theory of Capital* (Macmillan, 1961) pp. 18–31). In the same book, a paper by Paul A. Samuelson can be found that is very critical on the concept of income and its measurability in a dynamic economy: "The Evaluation of 'social income': capital formation and wealth" (pp. 32–57).

The two handbooks published in 2001 by the OECD are essential references to understand the evolution of the methods and issues concerning CFC, the measurement of capital stocks and capital services, and the link between theoretical and practical approaches for measuring changes in productivity, similar to those of growth accounting. They are: *Measuring Capital: A Manual on the Measurement of Capital Stocks, Consumption of Fixed Capital and Capital Services* (OECD; Derek Blades was its principal drafter) and *OECD Manual on Productivity: A Guide to the Measurement of Industry-Level and Aggregate Productivity Growth* (drafted by Paul Schreyer).

An overall discussion of the relationships between production, income and capital is in Vanoli (2001) quoted in Box 54 and the appendix to the present chapter.

The comprehensive study by Jacques Mairesse, *L'évaluation du capital fixe productif. Méthodes et résultats* [The Evaluation of Productive Fixed Capital. Methods and Results] (Les collections de l'INSEE, series C, no. 18–19, November 1972) remains the reference for INSEE's works on the topic. On its application to the accounts of the 1995 benchmark year, see "Les comptes du patrimoine et de variations de patrimoine en base 1995" [Balance sheets and changes of balance sheets accounts in the 1995 benchmark year series] by Gwennaëlle Brilhault (Insee, *Méthodes*, No. 106, February 2004).

Taking inflation into account in national accounts, in particular in connection with interest, has given rise to a rather abundant literature. At the beginning of the 1980s, Jack Hibbert prepared a report for the OECD and Eurostat, *Measuring the Effects of Inflation on Income, Saving and Wealth* (OECD, 1983) [the conclusions recommend establishing sectoral balance sheets and calculating gains and losses of the purchasing power of assets and liabilities; the difficulties in recording real interest in flow accounts are underlined, §§ 2.11–2.12, the idea to take into account capital gains and losses in the definition of income is discussed and rejected, §§ 2.13–2.16; a statistical annex presents balance sheets for 1970 to 1979 in six countries at current value, at purchasing power of the current year and at purchasing power of year 1975].

In the last period, *Inflation Accounting. A Manual on National Accounting Under Conditions of High Inflation* (OECD, 1996), by Peter Hill, follows solutions different from those of the 1993 SNA, Chapter XIX annex B. These two series of proposals are discussed by André Vanoli: "Interest and inflation accounting" (*The Review of Income and Wealth*, September 1999, pp. 279–302) [very critical with respect to *Inflation Accounting*].

On the overall issue, see Michel Séruzier. "Compilation of national accounts in high inflation countries" (*The Review of Income and Wealth*, March 1989, pp. 81–100).

The 1998 Danish proposal is presented in Esben Dalgaard, Christoffer Eff, Annette Thomsen, "Reinvested earnings in the national accounts" (*The Review of Income and Wealth*, December 2000, pp. 401–419).

For references to Haberler and Hagen, see chapter 6, p. 271, to Eisner, see chapter 7, p. 300, to Kuznets (1933, 1949), see chapter 6, p. 271, and chapter 7, p. 299, to Stone 1945, see chapter 1, p. 32.

The literature on environmental accounting became overwhelming in the last decades of the century. The collective book published by Kimio Uno and Peter Bartelmus, *Environmental Accounting in Theory and Practice* (Kluwer, 1998) adds almost twenty articles to an alphabetical list of approximately 400 references. This volume and two collections of articles published by the World Bank make it possible to cover the principal aspects of the question. The first of these collections [Yusuf J. Ahmad, Salah El Serafy, Ernst Lutz (eds.), *Environmental Accounting for Sustainable Development*, The World Bank, 1989] includes in particular articles by El Serafy "The proper calculation of income from depletable natural resources", pp. 10–18, and by Anne Harrison "Introducing natural capital into the SNA", pp. 19–25, which this text refers to. The second, [Ernst Lutz (ed.), *Toward Improved Accounting for the Environment*, The World Bank, 1993] contains in particular an article by John Hartwick and Anja Hageman, "Economic depreciation of mineral stocks and the contribution of El Serafy" (pp. 211–235).

The other papers on the treatment of the extraction of subsoil resources, to which reference has been made, are in *Proceedings and Papers* of the London Group on Environmental Accounting (secretariat held by Statistics Canada), volumes of 1994 and 1995 for those of Peter Hill and Anne Harrison and volume of 1998 for that of André Vanoli, taken from an unpublished paper of 1997. A personal synopsis of the debate, less summarized than in chapter 8, is found in § 2, Les actifs naturels marchands épuisables [Nonrenewable market natural assets] by André Vanoli, "Relations Production, Revenu, Capital: Notes sur quelques approfondissements en cours" [Relationship between Production, Income and Capital. Notes on ongoing reflections], in E. Archambault and M. Boëda (eds.), *Comptabilité Nationale. Nouveau système et patrimoine* [National Accounting: New System and Balance Sheets] (*Economica*, 2001, pp. 51–73). By Robert Repetto (associated with William McGrath, Michael Wells, Christine Beer, Fabrizio Rossini), see *Wasting Assets: Natural Resources in the National Income Accounts*. (World Resources Institute, 1989).

The publication *Les comptes du patrimoine naturel* [Natural Patrimony Accounts] (Les collections de l'INSEE, C 137–138, December 1986), presents the result of works of the *Commission interministérielle du patrimoine naturel* [Interministerial Commission on Natural Patrimony Accounts]. The basic ideas and the general methodology are described in Chapter 1, "Le patrimoine naturel" [Natural patrimony], pp. 35–64, and Chapter 2, "Le système de comptes du patrimoine naturel" [The system of natural patrimony accounts], pp. 65–126, drafted by Jean-Louis Weber who coordinated this research.

The UN published a provisional handbook in 1993: *Integrated Environmental and Economic Accounting*. For critical views see, for instance, A. Aaheim and K. Nyborg, "On the interpretation and applicability of a 'Green National Product'" (*The Review of Income and Wealth*, March 1995, pp. 57–71), and André

Vanoli, "Reflections on environmental accounting issues" (*The Review of Income and Wealth*, June 1995, pp. 113–137), "Modeling and accounting work in national and environmental accounts", in Kimio Uno and Peter Bartelmus (*op. cit.*, pp. 355–373). The orientations suggested for France (*Conseil Scientifique de l'Institut Français de l'Environnement* [Scientific Board of the French Institute for the Environment], *Comptes Economiques de l'environnement* [Economic accounts for the Environment], Report of the working group chaired by André Vanoli and led by Jacques Theys, December 1996) are very doubtful regarding the research of integrated monetary aggregates and the proposals of the SEEA (see in particular Chapter V, "Aggrégation, Intégration, Indicateurs" [Aggregation, Integration, Indicators], pp. 137–163). One can also read with interest the often differing proposals included in the report of the *Panel on Integrated Environmental and Economic Accounting* of the National Research Council of the USA, William D. Nordhaus and Edward C. Kokkelenberg (eds.), *Nature's Numbers, Expanding the National Economic Accounts to Include the Environment* (National Academy Press, 1999). Much more favorable to a global monetary approach, the report is based in particular on the paper by Martin L. Weitzman, "On the welfare significance of national product in a dynamic economy" (*Quarterly Journal of Economics*, vol. 90, 1976, pp. 156–162).

The main text of section 3 of the present chapter and several boxes refer to the very interesting, though sometimes daring, essay by the World Bank: *Expanding the Measure of Wealth. Indicators of Environmentally Sustainable Development* (1997) [references at the end of each chapter]. See also Kirk Hamilton and Michael Clemens, "Genuine savings rates in developing countries" (*The World Bank Economic Review*, vol. 13, no. 2, 1999, pp. 333–356).

A series of booklets published by the Cambridge Research for the Environment (CRE), Series Editors: Clive L. Spash and Claudia Carter, in the framework of a concerted action funded by the European Commission, "Environmental Valuation in Europe", *Policy Research Brief*, (nos. 1–11), present in a simple and synthetic way the conclusions of the research undertaken. See in particular *Natural Capital* (no. 3), by Martin O'Connor, and *Greening National Accounts* (no. 9), by Martin O'Connor, Anton Steurer and Marialuisa Tamborra.

The report on the "Green stamp" project is in R. Brouwer and M. O'Connor (eds.), *Final Project Report: Methodological Problems in the Calculation of Environmentally Adjusted National Income Figures*, C3ED Research report (Université de Versailles-Saint Quentin en Yvelines, July 1997). There is also a Summary Report (same references). On the two approaches mentioned in the text, see Martin O'Connor, *Towards a Typology of "Environmentally Adjusted" National Sustainability Indicators: Key Concepts and their Policy Applications*, C3ED Research report (December 2000); selected references pp. 45–48.

By Rufie Hueting, see *New Scarcity and Economic Growth: More Welfare through Less Production* (North-Holland, 1980). Also, for a synthetic overview of his proposal for an adjustment of national income see: "Correcting national income for environmental losses: toward a practical solution for a theoretical dilemma", in R. Costanza (ed.), *Ecological Economics, The Science and Management of Sustainability* (Columbia University Press, 1991).

Problems of valuation in the field of the environment are treated in the book by Brigitte Desaigues and Patrick Point, *Economie du patrimoine naturel. La valorisation des bénéfices de protection de l'environnement* [Natural Patrimony Economics. The Valuation of the Benefits of Environmental Protection] (Economica, 1993) and in Chapter 6 of Sylvie Faucheux and Jean-François Noël's book *L'évaluation de l'environnement* [The Evaluation of the Environment], *Economie des ressources naturelles et de l'environnement* [Economics of Natural Resources and the Environment] (Armand Colin, 1995, pp. 211–236).

Appendix. Hicks' concept of income and national accounts: interpretation issues

The following abstract comes from a paper by André Vanoli "Comptabilité nationale et concepts de production, de revenu et de capital: une revue critique" [National accounting and concepts of production, income and capital: a critical review] (pp. 26–27, 35–40), in E. Archambault and M. Boëda (eds.), *Comptabilité nationale, Nouveau système et patrimoines* [National accounting. New System and Balance Sheets] (*Economica*, 2001, pp. 25–49).

"[. . . .] in the chapter titled "Income" of *Value and Capital* (1939), [Hicks] formulates a definition of income entirely future-oriented: "we ought to define a man's income as the maximum value which he can consume during a week, and still expect to be as well off at the end of the week as he was at the beginning" [p. 172], whereas the traditional expression "maintaining capital intact" seems rather past-oriented. This definition, which was to become famous, and caused a lot of ink to flow, uses the concepts of income, consumption and capital. The relationship between income and capital is privileged. The concept of production does not appear directly. [. . . .]

Return to Hicks' definition of income: exegeses

Paradoxically, the definition proposed by Hicks in 1939 and previously quoted became the theoretical definition of reference of most economists. Paradoxically, because it is formulated in a chapter that is a charge against the concept of income itself (or the associated concepts such as saving, depreciation or investment). Hicks first considers (p. 171) that these familiar concepts, used in the theoretical controversies of recent years, with differing definitions for income and saving, none of which is coherent or completely satisfactory, are not suitable tools for any analysis which aims at logical precision. And he finishes by concluding (p. 180) that calculations of individual income can have an important influence on individual economic conduct, and those of national income (he says *social income*) to be very important in social statistics and in welfare economics, whereas at the same time the concept of income can only be used by the positive theoretical economist at his own risk. For him, it is a very dangerous term, which should be avoided. In the meantime he presents several possible concepts of income *ex ante*, and as many of income *ex post* with formulations often cryptic enough for his reviewers to offer varying interpretations.

The essential difficulty is due to the intrinsic subtlety of Hicks' approach. He proposes a theoretical definition of individual income, based on a dynamic reinterpretation of the concept of maintaining capital intact, which implies taking expectations into account. A similar theoretical definition of national income is not possible, if only because of the basic incompatibility of individual expectations. But aggregates are statistically useful and macroeconomics will both use them and make them popular (the *General Theory* had been just published). Actually, the introduction to economics that Hicks will publish in 1942 (*The*

Social Framework) is based entirely on national accounting. Hicks regards it as a precondition to the study of economic theory, and there is no reference to the 1939 theoretical definition of income. *The Social Framework* is entirely presented from the point of view of *ex post* income, saving, etc. The definitions of *ex post* national income presented in *Value and Capital* aim at suggesting an empirical approach which, supposing consumption measurable, seeks to approximate, using various adjustments, a measurement of net capital formation, which would eliminate from the changes in wealth (capital, net worth) elements that a careful economic behavior would not regard as consumable. However, in so doing, a prudent empirical measure of national income is put forward, which though justified in practice, cannot be interpreted as an approximate measure of the theoretical definition itself. For Hicks ("The Valuation of the Social Income", 1940, p. 123) this definition is individual and remains "purely subjective, incapable of objective measurement". From what the individual *thinks* [emphasis by Hicks] he can consume, etc. ... one proceeds by taking some conventional rule, to what he *ought* [id.] to reckon as his income.

The subtlety of the approach was the cause of a number of complexities in the debates that followed, either because the *ex post* empirical measure was taken as a theoretical definition (from there, the word for word commentaries of the formulations used by Hicks), or because the theoretical definition itself was regarded as determining prescriptions to practitioners who were simply expected to approximate it in practice.

1. Samuelson, Scott, Usher

The theoretical definition though – once its transposition to the level of society has been accepted – is not easy to interpret within the context of a dynamic economy. Hicks' definition has been regarded as the basis of the definition of sustainable income. According to Samuelson, for example (1961, p. 45, note 1), Hicks in *Value and Capital* defines income as "the maximum level of consumption which can be permanently sustained". But it is not easy to give an actual content to the idea that income is the maximum amount that could be consumed if the whole income of the period were consumed without compromising the future. The definition seems to imply the concept of a potentially stationary state of the economy in which consumption would be constantly equal to what it was, and similarly for total income.

Scott (1990) explains it by saying that one must add to actual consumption the extra consumption, which would be made possible if resources devoted to (net) investment were transferred to consumption. It seems reasonable for him to suppose that a dollar's worth of investment thus transferred would provide a dollar's worth of consumption. Samuelson, who retained this assumption in a first very simplified theoretical model, evidently regarded as an arbitrary simplification the assumption of the infinite substitutability of consumption and capital formation along a production possibility curve with a –45° slope (p. 47). Usher, in a careful reflection on the measurement of real income (1976), went further than Scott by referring also to a stationary state in the solution that had his preference. He then defined income as "the amount of consumption that could be obtained in the stationary state that would arise if technical change, net investment and population growth ceased today" (p. 326). In the equation $Y = C + S$, he replaced S (saving) $= \Delta K$ by $S = \Delta J$, J being a stock of virtual capital having the property that its variation is numerically and dimensionally equivalent to the quantity of saving expressed in terms of a quantity of capital goods. He then finds (Usher, p. 327) a difficulty brought forward by Samuelson that a displacement of the curve of supply of new capital goods has as a consequence that an additional unit of the latter represents a different amount of consumption, which one gives up. Under these conditions, the income according to Hicks (1939) corresponds to a definition whose content is not observable statistically: "An economy that has historically been doing positive investment will not, in the absence of gigantic controlled social experiments, reveal what its full consumption potentialities are" (Samuelson, p. 46). Still in this 1961 text, Samuelson showed that one could not draw a conclusion on the relative incomes of two societies without taking into consideration the form of their production functions in the future, which made Hicks' 1939 definition vulnerable, associated as it was to an implicit concept of a stationary economy. It must be noted though that Samuelson did not especially blame Hicks for this definition, since the latter argued in fact *against* [emphasis is by Samuelson] the concept of income, but he considered that his formulation of income as "level of consumption flow permanently attainable" reflected the typical definition of his predecessors (Hayek and many others before him, on the topic of maintaining the capital intact).

On a theoretical basis, Samuelson is led to reject all *current income* [*italics* are Samuelson's] concepts and he ends up with something close to wealth, understood as (the formulation is assigned to Fisher[1] in imaginary remarks) the present discounted value of all future *consumption* [emphasis is by Samuelson] (and not that of future earnings) in a welfare-type approach (p. 51). But obviously, there are no ways of calculating that, due to the fact that there is so much "futurity" in any welfare evaluation of any dynamic situation. This is inherent in the nature of things: "An appraisal of an economy's situation does involve implicitly or explicitly an appraisal of its future prospects" (p. 53).

From these short notes extracted from complex analyses, one could, it seems, draw the conclusion that it is impossible to give a rigorous theoretical content to Hicks' so often quoted definition, unless, but then it is useless, the economy is in a stationary state, and not in a potentially stationary one. There would then be nothing such as an ideal concept and measure of income that practitioners should attempt to approximate, a conclusion, which, it is hardly necessary to say, is not shared by everyone.

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[1] Let us recall that Fisher's definition of income (1906) as the services of capital has been interpreted as restricting income to consumption and excluding everything else.

2. Eisner, Sunga, van Bochove and van Sorge, and some others

From these considerations or others, economists and national accountants have sought to propose (or at least to examine) interpretations of the concept of *ex post* income, which would take or not take into account *ex ante* considerations, using directly or not using Hicks' formulation. As the principal idea was in general to examine the concept of income in national accounting and its possible modification, reflections dealt primarily with the elements of the change in net worth excluded from income, i.e. especially capital gains/losses, capital transfers possibly intervening marginally.

A first series of analyses introduces into income all capital gains/losses. Income is then equal to the sum of consumption and change in wealth:

$$Y = C + \Delta W.$$

This definition, worked out by income tax analysts, is known under the names of Haig (1921) and Simons (1938). Though applicable to the income of individuals, Simons considers (see Usher, 1976, p. 313, note 6) that it is not applicable to national accounts. Eisner (1988) applies it at this level, and for this definition associates Haig and Simons with Hicks (p. 1624). He calculates the real capital gains accruing on physical assets, and refers to works by Ruggles and Ruggles and Jorgenson and Fraumeni, who also include revaluations as sources of changes in wealth (p. 1622). Sunga, in a study on the changes in wealth due to price changes (1987), defines a concept of "comprehensive income" that he attributes to Hicks, though he notes (p. 98) that it is necessary to make sure that this interpretation is fully coherent with Hicks' concept.

None of these authors apparently envisages including in the calculation of income the effect of the destruction of capital due to non-economic phenomena. By contrast, van Bochove and van Sorge (1989) define, within the specific framework of accounting for war damages in the Netherlands, a national income at constant wealth, by withdrawing the value of destruction due to war from the income derived from national accounts. Following and broadening Sunga's reflection, they also attribute this concept of income to Hicks. Milot, Teillet and Vanoli's position (1989) is ambiguous. They envision an extraordinary income that would take into account all the elements of the change in net worth not attributable to saving or to capital transfers and qualify the sum of the SNA income and this extraordinary income as "quasi-hicksian income". But they do it within the context of an illustrative accounting development of possible income variants, not in connection with a reflection on the concept of income itself.

3. Usher again, Weitzman

Usher also associates Hicks and the $Y = C + \Delta W$ equation. It is interesting to note, to illustrate a certain complexity of these concepts, that he links this equation to the definition of income as the maximum sustainable consumption

(p. 313). He wonders however whether this equation reflects actually what Hicks had in mind, and if he did not think rather of the definition, which he himself (Usher) prefers in terms of a stationary state. In Usher's view, the difference between the two concepts lies in the use of a different sequence of production functions (actual for $Y = C + \Delta W$, potential for $Y = C + S$, with S representing the change in the stock of a virtual capital without any technical progress). It has been seen above that Scott understood Hicks in terms of a stationary state but that it is through that notion that he linked, as did Samuelson, the concept of income as the maximum sustainable consumption. Confusion may seem total when recording that Samuelson rejected this concept of income, like all the others, in favor of a concept of wealth understood as the present value of all future consumption, whereas Usher also rejects it, but because he precisely interprets it like defining income in function "[...] of the whole time stream of consumption from now to the end of the world" (p. 314). However Usher's reasoning that "[...] income reflects what is happening today rather than what will arrive tomorrow" (p. 315) is quite unwise. In a later text (1994), he admits that "[...] investment is necessarily forward-looking" (p. 124).

It happens that, in the same year when Usher published his 1976 paper, Weitzman had again taken up the problem where Samuelson had left it in 1961 and had attempted to demonstrate that, under certain conditions, the net national product of a period, sum of consumption and net investment, represented indeed the maximum level of consumption which could be sustained permanently even if this level could not be reached at the present time. Weitzman thus avoided the problem, over which a number of commentators stumbled and will continue to stumble, that is the impossibility of admitting the transformation at a one-to-one average rate of today's investment into today's consumption. He demonstrated that net national product is "what might be called the *stationary equivalent* of future consumption" (p. 160). His analytical framework is obviously very restrictive: the economy moves along a competitive path, the representative consumer maximizes his inter-temporal utility, the capital market is competitive with perfect expectations, and the concept of capital is generalized, so that all sources of economic growth are supposed to be identified and allocated to some forms of capital (p. 157).

If it is interpreted by saying that investment (net capital formation) does not let anything escape from what is the source of future consumption, one sees that the question of knowing whether it is necessary or not to include certain real capital gains (apart from the effect of non-economic phenomena) in the measure of capital formation and thus of income is supposed in this model to be solved or rather the case does not arise. But in practice it remains open.

4. Malinvaud, Scott, Harrison, Hill

Many analysts think that a correct measure of income should include certain capital gains. Malinvaud (1987) however shows the complexity of the enterprise. His interpretation of Hicks is that the revaluations of the stock of capital belong to income as long as they are expected, but are excluded if not. But the distinction, though essential in economic analysis, is more often not so clear. In relationship to the study of consumption behaviors, the problem seems rather that of the distinction between gains that are purely transitory and those that present a certain degree of permanence. Regarding Scott, he brings together the idea of sustainability according to Hicks and that of permanent income according to Friedman (1957), but he is very reluctant to include capital gains in income. The concept of permanent income implies a certain smoothing of income that, by no means, corresponds to the income as measured by national accounting which can strongly fluctuate, for example in agricultural economies (Eisner notes this point in his response to Scott, 1990). Harrison (1999) seems willing to only exclude capital gains/losses due to exceptional events (catastrophes, etc., i.e. essentially what the 1993 SNA records as "other changes in volume of assets"), and to include real holding gains or losses. Hill (1996, p. 83) supports the idea that income according to the SNA correctly tends to measure the ideal theoretical income according to Hicks. He then interprets the other changes in volume of assets and the holding gains/losses as *windfalls* (unexpected gains or losses) in the sense of Hicks."

An additional note

In an article (1997) much later than his 1976 paper, Martin L. Weitzman in collaboration with Karl-Gustaf Löfgren, revisits the question of the interpretation of net domestic product in terms of welfare and sustainability. The very restrictive assumption of absence of technical progress is no longer retained. The authors conclude (p. 149): "Because it omits the role of technical progress, net national product, whether conventionally measured or "green-inclusive", seems to understate an economy's sustainability which, at least as of now, probably depends more critically on future projections of technical change than on the typical corrections undertaken in the name of green accounting".

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Chapter 9

Value, Volume and Prices

Contents

During the long period in which efforts are primarily dedicated to the estimation of national income, the latter is only established at current prices. King’s experience in the old days (see chapter 1, p. 4) remains a short-lived one. Moreover, works on the topic are almost always isolated ones. In the first decades of the 20th century, the compilation of series begins to develop and, with it, the concern for escaping from nominal value changes due to changes in prices. In the 1930s however, the focus is only on the calculation of “real” national income (on the variants in the meaning of the term “real”, see Box 71) by deflating its total current value by a general price index, in most cases, in fact, a cost of living index. Attempts are also made to apply such a general index to all the entries in the accounts. The idea is then to eliminate the influence of the changes in the global purchasing power of the currency, not to measure what later will be called changes in the “volume” of the various flows of goods and services. Some exceptions should be mentioned, however, which focus on the evaluation of physical output using the prices of a base year. Such is the case of the estimates by Matolcsy and Varga for Hungary (series from 1924/25 to 1937/38 at the average prices of the first three years) and those for the Soviet Union, which will fossilize in a rigid method (1926–27 prices are used until the 1950s).

The shift of focus in the post-war period towards expenditure and product led, after some initial attempts (USA 1942, but especially Kampmann in Denmark), to a fundamental change of approach. The objective is to measure each flow at constant prices by taking into account the change in its specific prices as compared to those prevailing in a reference period. It is a complete shift because, from now on, the price index of the more general aggregate (GDP or GNP) will be derived by comparing the total of its components at current and constant prices (method introduced by Geary). From this derives the frequent label of "implicit deflator" of GDP or GNP.

1. Goods and services accounts at constant prices

1.1. Towards an integrated system

The experiences at the beginning are so limited and the price statistics so incomplete that the first international Standardised System (1952/53) does not include any recommendation concerning accounts at constant prices. However, concerns about reconstruction and economic growth in a context of high inflation lead producers and users to be more interested, in the case of output and its uses, in the measurement of changes in volume rather than at current prices. As early as 1956, Stone prepares for the OEEC a study that complements the Standardised System (*Quantity and Price Indexes in National Accounts*).

Two principal approaches will be followed. Most countries, all of them at the beginning, will separately deflate the main types of supply and use of goods and services, either restricting this procedure to the components of national expenditure (final consumption, fixed capital formation, etc.), or covering also value added by industry. In both cases, and this is true both at current and at constant prices, the study of each type of expenditure or of value added is carried out at a specific level of detail. Supply and uses are only globally balanced, and a statistical discrepancy is possibly recorded (see chapter 5).

Some countries (Denmark, France, Norway, the Netherlands) choose a different direction very soon, and decide to build annual input–output tables. The purpose is to structure an integrated analysis of the changes in volume and price both for supply and use balances and for output and intermediate consumption of industries, either by simultaneously compiling input–output tables at current and constant prices (France for example, and later the Netherlands), or – a more usual method – by deflating an input–output table previously compiled at current prices (Denmark for example, later Canada).

International recommendations regarding accounts at constant prices will soon be organized around the idea of an integrated system. Touched upon by Stone in 1956, it is developed in one of the chapters (Chapter IV) that constitute the conceptual backbone of the 1968 SNA. Stone systematically uses the term "quantity", a term which is traditionally used by index numbers specialists, but the French translation of the SNA 1968 replaces this term by "volume", since measures at constant prices take into account changes both in the quantity and quality of products, as well as structural effects, such as those due to the type of use, for instance. In addition to the French practice, this terminology reflects the experiences gained in the field of input–output analysis and associated measures at constant prices within the framework of the SOEC (later Eurostat). More directly than the SNA 1968, the SOEC publishes recommendations on this issue in *A System of Integrated Price and Volume Measures* (1972) prepared by Hill. The UN follows the same direction in *A Manual on National Accounts at Constant Prices* (1979), written by the same author. The concept of an integrated system becomes, thus, the general conceptual reference, even for countries that do not actually compile annual input–output tables. Value added in volume is obtained by double deflation, i.e. by difference, for each industry, between its output and its intermediate consumption at constant prices, a method which is sometimes also followed within the less rigorous framework of the first approach described above (on double deflation, see section 4 of the present chapter).

This integrated system is designed to be used, at the same time, as a guiding support for a coherent development of economic statistics on volumes and prices – it is a tool for statistical coordination – and as a framework for the production of a whole set of results, which because of their conceptual and practical coherence, is applicable to a great variety of uses. For many years, its implementation, developed or not in the framework of an actual input–output table, seems necessarily to require being based on the calculation of Laspeyres fixed-base volume indices, associated to Paasche price indices.

1.2. From fixed-base indices to chain indices (see appendix, "Reviewing indices")

The method, traditional in French national accounting, – its implementation dates back to the end of the 1950s (see chapter 2) – of compiling accounts at previous-year prices, is still seen as an oddity during the discussions that lead to the 1968 SNA. French national accounting itself derives an invaluable, but incomplete, advantage from it. Each annual link draws benefits from a permanent update of weights and thus takes into account, with this frequency, the effect of the changes in the relative prices of all products. (Since 1971, the method of annual reweighting used by INSEE in the calculation of the consumer price index is based on this model.) Indices concerning the annual links are then chained, but only as an intermediate calculation at the most detailed level of the goods and services accounts. An adjustment is then generated in order to restore to this level balanced supply and use accounts at fixed base-year prices. Less detailed levels are then obtained by successive aggregations and are, therefore, also balanced, as they integrate by construction the adjustments carried out at the more detailed levels. Under these conditions, no chain index is calculated for the series of GDP or its components, or their sub-aggregates. This leads to traditional Laspeyres fixed-base volume indices, under the assumption of homogeneity of price changes for products within the same position at the finest level of the classification being used in the worksheets.

The additivity constraint (the total value of resources and that of uses are equal at all levels, at constant prices and at current prices) is given preference everywhere. It is convenient for users, in particular for modeling, and facilitates the communication among accounts compilers. Admittedly, statisticians know that this additivity is, except in very particular cases, a fiction, since, in another period's price system, the quantities of a given year would have been somewhat different, in response to the differences in relative prices. Accounts at constant prices result thus partly from observations, partly from modeling, which most likely will not provide a unique set of results. All the inconveniences that theory indicates regarding fixed-base volume indices are to be found in national accounts.

For a long time, the answer is to say that the reference period should be frequently changed, in response to significant distortions of relative prices. The UN (1979) recommends changing it every ten years, the SOEC (1972) every five years, and at the same time, the latter advocates for the harmonization of the reference year among countries. Although the comparison of fixed-base indices and chain indices results in general in favor of the latter, the loss of additivity that they involve and the need for annual reweighting explain that recommending the latter was still rejected during the discussion of the issue in November 1986, at the beginning of the preparation of the future 1993 SNA. Nevertheless, finally the 1993 SNA, as well as the 1995 ESA, reverses its position and recommends favoring year to year measures using Fisher volume and price indices (the geometric mean of the corresponding Laspeyres and Paasche indices) or, as an acceptable alternative, Laspeyres volume indices and Paasche price indices. Longer evolutions are obtained by linking annual indices at all levels (1993 SNA, Chapter XVI, §§ 16.31–16.59, chain indices; §§ 16.60–16.77, chain indices for value added and GDP; 1995 ESA, Chapter 10, §§ 10.61–10.67).

This change of position, facilitated by developments in the theory of indices (see the appendix, "Reviewing indices"), is due in particular to a strong pressure from the Netherlands and Norway who had just introduced accounts at previous-year prices into their procedures, in the case of the latter country, in particular, in order to solve the problems resulting from large changes of oil prices in a system of fixed-base prices. On the other hand, in 1985, the US compilers changed their method of calculation of changes in the prices of computers, with such great consequences as compared to the former evolutions that a change, even quinquennial, in the reference year, did not seem any longer to be an adequate response.

An outstanding innovation is thus introduced towards the end of the century with chain indices, designed to identically measure year to year changes in volume and price both in short-term and in long-term series. The most significant indices are thus preferred and no longer the values "at constant prices".

Chain volume indices can be used to extrapolate any given year's values, without rebalancing, and a discrepancy then appears between supply and use. The resulting series use the general price level of the chosen year, but not its system of relative prices. They are neither "at prices of" nor "in francs (or dollars) of the year in question". It is only a matter of simple convenience of visualization. From this point of view a learning period initiates. Even the terminology concerning these series vacillates, the USA chooses to say: "chained (1992, for instance) dollar estimates", or more completely: "chained-dollar series indexed to the current dollars of whatever base period is appropriate for the analysis" (*Survey of Current Business*, March 1998, pp. 38–39). The INSEE uses "séries aux prix de l'année précédente, chaînés, base 1995" [series at previous year's prices, chained, base 1995].

The difference in terminology partly reflects a difference in methodology. The Americans, who in their series only globally balance GDP and its components (except for the years when an input–output table is built), calculate for GDP and each of its components Fisher volume and price indices between two successive years without any additive balancing of supply and use "at constant prices". The French maintain their old technique of input–output tables with additive balancing at previous year's prices, with implicit adjustments between supply and uses in this process of balancing the table, insofar as changes in relative prices occur. They then chain Laspeyres volume indices. Other countries, though compiling annual input–output tables at current prices might choose to calculate Fisher indices within this framework. Others will probably keep, at least for some time, fixed-base systems, but with frequent changes of the base period.

Many choices have to be made within this new orientation. One refers to what has to be done with possible complementary series, in which the additivity constraint is reintroduced in order to respond to certain needs (see the 1993 SNA, § 16.75, and the 1995 ESA, § 10.67). Thus, French national accountants continue to calculate series "at 1995 prices" rebalanced by allocating automatically the discrepancy resulting from chaining, at the level of 118 products, either to changes in inventories or to output.

The adoption of chain indices in the core of national accounts is accompanied by a certain additional complexity as the price to be paid for a greater rigor. This implies a partially experimental phase, but *in vivo*, during which many methodological problems will need to be resolved, including those concerning the level of detail of classifications to be used in the balances of supply and use of goods and services at current prices and in volume: a global balance (USA for example), a few hundred (France, among others) or a few thousand (Denmark, Norway, Japan in particular).

2. Changes in the terms of trade and calculation of a "real" national income

The change in the volume of GDP intends to measure the rate of growth of an economy. But does it also measure the change in the purchasing power of this economy? In a closed economy, the change in the global purchasing power of national income is necessarily the same as that of GDP, as the movements in relative prices balance. It is easy to see that, in an open economy, this is not generally the case, because of the possible relative price changes of imports and exports between the reference year and the current year. In the calculation of the volume of GDP, flows with the rest of the world are valued at constant prices using their own price changes. If, in the interval, export prices increased less than import prices, the change in the purchasing power of the nation will have been lower than that in the volume of its output, since it will have to export more to pay for the same volume of imports, and *vice versa*. From here comes the idea to calculate, in addition to GDP in volume ("at constant prices"), a so-called real national income, i.e. in terms of purchasing power, which would take into account the effect of changes in the terms of trade (see Box 66). Another way of presenting the same problem is to say that the balance of foreign trade could have a different sign at current prices and at constant prices, which is a particular illustration of a possible consequence of the calculation of a balancing item as the difference between two flows at constant prices (double deflation, see section 4). This is considered as hardly acceptable from the point of view of measuring the purchasing power of an economy.

The apparently simple idea of taking into account the effect of changes in the terms of trade will give rise to an intense debate and abundant literature focused on the question of finding the appropriate price index to deflate the foreign trade balance at current prices in the formula of calculation used. The gains or losses T that result from changes in terms of trade are indeed measured by the difference between the balance of foreign trade at current prices, directly deflated by a certain index P, and the balance of foreign trade calculated as in the calculation of the volume of GDP, i.e. as the difference between exports E deflated by their specific price index p_E and imports also deflated by their specific price index p_I:

$$T = \frac{E-I}{P} - \left(\frac{E}{p_E} - \frac{I}{p_I}\right).$$

The first idea (suggested by Stuvel, Nicholson) is to choose for P the import price index, the convincing argument being that exports are used to buy imports (In 1953, Ohlsson already evokes this solution, *On National Accounting*, § 6.24). On this basis, the OEEC publishes in the 1950s a gross national income, inopportunely described as "at constant prices", which differs from gross national product "at constant market prices" by the trading effect T calculated accordingly.

This one is equal, with $P = p_I$, to $E/p_I - E/p_E$, that is, the difference between exports deflated by the import price index and exports deflated by the export

Box 66
From GDP in volume to real national income

The 1993 SNA presents two alternative accounting schemes to link GDP in volume to real national income (on the term "real", see Box 70).

The first one assumes that one calculates the gain or loss resulting from changes in the terms of trade by using as deflator P (see the text of this chapter) a price index or an average of price indices related to foreign trade.

The transition table is as follows (1993 SNA, § 16.157):

"**16.157.** Assuming that measures of trading gains or losses are available, various different real income aggregates may be identified within the System. The links between them are displayed in the following list:

a. *Gross domestic product at constant prices*: i.e., GDP in the current year, valued at the prices, or price level, of the base year, obtained by extrapolating (i.e., multiplying) the value of GDP in the base year by the volume index for GDP, whether a fixed weight or a chain index;
   plus the trading gain or loss resulting from changes in the terms of trade;
b. equals: *real gross domestic income*;
   plus real primary incomes receivable from abroad
   minus real primary incomes payable abroad;
c. equals: *real gross national income*;
   plus real current transfers receivable from abroad
   minus real current transfers payable abroad;
d. equals: *real gross national disposable income*;
   minus consumption of fixed capital at constant prices;
e. equals: *real net national disposable income*."

To go from b) to c) and from c) to d), no attempt is made of using an estimation procedure which would follow the logic of the analysis of the effects of changes in the terms of trade. It is recommended to use conventionally a price index of wide coverage, preferably that corresponding to gross national expenditure, that is the total of final expenditure, which leads in fact for the choice of P to a mixed procedure combining partly one or several foreign trade indices, partly a general domestic price index. Some analysts prefer to follow more thoroughly a logic specific to foreign trade (see for example Silver and Mahdavy, 1991, pp. 141–2).

This first scheme is recommended by the SNA. However, in order to take into account the view of a minority on a topic that does not necessarily call for a harmonized treatment, the SNA also presents a possible alternative (§ 16.159). According to the latter, starting from net national final expenditure (final consumption + net capital formation) at constant prices, real net national disposable income can be obtained by adding the balance of foreign trade, the balance of primary income and the balance of current transfers, the three of them being deflated using the net national final expenditure price index.

This second scheme is equivalent to deflating net national disposable income (or net national income) by this price index. It is obviously liable to criticisms addressed to solutions that base the calculation of trading gains or losses on a domestic price index.

price index. However, Stone (*Quantity and Price Indexes in National Accounts*, 1956) criticizes this procedure, which for him seems only reasonable if the value of imports and exports are always balanced, and if there are no other elements in the Balance of Payments. For example, an export surplus will not necessarily be used later on to finance imports.

The OEEC attempt remains an isolated one, but the debate does not stop there. Some think of using for P the export price index, especially in the case of a foreign trade surplus, the import price index being useful in the event of a deficit (R.W. Burge and R.C. Geary, 1957), since in the first case the balance is a part of exports, whereas in the second it is a part of imports. But Raymond Courbis (1964) observes that the gain or loss T is only realized on the part common to exports and imports. He thus proposes, and Yoshimasa Kurabayashi (1967, 1971) follows him later, to define P as a combination of p_E and p_I. In the meantime, Geary had considered a similar solution by suggesting a simple arithmetic average of p_E and p_I. Courbis and Kurabayashi weight these indices by their respective share in the total of exports and imports at constant prices, which is equivalent to measuring P as the ratio between the sum of exports and imports at current prices and their sum at constant prices.

Courbis attempts to show, in a somewhat complicated way, that P thus measured is an index of the change in the international purchasing power of the currency of a given country, which is understandable, since as foreign trade is expressed in national currency in the accounts, the index P is normally close to the change in the exchange rate, which depends, among other things, on the inflation differential between the country and the rest of the world. In particular, Courbis and Kurabayashi, by their formula, can interpret the effect of changes in the terms of trade as a weighted arithmetical average of the effect due to exports and the effect due to imports.

Some participants in the debate, however, prefer a domestic price index for P. Stuvel (1959) takes the implicit deflator of net domestic product at market prices, W. Godley and F. Cripps (1974) that of domestic expenditure, excluding general government's, at factor cost.

The 1968 SNA does not recommend anything. It just recalls the import price index and the domestic expenditure price index methods. The 1979 *Manual of National Accounts at Constant Prices* leaves the question aside. The issue lingers on however and the considerable changes in the terms of trade after the first oil crisis of 1973 show its importance. In 1981, Pierre Gutmann at the OECD makes a very useful review of all the proposals. He tries to define the selection criteria resulting from a twenty-five year debate: in particular that there is no effect when the terms of trade do not vary (this eliminates solutions such as those of Stuvel and Godley and Cripps based on domestic price indices); that the effects are symmetrical between two countries, which would exclusively trade with each other (it implies that they are also symmetrical between a country and the rest of the world). Only Burge and Geary's method, Geary's second method and Courbis–Kurabayashi pass this test successfully, although Nicholson's method (the import price index), which does not pass it, is probably the most used in practice. In the middle of the 1980s, for example, the United Kingdom, the USA, the Netherlands, Sweden and Iceland apply it, whereas Norway follows the Stuvel method. Gutmann finally selects the Courbis/Kurabayashi method, whose formula has a broader economic meaning, recognizing that the problem can only have a conventional solution.

The revision of the SNA will soon begin. The subject is discussed within the

Expert Group in November 1986. Preparatory background papers recall the terms of the debate and note that the Courbis–Kurabayashi formula has the disadvantage of using base period weights so that, if weighting is to be done, it is preferable to use a formula like that of Tornqvist (known also as the translog formula), which attaches an equal weight to the two periods being compared (see "Reviewing indices", the appendix to the present chapter). The group is not able to reach a conclusion. Finally, the 1993 SNA recognizes that the absence of agreement on the choice of *P* reflects the fact that no deflator is optimal in all circumstances. For the first time however, it introduces "real" national income and "real" national disposable income into the system (the word "real" is unfortunately used in the final version instead of the expression "in real terms", which had been retained in 1986 by the Expert Group). It shows a clear preference for a deflator based on foreign trade prices, instead of those based on final expenditure, and for an average of import and export price indices, the simplest one being the non-weighted arithmetic mean. However the choice is left to countries (see Box 66). Thus, for instance, the USA continues to use the import price index.

Issues of principles have been discussed extensively, and the debate is certainly not closed. Simulations have also been carried out to estimate the differences resulting from different methods, which showed that between the use of export price indices and import price indices, the differences were often substantial, especially for non-industrialized countries. As soon as an average of export and import price indices is used, the differences are in general lower, whether this average is weighted or not, though in some cases relevant differences could be observed. It has often been pointed out that the levels and possibly the sign of the effect of changes in the terms of trade depended on the base period selected. The adoption of chain indices should solve this difficulty, as it should considerably limit the consequences of the choices of the formulas, for example between several weighting systems.

The essential problem of interpretation of changes in the terms of trade as "gains or losses" remains, an expression which calls to mind gains or losses of purchasing power resulting from the very conditions of the exchange. The issue holds an important place in development economics and in the literature on "unequal exchange" so popular at a time. Basic commodities, and therefore the large exporting or importing countries, constitute the field where such an analysis is more relevant. Beyond that, interpretation becomes more complex, because of the consequences of the frequent use of average values instead of true price indices, changes in the composition of the exchanges, relative changes in productivity of the exchanged products, changes in exchange rates, etc. It is the reason why the interest paid to this measurement was especially significant for developing countries, although (see above) several OECD countries calculate such trading gains or losses. On the other hand, France for example, hardly thought of introducing such a global measure into its national accounts, leaving the question to specific analyses. Courbis was interested in the problem in 1964, but in a broader framework, that of complete national accounts at constant prices.

3. Complete national accounts systems at constant prices

Stone opens the debate on this topic as early as the mid-1950s (obviously, a subject of frequent exchanges among national accountants). Stone (1956, Chapter VII "The treatment of non-commodity flows", pp. 89–96) considers that, as many flows do not represent the product of quantities by prices, they can only be calculated at constant prices using a different procedure based on the uses given to these flows. But many different baskets of goods and services can be chosen to express a current series in terms of constant purchasing power. The constraint of an accounting system reduces the possibilities, but cannot avoid altogether the arbitrary nature of the decision. At the end of a section with an eloquent title ("The arbitrary nature of attempts to balance an accounting system in real terms", pp. 90–93), Stone concludes "[. . .] that, in general, it is impossible to find a unique set of deflated values of the non-commodity transactions in an accounting system such that the accounts continue to balance in real terms" (p. 93). That may happen in certain simplified cases, but the values obtained are of a doubtful economic significance.

Geary and Burge (1957) and Stuvel (1959) accept the challenge. The first ones insert the balance of directly deflated foreign trade (the balance of factor income with the rest of the world is treated in a similar manner) within a simplified accounting framework where flows of goods and services are calculated in volume. Using accounting relationships, they then calculate national product, incomes distributed by enterprises to households and trading gains at constant prices.

Stuvel deflates all the entries in the accounts in current value including flows of goods and services by an indicator of the change in the general price level (the price index of net domestic product at market prices). As for goods and services, the values deflated by their specific price indices are also usually available; by comparing the production accounts deflated by these two different methods, differences are obtained for flows of goods and services (consumption, capital formation, imports and exports) which represent the effect of the relative price changes between each of these flows and the domestic product. The real income gains resulting from relative price changes are thus exhibited. Gains associated to change in the terms of trade with the rest of the world result, for exports, from the ratio between the export and the domestic product price indices and for imports, from the ratio between the import and the domestic product price indices.

Stuvel indicates clearly that, in his analysis, the size of the effects of relative price changes on consumption and capital formation does not only depend on the change in the terms of trade with the rest of the world. Indeed they are not zero, even if it is the case of their sum in a closed economy. But Courbis shows, more radically, that in Stuvel's system there is no compensation between gains obtained by a country in its exchanges with the rest of the world and those obtained by the rest of the world in its exchanges with this country: if domestic prices in a country increase, while import and export prices as well as the domestic price level everywhere else have not changed, the country in question will record trading gains/losses with the rest of the world while the latter will not record any with respect to the country in question.

Courbis will then propose the construction of a complete system of national accounts at constant prices (1964), a very ambitious prospect both in its development and in his attempt at interpreting them (see Box 67). He initially will try to generalize the concept of volume so that the current value change of all flows in the system, including distributive transactions, etc., is broken down into a change in volume and a change in price (specific therefore to each flow). This extension relies on the idea of the existence, for any flow, of an explicit or implicit "contract" between economic transactors. Volume is then, in all cases, the monetary counterpart in the price system of the base year, of the "physical" fulfillment of the contract (the quotation marks are from Courbis himself), which aims at providing a certain satisfaction.

Courbis advocates then, as all flows are supposedly calculated in volume (actually at constant prices), that the balancing items – though meaningful in current monetary terms – would lose their significance if they were calculated as balancing items of the corresponding accounts at constant prices. In current value, they have an intrinsic existence as change in a stock of money, whose equivalence, in the price system of the base year, has to be found. But the author does not use for this purpose the most general price index, as Stuvel does; he retains for a balancing item the general, particular one might say, price index of the transactions from which this balancing item results.

All the accounts being then unbalanced, balance is restored thanks to the introduction, besides each balancing item, of a gap variable. In so doing, Courbis extends to all the accounts a similar analysis as that applied by Geary and others to the balancing item of foreign trade, i.e. a direct deflation of the balancing item in current value and the introduction of a rebalancing term. He then attempts an interpretation, within the framework of microeconomic theory, of the gap variables, as surplus variations, which would measure, for the considered transactions, the change in the satisfaction of the transactor due to distortions in the price system. The term "real" in real income means then: "calculated with a currency unit of a same desirability as that in the base year" (p. 5).

An application of the method is attempted, with inevitable practical simplifications, using the integrated economic account of France for 1957, calculated at 1956 prices. The experiment has no repercussion. Too many flows resist volume–price factoring, and their calculation at specific constant prices depends on arbitrary choices. Interpretation in terms of surplus variations relies on bold jumps over the validity conditions imposed by theoretical analysis (concept of utility extended to all economic transactors, comparable and measurable utilities, desirability of the currency unit in the base year equal to 1 for all transactors, etc.). The problems of the micro/macro linkage are supposed to be resolved.

Box 67

Complete national economic accounts at constant prices: Courbis summarized by Courbis

"The problem of economic accounts "at constant prices" is, in fact, the problem of the comparability of time series of accounts, as changes in the price structure preclude any direct comparison of the different economic flows.

The establishment of such accounts will make it possible to directly compare the same flow at two different times within a global framework – without therefore disregarding other flows: that is, a simultaneous synthetic and analytical comparison.

They could then be used for time series analysis, projections, and structural research (for example, to study the changes in income distribution mechanisms).

The first stage of the development is the determination of a univocal system of price indices for all flows.

Besides the problems involved in the practical construction of price indices, the difficulties are essentially:

1. The choice of the concept to be followed in building such an index: for example, for wages, should the hourly wage rate index or the cost of living index be used? Which index should be used for a balancing item? Depending on the cases, there are *a priori* either plurality or absence of logically acceptable indices.

   These difficulties are associated with a general problem of the definition linked to "volume". The criterion of the implicit "contract" between transactors must be followed for the French national accounting system: the volume is the counterpart expressed in the base year currency – and within the base year price systems – of the "physical" fulfillment of the contract, this fulfillment aiming at providing a certain satisfaction. Quality issues are thus fundamental.

2. The calculation of balancing items and the balance of accounts: the value "at constant prices" of the balancing items at current prices cannot be simply equivalent to the balancing items of accounts at constant prices, as the results obtained would lack any significance. It is necessary to calculate them directly using an appropriate price index.

   Then the accounts are no longer balanced "at constant prices". In order to balance them, gap variables have to be introduced: but they must be economically significant.

   Determining balancing items and gap variables are obviously closely connected problems.

   The "value at constant prices of a balancing item" (saving, gross operating surplus, etc.) can be defined as the quantity of the base year currency, which has, for the transactor and the transactions under scrutiny, the same "value" (i.e. which provides the same satisfaction) within the price system of the base year, as the balancing item at current prices within the price system of the current year. This definition is nothing else but the application to balancing items of the general definition of "volume" and the "contract" criterion.

   The index to be retained for a given balancing item is the general price index of the transactions for which that balancing item is the result; it makes it possible to operate with one currency unit at a constant level of desirability.

   Under these conditions, the gap variables, introduced rather artificially at the beginning, are precisely the first order variations (between the year under consideration and the base year) of Dupuit's surplus of the transactor in question for the considered transactions. Now this variation, if calculated according to certain conditions – which are verified when using the suggested methods – measures, for the transactions under scrutiny, the change in the satisfaction of the transactor due to distortions in the price system.

   The terms of surplus make it possible to go from physical flow or volume (value at constant

cont'd

Box 67 (cont'd)

real prices) to real monetary flow or real income (the word "real" meaning: estimated with a currency unit of a same desirability as that in the base year).

3. Problem of the aggregation of the accounts at constant prices. If a global account and partial accounts are separately calculated, the global balance (or the global surplus item) is in general different from the sum of the partial balances (of the partial surplus items).

   Various theoretical solutions to this problem are presented. It is however suggested, as presently the most practical one, to introduce in the accounts an additional account of "indirect transfers on surpluses", whose interpretation is interesting.

4. The problem of a practical methodology appropriate to French accounts is discussed in the second part. Some additional difficulties appear (in particular for the capital account); solutions are proposed. Thus the breakdown of the variation of surplus of the capital account can be done *a priori* following two different concepts. The concept that is retained leads to a breakdown of real nature, the other has a virtual character.

   Pursuant to the methods discussed, a proposed integrated economic account for France in 1957 "at 1956 prices", is presented."

Source: Raymond Courbis, "Comptes économiques nationaux à prix constants" [National economic accounts at constant prices], (*Etudes et Conjoncture*, July 1964, pp. 5–6).

Thirty years later, however, a new attempt of compilation of complete national accounts at constant prices is carried out (within the framework of SAM, but the problem is the same one) by Steven J. Keuning in his dissertation (*Accounting for economic development and social change, with a case-study for Indonesia*, University of Rotterdam, 1995). The author, who was only belatedly informed about Courbis' work, adopts a more empirical approach, without any attempt of second degree theoretical interpretation of what he is measuring. Actually, he does not try, as Courbis in principle does, a systematic volume–price factoring, but combines estimates in volume for flows of goods and services and factor inputs and estimates at constant purchasing power for most of the rest. As he claims to calculate, by difference for each sector, a global effect of changes in terms of trade, he creates the illusion of having taken into account in a generalized way the changes in relative prices. In addition, as he calculates residually an effect of changes in terms of trade with the rest of the world equal, by construction, to the balancing item of the effects of changes in terms of trade for all resident institutional sectors, and believes to avoid by this method the complicated issue concerning an autonomous calculation, he lays himself open to Courbis' criticism addressed to Stuvel: the risk of interpreting the effect of changes in terms of trade thus calculated as a (net) transfer of purchasing power from abroad (see above, p. 380).

The conclusions that can be drawn from the few experiments that have been carried out point to the same negative direction as Stone's (1956); the 1993 SNA distinguishes, as he did, flows that can be calculated at constant prices (in volume) – those of the input–output tables including taxes and subsidies on products and production factors inputs – and flows that can only be calculated in real terms, which can be measured thus – at constant purchasing power – from several standpoints, which makes impossible the establishment of a unique set of accounts in real terms suited to all possible uses (§§ 16.2, 16.3). Nevertheless, reflections on this issue remain stimulating and should be continued, in particular concerning the concept of change in the general price level now that balance sheets and changes in assets and liabilities are integrated in the system of accounts.

4. Volume of value added and double deflation

4.1. Double deflation methodology spreading

The first to use the double deflation method (difference between the value of output and that of intermediate consumption at base year prices) to calculate the "real value added" is Solomon Fabricant in 1940 concerning the US manufacturing industry. Kendrick and Jones apply it in 1951 to agriculture. It is integrated in the system of price and quantity indices presented by Stone (1956), but he seems not to have used the expression.

The implementation of input–output tables tends to generalize the method. At the beginning of the 1970s, among the OECD countries, according to Hill (1971), Norway, the Netherlands, France and Japan use it with an annual IOT. Sweden, Italy, Germany, Belgium, Canada and the USA do it without an annual IOT, but in relation to a base year IOT. Finally Denmark, Ireland and the United Kingdom use what is sometimes called simple deflation (except in agriculture where double deflation is of general use), i.e. essentially the deflation of value added by the price index of the corresponding output (or its extrapolation by means of the volume index). The doubts concerning the virtues of double deflation are, however, greater than what could be expected by considering the list of countries presented above. For national accountants, according to Hill's study, it seems principally due to the insufficiencies of the information system to correctly measure intermediate consumption at constant prices (its measurement at current prices is often less robust than for output). The smaller the magnitude of value added as compared to output and intermediate consumption, the greater the possible impact of measurement errors in output and mostly intermediate consumption on value added at constant prices.

The growing efforts of statistical offices towards the setting up of integrated systems of volume and price indices within the framework of IOTs, generally sweep away these reservations. Eurostat (1972), then the UN (1979) strongly recommend the method. The UN handbook is clear: "In an ideal world, real product by kind of activity would always be derived from an input–output table by double deflation" (§ 7.18). In the absence of the required IOTs, other methods are viewed as second-best. The possibility that the measure of value added at constant prices resulting from double deflation can be distorted, and even become negative, in the event of strong changes in relative prices between output and intermediate consumption, produced, for instance, by substitutions in intermediate consumption, is obviously not ignored: shocking as it may be – a positive value added in current price can appear negative at base period prices –, this situation however is not overdramatized (§§ 7.7–7.14). It results from the fact that current quantities would have been different with another price system, a general problem for all estimations at constant prices. If its impact is meaningful, the base year should obviously be changed. Regarding industries in which value added represents a very small proportion of output, the solution to its possible erratic evolution is to add them with others. Globally the probability that the method gives unacceptable results for the users is very small and thus does not question its overall validity, considers the *Manual*.

4.2. Discussions in the economic literature

However, value added at constant prices obtained this way is debated in the economic literature, from the beginning of the 1960s until practically the end of the century. These debates often mix two problems, the criticism on the significance of value added at constant prices and the criticism on the measuring technique that is used (infrequently changed Laspeyres fixed-base volume indices).

In North America, the question of knowing whether "real value added" can be effectively used as a measurement of industries' output is extensively discussed. The debate is due largely to the fact that, in Canada until the end of the 1970s, and in the USA until the beginning of the 1990s, only value added by industry at constant prices were published, not output values. Researchers and analysts of production and productivity widely use them. Several authors (C. Sims, 1969; Kenneth Arrow, 1974; K. Sato, 1976; Michael Bruno, 1978) show that value added can be interpreted as a measure of output only if the separability condition between intermediate consumption and primary factors in the production function holds (value added is produced with labor and capital, then output is produced with value added and intermediate consumption), or if (Bruno, Diewert, 1978) relative prices of outputs and intermediate consumptions do not vary. In the 1970s, a series of studies based on US or Canadian data concludes, as could be expected, that none of these requirements is verified in practice. Consequently, productivity measures of industries are skewed, if they do not take into account output and all factors.

Another approach, already found (section 3) in connection with balancing items, is associated with the fact that value added, compiled at current prices, has an existence of its own as an amount representing economic value. This characteristic should not be blurred or disappear, even when accounts are compiled at constant prices; by nature, a positive value added at current prices must, as is the case for a foreign trade balance, remain positive at constant prices. Some authors in fact went further and even rejected as meaningless the concept of value added in volume. This is Vincent's position (1963), which is based on both the several perspectives from which value added may be considered (balance at constant prices between output and intermediate consumption, purchasing power of generated incomes, compensation of primary factors of production used), and the deformations or anomalies possibly involved in double deflation. T.K. Rymes (1971) also rejects it, but within a criticism of real value added as a measure of output.

Courbis (1964) considers that, from Vincent's criticisms, it should rather be concluded that it is the calculation of value added in volume as a balancing item that is not an acceptable solution. He thus applies to value added his general approach (pp. 50–53). He proposes to deflate value added at current prices of an industry by a general price index of its transactions (output and intermediate consumption) or more simply, in order to preserve the property of additivity of value added without having to use the complex method of aggregation that he is analyzing, by the same general index for all industries (price index of final and intermediate goods). To balance the production account, a gap variable is introduced that he also analyzes in terms of economic surplus. What he obtains is very difficult to interpret in a rigorous way due to the distortion of prices that has occurred.

Other alternatives were proposed to the calculation of value added using double deflation. They are often associated with positions already mentioned here. Thus P.A. David proposes (1962) using the purchasing power index of the incomes accruing to the primary factors of production or (1966) the price index of the output of the corresponding industry. In the second case, the effect of the change in the terms of trade between output and intermediate consumption, which appear if compared with the result of the double deflation procedure, is set aside. S. Fenoalta (1976) recommends the use of a general deflator, which might be either the price of raw labor or the GNP deflator (in the latter case, the allocation of GNP in volume by industry is the same as that at current prices), which poses obvious problems for productivity analysis.

René Durand proposes (1994) the most elaborate alternative to double deflation; he places himself within the strict framework of IOTs, though sophisticated ones. The method relies on the transformation of an IOT so as to obtain a cross-classification between value added of actual industries (that usually have multiple outputs) and value added of homogeneous branches of production (without intermediate transactions between them) corresponding to groups of products making up final demand. For each industry it is possible to get its direct and indirect contribution to the final demand corresponding to each group of products. For each one of them, as value added and final demand are equal in a closed economy (the analysis extends afterwards to the case of an open economy) both at current and constant prices (the equality of GDP and its final uses is verified for each group of products), the value added of each homogeneous branch is deflated by the price index of the corresponding final demand, as well as the direct and indirect contributions of each actual branch to this value added. The value added of an actual industry is thus deflated by the price indices of the final demand of the various groups of products to which it contributes.

The advantages of this method are, in particular, that it does not depend on the price indices of intermediate consumption (which disappear), that are more difficult to calculate than those of final demand. Additionally the share of each industry in the final product in volume is directly associated, for each group of products, with its share in the current value of this product (and, therefore, with the relative prices of the current period, not those of the base year). It avoids, even over a long period, the anomalies that a fixed base might involve, when relative price changes and substitutions are big, which is precisely the objective pursued.

These advantages are acquired at the price of a clever construct of an abstract economy in which the production of each group of products is vertically integrated as if it were produced by only one homogeneous production unit for the economy as a whole. There are as many such units as products, without any exchange between them. No exchange occurs, either, inside each unit, since national accounting generally does not record internal deliveries within establishments. The construction of such a table rigorously rests on the assumption that, inside any actual production unit with multiple output, the production function of each different product is separable from the others, without reciprocal influences, and that the corresponding intermediate and primary factor inputs can be known.

International recommendations at the end of the century do not follow such an orientation. Double deflation is still advocated. But, in the recommended chain indices approach, it applies only to the year-to-year Laspeyres or Paasche volume indices (in principle within the framework of annual IOTs). Beyond a year, the evolution of value added, in volume and prices, is obtained by chaining the annual indices of value added themselves (1993 SNA, § 16.64). It does not result from the respective chaining of output and intermediate consumption indices (this is already the case if Fisher or Tornqvist indices are calculated for each annual link). If these three indices (of output, intermediate consumption and value added) are applied to the values of any given year, a discrepancy is likely to appear between the three elements of the production account. Then the general situation is to be confronted (see section 1). This leads either to accept the result as it is or to rebalance within the framework of rebalanced series “at fixed base-year prices”.In the same way, changes in volume of the primary production factors and of total factor productivity are calculated accordingly, by chaining their respective annual changes. The main recommendation of national accounting thus gets closer to the preferences generally expressed by economists. Chaining allows an annual update of weights that brings volumes and prices closer to the effective conditions in which economic transactors make their decisions.

5. Measuring the volume of production factors, growth accounting and productivity

From the mid-1950s, national accounting will be used as a framework for research on growth accounting and productivity. They have many common points, such as the measurement of changes in the volume of production factors used and the estimate of a term of global or total factor productivity (GFP or TFP). This term is most often interpreted in connection with the analysis of the determinants of growth, as resulting from the evolution of technical progress (an ambiguous terminology, since it can only refer to technical progress not embodied into labor or equipment, and other elements play a role – changes in the organization of enterprises, for example). Global or total factor productivity represents the part of output growth that is not due to the evolution of the quantities/volumes of labor and capital or more generally to all factors that are measured.

In theoretical (Robert Solow, 1957) or macroeconomic research (Denison, 1962, 1967; Jean Jacques Carré, Paul Dubois and Edmond Malinvaud, 1972; Angus Maddison, 1987), two factors of production are considered, labor and capital, and on the output side value added, even if the effect on the global economy of other growth factors, such as the transfer of resources towards more productive activities (migrations from agriculture, in particular, in the research developed by Carré, Dubois, Malinvaud) is also studied. Attention focuses on the analysis of global growth, even when the main sector differentiations are also taken into account.

5.1. The French experience of "surplus accounts"

In France, in the 1960s and 1970s, a full set of studies develops, starting with an initial impetus by L.A. Vincent, which is mostly concerned with productivity measurement at the level of industries and firms. With the creation of the Centre d'études des revenus et des coûts (CERC) [Center for Research on Income and Costs] in 1966, this research takes the form of "surplus accounts". The principal objective pursued in particular by the Commissaire au Plan (the head of the Planning Bureau), Pierre Massé, is no longer the analysis of growth, but that of the distribution of its fruits, as a support for an income policy "toward a rapid and healthy expansion and a more equitable distribution of the fruits of growth" (Preamble of the decree of creation of the CERC). The title of the study: ""Surplus de productivité globale" et "comptes de surplus"" ("Global productivity surplus" and "surplus accounts") published in the first issue (1st quarter 1969) of *Documents du CERC* is preceded by an explicit front page: "The study of productivity within the framework of an income policy".

This method is applied by the CERC, between 1966 and 1972, to four large public corporations (Société Nationale des Chemins de Fer Français, Gaz de France, Electricité de France, Charbonnages de France) [French Railroads, French Gas, French Electricity, and French Coal Industry]. An attempt at implementation for the whole economy, split out in seven large sectors, is published by INSEE (Philippe Templé) in 1971 for the period 1959–1967, and is extended, in-house, to 10 sectors and years 1968–1969. The elaborate methodological publications issued by the CERC in 1973 ("Les comptes de surplus des entreprises, méthodologie et modalités d'application" [Firms' surplus accounts, methodology and implementation methods], *Documents du CERC*, no. 18, 2nd quarter 1973) and the INSEE in 1975 (Raymond Courbis and Philippe Templé, "La méthode des 'comptes de surplus' et ses applications macroéconomiques" [The "surplus accounts" method and its macroeconomic uses], *Collections de l'INSEE*, series C, no. 35, July 1975) which mention several possible uses of the method, in particular for forecasting or prospective purposes, appear in fact at a time when the orientation of the French economic policy will radically change. Indicative planning and income policy (the latter having largely remained in an infant stage) are no longer in vogue.

Oriented towards the enterprise, the method of the surplus accounts is placed within the complete combined framework of production and operating accounts of enterprises. It aims at breaking down their change between two periods into a change at constant prices (volume) and a price change. In this framework, the list of production factors is extended compared to studies within a more global perspective. Intermediate consumption is introduced (as in Vincent), and also government and lenders, what brings its own complicated problems. The difficulty of volume–price factoring of flows such as financial costs or net operating surplus has to be faced (should the latter "constant prices" value be considered as a change in the volume of a factor or not?

The difference between the value of output at constant prices and the value of factors, thus widened, represents the global productivity surplus. The latter, increased by possible "heritages" resulting essentially from a decline in the relative prices of intermediate consumption, is allocated *via* relative price changes between customers, labor, owners of capital and lenders.

In this context, Courbis (1969, 1975), based on a proposal by Geary (1957), extends his 1964 research by a proposal of accounts at constant prices and constant productivity. He goes from a reference year account to the current year account by building several intermediate accounts, one at constant prices and constant average return (volume index of output and volume index of factors are equal), a second one at constant prices and effective factor return (the volume index of output is in general higher than that of factors, economies of factors are recorded, i.e. productivity gains), another at variable relative prices and constant general price level, which shows how the productivity gains are allocated, including, if necessary, to business themselves. Courbis extends to productivity gains, under certain conditions, his interpretation in terms of variation of economic surplus and reinserts all this in his former integrated economic account (and in principle also balance sheets) at constant prices, highlighting thus generalized transfers of surplus (of purchasing power) [see Box 68].

The focus of French research on the distribution of productivity gains, seems to have no equivalent in foreign research at that time, even if Kendrick notes in 1961 (*Productivity Trends in the United States*, NBER/Princeton University Press, p. 111) that relative price changes are "the means whereby the fruits

Box 68
Surplus accounts

The following diagram (Courbis and Temple, 1975, Figure 1, p. 25) is a good example of the surplus accounts goals:

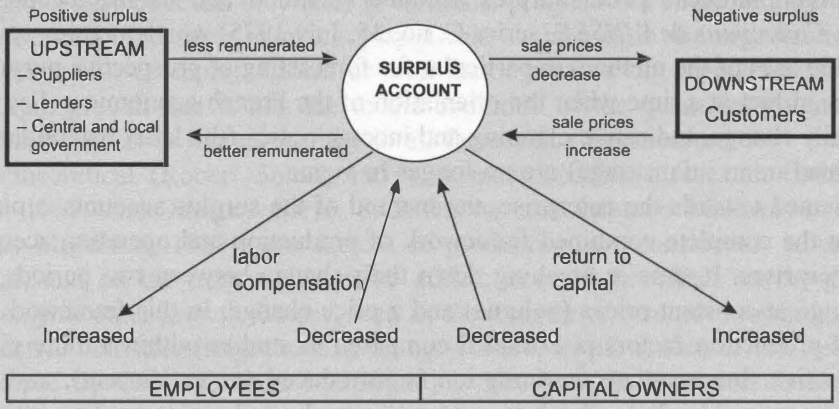

Diagram of a surplus account

Once the global productivity surplus is calculated, one tries to estimate how it is distributed between the various stakeholders of an enterprise, within it and outside.

The process involves workers and the capital owners, upstream: suppliers and lenders, local and central government; downstream: customers. All of them are more or less remunerated than before, i.e. their relative prices, in a broad sense, have increased or decreased (the diagram is in constant currency units). French national accounts at that time are established at market prices, all taxes included, and what goes to general government is wrongly considered here – see chapter 6 – as the direct counterpart of public services, understood as ordinary production factors, from which the business benefits. All of them are either more or less remunerated than before, i.e. their relative prices, in a broad sense, have increased or decreased (the diagram is in constant monetary units).

When the upstream part is less remunerated, the enterprise benefits from *heritages* (formulation introduced in 1965 by economists at Electricité de France), which are a part of the productivity gains distributed by its suppliers. This means that an enterprise benefitting from such heritages distributes an amount larger than its own productivity surplus.

This analysis may only be complete within the framework of an enterprise with total availability of information (this is the case for the large public corporations studied then by the CERC) or within a complete national accounts system, including IOT and operating accounts for businesses. As a counterpart, this context requires specifying the treatment of certain items of the accounts, such as, in particular, taxes on production (see above), which complicates the analysis.

A quantified application to the account of non-financial enterprises as a whole is presented for 1967 (France). It is reproduced here for the sake of illustration (Courbis and Templé, 1975, table 2, p. 21, taken from Templé 1971). The two parts of the table successively show the formation then the distribution of the global productivity surplus and the possible heritages. The text insists (p. 24) on the interdependent character of the creation and distribution of surplus (it would rather prefer the term *use* to that of *distribution*), while noting that the CERC tends to give a sequential interpretation of it (note 1, p. 24).

cont'd

Box 68 (cont'd)

Formation and Distribution of Global Productivity Surplus in 1967[1]

A. Formation of Global Productivity Surplus

Million francs 1962

All industries	1966 account at 1966* prices	Volume indices	1967 account at 1966 prices	$p\Delta Q$	$f_j\Delta X_j$
Output	571,284	104.9	599,141	27,857	
Employees	165,131	99.9	164,953		–178
Self-employed	45,118	98.7	44,515		–603
Intermediate consumption	185,206	105.4	195,123		9,917
Capital owners					
1. Depreciation	39,459	107.5	42,427		2,968
2. Balancing item	52,908	100.0	52,908		...
Government	59,950	104.9	62,876		2,926
Lenders	13,848	107.9	14,940		1,092
Others	9,664	107.4	10,375		711
Sub-total	...	...	...	**27,857**	**16,833**
Global productivity surplus			11,024	...	11,024
Total	**571,284**		**599,141**	**27,857**	**27,857**

B. Distribution of Global Productivity Surplus

Million francs 1962

All industries	1967 account at 1966* prices	Relative price indices	1967 account at 1967 prices	Origin	Distribution
Customers	599,141	99.4	595,703		3,438
Employees	164,953	105.1	173,410		8,457
Self-employed	44,515	104.6	46,582		2,067
Intermediate consumption	195,123	98.6	192,328	2,795	
Capital owners					
1. Depreciation	42,427	99.8	42,353	74	
2. Balancing item	52,908	101.7	53,808		900
Government	62,876	97.6	61,378	1,498	
Lenders	14,940	104.6	15,625		685
Others	10,375	98.5	10,219	156	
Sub-total	...	...	...	**4,523**	**15,547**
Global productivity surplus	11,024	...	...	11,024	
Total	**599,141**		**595,703**	**15,547**	**15,547**

* "At 1966 prices" should be understood as "at 1966 relative prices", since the table is calculated in 1962 francs, the general price index is assumed to be equal to 100.

[1] From: Philippe Templé, "The surplus method. A tentative application to enterprises accounts (1959–1967)" (*Economie et Statistique*, December 1971, pp. 33–50).

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Box 68 (cont'd)

The table is compiled at the general 1962 price level. A global productivity surplus (11,024) appears because growth in the volume of output is larger than growth in the production factors (in a broad sense). In the second part of the table, factors providers realize a gain if their relative price index increases, a loss in the opposite case. Customers realize a gain when the output relative price index drops.

The foreword to the study by Courbis and Templé (p. 3) presents the "surplus accounts" method as a means of synthesizing the analysis of "global factor productivity", "accounts at constant prices" (this expression refers to the complete accounts at constant prices as attempted earlier by Courbis) and "distribution of the fruits of growth" carried out in France since the beginning of the 1960s.

Courbis' scheme of analysis showing the four intermediate accounts that he distinguishes (see text of the present chapter) appears in the table on p. 393.

One goes from the account of year N_0 at n_0 prices to account (a) by applying to all items the volume index of output (constant returns are initially assumed), then from (a) to (b) using the indices of factor return (they indicate factor saving if $h/q < 1$, the reverse if $h/q > 1$). The "surplus gain due to productivity improvement" S'_{P} rebalances account (b). To understand account (c) of year N at constant prices, it is better to start from the right-hand side. Column (d) is obtained by dividing the current values of the account of year N at n prices by the same general price level index (the same one, only by convention, see note 3 of the table). Then one goes from (d) to (c) using the relative price indices proper to each item. The "net financial gain of surplus resulting from changes in prices", S'_{F}, balances account (c). S'_{P} and S'_{F} do not entirely compensate because the enterprise is supposed to retain for itself a part of the productivity gain. This retained gain appears on the row "net profit" of the table. The difference between S'_{P} and S'_{F} is then the "additional net profit" of year N.

It will be noted that the calculation of S'_{P} on one side, or of S'_{F} on the other, calls to mind the approaches known as primal and dual (measurement of changes in productivity by the shift of a cost function) in the neo-classical theoretical framework of growth accounting (see for example Bruno Crépon and Thomas Heckel, "La contribution de l'informatisation à la croissance française: une mesure à partir des données d'entreprises" [The contribution of computerization to french growth: a measurement using enterprise databases] (*Economie et Statistique,* 2000, 9/10, no. 339–340, pp. 93–115, box 1: "Le cadre théorique de la comptabilité de la croissance" [The theoretical framework of growth accounting], p. 95). In this framework, the profit retained by the enterprise is excluded due to the chosen theoretical assumptions and S'_{P} and S'_{F} are in principle identical, although practical applications lead to different results.

This table shows the extreme efforts made to implement analysis and quantitative estimates, within the strict national accounting framework. They bear the concern for social dialogue that characterizes Massé and the CERC, and, in the case of Courbis, the growing concern for remaining inside a rigorous theoretical approach. The restrictive conditions of the neo-classical growth model, and its measurement of global factor productivity, necessarily create a gap between analysts and observers (statisticians and national accounts compilers) who face practical economic reality. Some decades later there is the attempt to attibute to national accounting conclusions derived from the theoretical model (see in Box 56, some research proposals included in the OECD handbook *Measuring Capital*).

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of productivity gains are distributed to workers and investors", while adding "by the market mechanism ". This reflects, in the case of France, the mixed character of its economy, where in the 1960s, a non-inflationary growth seems to be based, according to economists like Gruson and Massé, on an income policy resulting from a dialogue at various levels, in particular within each large public

Scheme for the analysis of productivity surplus and its distribution through changes in prices[1]

			(a)		(b)		(c)		(d)		
	Year N_o values	Volume indices	Year N volume at constant returns	Factor's returns indices	Year N volume at actual returns and constant rate of profit	Indices	Year N at constant prices	Relative price indices[2]	Year N at relative prices and constant currency	General price level index[3]	Year N current values
Output	P_o	q	P'	1	P'	1	P'	p	P''	d	P
Net financial gain of surplus resulting from changes in prices	...	...	...	...	...	...	S'_F	0	...	...	...
Total	**P_o**	**q**	**P'**		**P'**		**$P' + S'_F$**		**P''**	**d**	**P**
Suppliers	C_o	q	C''	hc/q	C'	1	C'	fc	C'''	d	C
Labor	W_o	q	W''	hw/q	W'	1	W'	fw	W'''	d	W
Capital[4]	K_o	q	K''	hk/q	K'	1	K'	fk	K'''	d	K
Total	**X_o**	**q**	**X''**	**h/q**	**X'**	**1**	**X'**	**f**	**X'''**	**d**	**X**
Net profit	C_o	q	B''	1	B''	b'/q	$B''' = B'' + \mathrm{s}'$	$b_r = 1$	B'''	d	B
Surplus gain due to productivity improvement	...	...	...	...	$\mathrm{S}'\mathrm{p}$	0	...	...	...	...	...
Total	**P_o**	**q**	**P'**		**P'**		**$P' + S'_F$**		**P''**	**d**	**P**

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[1] From Courbis (1969), p. 65.

[2] If x is a nominal price index, the relative price index is equal to $x_r = x/d$.

[3] d = "price index", of the "constant currency" unit ($1/d$ measures the devaluation of the "nominal" unit resulting from the general increase in price); d is the inverse of the desirability of money. The valuation of d is to a great extent subjective; it may therefore be different for the various transactors. Collectively, one may be satisfied with GDP price index, as it is done in national accounting.

[4] Economic depreciation = capital depreciation + return to capital (either borrowed or own funds)

corporation. The high inflationary pressures of the former decades were partly imputed to conflicts between social groups over the distribution of income. The issue of the distribution of gains resulting from growth and, in particular, the search for a more equitable distribution of these incomes, is then recurrent. This debate however is rather senseless in terms of primary distribution of incomes, if one assumes, in the framework of a more market-oriented economy, that real returns to production factors closely reflect their respective marginal productivities. Since the mid-1970s, the issue of distribution of the fruits of growth will disappear from the public debate, as that of unemployment will take the forefront.

5.2. Interpretation issues

From a methodological point of view, it should be noted that the sequential accounting analysis of the generation of the productivity surplus, then of its distribution, poses a problem, in spite of the careful terminology stressing the simultaneity of the phenomena. It might lead to think, indeed, of a kind of actual independence of the relative price changes of products and factors compared to real changes ("physical") of the economy. In fact, the problem of interpretation of the relative price changes is masked, and the concept of surplus distribution or transfer is ambiguous.

Moreover, a questioning addressed to the analysis of both growth determinants and productivity surpluses, the measurement of global or total factor productivity, or more generally of its variation, strongly depends on the methods used to define and measure changes in the volume of factors, output or value added. Concerning labor, analysts seek to take into account the effective amounts of labor used (manpower and actual duration), but Dubois indicates that every working hour is, in current productivity calculations and usual production functions, treated as homogeneous ("Ruptures de croissance et progrès technique" [Growth gaps and technical progress], *Economie et Statistique*, October 1985, pp. 3–31). Nevertheless, Carré, Dubois, Malinvaud (1972), then Dubois (1985), estimate the change of the quality of the working population according to educational level, age and gender and find that they are significant: nearly 0.5% per year at the beginning of the century, then 1% at the end of the 1960s.

Employment data, even when integrated into national accounts, do not have an endogenous character. The case is different for output, value added and fixed capital, which from the second half of the century, even earlier in some countries, are series taken directly from national accounts or mostly derived from them (for fixed capital, see Box 56). In many countries, as is the case in France since Mairesse's study (1972), fixed capital stock tends to become part of national accounts series. Volume–price factoring of equipment goods thus intervenes in the measurement of output and value added of industries at constant prices, as in the measurement of fixed capital at constant prices used by industries and of

CFC. Productivity analysts supplement the estimate of fixed capital in volume, considering, for example, the duration of the use of equipment (using short-term economic surveys), but largely depend on series of GFCF in volume.

6. Volume–price factoring for equipment goods

6.1. Two opposing views

Nevertheless splitting the change in the current value of equipment goods into change in volume and change in price is one of the most difficult issues regarding statistics at producers' prices (in general, later developed than consumer goods prices) and the compilation of accounts at constant prices. A recurring debate on this topic crosses the half-century, especially in the USA. It has to do with the way of measuring the effect of quality changes whose incidence on the value of goods should not be taken as a change in their price, but in their volume. Two principal theses are opposed. For the first one, in particular sustained by Denison (1957), the quality change of equipment goods is measured by the cost it represents for their producer. Traditionally, this approach dominates among statisticians with many variants. The US Bureau of Labor Statistics, for instance, identifies the changes of specification; if they are considered small, they are neglected, otherwise a link is created, which consists in neutralizing the influence of the new model for its month of introduction into the index, or also, in a limited number of cases, the manufacturer is requested to quantify the cost of the change in specification.

The second position is that quality changes should be appreciated from the point of view of the purchaser and thus, for equipment goods, by their differential contribution to production. Denison considers that though valid from a theoretical point of view, it is impractical. For a long time, the discussion stands as a matter of principle; many economists (Zvi Griliches, Dale W. Jorgenson, Jack E. Triplett, etc.) support the criterion of user-value, against that of resource-cost for the producer. But in the mid-1980s, the US practice is modified because of computers. Hereafter, the changes in volume and price are associated to the changes of their characteristics (speed, memory size, etc.) by applying hedonic methods (of very limited use before in statistical practice: only one precedent in the USA, since 1968, for single-family houses under construction).

At the end of the 20th century, the use of hedonic methods (calculation using econometric models to define the relationship between prices and characteristics of different models) remains exceptional in official statistical services, except in the USA where, after computers, it extends to peripherals, a significant part of software and telephone terminals. In Europe, Sweden and France (for microcomputers and servers) introduce it. Several Eurostat groups work on the improvement and homogenization of the volume measurement methods for computers and software, possibly also for heavy equipment goods. Eurostat also recommends the method for the calculation of price changes in the services produced by owner-occupier dwellings (Commission Decision of July 1995).

A more ambitious attempt is carried out by Robert J. Gordon who publishes in 1990 a book on *The Measurement of Durable Goods Prices* (NBER/Chicago University Press) in which the criterion used to compare capital goods is not only their contribution to the increase in output, but more generally their capacity to generate gross operating surplus. Not only the effect on output should be taken into account, but also the effect on variable costs (labor, energy and other intermediate inputs). The book gives rise to a discussion between the author and Denison, which was published, shortly after the latter's death, in *The Review of Income and Wealth* (March 1993). Denison seems to recognize that Gordon's approach is theoretically the relevant one. He thinks however that net generated operating surplus should be compared. One can note however that Gordon's approach is consistent with the formulation of the theoretical definition of the value of a capital good as the present value of the sequence of expected gross operating surplus. Denison stresses that the method is not generally applicable. Gordon could only apply it completely to two products: commercial aircraft and power stations, and only partially to others (computers, for example). Gordon answers that half a loaf is better than no loaf at all. Denison also observes, and this is Gordon's opinion too, that using hedonic methods, for instance with computers, takes only into account the effects on output, not on variable costs. The production costs approach is, on the other hand, generally applicable (and is used in practice, except for computers). If one rejects it for reasons of logical consistency (unless it gives the same results as the other), for Denison there is only one valid approach left, that which, according to the Cambridge School, values investment by the value of consumption given up when investing, an approach that Denison rejoined before (1989). But the latter is only valid for the total values of investment and stock of capital deflated by the final consumption price index. Should it then be used as a complement to the traditional method? Gordon does not find that convincing at all. (On the different methods mentioned see Cette, Mairesse and Kocoglu's presentation in Box 69).

The Denison–Gordon discussion often refers to the approach formulated by Jack E. Triplett in a 1983 theoretical paper ("Concepts of quality in input and output price measures: a resolution of the user-value resource-cost debate"). Triplett, then at the BLS, became, for a time, chief economist at the Bureau of Economic Analysis, which is in charge of the US national accounts. Triplett redefines goods in terms of their characteristics (speed, washing capacity, transport capacity, area of an apartment, etc.) following Kelvin Lancaster (*Consumer Demand: A New Approach*, Columbia University Press, 1971) and introduces quality changes in the theoretical economic approach to index numbers by defining quality as quantities in a vector of characteristics. Goods are aggregates of characteristics. Their quantities are the true *inputs* in the production function. He defines the concepts of characteristics of *input* and *output* – within the framework of an analysis in terms of production function – as well as

Box 69

Volume–price factoring of the value of investment: Contrasting alternative approaches

The following text is quoted from Gilbert Cette, Jacques Mairesse and Ysuf Kocoglu (pp. 75–79): “La mesure de l’investissement en technologies de l’information et de la communication: quelques considérations méthodologiques” [The measurement of investment in information and communication technologies: some methodological considerations] (*Economie et Statistique,* 2000, 9/10, no. 339–340, pp. 73–91).

Volume–price factoring of the value of investment

Factoring the change in value of investment into its two components of volume and price is an extremely difficult issue, because production techniques and investment goods performances do not remain stable but generally keep progressing over time (Mairesse, 1971 and 1972; Cette, 1994). Two opposing approaches are theoretically possible, one of which, the “factor cost” approach, proposes to take into account progress in the production of investment goods, and the other one, the “productive services” approach, intends to take into account progress in their productive performances. The latter, generally preferred in principle, is particularly difficult to implement in practice.

Factor cost approach and productive services approach. Simplifying and to some extent by tautology, it is possible to say that, in the factor cost approach, the volume of an investment good changes following the factors required to produce it, whatever the evolution of its productive performances might be, whereas in the productive services approach, the volume of this same investment good changes according to the evolution of its productive performances, whatever the evolution of the quantities of factors necessary to its production might be.

The difference between these two approaches can be illustrated starting from the simple example of an eraser (6), sometimes suggested in the literature [cf., for example, Triplett (1996)].

First of all, let us imagine that a technological innovation makes it possible to manufacture, with the same quantities of factors as before (and thus at the same production cost and, with unchanged margin behavior, the same unit value), erasers of which the service life is doubled, for comparable uses at the same intensity (in other words, the productive services of the eraser are doubled). In the factor cost approach, the volume and the unit price of an eraser remain unchanged, and the global productivity of the user increases (due to the increase in the capital productivity). In the productive services approach, the volume of erasers doubles, price is divided by two, and the global productivity of the user remains unchanged.

Let us imagine now that another technological innovation makes it possible to produce identical erasers with twice less factors of production and that, as a consequence, the market value of erasers is divided by two. In the factor cost approach, the volume is divided by two, the price remains unchanged, and as in the previous case the global productivity of the user increases (due to the increase in the capital productivity). In the productive services approach, the volume remains unchanged, the price is divided by two, and as in the previous case the global productivity of the user remains unchanged.

In the productive services approach, the productive performances of the equipment, which must be taken into account for volume–price factoring, correspond not only to the characteristics directly influencing the productive efficiency of this equipment (i.e. its partial productivity), but must also correspond, in principle, with the characteristics influencing the variable costs associated with their use.

Let us illustrate also this point by a simple example, that of a new generation of equipment goods which have the same productive efficiency (or partial productivity) as the previous one and the same market value (and thus, with an identical mark-up rate for the producers of equipment goods, the same factor cost), but which allows to save on some variable costs (for example a

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Box 69 (cont'd)

smaller energy consumption). In the productive services approach, one unit of this new generation of equipment goods has, because of this saving in variable costs, a greater volume and a smaller price than a unit of the previous generation, while in the factor cost approach it has the same volume and the same price (7).

Hedonic or matched methods. The practical application of the productive services approach is obviously very difficult to undertake for many goods (cf. *infra*) because it supposes the handling of much complex information on the productive efficiency of equipment goods and on the variable costs induced by their use. To our knowledge, Gordon proposed the only thorough attempt at such an approach (1990, 1993) for two very particular types of goods: aircraft used by air carriers and power stations. Price statisticians developed a method known as "hedonic" (thus named because it aims at apprehending the utility of the item, good for the consumer), or characteristics method, or econometric method, which tries to take into account certain quality changes of the goods covered by price indices. Applied to investment goods, this method allows a volume–price factoring, which gets closer to the productive services approach. The matched method also aims at getting closer to this approach (8).

The hedonic method of volume–price factoring applied to equipment goods consists, in its most frequent version, of estimating econometrically the value of the products in which one is interested (for example microcomputers) by using as explanatory variables the whole set, if possible, of the most significant technical characteristics (speed, memory, weight, etc.), as well as time dummy variables for each period of time (each year, if this method is applied to annual data). The coefficients of the time dummy variables then correspond to the prices of the goods at each period (annual prices for example), corresponding to fixed characteristics and thus to assumed unchanged volume. This method can thus result in concluding that the price of a new good with higher performance is lower than the price of the old one, even if its market value is strictly identical, whatever its production costs are; on the contrary, its volume, calculated on the basis of hedonic price, will be higher than one based on the (non-adjusted) observed price. This result is characteristic of the computer equipment market, and the hedonic methods applied in this case lead indeed to measure an extremely fast price fall (9).

If the hedonic method can take into account significant characteristics of the performances of the products considered, it cannot handle cases when completely new characteristics appear. Besides, it does not generally include the characteristics of variable user costs. For example, the new generation of computer equipment (large systems, networks) has, for the same value, even for a smaller value, a much higher productive efficiency and nevertheless implies variable operating and maintenance costs lower than the previous generations. The hedonic method tries to take into account the first aspect (productive efficiency) but often ignores the second (saving in variable costs per unit of output). Consequently, it tends to over-estimate the price increase (or to underestimate the price decrease) for productive services (cf. Gordon, 1993). It thus provides an evaluation of the price trend, which is intermediate between the factor cost and the productive services' approaches, even if one may think that it must be much closer to the latter.

The matched method, frequently used in practice, only takes into account, in the calculation of the price index between two successive periods, the products present on the market at these two periods. It does not try to evaluate the price change induced by the appearance of a new product at the time when it appears. For markets such as ICT [information and communication technology], where the renewal of products is extremely fast, this computational convention can have serious consequences, because price drops can intervene at the same time as the introduction of new products on the market. Thus, for ICT, it is not unfrequent to market a new product both more powerful and cheaper than the former one. The matched method, which does not take into account the decrease in price due to the appearance of the new product, leads then to an underestimation of the price drop. The latter can be all the more important when the renewal of products is itself

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Box 69 (cont'd)

more significant. Examples of such differences in the comparisons of price changes derived from hedonic and matched methods can be found for computer equipment in Cole *et al.* (1986), and for software in Parker, and Grimm (2000) (10).

Globally it can be concluded that, in the case of ICT, the measures of price changes using theoretical approaches and practical methods are ordered as follows:

Productive services approach < Hedonic method < Matched method < Factor cost approach

Let us stress that the difficulties in measuring prices associated to ICT do not relate only to business investment, but also to household consumption, either of computers or of mobile phone products and services. They also lead in this case to an underestimate of the price decrease (or an overestimate of the increase).

Explanatory notes by the authors

6. This example is of course purely pedagogical; an eraser cannot be regarded as an investment good, because it does not satisfy the condition of a minimal unit value nor that of a service life (corresponding to a normal use) of more than one year.
7. In the eraser's example, the only variable cost was the remuneration of the user of the eraser, which was implicitly supposed unchanged (more exactly proportional to the productive services).
8. For a presentation of the principle of the hedonic and matched methods, cf. Triplett (1986) or Cole *et al.* (1986).
9. Obviously, one should not conclude from this that the hedonic method systematically leads to a decrease in prices; it is the case for computer equipment, but it is not so for other goods whose performance improves less rapidly.
10. These examples are included in OECD (1999).

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The article from which the preceding text is extracted presents in box 1 (pp. 77–78), not reprinted here, the principal methods with the calculation formulas that characterize them. It will be noted that in the text of the present chapter, the expression "resource cost" is preferred over "factor costs" used by these authors, in order to avoid any confusion with the meaning of this latter terminology in the history of national accounting (see chapter 6).

price indices of the cost of the *input* characteristics and price indices of the *output* characteristics. For the former, the quality adjustment is done from the user's point of view, for the latter, using the resource cost. The two approaches correspond to two different views – construction of an index of *inputs* and measurement of the *output* of capital goods – that Triplett reconciles at the theoretical level.

However, as Denison indicates, for Triplett the relevant characteristics and the measurement of their prices are almost always the same in the two approaches (and are *input* characteristics), the production cost approach is reduced in fact, with few exceptions, to that of the user value. National accounting, in addition, in its goods and services accounts, uses the same volume–price factoring for the production of equipment goods and for the corresponding GFCF.

6.2. A crucial controversy

The methodological renewal thus initiated is far-reaching in scope. It questions empirical measurement practices, whose significance was unclear. However the implementation on a large scale of the suggested approach raises many problems. The redefinition of goods in terms of characteristics often proves complex and hedonic methods consider only a limited number of characteristics. Triplett notes (1990) that the automobile for instance – a classical case of experimentation of the hedonic approach since Andrew T. Court's first attempt in 1939 – is particularly difficult to determine: one can assert that, from an engineering standpoint, an automobile is more complicated than a computer or aircraft; the way in which its characteristics enter the user utility function is very complicated and very hard to model; the degree of multicollinearity among explanatory variables is high (pp. 219–220).

In practice, the new approach is likely to have considerable impact on the measure of productivity and growth, when and where technical progress is rapid. It leads, then, to increases in the volume of output of equipment goods that can be much higher than before (and thus to lower increases, or to significant drops in price).

Productivity gains, thus, tend to be displaced from industries using equipment goods, where they traditionally appear, towards the industries that produce them (the latter, of course, do not constitute the ultimate stage of the analysis, since it is necessary to investigate the initial sources of the changes in performances, i.e., in particular, the increase in the quality of human resources and the mechanisms of innovation). Will there even remain any productivity gains in the former? To the objection of their disappearance, which he mentions (*Panel to Review Productivity Statistics*, 1979, p. 13), Triplett answers (1983, pp. 303–304) that it is not the case ... in theory, because one should not mix up the contributions of increased characteristics (a movement along a production function) and a shift in the production function itself (a productivity change). He recognizes that if the production function is not known, but only inputs and outputs in both periods, it is not possible then to distinguish the two phenomena and the measure of productivity change for the user vanishes if one assigns all output changes to input changes.

At the global level, measurement of growth rate by using GDP is likely to be skewed. Indeed, from the method followed for the estimates of GDP it results that the increase in volume of the output of fixed capital goods has a counterpart in the volume of GFCF as final use. On the other hand, the increase in volume of the fixed capital utilized by industries, which appears in productivity calculations involving them, does not influence, as inputs, the calculation of GDP. The latter then records the effect of the increase both in the volume of the capital goods that are produced and in the volume of output to which they contribute. A faster increase in the volume of capital goods certainly has as a counterpart a higher consumption of fixed capital in volume, but this one, by definition, does not intervene in the calculation of GDP. Obviously, this problem is not new. It has been well known, for a long time, that NDP (consumption of fixed capital being deducted) and not GDP should be used as a measure of growth. Since there is a tendency towards a wider introduction of technical progress in the measure of the volume of fixed capital, the inadequacy of GDP as a macroeconomic indicator of the productive activity is accentuated in periods of strong technical change. For example, it has been possible to quantify the total growth differential between France and the USA over the period 1995–1999 as 1.9% for GDP, but as approximately 1.4% for NDP (François Lequiller, “La nouvelle économie et la mesure de la croissance” [The new economy and the measurement of growth], (*Economie et Statistique* 2000, 9/10, no. 339–340, pp. 45–71, see p. 68).

To the already difficult new approaches to the measurement of changes in volume and price for capital goods, is to be added, in the last decade of the century, a critical resurgence of interest for statistics on capital stocks. An international group considers the issue. In this context, Triplett again (1997), still in the line of Jorgenson and his associates, distinguishes wealth capital stock and productive capital stock. The first is well adapted to measures of SNA value, income, saving, etc., and to measures of capital for the accounts of industries and sectors if one is interested in flows of income which derive from them. But it is not adapted to the analysis of output and productivity estimates. It is the productive capital stock that is appropriate in those cases. In the latter concept, basically physical, even if aggregation in value is necessary, goods must be normally aggregated using as weights the prices of capital services and not the prices of the goods themselves. The productive capital stock depends on the profiles of “deterioration” of the capital vintages (losses of productive efficiency according to age and retirements), and not on the depreciation profiles (see Box 56, chapter 8).

Triplett stresses the need for actual measurement, by means of observations, of the evolution in the volume of capital services. Indeed, the usual definition, which supposes them proportional to the productive capital stock, is circular since the capital stock itself depends on the services that are expected from it, but from this point of view, it rests on speculative bases, not on empirical observations.

Thus the orientation suggested leads, as in the case of volume–price factoring of equipment goods according to their productive performances (but that is also valid for the consumer goods, and not only for durable goods), to emphasize the need for the development of a considerable amount of complex and expensive technical and economic information on capital services as well as on capital stocks.

In the two last decades of the century, the case of computers and more widely new information and communication technologies (ICT) is what most draws the attention. Technical progress is so fast in this field, and the changes in price trend profiles, following changes in measurement methods, are so spectacular, that it concentrates the efforts of both measurement and analysis. It would be nevertheless a mistake to believe that one can be satisfied with following the old approach elsewhere. As the Gordon study shows for commercial aircraft, technical progress is or was at various times considerable for many equipment goods (aircraft, automobiles, locomotives, electric and electronic appliances, etc.) or for consumption goods (pharmaceutical products in particular), but also for services (in the field of health for example). All goods and services, beyond ICT, which experience high efficiency gains for their users call for research where public and private inter-institutional collaboration appear necessary. A partial renewal of economic history is at stake here.

7. International comparisons of volume and price

7.1. Before the ICP project

From the very beginning, as early as in the works of Petty and King, concern for comparing national income of different countries is present. It tends to grow blurred during the following centuries and becomes of major importance, on the contrary, in the second half of the 20th century. Shortly before, Colin Clark carries out pioneer research in *The Conditions of Economic Progress* (1940). He gathers data on national income in various countries and seeks to make them comparable using an international unit of real income defined as “the quantity of goods and services exchangeable in the USA for 1$ over the average of the decade 1925–1934” (3rd ed., 1957, p. 18).

After World War II, national accounts compilations multiply. International economic and political cooperation creates a pressure for extending and making national accounts comparable. Four types of needs appear, which, in what remains of the century, will bring about efforts of unequal intensity:

- need for a standardization of statistical and accounting frameworks, in order to define in a coherent way what is to be measured (see part II of the present volume);
- need to measure in a homogeneous way what has been defined (see part III);
- need to take into account the peculiarities of countries with different structures and levels of development; clearly present in Kuznets, in particular in 1947 in

his comparison of income per capita between the USA and China, this concern is so strong among specialists in Third-World issues, that it often results in questioning the adequacy of the Standardized Systems of national accounts to the conditions of less-developed countries and thus the relevance of any international comparison of income involving them; recognized as legitimate in its principle, it will nevertheless be rather neglected in actual international activity;

- need to overcome the obstacle to comparability represented by the existence of a variety of currencies, compositions of baskets of goods and services produced and used, price levels and relative prices.

Trying to satisfy this last concern amounts to facing the same basic problems as in inter-temporal comparisons within a country, but under more difficult conditions. The problem arises, of course, only because the use of exchange rates, frequent as it is, is considered to be misleading for national income comparisons.

The exchange rates indeed, even when they are not fixed by public authorities, reflect primarily the price ratios of goods and services that enter international trade, though not those of all products, and are also influenced by capital flows, subject to short-term variations of great amplitude. In order to compare GDP or GNP in volume and their components, the idea is to calculate more significant "purchasing power parities" (PPP) which, applied to current values stated in terms of national currency, make it possible to get estimates in volume. Based on price ratios observed between various countries for identical or similar products, the PPPs are coefficients through which current values stated in terms of national currency are converted into international value as homogeneous as possible in terms of purchasing power. They are calculated for groups of products, for components of GDP on the expenditure side (consumption, capital formation) and for GDP as a whole.

The OEEC, which greets "the enormous statistical *tour de force*" (Gilbert and Kravis) that Colin Clark's work represents, plays a pioneer role. It publishes in 1954 "An international comparison of national products and the purchasing power of currencies", prepared by Milton Gilbert and Irving Kravis, which covers five countries for the year 1950 (the USA, the United Kingdom, France, Germany, Italy). Gilbert and his associates then extend it ("Comparative national products and price levels", 1958) to four more countries (Denmark, Norway, Belgium and the Netherlands) and to the year 1955. Comparisons are also carried out starting from the end of the 1950s within the framework of the CMEA for Eastern European countries, somewhat later in Latin America. Others, limited to consumption, start between some countries with planned economies or market economies, within the framework of the UN Regional Commission for Europe.

7.2. The International Comparison Project (ICP)

The international statistical community then decides to go a step further. In 1968 the International Comparison Project of the United Nations is created, since then largely known under its ICP acronym, in order to extend comparisons to more countries, if possible at the world level, and to make regular compilations. Kravis and his associates at the University of Pennsylvania (Alan Heston and Robert Summers) play the leading role until the end of the 1970s. Then it is taken over by international organizations, in particular Eurostat (Krinze-Locker is the driving force there) and starting from the mid-1980s the OECD (Hill and David Roberts), in the context of a regionalization of the Project.

The results obtained by the ICP are very significant. They show the importance of the *exchange-rate-deviation index* (ratio between the value of GDP estimated by the ICP and the one resulting from the use of the exchange rate). Above all, they show that this index varies negatively according to the level of GDP per capita in volume. Thus, in 1975, it varies from 0.8 to 1.1 in Western Europe and Japan, while it reaches 3.2 for India, 3.1 for Pakistan, 2.8 for Colombia, 1.9 for Kenya and 1.6 for Brazil (*World Product and Income*, UNICP phase III, p. 12). For a developed country, which experiences strong fluctuations in its exchange rate, the comparative level of its GDP can strongly vary if converted with these rates. Thus, using exchange rates, Japan's GDP seems to represent 34.5% of the US GDP in 1982 but ... 73.5% in 1995 (respectively 36.8% and 60.7% of the GDP of Europe of 15), a completely incredible evolution, whereas converted using PPPs derived from ICP, it represents respectively 36.9% and 39.3% of the US GDP and 34.5% and 39.4% of the European GDP (Table 1, p. 6 of a report by Ian Castles for the OECD). The exchange rates, linked to the international purchasing power of currencies, poorly reflect their total purchasing power, and this situation is in general worse as countries are less developed and/or slightly open.

These conclusions are widely acknowledged. Nevertheless, thirty years after the beginning of the ICP, PPPs are still not currently used. They have not systematically replaced exchange rates for international comparisons of product and income. At the end of the century, the media frequently disseminate aberrant conversions of income per capita, for instance for Central and Eastern European countries and Russia. PPPs are used by international organizations for statistical purposes, but not in a systematic way. The Castles report observes that a range of OECD publications continue to use exchange rate conversions in making economic comparisons of economic quantities. Positive signs however: starting with its 1995 issue, the *World Bank Atlas* uses PPPs to compile alternative estimates of income to those obtained using exchange rates; the 1997 edition and the following editions of the *World Bank's World Development Indicators* make a broader use of them (see Box 70); the UN uses them in the calculation of its Human Development Indicator. By contrast, PPPs are not used to establish the contributions of Member States. The most important official application of these results is the use by the European Union to compute GDP per capita, on which basis most of the structural funds are allocated.

At the end of the century, the ICP is, in fact, still questioned (it is "in crisis" says the 1998 evaluation report by Jacob Ryten for the IMF, the UN and the World

Box 70
National income per capita, according to exchange rates and purchasing power parities (World Development Indicators 2000)

For the sake of illustration, the table below, extracted from the World Bank's publication *World Development Indicators 2000* (p. 12), shows gross national income per capita in the 1993 SNA sense (this publication still uses the term GNP) for major country groups, first by converting national data using exchange rates (the Bank uses a three-year average), and secondly by converting them using purchasing power parities (estimates by the Bank based on prices collected by the International Comparison Program). The results are in international dollars, an international dollar having the same purchasing power on GNP as a US dollar.

Based on the table, it is easy to observe the negative correlation between the level of per capita income and the spread between PPPs and exchange rates.

GNP (GNI) in dollars per capita

	With exchange rates	With PPP
World	**4,890**	**6,300**
Low-income countries	**520**	**2,170**
– except China and India	370	1,360
Middle-income countries	**2,990**	**5,990**
– lower middle-income	1,740	4,700
– upper middle-income	4,870	8,020
Low and middle-income countries	**1,250**	**3,300**
East Asia & Pacific	990	3,280
Europe & Central Asia	2,200	5,510
Latin America & Caribbean	3,860	6,340
Middle-East & North Africa	2,030	4,630
South Asia	430	1,940
Sub-Saharan Africa	510	1,440
High-income countries	**25,480**	**23,420**
European Monetary Union	22,350	20,440

Bank) and evaluations of the results and difficulties of the project are under way at the OECD and the United Nations. A small group of influential countries continue to express reservations on the implementation and the results of the Project. This is an astonishing situation, after such a long period of statistical development in the world, and when the purpose is to calculate fundamental indicators for economic and social analysis. This situation is due to the difficulties of the endeavor and, according to Castles, the negligible amount of resources devoted to these comparisons.

The ICP extends with difficulty its geographic coverage. From 10 countries included in phase I (1970), it goes to 34 for phase III (1975) and to about sixty for the two following phases (1980 and 1985). It is only for phase VI (1993) that coverage becomes large (120 countries, a third of which on the basis of a limited information method). Europe and North America are completely studied. African countries are financed by Europe, as the Eastern European countries for 1993. Latin America in particular is only partially included, and in a very fluctuating manner. At the end of the century, China's participation is expected.

The results of the different phases of the Project, with intervals from five to eight years, are not strictly mutually comparable for many reasons (each phase represents the building of an independent base, the number of countries changes, methods evolve). Moreover, they are available, on a worldwide scale, with a long delay of approximately six years (for comparisons organized by Eurostat and OECD the delay is reduced to only fifteen months). Since 1990 the Eurostat–OECD program provides annual results for the European Union and triennial results for the OECD countries.

The ICP methodology, which carries out simultaneous multilateral comparisons, is inevitably complex and may give rise to variants that significantly differ and influence the results. The transitivity constraint (indices indirectly connecting pairs of countries must be equal to the direct indices between them) is essential for spatial comparisons (it is not so for comparisons across time, see on this point section 1 and the appendix to this chapter "Reviewing indices"). It ensures that the results are invariant whatever national currency is used as the numéraire for presenting them. At the detailed category level (groups of products), as it is not possible to start from an identical list of products for all countries involved (on a worldwide scale it would be too limited), it is necessary to build a complete and transitive matrix of elementary PPPs using mathematical procedures, in order to estimate missing prices. The ICP uses for this purpose alternately the country-product-dummy method from Summers, based on a regression technique, then – starting in 1975 – the EKS method (independently proposed by Eltetö, Köves and Szulc), which in its principle is based on the geometric mean of the various direct and indirect estimates of a PPP.

Higher than the detailed category level (at this level – due to data issues – the price ratios of the products observed have usually not been weighted), the aggregation procedure in order to obtain GDP and its main components gives rise to severe methodological confrontations. Until the exercise for 1985, the ICP uses the method suggested by Geary (1958) and further developed by Khamis (1967, 1970, 1972). It uses international average prices corresponding to the group of countries under consideration, in a way similar to the compilation of base year constant prices in time series. It has advantages (in particular it provides balanced additive results) and drawbacks (specifically, as international average prices are strongly influenced by those of the richest countries, it tends to over-estimate the volumes corresponding to poor countries insofar as volumes and prices are generally negatively correlated). The EKS method has a different approach. It starts from all the possible binary comparisons between pairs of countries and the resulting, non-transitive, Fisher indices, and derives from them transitive indices presenting a minimum deviation. For each binary comparison, weights are specific to the couple considered. Multilaterally, the situation is similar to that of chain indices, and results are non-additive. At the end of the 1980s, the experts' preference moves towards the EKS method. Nevertheless, no method is considered to be better from all the points of view, and the 1993 SNA (§§ 16.102–104) concludes that they both have their place (the OECD publishes results according to both methods). The SNA reinforces the parallel with the use of fixed-base indices and chain indices in time series and recommends the compilation of EKS indices for GDP and the principal expenditure aggregates when these indices are taken in isolation and the use of results according to the Geary–Khamis method for structural analyses where additive consistency is desirable.

The regionalization of the Project, which is introduced starting from phase IV (1980) results partly from institutional and financial considerations (weakening of the United Nations and increased role of Eurostat in particular) and facilitates the organization of operations and an earlier publication of the results. It aims also at limiting certain weaknesses of the ICP on a worldwide scale. On a regional basis, the choice of the products whose prices are to be observed makes it possible to better take into account both their characteristicity (to have identical or equivalent products in terms of characteristics, a condition for a homogeneous observation) and their representativeness (relevant weights in the various countries, a condition for a significant comparison). Differences in results due to the application of the GK or EKS methods are usually small for economically similar countries (but remain high for those which deviate from the majority of the area, the case of Greece and Portugal in Europe, for example), which allow also to choose different methods according to regions. In zones such as the European Union it is possible to keep the comparisons between Member States fixed at all levels, the Union being then regarded as a single country at the higher levels of aggregation. In certain cases the region is divided into groups, with certain countries present in two groups, playing the role of bridge-country.

Upstream from the above-mentioned methodological difficulties, the observation of prices remains the fundamental stage of the process (the values of GDP and its components in national currencies are not free from problems, but are derived from national accounts). Difficulties are particularly important for certain types of services (housing, education, health, government collective services), so severe in fact that the ICP gave rise to the expression "comparison-resistant services", and for fixed capital goods.

All these problems mean that the results of the ICP do not present, or at least not yet, the same degree of credibility as those of national price indices (themselves not exempt of difficulties but to a lesser extent). Reservations and criticisms have a technical character, but in certain cases there is also a political background. Thus a country like India, fearing the use of the results in determining country eligibility for aid or loans with favorable conditions, assumed from the very beginning a very critical attitude towards them. Orders of magnitude provided by the Project are certainly much more reliable than those obtained by the use of exchange rates, but the state of methods and practices at the end of the century cannot guarantee that the new level of GDP or consumption in volume is not at this time over-estimated for certain developing countries, or that the possible distortions are not unequal among countries. The case of the ICP well illustrates the opposition between real objectivity (a measure is better, but it might lack precision and be difficult to explain) and formal objectivity (a measure is manifestly bad, but it is precise and easy to explain).

The difficulties encountered in the ICP for international comparisons concerning GDP, measured according to the final expenditure approach, explain why the project was not extended to the comparison of GDP from the production, value added and productivity points of view. Research is underway in several places, in particular since 1983 at the University of Groningen in the Netherlands (International Comparisons of Output and Productivity or ICOP).

This chapter shows that factoring the change in current value of an economic magnitude between change in volume and change in prices is an exercise which combines observation and modeling, in different proportions according to the problems to be solved.

Outlook

To break down the nominal changes of the apparent prices of products and assets into what corresponds to a change in volume (often described as a "real" change, see Box 71) and what truly represents a change in prices, raises a range of problems among the most difficult that national accounting and economic statistics are trying to solve. The question arises both at the level of elementary products, with characteristics directly observable in principle, and at the level of groups of products arranged according to various criteria and of the most general aggregates of an economy, or even of a set of economies.

What is "volume"?

The concept itself of what is to be measured when speaking of "volume" is not obvious, and increasingly so as the levels of aggregation go higher. What is to be understood, for example, by growth in volume for an economy as a whole? Still more complex a question, but in fact a part of the previous one, is to know what has to be understood by growth in the volume of investment (GFCF). And even beyond is the enigma of the change in volume of the stock of capital and its measurement, understood in its broad sense as all that is used to produce other goods and services.

By speaking of "volume", reference is implicitly made to a kind of invariant standard, permanent over time and in space, in whose multiples the "real" variations of economic magnitudes could be expressed and measured beyond their apparent changes.

Box 71
Vocabulary : "Real"

The term "real" is the most used at the beginning, first with the view of deflating national income by a general price index, in order to make it possible to measure its evolution at constant purchasing power.

Calculations at specific constant prices, which are developed later, are often wrongly qualified as calculations "in constant francs or dollars". This qualifier is valid only for the deflator of GDP or GNP, if it is regarded as measuring the change in the general price level. It is unsuitable for all other entries of goods and services. In 1966, following Courbis' suggestion, CNF (French national accounts) replaces constant "francs" by constant "prices" ("Rapport sur les comptes de la nation de l'année 1965" [Report on national accounts for the year 1965], *Etudes et Conjoncture*, June 1966). On the other hand, the USA and Canada, for example, still improperly use the expression "constant dollars".

National accountants and specialists in statistical observation substitute the term "volume" for that of "quantity", which exclusively applies to the elementary level. Volume combines heterogeneous quantities. It covers at the same time changes in quantity, quality and structure. However, the specialists of indices still use the term "quantity" since, in the theory, all elementary quantities and prices are supposed to be known. Triplett criticizes (orally on the occasion of a IARIW conference) the use of volume, which evokes for him physical measurements of quantity (the term "volume" is precisely used in national accounting to avoid what the term "quantity" suggests ...). More deeply, he analyzes, as Lancaster does, the goods in terms of characteristics, all likely to be expressed as quantities. The revised US accounts, which are still formally apart from the framework of the SNA, do not speak about GDP in volume or at constant prices but of real GDP. The 1993 SNA advises against this expression (§ 16.71). The SNA keeps the term "real" for the case where a magnitude is deflated by a suitable price index to calculate it at constant purchasing power. In truth, the SNA wanders a little between the use of the word "real", ambiguous, though often used by some instead of "in volume", and the use of the preferable expression "in real terms" (§ 16.2).

The SNA also uses the term "real" in the expression "real holding gains and losses", which refers to the change in the value of assets/liabilities due to the change in their relative prices, excluding what is only equivalent to the change in the general price level (see Box 55, chapter 8). Correspondingly, it speaks about changes in real net worth, when only real holding gains and losses are taken into account. This change in real net worth is not a change in volume of wealth ("at constant prices"). Moreover net capital formation, which, simplifying, is equivalent to net saving, is at the actual prices of the period.

The SNA also uses the word "real" in the expression real national income ("in real terms" would have been better) for national income once taken into account effects of changes in the terms of trade with the rest of the world. Having used "real" as meaning "in volume" for GDP, the USA is then constrained to find another expression for GNP (which is the gross national income of the 1993 SNA) adjusted for changes in the terms of trade: it is what they call the "command-basis GNP". This expression alludes to the capacity to acquire goods and services. Without using the expression itself, Denison, in 1967, comments about the concept: "This provides a measure of the quantity of goods and services a nation can command for its own use as a result of its production" (Edward F. Denison, *Why Growth Rates Differ*, The Brookings Institution, 1967, p. 30).

Within the context of national accounting, the term "real" is thus ambiguous. Moreover, for many theoreticians (Hicks, Samuelson, etc.), it refers to a measure of the change of national income, which could be interpreted without ambiguity as a change in welfare (in the meaning of the neo-classical theory) for society as a whole. In a similar approach, Courbis (see section 3 of the present chapter, and Box 66) uses the term "real" in real income with the meaning of "estimated with a currency unit of a same desirability as that in the base year". As for them, financial accounts

cont'd

Box 71 (cont'd)

experts are often inclined to use the term "real accounts" to designate non-financial accounts. Frisch characterized real objects and financial objects.

Finally, economists qualify as real interest, positive or negative, in opposition to nominal interest, what remains after subtracting from the latter the amount required to compensate for the effect of inflation on the principal of a claim. This real interest is not expressed either in volume or in purchasing power (in real terms).

In addition, theoretical models often call real prices, the prices of goods expressed, in the absence of money, in terms of the price of the good chosen as numéraire.

"Real" is thus a term to be handled with caution.

It is neither a "quantity" of satisfaction . . .

The neo-classical economic theory intends to rigorously found the concept of what statisticians want to grasp through the idea of volume. It refers to utility, satisfaction, or welfare of the consumer, utility whose maximization represents the objective of the consumer, under certain conditions and assumptions. However, as the cardinal approach (definition of a numéraire allowing the measurement of the whole utility) seems impracticable, the theory of consumer's preference must, with the concept of ordinal utility, introduce a distance between its conceptual constructs (preference functions and their shift over time) and what can actually be observed (prices and quantities involved in transactions at different places in time and space).

In this context, the measurement of what is behind the idea of volume, or rather the measurement of its change, does not relate to the field of direct observation but to the field of indirect interpretation of what is observed. Even exclusively limited to market final consumption, the interpretation of the changes in the indices that are actually calculated, in terms of welfare for society as a whole seems impossible and with it the interpretation of the change in national income in these terms (see chapter 7, section 1, regarding Hicks and the "*Economica* debate"). From there, the ambitious attempt by Courbis to extend the measurements of change in volume to all flows and stocks covered by a national accounting framework and to interpret the relative price changes thus broadened (as well as the productivity gains) in terms of gains or losses of economic surplus, considered as a change of satisfaction, can only lead to a dead end (see sections 3 and 5 of the present chapter).

In practice, in order to be able to position their analyses within their general theoretical framework, economists who follow the neo-classical theory must adopt very restrictive assumptions, such as that of the representative consumer (an abstract consumer whose preferences are equivalent to those of the whole society) with a stable inter-temporal preference function, etc. However, the conditions that found the interpretation of net domestic product in terms of welfare and sustainability, for example in Weitzman (see chapters 7 and 8), cannot be taken for granted *ex post* in actual economies.

Concerning the economic theory of indices, it only demonstrates a close connection between changes in volume measured by an index of a certain type and changes in welfare in the case of a consumer with a particular utility function, but the value of the theoretical index differs among different consumers with different preferences (see Box 48). Within this framework, it recommends the calculation of indices of a certain type for year-to-year changes and their chaining over time, a conclusion to which empirical approaches also lead (see the appendix "Reviewing indices" of the present chapter), as it seems reasonable, although during a very long time opposite practices with fixed base prices were used, to associate as much as possible the observed quantities to the prices prevailing when the transactions took place.

All in all, it does not seem possible to interpret either in time, or in space, the concept of change in volume of national accounts magnitudes, compiled *ex post* by statisticians, in such a manner that it would represent the change in a welfare-like substratum, subjectively valued by consumers.

From this point of view, it might be necessary to conceive of the relationships between national accounting and standard economic theory in terms of absence of contradiction rather than with the idea that measurement by the former should be based on the latter with the implication that national accounting would try to approximate the measure of change in welfare.

Nor an objective "physical" reality

This conclusion does not imply, however, that the volume targeted by measures of national accounting would have the character of an objective "physical" reality, in the sense of caloric factors, oil equivalent or labor equivalent (labor accounts in particular in the 1960s and 1970s are primarily designed as instruments for structural analysis of the productive system in terms of employment contents within the framework of IOTs). Since changes in quantities and qualities of very diverse products (or quantities of characteristics of these products) are to be combined, the interaction of economic interdependences produces a simultaneous intervention of the determinants of supply, demand, and changing price systems, consumer choices under resource constraints and psychological and social factors as well as those of producers under financial and technical constraints, all of that within the framework of institutions in the broad sense which determine and control the rules of the game.

An abstract concept

In this context, the concept of volume can only have an abstract character, even if the elementary objects (goods and services) that are combined show concrete characteristics. The approach followed by statisticians and national accountants is operational by nature, guided by technical principles and rules of professional ethics. They have nevertheless to be aware of the approach of the theoreticians of economics, in order to draw some guidelines from it, or at the very least to prevent entering into contradiction with it if there are no strong reasons to do so (on the interactions between theory and observation, see also chapter 10). On the other hand, the final interpretation of the resulting measures, in terms of the general objectives of a society and its members, does not seem to be possibly derived from the methodology of the measurement itself. It depends on political considerations, in a very broad sense, even at the individual level, and not strictly on economic ones.

Volume and performance of equipment

The sudden revival, in the last decades of the century, of the debate on the change in volume of investment (see section 6 of the present chapter) and the partial change of the methods in this field clearly illustrate the possible influence of theory (in this particular case the theoretical framework of growth accounting and productivity measurement) on the national accounts measures. At the same time, it seems clear that the principle of comparing two different equipment goods of similar use through the analysis and measurement of their productive performances could have been derived from the sciences and the practice of engineers.

This change of orientation, from the comparison of the respective production costs of the given goods, represents an enormous challenge for economic statistics and analysis at the end of the century, of which the statistical system is probably not yet truly aware. The implementation in this field of hedonic methods, though partial, requires the use of significant economic and technical information and the collaboration of experts from the fields concerned. The more complete approach *via* the productive services (see Box 69 on these methods) is even more demanding, but it more acutely involves, at the same time as it would provide tools for, a notable re-reading of the economic and social history. By doing so, the evolution of technical progress could probably be fully, or in any case much better, accounted for in statistical and national account measures. Though less complete, the implementation of the hedonic methods will surely be highly disturbing.

On the scope and quality of these measures depends the shift of the observed border between, on one side, using the productivity analysts' terminology, technical progress embodied in equipment goods, more generally in production factors (the analysis and measurement of labor and intermediate consumption also require refinement), and, on the other side, dis-embodied technical progress. On this also depends a better delimitation of the respective roles of labor and capital (also of intermediate consumption) on one side, and that of elements (organization, spill-over effects, etc.) non-reducible to components of production factors considered by the theory (see for example Box 56).

Changing the volume–price factoring of investment, with its effects on estimates in volume for tangible and intangible fixed capital stock and the derived productive services, will have – all the more so if widely implemented – significant effects on the analysis and measurement of productivity gains, their distribution between industries producing investment goods and services and industries using them (in an upstream shift of recording within the production process) as well as over time (earlier recording).

At the level of industries producing investment goods and services, the principal challenge is to integrate the analysis of the technical innovation process – and of highly qualified labor employed in it – which is the essential source of increase in productive performances, and consequently of the process of accumulation of education and knowledge.

The complexity and cost of the required statistical investments, and the uncertainty concerning the possibility of extending them in a systematic way to the whole field of investment, create the risk that statisticians and analysts may be driven on a long-term basis into intermediate methodological zones, with substantial simultaneous use of several existing methods, including the more traditional one (which relies on the cost of the resources used). The inevitable consequence of such a situation would be to maintain, even to reinforce, the recurring difficulties in the interpretation of the results of global productivity gains, as well as measures of volume growth of GFCF and GDP.

The progress in spatial comparisons, so useful in contemporary economies, depends also on significant statistical investments, whose implementation seems very slow, whereas the conceptual and methodological difficulties to overcome are still larger than in the case of intertemporal comparisons.

Annotated bibliography

On the antecedents before World War II, see Studenski, *The Income of Nations* (1958, pp. 217–220) and Gutmann (1981, pp. 435–436, see below).

The integrated approach is presented in particular by Richard Stone in *Quantity and Price Indexes in National Accounts* (OEEC, 1956, Chapter III, "Index-numbers in a social accounting framework", pp. 27–45) and by Peter Hill in *A System of Integrated Price and Volume Measures* (OSCE, 1972, Chapter I, "Price and volume measures in an accounting framework", pp. 10–24).

Chapter XVI of the SNA 1993 (due to Hill) presents an excellent synthesis and brings about the methodological problems and solutions recommended on most of the topics of the present chapter.

The measurement of the effect of changes of the terms of trade has been widely discussed in the literature. Pierre Gutmann's synthesis "The Measurement of terms of trade effects" (*The Review of Income and Wealth*, December 1981, pp. 433–453) is probably the simplest introduction. The bibliography (p. 447) provides the references to the authors quoted in this chapter. A very interesting review of the existing literature, with references and discussions of the variants in interpretation and terminology, is also to be found, in a condensed way, in the appendix "Deflators for deriving command series" (pp. 27–28) of Edward F. Denison's paper "International transactions in measures of the nation's production" (*Survey of Current Business*, May 1981, pp. 17–28). The discussion paper submitted by the IMF to the Expert Group in November 1986 also carries an excellent synthetic presentation (Mick Silver and Khashayar

Mahdavy, “Measurement of a nation’s terms of trade effect and real national disposable income within a national accounting framework” in Vicente Galbis (ed.), *The IMF’s Statistical Systems in Context of Revision of the United Nations: A System of National Accounts* (International Monetary Fund, 1991), pp. 123–153). [References in footnotes. General table of the suggested formulas, pp. 132–133. Numerical comparative results according to the various methods for 50 countries, pp. 144–151.]

On the question of complete national accounts systems at constant prices see Raymond Courbis (“Comptes économiques nationaux à prix constants” [National economic accounts at constant prices] (*Etudes et Conjoncture*, July 1964, pp. 5–76), very technical, in particular in his attempt to give an interpretation (pp. 21ff), it is very well summarized by the author himself (Box pp. 5 and 6, and in this book, Box 66). Briefly commented references (p. 65) in particular to Stone, Geary and Burge, Stuvel. The discussion of the treatment of external transactions by Geary and Stuvel and the solution suggested by Raymond Courbis himself are to be found on pp. 11–20. The integration by Geary of the external account within accounts at constant prices as a whole (R.W. Burge and R.C. Geary, “Balancing of a system of national accounts in real terms”, IARIW Conference, August 1957) is explained on p. 13. G. Stuvel’s method (“Asset revaluation and terms-of-trade effects in the framework of the national accounts” (*The Economic Journal*, vol. LXIX, June 1959, pp. 275–292) is presented on pp. 14–16.

On growth accounting, for France (within the framework of parallel research on Germany, United Kingdom, the USA, Italy, Japan and Sweden), see the book by Jean Jacques Carré, Paul Dubois and Edmond Malinvaud, *La Croissance française. Un essai d’analyse économique causale de l’après-guerre* (French Growth. An Essay of Causal Economic Analysis of the Post-war Period] (Seuil, 1972, première partie “Facteurs physiques de la croissance” [First part “Physical factors of growth”). A similar comparative research was developed in: Edward F. Denison, assisted by Jean-Pierre Poullier, *Why Growth Rates Differ: Postwar Experience in Nine Western Countries* (The Brookings Institution, 1967). Denison had published before *The Sources of Economic Growth in the United States and the Alternatives before Us* (Committee for Economic Development, 1962). The now classical paper by R.M. Solow, “Technical Change and the Production Function” (*Review of Economics and Statistics*, vol. 39, 1957, pp. 312–320) is included in the book of Readings *Growth Economics*, Amartya Sen (ed.) (Penguin Books, 1970, pp. 401–419). This same volume presents (pp. 420–473) a paper by D.W. Jorgenson and Z. Griliches “The explanation of productivity changes” (*Review of Economic Studies*, vol. 34, 1967, pp. 249–283) [assumption: “if real product and real factor input are accurately accounted for, the observed growth in total factor productivity is negligible”, “the growth in total output is largely explained by growth in total inputs”, in *Growth Economics* pp. 420–421]. For a research over long period, see Angus Maddison, “Growth and slowdown in advanced capitalist economies: techniques of quantitative assessment” (*Journal* *of Economic Literature*, June 1987, pp. 649–698; its two conclusion pages, pp. 677 and 681, constitute a summary of the debate).

On the topics of sections 5 and 6, the two OECD handbooks (*Measuring Capital* and *Productivity Manual*) used in chapter 8 are essential background material.

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The Denison–Gordon discussion is a good introduction to the various approaches that have been suggested to measure the changes in volume and price of equipment goods. Edward F. Denison, "Robert J. Gordon's concept of capital" (*The Review of Income and Wealth*, March 1993, pp. 84–102); Robert J. Gordon, "Reply: The concept of capital" (*ibid.*, pp. 103–110; Bibliographical references, p. 102).

References to Denison 1957 and 1989 are: "Theoretical aspects of quality change, capital consumption, and net capital formation, and Reply by Mr. Denison", in *Problems of Capital Formation*, vol. 19 of *Studies in Income and Wealth* (Princeton University Press for the National Bureau of Economic Research, 1957), pp. 215–261 and pp. 281–284; *Estimates of Productivity Change by Industry; An Evaluation and an Alternative* (Brookings Institution, 1989).

The 1983 paper by Jack E. Triplett is somewhat difficult to read: "Concepts of quality in input and output prices measures: a resolution of the user-value resource-cost debate", in M.F. Foss (ed.), *The U.S. National Income and Product Accounts*, vol. 47 of *Studies in Income and Wealth* (University of Chicago Press for the National Bureau of Economic Research, 1983), pp. 269–311. Less difficult, his 1990 paper, "Hedonic methods in statistical agency environments: an intellectual biopsy", in E.R. Berndt and J.E. Triplett (eds.), *Fifty Years of Economic Measurement*, vol. 54 of *Studies in Income and Wealth* (NBER/University of Chicago Press, 1990), pp. 207–233 is a very lively discussion of the conceptual and practical attitudes concerning the hedonic methods (many references pp. 231–233, of which that to Andrew T. Court, "Hedonic price indexes with automotive examples" in *The Dynamics of Automobile Demand*, General Motors Corporation, 1939). Triplett's paper "Concepts of capital for production accounts and for wealth accounts: the implications for statistical programs" was prepared for the International Conference on Capital Stock Statistics (March 10–14, 1997, Canberra, Australia).

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T.P. Hill, *The Measurement of Real Product* (OECD, 1971) discusses (Chapter 2) the properties of the various methods followed to estimate real product (i.e. at constant prices) and presents (Chapter 3) the methods used in each country and by industry (summary table pp. 58–59). [An answer full of nuances pp. 66–67 to the question “should double deflation be more extensively used?”]. Discussions on double deflation are summarized in the present chapter using a paper full of information presented to the August 1994 IARIW Conference by M. Salem, N. Miller and Y.M. Siddiqi, “Double deflation and the Canadian experience in measuring real GDP” [The authors are Statistics Canada staff members]. References to the quoted authors (C. Sims, K. Arrow, K. Sato, M. Bruno, W.E. Diewert, P.A. David, S. Fenoalta) and others (in particular S. Fabricant and J.W. Kendrick and E.C. Jones) are given pp. 39–41. The paper by René Durand: “An alternative to double deflation for measuring real industry value added” is published in *The Review of Income and Wealth*, September 1994, pp. 303–316. The critical text of L.A. Vincent on the concept of value added in volume is his paper “La notion de valeur ajoutée et la prévision économique” [The concept of value added and economic forecast] (*Etudes et Conjoncture*, January 1963, pp. 87–93). Courbis’s “Comptes économiques nationaux à prix constants” [National economic accounts at constant prices] discusses it and makes an alternative proposal (1964, pp. 50–53).

Methods concerning international comparisons of volume and price are rather complex. Patrick Pauriche presents a broad outline of them in a short paper “Parités de pouvoir d’achat” [Purchasing power parities] in *Le Courrier des Statistiques* (no. 64, December 1992, pp. 15–22). Annex I of the *Handbook* *of the International Comparison Programme* (United Nations 1992) is dedicated to the history (pp. 64–69) and the organization of the International Comparison Program, with references. History also, including additional references to the 1995 and 1996 publications, in a short paper by David Roberts, "The International Comparison Programme: past, present and future" (*Bulletin of the International Statistical Institute*, 51th session, Istanbul, 1997, vol. 1, pp. 205–208). Detailed references to the publications of results by Eurostat, the OECD and the UN can be found in the Eurostat publication, turned annual, *Purchasing Power Parities and Derived Economic Indicators* (with a general presentation of the methodology). Towards the end of the century, questioning on the results of the program gives rise to evaluation reports: Ian Castles, *Review of the OECD–Eurostat PPP Program*, STD/PPP (97) 5 (OECD, June 1997); Jacob Ryten, *The Evaluation of the International Comparison Project (ICP)* (International Monetary Fund, United Nations and World Bank, September 1998).

On labor accounting, see for example Jacques Freyssinet, Michel Hollard and Guy Romier's paper: "Les comptabilités sociales en temps de travail" [Social accounting in labor time] (*Economie et Statistique*, no. 93, October 1977, pp. 39–49, with bibliography).

The ICOP Project of multilateral comparisons of output and productivity is presented by B. van Ark, in *International Comparisons of Output and Productivity* (Monograph series no. 1, Groningen Growth and Development Center). See also by D.S. Prasada Rao and Marcel Timmer, "A framework for multilateral comparisons of manufacturing sector comparisons in the ICOP project: issues, methods and empirical results" with a historical summary pp. 3–4 and references pp. 37–39 (presented at the 26th IARIW Conference, Cracow, Poland, August 27 to September 2, 2000).

Appendix. Reviewing indices

Chapter XVI of the SNA 1993 (written by Peter Hill) treats the topic of prices and volume. Certain extracts are reproduced here.

16.14 A price index is an average of the proportionate changes in the prices of a specified set of goods and services between two periods of time. Similarly, a volume index is an average of proportionate changes in the quantities of a specified set of goods and services. [...]

16.15 In line with normal conventions, the period that serves as the reference point will be designated as period *o* and the period which is compared with it designated as period *t*. [...] The ratio of the price, or quantity, of a specific product in period *t* to the price, or quantity, of the same product in period *o*, is described as a price relative, or quantity relative: namely, p_t/p_o or q_t/q_o. [...]

Most index numbers can be expressed as, or derived from, weighted averages of these price or quantity relatives, the various formulas differing from each other mainly in the weights which they attach to the individual price or quantity relatives and the particular form of averages used: arithmetic, geometric, harmonic, etc. [...]

16.16 The two most commonly used indices are the Laspeyres and Paasche indices. Both may be defined as weighted averages of price or quantity relatives, the weights being the values of the individual goods or services in one or other of the two periods being compared.

Let $\upsilon_{ij} = p_{ij}q_{ij}$: the value of the *i*th product in period *j*

The Laspeyres price index (Lp) is defined as a weighted arithmetic average of the price relatives using the values of the earlier period *o* as weights:

$$\mathrm{Lp} = \sum_i \frac{\upsilon_{io} \cdot p_{it}/p_{io}}{\sum_i \upsilon_{io}}, \tag{1}$$

where the summation takes place over different goods and services. The Laspeyres volume index (Lq) is a similar weighted average of the quantity relatives, that is:

$$\mathrm{Lq} = \sum_i \frac{\upsilon_{io} \cdot q_{it}/q_{io}}{\sum_i \upsilon_{io}}. \tag{2}$$

[...] As the summation always takes place over the same set of goods and services it is possible to dispense with the subscript *i* in expressions such as (1) and (2). As υ_j is equal to p_jq_j by definition, it is also possible to substitute for υ_j in (1) and (2) to obtain:

$$\mathrm{Lp} = \frac{\sum p_t q_o}{\sum p_o q_o} \tag{3}$$

and

$$\mathrm{Lq} = \frac{\sum p_o q_t}{\sum p_o q_o}. \tag{4}$$

Expressions (1) and (3) are algebraically identical with each other, as are (2) and (4).

16.17 Paasche price and volume indices are defined reciprocally to Laspeyres indices by using the values of the later period *t* as weights and a harmonic average of the relatives instead of an arithmetic average. A Paasche index (Pp or Pq) is defined as follows:

$$\mathrm{Pp} = \frac{\sum v_t}{\sum v_t \cdot p_o/p_t} = \frac{\sum p_t q_t}{\sum p_o q_t} \tag{5}$$

and

$$\mathrm{Pq} = \frac{\sum v_t}{\sum v_t \cdot q_o/q_t} = \frac{\sum p_t q_t}{\sum p_t q_o}. \tag{6}$$

When a time series of Paasche indices is compiled, the weights therefore vary from one period to the next.

16.18 [...] When both $\sum v_t$ and $\sum v_o$ are known, one or the other out of a complementary pair of Laspeyres and Paasche indices can be derived indirectly. For example,

$$\mathrm{Lq} = \frac{\sum v_t / \sum v_o}{\mathrm{Pp}} \tag{9}$$

and

$$\mathrm{Pq} = \frac{\sum v_t / \sum v_o}{\mathrm{Lp}}. \tag{10}$$

Thus, the Laspeyres volume index can be derived indirectly by dividing the proportionate change in values by the Paasche price index, a procedure described as price deflation. As it is usually easier, and less costly, to calculate direct price than direct volume indices, it is common to obtain volume measures indirectly both in national accounts and economic statistics generally.

16.20 Before considering other possible formulas, it is necessary to establish the behaviour of Laspeyres and Paasche indices vis-a-vis each other. In general, a Laspeyres index tends to register a larger increase over time than a Paasche index, that is, in general:

$$\mathrm{L_p} > \mathrm{P_p} \quad \text{and} \quad \mathrm{L_q} > \mathrm{P_q}. \tag{13}$$

It can be shown that relationship (13) holds whenever the price and quantity relatives (weighted by values) are negatively correlated. Such negative correlation is to be expected for price takers who react to changes in relative prices by substituting goods and services that have become relatively less expensive for those that have become relatively more expensive. In the vast majority of situations covered by index numbers, the price and quantity relatives turn out to be negatively correlated so that Laspeyres indices tend systematically to record greater increases than Paasche with the gap between them tending to widen with the passage of time.

16.24 Fisher's Ideal Index (F) is defined as the geometric mean of the Laspeyres and Paasche indices, that is:

$$F_p = (L_p \cdot P_p)^{1/2} \tag{14}$$

and

$$F_q = (L_q \cdot P_q)^{1/2}. \tag{15}$$

Fisher described this index as "ideal" because it satisfies various tests that he considered important, such as the "time reversal" and "factor reversal" tests. The time reversal test requires that the index for *t* based on *o* should be the reciprocal of that for *o* based on *t*. The factor reversal test requires that the product of the price index and the volume index should be equal to the proportionate change in the current values, $\sum v_t / \sum v_o$. Laspeyres and Paasche indices on their own do not pass either of these tests. On the contrary, assuming the relationships given in (13) hold, it follows from (7), (8) and (13) that:

$$L_p \cdot L_q > \sum v_t \Big/ \sum v_o \tag{16}$$

while

$$P_p \cdot P_q < \sum v_t \Big/ \sum v_o \tag{17}$$

so that neither index passes the factor reversal test.

16.25 The Fisher index therefore has a number of attractions that have led it to be extensively used in general economic statistics. However, it is worth noting that it also has some disadvantages, some practical, some conceptual:

a. The Fisher index is demanding in its data requirements as both the Laspeyres and the Paasche indices have to be calculated, thereby not only increasing costs but also possibly leading to delays in calculation and publication;
b. The Fisher index is not so easy to understand as Laspeyres or Paasche indices which can be interpreted simply as measuring the change in the value of a specified basket of goods and services;
c. The particular preference function for which Fisher provides the exact measure of the underlying theoretic index is only a special case; [see chapter 7, Box 48, point 4];

d. The Fisher index is not additively consistent. As explained below, it cannot be used to create an additive set of "constant price" data.

16.26 [. . .] It has been shown that any symmetric mean of the Laspeyres and Paasche indices is likely to approximate the theoretic index quite closely, the Fisher index being only one example of such a symmetric mean.

16.27 The notion of symmetry can be extended to describe any index that attaches equal weight or importance to the two situations being compared. Another important example of a symmetric index is the Tornqvist, or translog, index (T) the volume version of which is defined as follows:

$$\mathrm{T_q} = \prod \left\{ (q_t/q_o)^{1/2(s_o+s_t)} \right\}, \tag{18}$$

where s_o and s_t denote the share of the total values $(v/\sum v)$ accounted for by each product in the two periods. The Tornqvist index is a weighted geometric average of the quantity relatives using arithmetic averages of the value shares in the two periods as weights. The Tornqvist price index is obtained by replacing the quantity relatives (q_t/q_o) in (18) by price relatives (p_t/p_o).

16.28 The Tornqvist index is commonly used to measure volumes changes for purposes of productivity measurement. [. . .]

16.29 The Tornqvist index, like the Fisher, utilizes information on the values in both periods for weighting purposes and attaches equal importance to the values in both periods. For this reason, its value may be expected to be close to that of an average of the Laspeyres and Paasche indices, such as the Fisher, especially if the index number spread between them is not very large. The difference between the numerical values of the Tornqvist and Fisher indices is likely to be small compared with the difference between either of them and the Laspeyres or Paasche indices.

16.41 If the objective is to measure the actual movements of prices and volumes from period to period indices should be compiled only between consecutive time periods. Changes in prices and volumes between periods that are separated in time are then obtained by cumulating the short-term movements: i.e., by linking the indices between consecutive periods together to form "chain indices". Such chain indices have a number of practical as well as theoretical advantages. For example, it is possible to obtain a much better match between products in consecutive time periods than between periods that are far apart, given that products are continually disappearing from markets to be replaced by new products, or new qualities. Chain indices are also being increasingly demanded by economists and others for analytical purposes and are being increasingly used for special purpose indices, such as consumer price indices, in order to have indices whose weighting structures are as up-to-date and relevant as possible.

16.42 In order to understand the properties and behaviour of chain indices in general, it is necessary to establish first how chain Laspeyres and Paasche indices behave in comparison with fixed base indices. A chain Laspeyres volume index connecting periods *o* and *n* is an index of the following form:

$$\mathrm{L}_{\mathrm{q}}^{\mathrm{c}} = \frac{\sum p_o q_1}{\sum p_o q_o} \cdot \frac{\sum p_1 q_2}{\sum p_1 q_1} \cdots \frac{\sum p_{t-1} q_t}{\sum p_{t-1} q_{t-1}} \cdots \frac{\sum p_{n-1} q_n}{\sum p_{n-1} q_{n-1}}. \tag{19}$$

A chain Paasche volume index $\mathrm{P}_{\mathrm{q}}^{\mathrm{c}}$ is obtained by adding 1 to each of the price subscripts in (19). Laspeyres and Paasche price indices are obtained by interchanging the *p*'s and *q*'s in the expressions for the volume indices.

16.47 [. . .] When the sets of relative prices and quantities in two time periods are similar to each other they should be compared directly and not indirectly via another period whose relative prices and quantities are very different. A chain Laspeyres, or Paasche, index should not be used if the chaining involves an economic detour; i.e., linking through a period, or periods, in which the sets of relative prices and quantities differ more from those in both the first and the last period than the latter do from each other.

16.48 Conversely, a chain index should be used when the relative prices in the first and last periods are very different from each other and chaining involves linking through intervening periods in which the relative prices and quantities are intermediate between those in the first and last periods. [. . .]

16.49 On balance, situations favourable to the use of chain Laspeyres and Paasche indices over time seem more likely than those that are unfavourable. [. . .]

16.50 As explained in the previous section, the index number spread between Laspeyres and Paasche indices may be greatly reduced by chaining when prices and quantities move smoothly over time, even if the cumulative changes in the relative prices and quantities are quite large in the long run leading to a wide spread between the direct Laspeyres and Paasche. [. . .]

16.51 When the index number spread can be reduced by chaining, the choice of index number formula assumes less significance as all relevant index numbers lie within the upper and lower bounds of the Laspeyres and Paasche indices. Nevertheless, there may still be some advantages to be gained by choosing an index such as the Fisher or Tornqvist that treats both periods being compared symmetrically.

16.52 Such indices are likely to more closely approximate the theoretic indices based on underlying utility or production functions even though chaining may reduce the extent of their advantages over their Laspeyres or Paasche counterparts in this respect. A chained symmetric index, such as Fisher or Tornqvist, is also likely to perform better when there are fluctuations in prices and quantities. [. . .]

(Regarding the implementation of chain indices at the INSEE, see "Les prix chaînés" [chained prices], *Méthode base 1995*, no. 12, November 2000); on the methods implemented in the USA, see Eugene P. Seskin and Robert P. Parker, *Survey of Current Business*, "A guide to the NIPA's" March 1998, pp. 36–39, Box p. 38 on the formulas used, Box p. 39 "Calculation of component contributions to the change in GDP".)

PART V

Politics

Chapter 10

Uses and Status of National Accounting

Contents

1. "The Golden Age of National Accounting"

The irruption of national accounting is very broadly welcomed in its time as a major innovation. Martin R. Gainsbrugh, before the Joint Committee of the US Congress, in 1957, "made the following illuminating observation regarding the scientific and practical value of national economic accounts generally in the life of any modern society" (Studenski, *The Income of Nations*, p. 214), while emphatically observing: "The introduction and development of an integrated system of national accounts promises to rank in historic significance with some of the more heralded inventions of recent decades in the fields of physical sciences. This growing family of income and product statistics is without question one of the major contributions – if not the greatest – of the economic fraternity thus far in the 20th Century" (quoted by Studenski, *ibid.*).

As early as 1942, John Hicks places national accounting ("*Social Accounting*" in his terminology) at the core of his introductory book on the study of economics, *The Social Framework. An Introduction to Economics*. He regards it as "a distinct branch of economics", resulting from the work of economic statisticians and some of the newer developments in economic theory. "[...] it is nothing else but the accounting of the whole community or nation, just as Private Accounting is the accounting of the individual firm". It is probably the best way to begin the study of economics, "[...] the other topics [economic theory and applied economics] should come afterwards after the groundwork of Social Accounting has been mastered." (*ibid.*, Preface, p. VI). In 1947, a specialized international association is set up, the IARIW (see Box 72).

1.1. Postwar Reconstruction and Government's economic role

The importance attached very early to national accounting, which is fully illustrated by Gainsbrugh's formulation, has to be understood in reference to the Great Depression of the 1930s and the emergence of the Keynesian theory which is rooted in it. The 1929 crisis had shown both governments and economic agents in disarray. Some dictatorial regimes (Germany, Italy, various Central European countries) try to resolve the crisis by militarizing their economies and societies. Other regimes (USSR) with planned economy, State owing property and without overproduction, represent a challenge. The democratic world answers with the acceptance of increasing government intervention and the idea of macroeconomic regulation centered on demand. The war, which sees the emergence, under Keynes' impetus, of the first actual national accounts, crystallizes the evolution then underway. The extent of human losses and material destruction and the corresponding reconstruction needs; the extension of the Soviet sphere of influence and the risks of shifts elsewhere; the failure of some of the elites in occupied Europe and the recognized necessity of economic and social transformations, in particular of certain nationalizations, after years of suffering, mean that the end of the war does not lead to a swift return to the conditions of a liberal peace economy, with the major exception of the USA. Moreover, the decade preceding World War II was almost everywhere atypical, unlike the situation prevailing before World War I.

The increase in the economic role of government is at that time very generally accepted – although it also gives rise to reserves and criticisms – and is regarded as a durable structural change. The mechanisms of state intervention inherited from the war will evolve, but certain methods of control (of external transactions, prices, wages, foreign exchange, credit, etc.) will persist for a long time, with varying intensity, forms and evolutions, practically during all the growth period of "the Thirty Glorious Years". The transition towards the liberalization of

Box 72
The IARIW

The International Association for Research on Income and Wealth, known as IARIW, is created in 1947. Its foundation is rooted in the Conference on Research in Income and Wealth, which has existed in the USA since 1936.

The set-up meeting, held in Washington in September 1947, designates a provisional Council made up of nine people, introduced in the following way (Carson, 1999, p. 380):

Professor Kuznets
Mr. Stone
Professor Rao
Mr. Clark
Mr. Gilbert
Mr. Derksen
Mr. Lundberg
Professor Tinbergen
Professor Perroux

Almost all these names appear among the principal actors of chapter 1 of this book and no comments are needed.

The fields of activity of the IARIW are widely defined (Carson, p. 381):

- definition and measurement of national income and wealth;
- social accounting [it is the term then in use; see Carson p. 389, box 2 on transition from the social accounting terminology to that of national and economic accounting] and its use in economic budgeting;
- international comparisons and aggregations of national income and wealth;
- problems of statistical methodology, and
- related matters.

Membership in the Association is by invitation. There are thus approximately a hundred members when the first General Conference is held in 1949 in Cambridge (the United Kingdom). Chairmen are to serve a two-year term. Richard Stone is the first Chairman (1949–1951); he is succeeded by Milton Gilbert (USA), Benedetto Barberi (Italy), Kjeld Bjerke (Denmark), Raymond Goldsmith (USA), etc. [Among the French, Jean Marczewski is, from the beginning, a regular participant, Edmond Malinvaud is elected member of the Council in 1957 (for six years). Jean Marczewski belongs to the Council from 1966 to 1969, Jacques Mayer in 1970 and 1971; André Vanoli is Chairman from 1977 to 1979].

The Association holds a General Conference every other year, and regional conferences which, numerous at the beginning, become more scarce afterwards. Until the mid-1960s, a selection of the papers submitted to each General Conference is published in the *Income and Wealth* volumes. In 1965, the formula is changed and participation in the Association becomes open. A quarterly review is created, whose first issue comes out in 1966. *The Review of Income and Wealth* aims at publishing not only a selection of the papers presented to the General Conferences of the Association but also a selection of papers directly submitted to the Review and accepted after the examination procedure current in scientific publications. Very few articles are published in French, almost all are in English. The first issue of the *Review* includes papers by Richard Stone, Peter Hill, John Kendrick and Jacques Mayer. In 1971, Odd Aukrust, assisted by his colleague Per Sevaldson, is the first editor of the *Review*. John Kendrick and Jacques Mayer replace them as co-editors, but as early as 1973 – the task being burdensome – they ask to be replaced.

From 1973 to 1987, Nancy Ruggles, who since 1961 serves as Secretary of the Association at Yale University, and effectively drives the IARIW, also assumes the task of *de facto* Managing Editor of the *Review*, a responsibility that Richard Ruggles assumes after Nancy's death. He is replaced, in 1988, in the function of Editor by Edward Wolff (New York University). Jane Forman becomes the Secretary of the Association. [Nancy and Richard Ruggles have for years been the soul of the Association. Three volumes of their research work have been reprinted in 1999: Nancy D. Ruggles and Richard Ruggles, *National Accounting and Economic Policy; The United States and UN Systems; Pricing Systems, Indexes and Prices Behavior; Macro- and Micro-data Analyses*

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Box 72 (cont'd)

and their Integration (Edward Elgar). Review article by Utz-Peter Reich in *The Review of Income and Wealth*, December 2000, pp. 501–506].

The evolution of the topics of the conferences and the contents of the *Review* reflect the tendencies at work in national accounting and in the broader fields covered by the IARIW. Since the mid-1980s, it is possible to note the increase in the relative share corresponding to topics related to the distribution of household income and wealth. Many of them rely on the analysis of micro-data bases. They often cover issues that more broadly relate to the observation of households living conditions and standards, such as that of poverty.

Thus, the activity of the Association is focused both on topics of national accounting, which themselves have considerably diversified since the origin of the Association, and those of distribution of income and wealth and more generally social studies. This coexistence evolves according to the changes in the relative importance of these two approaches over time. Towards the end of the 1970s, a pattern of plenary sessions and simultaneous section meetings is introduced in the week-long biennial Conferences. This permitted discussions of specific subjects, while maintaining full discussion on topics of general interest.

The participation in these Conferences (it has increased substantially) corresponds to the traditional need for exchanges between persons active in the same disciplines. It is – and this is especially true if this participation is regular – a powerful means to keep up-to-date with works and reflections that are carried out in national statistical offices, research centers, universities and other national and international institutions. It is thus a way of looking beyond the daily activities and their constraints (the author of this book misses only one General Conference between 1965 and 2000, and that unwillingly, the rumor says that he reads all the papers which are presented, but it is an exaggeration).

In 2001, the IARIW has nearly 370 members and its review approximately 900 subscribers. The participation in the conferences includes a variable, but significant, number of nonmembers according to the topics to be debated. The immense majority of members and other participants come from Europe and North America.

National account compilers also participate in the activities of the International Input–Output Association. It was created in 1988 and, since 1993, it has taken up the responsibility of the Input Output International Conferences set up by Wassily Leontief, and which became biennial. The Association has around 350 members.

In the USA, the Conference on Research in Income and Wealth, which is managed by the National Bureau of Economic Research, holds an annual conference on the issues of measurement in the various fields of economics. The papers are published in the series *Studies in Income and Wealth* (NBER and Chicago University Press), which nowadays has reached its issue number 64. [History of the first years by Carol Carson to be found in Chapter 1 of Ernst R. Berndt and Jack E. Triplett (eds.), *Fifty years of Economic Measurement: The Jubilee of the Conference on Research in Income and Wealth, Studies in Income and Wealth*, no. 54, 1990].

In India, an Indian Conference is created in 1957, which in 1962 becomes the Indian Association for Research in Income and Wealth. It holds each year alternatively a conference or a seminar (see S.G. Tiwari "Development of National Accounts in India", in *The Accounts of Nations*, IOS Press, 1994, pp. 124–143, see p. 127).

In France, the *Association de comptabilité nationale* (the National Accounting Association) is created in 1983 and organizes a seminar every other year, of which the proceedings are published by *Economica.*

References:

Three papers on the history of the IARIW were presented at the General Conference celebrating

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Box 72 (cont'd)

the fiftieth anniversary of the Association in Cambridge (1998) and were published in *The Review of Income and Wealth*, September 1999:

- Carol S. Carson: "50-Year Retrospective of the IARIW: The Early Years", pp. 379–396;
- Richard Ruggles: "The Middle Years of the International Association for Research in Income and Wealth, 1962–1987", pp. 397–407;
- Derek Blades: "The 'Recent Period' of the IARIW, 1988 to 1998", pp. 409–417.

economic exchanges, at national but especially international level, will be long and cautious.

During the first decades of the postwar period, a strong idea dominates in a certain number of countries (France, the Netherlands, Scandinavian countries) that society must define and control its collective destiny, by taking advantage of market mechanisms and individual initiatives, but without relying completely on them. The collapse of the interwar period has left its scars in peoples' memories. In this perspective, the idea of a plan becomes popular well beyond the groups traditionally on the left. General De Gaulle supports Jean Monnet in the launching of equipment and modernization plans and the creation of the Commissariat Général au Plan (General Planning Bureau). However, this movement is not general. Neither the USA nor the United Kingdom, more liberal, nor Germany nor Italy, where the idea is negatively linked to their fallen dictatorships, resort to it. Everywhere, however, government intervention is strong. At the beginning of the 1960s, the decolonization and independence in Africa and Asia see the spreading of development plans in these countries. Latin America on its side makes a great effort, especially through imports substitution policies, to reduce its foreign dependence.

In this general context, the availability of extended economic information is considered everywhere as a priority. Detailed, specific information certainly, but also synthesized and made intelligible as a whole by national accounts. The Marshall Plan, then the OEEC, the IMF, the World Bank, later the European Community, will push in this direction. In still highly government-controlled economies, general economic objectives of societies will be expressed, rather easily, in terms of national accounting: rate of growth of GDP, or GNP, investment rate, increase in consumption per capita, external balances, public sector financing, control of inflation, etc. National accounting becomes thus the central reference language of macroeconomics and economic policy. It enters into the public debate.

1.2. Originality of the French experience

The originality of the French experience is that national accounting will be placed, more than anywhere else, at the heart of a project of modernization of the economy and government, and even of the transformation of society. A reaction against the Malthusianism of the interwar period and the quasi-general traditionalism of the leadership circles, whose scope of economic knowledge is narrowly limited and its level in this field rather low. Whereas short-term economic analysis offices flourish elsewhere, Jean Dessirier sees himself countered in 1929 in his attempt at the Statistique générale de France (SGF) (France General Statistics), and it is only in 1938 that Alfred Sauvy, who finds in Paul Reynaud an informed interlocutor, obtains the creation of a Short-term Forecast Institute.

In spite of the strong tensions experienced by French society, shortly before the cold war, the idea of modernization is widely supported by very broad currents mostly emanating from the Resistance: Gaullism and its ambition for French greatness; the Communist Party, from the end of the war until May 1947 when it participates in government and takes part in the battle for production, in particular the battle for coal; the social reformist currents of the left-center and the right-center, etc., circles impregnated with Keynesianism (Pierre Mendès France, part of the senior public servants and engineers, etc.). The procedures of consultation and coordination between government and social partners, in particular in Plan's modernization commissions, will allow issues to mature without too much immediate interference from divergent political positions, once the crisis related to the departure of the communist ministers was over. The responsibilities given to employers' associations in the allocation of raw materials through the *Comités d'organisation* under the Vichy regime, and later their deep purging at the time of French liberation, have, at the end, paved the way to the participation of trade and industry associations in this type of approach.

1.2.1. The heroic period of the SEEF

The initial impetus role played by Jean Monnet and the Planning Bureau is essential. Monnet wants a "balance-sheet" for the French economy, similar to that of a firm. He appoints to the Planning Bureau René Froment, who has carried out some initial estimates of national accounts at the Short-term Forecast Institute, Jacques Dumontier and Pierre Gavanier. They compile accounts for 1938 and for the first years of the post-war period. Pierre Uri prepares in two months, for the *Commission du bilan* (National Balance Commission) created on October 1, 1947, a report that includes an estimated economic budget for 1948 bringing to light an inflationary gap between total resources and total uses as forecasted. A few years later, the responsibility for national accounting is transferred to the very new *Service des études économiques et financières* (SEEF) [Service for Economic and Financial Studies], created *de facto* in 1950 at the Treasury Department (François Bloch-Lainé) of the Ministry of Finance under the direction of Claude Gruson. It is there that the project of French national accounting will take shape. French national accounting emerges thus under the double patronage of the Planning Bureau and the Ministry of Finance, which are then the two poles in charge of economic policy. Even if it is formally stated that the compilation of past-years' accounts must correspond to the INSEE, the issue is not relevant in practice at that point in time. The creation of an original accounting framework and the development of the accounts for the past, the estimation of forecasted accounts and the advisory function on short-term economic policy will be carried out for almost ten years by the SEEF itself, very often even by the same people (the staff amounts to about fifty persons in all). Concerning forecasts, the effort will concentrate initially on economic budgets (Blanc, Mercier, Sérisé, then Mayer), covering one or two years, in which projections and economic analyses are narrowly intermingled, shortly afterwards also on medium-term projections for the Planning Bureau (Bénard, Blanc) [see Box 73].

Such a situation explains why, during this period, the expression "national accounting" is understood, in France, as covering at the same time past-years accounts, accounts for the future, the administrative body which develops them and the institutions and consultation procedures that are based on it. In the first place the *Commission des comptes et des budgets économiques de la Nation* [Commission for Accounts and Economic Budgets of the Nation], created in 1952 with Pierre Mendès France as its first chairman. He is a member of parliament from the radical party (member of the National Assembly representing the department of Eure): he was briefly De Gaulle's *Commissaire aux finances* in Algiers in 1943, then Minister for Economic Affairs in 1943–1944 for a little more than six months, with a "dirigiste" orientation as it is currently said in the post-war period. He will exert a strong intellectual and moral influence in favor of modernization ("governing means forecasting") and of a rigorous management of the economic and financial policy, and, in a word, of politics. Of course, he leaves the chair of the Commission when being appointed Prime Minister in 1954. The chair of the Commission – it is Edgar Faure who had appointed Mendès France to this post – will then no longer be held by an external personality but, starting with the 1960 reform, by the Minister for Economy and Finance himself.

National accountants however also work for the Planning Bureau. Gruson chairs the *Groupe de l'équilibre du Plan* (the Global Balance Group of the Plan) since 1952. Jean Bénard, with a small team, carries out, from the end of 1954, the synthesis of the third Plan, within a framework of national accounting. The idea of forecasting and programming is spreading. The method of consultation used in the commissions of modernization involves a great number of experts and representatives of the social partners, almost 4,000 persons starting from the preparation of the third Plan. From the beginning of the preparation of the fourth Plan around 1960, national accounts and its projections are extensively used.

In Gruson's view, the information system is inseparable from a political project; planning, forecasting and consultation organizations belong to a modern information system as does the institution in charge of statistical information. The future must be the subject of a rational and concerted anticipating vision. At the SEEF and the Planning Bureau, the views are obviously much more varied but there is a general feeling of being part of a decisive project of modernization, then of development of the French economy. When reporting on it, through the

Box 73
The SEEF staff

[A preliminary note: The content of this box is primarily directed towards a French audience. It has been kept however in the English edition as a background document. The purpose of this box is twofold: First, to show the very high level and diversity of the pioneering staff in an exceptional period, some years after the end of the war. Second, to illustrate the intellectual and political environment of this first French national accounts service. The figure of Claude Gruson combines the attitudes of promoting technical innovation and of social reform (pretty radical in a way).

As all names (many names!) have been kept, the first half of the box is not easy to read. The university degrees and professional titles are specific to France. It was decided not to try any translation for them. Some explanations may be useful however to the adventurous reader. In the French central government, most high-level civil servants are called "administrateurs civils" (they were "rédacteurs" until the end of World War II). Above them, a small number of people are "inspecteurs des finances". Most high-level civil servants come from the "Ecole Nationale d'Administration" (ENA) created after the war. In the government personnel, the "chargés de mission" (CDM) are people who do not belong to the official "career" but are recruited on a contractual basis.

France has several high-level schools of engineers, apart from universities. The "Ecole Polytechnique" is the most renowned. Its graduates are briefly referred to by the letter "X". Some of them belong to a higher group. They are for instance X-Mines or X-Ponts. At a similar level, but not a school of engineers, is the "Ecole Normale Supérieure". Its graduates are called "Normaliens".

Some people come from universities proper. The "agrégation" is a very competitive examination. The selected people are said to be "agrégés".

The INSEE has its own school for recruiting and training high-level statisticians. Some of them come from the "Ecole Polytechnique". They are referred to as X-INSEE in the Box. Teaching statistics also exist in universities, for instance at ISUP, "Institut de Statistique de l'Université de Paris".]

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The staff that gathers around Claude Gruson at the end of the 1940s and in the 1950s has very heterodox features. Their training is empirical and the selection procedures do not correspond to any traditional decision-making process. Personal initiatives (Claude Gruson, supported by François Bloch-Lainé, then Director of the Treasury Department) are decisive. Gruson circumvents the absence of official means thanks to his friendship and professional network, as he belongs in particular to the *Inspection des Finances* which he entered after the *Ecole Polytechnique* (he is an "X-Mines"). He thus obtains temporary appointments of civil servants from various areas of the Ministry of Finance, the possibility of hiring some staff members on a contractual basis, and also some part-time personnel whose remuneration is supplemented, not in strict conformity with the rules, by a financing from the Bank of France. Thanks to that, the SEEF staff will reach a hundred people in 1955, including approximately forty-five professionals as compared to a little more than a dozen in 1952.

At the beginning of the 1950s, the first core includes a great majority of civil servants from the Ministry of Finance. Claude Gruson and Simon Nora are *inspecteurs des finances*, Claude Alphandéry, Louis Bavelier, Michel Courcier, Jacques Le Noane, Jean Sérisé *administrateurs civils* coming from the first classes of the Ecole Nationale d'Administration (ENA), Jean Denizet, Emmanuel Hamel, Charles Prou "*rédacteurs*" before the creation of ENA. A small number of scientists from outside the Ministry joins them. Louis-Pierre Blanc X-INSEE still works theoretically in the INSEE before obtaining a contract, René Froment ISUP-INSEE depends administratively from the Planning Bureau, René Mercier, *normalien, agrégé de mathématiques*, is recruited by contract after a previous fifteen-day training period.

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Box 73 (cont'd)

The enlargement in the following years will be realized through the addition of other civil servants from the Ministry of Finance, but still more through the enrollment of outside personnel with scientific or economic backgrounds. The latter will tend to represent approximately two-thirds of the professional staff. Their formal education and labor experiences are particularly diversified.

Aude Terray in her dissertation (2002, p. 603) reproduces the organizational chart of the SEEF, at the beginning of 1959, with a little less than fifty professional staff. Gruson and Nora assume the direction, while Serisé and Le Noane are in charge of the coordination (with Froment as an adviser). The SEEF comprises four divisions and five sections.

Jean Aubry is head of the Current Studies Division, a civil servant from the Ministry of Finance where he replaced Alphandéry, after being a member of several ministerial staffs. He works with three *chargés de mission* (CDM), one a PhD in Law and two PhDs in Economics. Jacques Mayer, a *normalien* mathematician, heads the Accounts and Economic Budgets Division. He arrived in 1955 with part of the group that left the Institut des Sciences Economiques Appliquées (ISEA) following a conflict with François Perroux. In 1950, he spent six months at the Department of Applied Economics, under Stone, in Cambridge. The Division also includes three chargés de mission (ISUP, Arts et Métiers, PhD in Economics) and an *inspecteur des finances*, Gérard Eldin, who is in charge after Nora of the secretariat of the Accounts Commission and drafts the reports. The head of the Medium- and Long-term Programming Division is Blanc, who was before in charge of setting up the coordination area. He replaces Jean Bénard, a previous member of the Center for Economic Studies of the Confédération Générale du Travail CGT (A left-wing oriented trade union), who, after being denied by the jury for a long time, finally passed the *agrégation* in economics in 1958. Bénard continues collaborating with the division, which also includes an X-Mines (Pierre Maillet), an X-Ponts, another engineer, an ENA and an X-INSEE, on leave from the INSEE (Pierre Echard, who was before a mainspring of the 1951 Table). André Nataf, *normalien, agrégé de mathématiques*, heads the Studies and Research Division after having worked in the Households section. There are also two other *normaliens, agrégés de mathématiques*, Philippe Sentis and Pierre Thionet, the latter on a leave from the INSEE, and a sociologist.

The composition of the sections, which cover the various types of economic agents, varies according to the field: primarily CDM on enterprises and households, civil servants from the Ministry of Finance on general government, the Rest of the World and financial institutions. On Enterprises, André Hamaide, a public works engineer, who spent several years in Indochina, has with him five CDM (two X, of which one X-Pont, a Civil Engineer of Mines, a doctor in economics and a graduate in Political Sciences). Claude Fourgeaud (ISUP, doctor in mathematics) and three *CDM* with statistical backgrounds are in charge of Households. General government is under the responsibility of Pierre Orand with Pierre Lequéret, both *administrateurs civils*. Pierre Baichère replaced Pierre Millet (with two other *administrateurs*) on the Rest of the World. Jean Denizet heads the Financial Institutions section. Working with him is another *administrateur civil*, Serge Barthélémy who will soon replace him, and two CDM (ISUP).

Some have already left the SEEF: Michel Courcier who will later head the CEPI (Centre d'études et de prévisions internationales [Center for International Studies and Forecasts]) [see his role in the preparation of an "intermediate" system for French-speaking Africa, in the appendix to chapter 3, p. 136]; René Mercier, in 1957, who heads the Centre de recherches économiques appliquées [Center for Applied Economic Research], before being appointed as head of the SEDES (a research subsidiary of the *Caisse des dépôts*); Charles Prou who joins the academia, after his *agrégation* in economics (1954), and since 1957 ensures the joint management, with Edmond Malinvaud, of the CEPE (Center for Training in Economic Programs) which he himself designed. The CEPE in particular aims at facilitating the recruitment, difficult at that time, of staff for these new activities, and at remedying insufficiencies in higher education, that of economists from the university, then under strong criticism, that of engineers of the State technical bodies, poorly

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Box 73 (cont'd)

trained in economics, that of ENA graduates, too narrow for the needs of a department of economic studies.

As the pool of qualified people is reduced, classified ads, when the SEEF resorts to them, are not very effective. Recruitment is done primarily by personal contacts on a cooptation basis. On one hand, the SEEF calls the attention of people interested in the new techniques of quantitative economy, which start to be known in the footsteps of Keynesianism. On the other hand, the SEEF often allows a significant number of people, trapped in their professional career, frequently for political reasons, to find there the possibility of a creative activity. The SEEF thus acquires the fame of being dominantly leftist, with a certain number of communists within its staff.

Due to this, some issues may riskily lead to interpretation errors. Aude Terray, in her dissertation (2002), strongly insists on what she calls "the delicate question of the political affiliation of the Service" (p. 144), stressing the communists' one. While indicating that the SEEF staff that she interviewed "wanted, each one in his own way, to minimize the possible influence of the Marxist theory in their work" (p. 147), she however concludes that "there is [...] ground to question whether the Marxist theory did not constitute, consciously or not, an internalized conceptual base for the work on national accounting" (p. 148). In spite of Jean Saint-Geours' opinion, whom she calls upon (p. 147) – he will replace Gruson as the head of the SEEF in the beginning of 1962, and will work for its transformation (after the splitting with the INSEE) into the Directorate of Economic Forecasting in 1965 – nothing may be found in French national accounting (CNF) which would reflect, in connection with services, the Marxist theory of productive labor which at that time dominated in the Soviet Union. The restriction of the production boundary to goods and services exchanged on the market shows the stress placed on the recording of monetary transactions [see the analysis of the old CNF in chapter 2]. As for the uses of national accounting for economic budgets and medium-term projections, they respond primarily to the influence of Keynesianism and to the concept of planning, broadly widespread in the postwar period.

The effective political influence is rather to be linked in some analyses to Mendesism, but that has nothing to do with retrospective national accounting as such. It is visible in the report written by Nora on the accounts for 1951–1952 and submitted to the Accounts Commission in March 1953 ("The 1953 report, a Mendesist report", Aude Terray, p. 125). As the chairman of the Accounts Commission, Mendès France criticizes the governmental policy (the resulting tensions will put the SEEF in an awkward position), although SEEF's own work, in so doing, is promoted. From there stems, later on, the 1960 reform that gives the chair (of the Commission) to the Minister of Economy and Finance.

The personal positions developed by Gruson are not related to any political affiliation, but to his own vision of the need for a planned guidance of the economy. The latter is based on a strong mistrust with regard to the liberal automatisms and the capacity of the market to anticipate and solve essential long-term problems, and perhaps, still more basically, on a weak confidence in mankind after the horrors of the first half of the century.

From 1953–1954 on, planning becomes his central concern, but it will be increasingly against the general trend of evolution of the French society and policy. Mendès France, to whom he is close on certain aspects, is favorable to the liberalization of the economy. Pierre Massé, appointed *Commissaire au Plan* (Head of the Planning Bureau) by General de Gaulle in February 1959, is in favor of a plan "more than indicative and less than imperative" (*Aléas et Progrès* [Risk and Progress], *Economica*, 1984, p. 160, quoted by Aude Terray, p. 332) and according to his famous formula "reducer of uncertainty". The failure of the attempt to formulate an income policy (1963–1964), which Massé attributes to Gruson (who, according to Masse, questioned the market economy in his mid-1964 report), widens the gap between the two men. Jean Saint-Geours also does not share Gruson's interventionist and planning ideas.

However, if Gruson fails to be convincing on these topics, these personal failures – which can

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Box 73 (cont'd)

generate tensions and lead finally to his departure from the civil service at the end of 1966 – do not prevent the success of the SEEF experience, or the development of INSEE and the rise of its prestige when Gruson heads it from 1961 to 1966.

An exceptional personality by his intellectual and moral qualities, Gruson has a multi-scope vision. His long-term vision, rather notably utopian, does not prevail. The one that he promotes, in a more favorable context, regarding the design and development of the economic information and forecast system, plays an essential role. He makes a major breakthrough in French society with this idea.

The SEEF staff, which he constitutes, is rather remarkable by its level and its technical, professional, cultural and political diversity (Aude Terray, p. 199, underlines the role of outsiders in innovation). Relatively small, it is characterized by the absence of hierarchy and formalism; "the role of Claude Gruson is that of a federator and an awakener of concepts" (*ibid*, p. 88).

The diversity of the team is also to be found in the future careers of its members. Sérisé becomes a very close collaborator to Valéry Giscard d'Estaing, firstly Minister of Finance, then President of France (the latter himself had attended a short training course in the SEEF in 1952). Blanc, Deputy Head of the Planning Bureau (1967–1976) after having led the Directorate for economic syntheses at the INSEE, remains the closest to Gruson in his reflexions on planning. Nora, who was technical advisor of Edgar Faure in the Ministry of Finances, and of Mendès France as a Prime Minister, will also be an advisor to Jacques Chaban-Delmas, Prime Minister (1969–1971), after several years with the Economic Commission for Steel and Coal (ECSC) and before turning to the private sector (Hachette). Claude Alphandéry also turns to his family real estate business. The academia receives in particular Prou, Fourgeaud and Bénard (who joins the main stream in economics). Denizet directs the economic studies at the Banque de Paris et des Pays-Bas. Le Noane, Aubry, Barthélémy and many others continue their careers within the public administration. Eldin becomes Deputy Secretary General at the OECD. A numerous group follows Gruson to the INSEE. Mayer, who will also be later Director General of Eurostat, Hamaide, then – a younger person – Vanoli will ensure, with others, the insertion and extension of national accounting within the regular process of statistical production, etc.

[For the sources, François Fourquet, Aude Terray, see the annotated bibliography of the present chapter; Fourquet's book includes biographical notes].

testimony of a certain number of its actors, François Fourquet (*Les comptes de la puissance. Histoire de la comptabilité nationale et du Plan* [The Accounts of Power. A History of National Accounting and Planning], 1980) will speak of the "mystique" of the SEEF and of the Planning Bureau staff (p. 20). Chapter 7 of his book is dedicated to "the team [of the SEEF] and its mystique". A sentence of Jean Denizet is particularly illustrative (p. 133): "We were convinced to have found with national accounting the means of transforming the world, or at least the French economy, in the direction of our ideological preferences" (they are, by the way, diversified).

Nowhere else, it seems, could the history of national accounting and its uses in economic policy, during the first fifteen to twenty years of the post-war period, be told in the epic style chosen by Fourquet. If the adventure of the Planning Bureau and the SEEF is so little academic (Perroux, Marczewski will somehow regret it), it is because economic information is lagging behind and the creation of INSEE (1946) too recent at the time when active economic policy takes off. Before this period, the SGF (French General Statistics) with very poor resources, in an environment scarcely interested in statistics, had not taken – or followed – any of the great initiatives of the inter-war period; attempts at business barometers for forecasting purposes (USA, the Netherlands), transition of national income estimates from an artisanal stage to that of more ambitious projects (USA, Sweden, Denmark, the Netherlands), beginning of macro-econometric modeling (Tinbergen in the Netherlands). Academia had not perceived the revolution in quantification that was maturing elsewhere with the emergence of econometrics (Frisch, Tinbergen). How to overcome the crises and the stagnation of the economy by a rationalization of its management had been the subject of reflections by State engineers (Group "X-Crisis" [on the meaning of X, see the preliminary note to Box 73]) who play in France a great role in the operation of public services, but do not have an influence on economic policy which is managed primarily from a financial perspective.

The war upsets the cart. The modernizing and rationalizing currents tend to join mainly around Keynesian and planning ideas (a little later also around economic calculation mostly about investment choices and pricing) and public finance management will fall under a prospect of economic equilibrium and development. Quick estimates of the immediate past and the ongoing present are essential for the preparation of decisions. It is not possible to wait for the statistical apparatus to mature. Therefore, the producers/users of national accounts will themselves gather information from various sources and synthesize it.

Circumstances then do not allow the more orthodox path of separating institutions which analyse the past from those that forecast. In the Netherlands also, this separation had not been considered either at the beginning by the Central Bureau of Statistics (Idenburgh), nor even by Tinbergen who, incidentally, was part of it. Their proposal (May 1945) aimed at gathering national accounts and modeling in the same division of a public institution for statistics and research. The government prefers then to separately create a Central Planning Bureau, national accounts being covered by the Central Bureau of Statistics. This solution is possible in the Netherlands with an already well established statistical system (the research project on national accounts launched by Tinbergen in 1938 emerges in 1945). The situation is similar in Norway, however there is no Planning Bureau there. Short-term planning, in a more strongly controlled economy, is an internal administrative process within government, of an iterative type and based on national accounts. On the other hand, at the beginning of the 1960s when models start to play a role, they enter into the field of the Statistical Office, which works upon request from government.

1.2.2. Transfer to INSEE and change in utilization techniques

Justified as it was by circumstances, the organization of the tasks as retained in France in the 1950s gradually shows its limitations. The ambitious national accounting, as designed in the SEEF, calls for a considerable development of economic information and the creation of an authentic statistical system. This cannot be carried out within the Ministry of Finance, it is not its function, it cannot simply result from an impetus coming from the SEEF or the Planning Bureau as privileged customers. At the beginning of the 1960s, Gruson is appointed Director General of INSEE. From now on this institution is responsible for the national accounts of the past, but operates also as technical office for the Planning Bureau concerning medium-term projections and collaborates – within rather rapidly evolving terms – on the preparation of economic budgets with the old SEEF which becomes in 1965 the Direction de la Prévision (DP) [Directorate of Economic Forecasting]. The intermingling of INSEE–SEEF (DP)–Planning Bureau activities will remain strong in the 1960s. Part of the accounts of the past is still compiled in the SEEF-DP, another had been previously transferred to the Bank of France and to Public Accounting Directorate, but INSEE is in charge of the synthesis. Although INSEE has not, as an institution, a role as an economic policy adviser, the function of economic studies that it received from the legislator in 1946, its new role concerning projections and its proximity to the centers supporting public decision-making, will make it often move at the margins of studies and consultancy.

However, INSEE's principal, essential responsibility corresponds to the domain of statistical data. The arrival of national accountants (Box 74 presents, in an archetypal manner, the differences in culture between national accountants, statisticians, accountants and economists), and its participation in technical work for the Planning Bureau, will be accompanied by a considerable increase of its financial and human resources, an opening up and an improvement of its status in the administration and society. Remarkably, this blooming does not only concern, as some fear at the beginning, the narrow feeding in of data required by national accounts. Besides broad prospects on economic information itself, because of the characteristics of the French national accounting system inherited from the SEEF, social statistics and in particular, at the beginning, household sample surveys – that statisticians at the INSEE had set up since the war – receive a strong impulse. The reason for this is that the issue of the distribution of the fruits of growth becomes dominant at the beginning of the 1960s (a proof of it, for example, is the collective book edited by Darras on *Le Partage des Bénéfices. Expansion et inégalités en France* [Sharing the Fruits. Expansion and Inequality in France], Minuit, 1966), from the point of view of both the search for social justice and as a means of controlling inflation thanks to parameters of income growth which would be negotiated with the social partners. Pierre Massé makes an attempt in 1963–1964 to set up an income policy but fails (from it will result the creation of the CERC in 1966). The second half of the 1960s sees a true boom of surveys concerning "household living conditions". This is far from the ridiculous view sometimes conveyed as: "filling up the entries in the National Accounts".

The middle of the 1960s sees the beginning of a major technical transformation in the way in which national accounts are used to carry out short- and medium-term projections. The use of fully formalized econometric models will begin. The

Box 74
Economists, statisticians, accountants, national accountants: different cultures?

Business accountants

Accountants record series of events referring to a person representing a unit of patrimony (own assets and liabilities). The recording must be exhaustive, relate to each event individually, and the events must be certified by supporting documents (invoices, etc.). The recording is carried out based on accounting standards, which constitute the conceptual system of reference, representing the interrelationships internal to the concerned unit and its relations with third parties. The articulation between flows and balance sheet, and the double-entry principle of recording ensure global consistency. Accounting aims primarily at the measurement of surplus, in terms of difference between receipts and costs brought about by the activity of the transactor. Surplus and change in net worth are equivalent.

In theory, accountants move primarily in the field of observation. Their orientation is strongly institutional. The legal qualification of events is of first importance. However certain entries, which play a significant role in the measurement of the surplus, do not come from direct observation but from rules based on conventions and partly subjective assessments. It is the case of provisions for contingencies of various types (bad debts, for example) and the depreciation of fixed assets. Independently from the possibilities of embezzlements, accounting is finally less "objective" than it seems at first glance.

Statisticians

The "supporting document" for statisticians is the questionnaire (or the basic administrative act in the case of governmental sources). But it has not the verifiable character of the "supporting documents" of the accountant. It is based on the declarations of surveyed persons. Data editing and correction is then an essential phase of survey operations. Surveys are seldom exhaustive (except censuses, in particular population censuses). From observations limited to a part of the units concerned, statisticians try to obtain results valid for the whole population (in the sense of sets or subsets of statistical units of a certain type). Typically, statisticians seek to master their methodology: They prepare a questionnaire according to the phenomena to be observed; retain a sample design to ensure a collection limiting as much as possible observation errors; process and edit the collected data; extrapolate the results to the defined field and calculate random margins of error, following the characteristics of the survey carried out, to specify the significance of the results. The statisticians' typical approach is therefore defined by the type of instrument used (a particular survey). The analysis of results to which they proceed is then circumscribed to what could be observed (after editing) and extrapolated (population of reference resulting from the base of the survey or from the frame used to launch the survey). Nevertheless, the use of administrative data blurs the aforementioned methodological scheme because statisticians, in this case, do not control the questionnaire and the collection process.

National accountants and business accountants

Following strictly the above outlined profiles, national accountants are neither accountants, nor statisticians. National accountants' practical activity is not that of business accountants since they do not establish the accounts of a nation by recording, based on supporting documents, elementary events. On the other hand, the development of a system of national accounting presents many similarities with the complete set of accounting standards concerning microeconomic units. It is necessary to build a logically coherent accounting framework and to specify, in connection with concrete events of economic life, the recording procedure that best suits their nature and at the same time complies with the accounting rules that have been adopted. But national accountants

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Box 74 (cont'd)

feel less constrained than business accountants by the legal characteristics of the events in which they are interested and by the constraint of the "justifiability" of what they represent, in particular, in the case of valuation of inventories and fixed assets. National accountants place themselves in the context of valuation, at any moment, at the values of the day, i.e. of permanent revaluation. Once the original values have been used for the recording of transactions to which they refer, they disappear. Business accountants keep them, and are confronted with the loss of economic significance of the surplus that they measure as soon as the change in asset prices is relevant. If it becomes too big, it is necessary to resort to the delicate exercise, legally controlled because of its fiscal incidences, of isolated revaluation of balance sheets, or – in cases of high inflation – of a regular revaluation of those. Thus, national accountants adapt more easily, permanently in theory, to new values verified on markets. These values, it is true, might be sometimes speculative on the financial markets, and would pose a problem to business accountants to measure surplus; business accountants, on the other hand, attempt to anticipate certain changes of value, at least if they are negative, for example concerning bad debts. The technique of provisions allows obtaining, at the microeconomic level, a more significant estimate of the surplus. More generally, the national accounting rule consisting of abstaining to record capital gains or losses, in current transactions, – as long as it is not questioned – leads, at the level of the measurement of surplus, to opposing views: the microeconomic point of view of business accountants and the macroeconomic one of national accountants.

The rules of prudence, which are binding to business accountants, make it difficult for them to adapt to certain characteristics of the economies of the end of the century, concerning in particular the extension of the field of intangible investment and assets. Hence, in cases such as R&D expenditure, acquisition and even more on own-account development of software, the tendency of business accountants is not to immobilize, or to partially immobilize, or to modify their rules to treat them only with a large lag. National accountants feel freer, even if they often lack boldness (see Box 53).

Statisticians and national accountants

Business accountants and national accountants have a global point of view, the former on a particular unit, the latter on the economy as a whole. Statisticians have more limited points of view, generally by type of instrument. They have the hard task of collecting information. From this point of view, national accountants are not in the front line. They use results obtained by statisticians and through them even those obtained by business accountants. Compared to statisticians, the essential specificity of national accountants is the objective (and the constraint) to exhaustively cover the whole economy in a coherent way. It is thus necessary for them to estimate what has been left aside by statisticians (to fill the gaps). They must also compare statistics, as they are not always consistent, and partially or completely arbitrate them (for example: Supply and Use Tables for goods and services). What they then do does not have the rigor of basic statistical work. The particularity of their approach is specifically highlighted during the heroic starting stages. Global estimates have to be provided using all that is known, but all that is unknown should also be covered in principle. Then, and it appears very clearly in technical assistance activities, it is often necessary for them to convince, and this is difficult, school-trained statisticians, if they exist, that it is essential to go beyond orthodox statistical inquiries. It is also necessary for them, for example, to convince public accountants in the Ministries of Finance of the well-founded constraints resulting from the global accounting framework and the relative character of the budgetary classifications.

For statisticians, national accountants appear to lack seriousness when they put figures even where solid statistical data does not exist. For national accountants, statisticians have partial points of view and do not seem to understand well the need for global coverage. National accountants are, in principle, not very sensitive to institutional cleavages. Because of their search

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Box 74 (cont'd)

for exhaustiveness and coherence, they convey a culture of intra and inter-institutional coordination. They promote collaboration between national statistical offices, ministries of finance, central banks, etc. Statisticians from national offices, on the other hand, do not spontaneously seek to participate in third-party activities. They generally look with considerable circumspection on financial issues. On the other hand, they are spontaneously reticent to accept being coordinated themselves. This reserve is still stronger among central bank statisticians.

Differences between statisticians and national accountants tend to soften as the concept of a system of economic statistics or a system of business statistics develop (see chapter 5, section). Within this framework, the ideas of coordination, integration and coherence between various statistical sources also are essential. They also intervene in the mixed field of social and economic statistics relating to employment, less in the social field itself.

However, differences in culture do not disappear completely. In particular, statisticians often have difficulty understanding the national accountants' concern for completing and specifying their accounting framework and all their classifications, concepts and definitions, even when the possibility of observation remains well beyond these recommendations of principle. This activity can then seem to statisticians as an unfounded sophistication. Such an attitude is more likely to prevail, it seems, among statisticians working on short-term indicators compared to those in charge of the compilation of structural statistics. It tends to be shared by specialists in quarterly accounts, at least when they approach national accounting from this perspective, and even more limit themselves just to that.

Similar frictional attitudes are met in connection with the opportunity of carrying out, based on this general conceptual framework, an actual synthesis and ensuring a complete coherence of estimates. Most national accountants set it as a goal but their positions are diversified or still diverge (see chapter 5 about the problem of statistical discrepancies). Statisticians rather tend to consider the exercise as artificial. Data resulting from many consecutive reconciliation procedures are difficult to explain to users. What is more, these procedures are generally hardly documented. Besides, as they are carried out within the framework of each annual account, their homogeneity over time is dubious. The concern for complete coverage and synchronic coherence is likely to lead to forgetting this for significant measures of changes. Moreover, national accountants, by assumption, have difficulty in estimating the changes over time of flows that are not well covered by available statistics, which were necessarily estimated on weak bases. Combined with the rest, these flows may seem to pollute actual observations.

Statisticians, by training, prefer to obtain results whose genesis they can explicitly recall, even when the complete statistical chain is not simple. If two different approaches to the same phenomenon lead to different results, why not simply show the discrepancy, as it is frequently the case in the US accounts? As for changes over time, the intensity in the use of the results of national accounting for the short-term follow-up of economies must lead to privileging their measurement in a way as accurate as possible. It is precisely what price or production indices, as well as quarterly accounts, intend to do.

The differences in approach sketched above are actually observed, with different combinations, among both national accountants (chapter 5) and statisticians (employment statisticians are often confronted with the need for synthesis). They are more related to the nature of the field of interest than with *a priori* opposing methods. Statisticians generally find considerable difficulty in interpreting the results of structural surveys in terms of evolution over time. That is true in the case of household surveys, such as family budget surveys, because of the importance and variability of observation errors, associated, for example, to changes in habits and behaviors (see Box 36, chapter 5). It is also true for enterprise surveys, when the organizational systems of productive activities experience great transformation, as well as in the use of accounting sources. In this case statisticians and national accountants dedicated to these matters have to resort to the business

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Box 74 (cont'd)

accountants' culture (see chapter 5 about the intermediate system for enterprises) and to face the contradictions between cross-section analysis and evolution.

Evolution of users' demand (see chapter 5 and the text of the present chapter) imposes on statisticians and national accountants legitimate, but in part contradictory, requirements of synchronic and diachronic representativeness. To respond to those demands supposes, in particular, the combination of approaches and cultures (statistical, accounting, econometric).

Economists and national accountants

Economists, by nature, are oriented towards the explanation of the behavior of economies, having in mind, in particular, the preparation of forecasts and recommendations of economic and social policy, rather than towards its description and the observation of its results *ex post*. National accounts constitute a static descriptive model of the economy, but not an explanatory one, of the type in which economists are interested in. However, for practitioner economists, the analysis and interpretation of the results provided by statisticians and national accountants constitute an essential part of their approach. Contrariwise, the deductive theoretical approach, by assumption, consumes little data.

During the 20th century, the positions of economists with respect to statisticians and national accountants are very diverse, according to their theoretical and practical orientations. Macroeconomists are at the very same origin of national accounting and build the first accounting frameworks. In their inductive approach, econometricians – though they pay little attention to the estimation of basic "data" – work out methods of analysis to infer significant results from the study of the relationships among observed variables. Applied to economies as a whole, they take the form of macro-econometric models, which are important consumers of national accounts results. From the middle of the 1970s, the domination exerted by the neo-classic stream tends to divert the majority of theoretical economists of this current from any interest in national accounting, associated for them to the former Keynesian macroeconomics. The breach increases among academic economics, for which national accounting, in general, is no longer an object worthy of consideration, and practitioner economists, advisers to public or private decision makers or to media, which depend on its results for a considerable part of their analyses. However, as soon as a practical application of the theoretical model of general equilibrium is sought, recourse to a base of information is necessary. When the application refers to an economy as a whole or to certain sectors, such an information base relies, to a great extent, on national accounting results complemented or adjusted depending on the objectives or the characteristics of the models (see section 2 of the present chapter about models of computable general equilibrium and the confusion generated by the SAMs terminology).

The attitude of economists, whose work rests on the use of individual databases, is somewhat ambiguous, in particular when they involve enterprise databases. Insofar as national accounting is not in a position to establish a complete micro–macro link at individual level, the adjustments that are made do not really interest these economists, even when their aim is to provide economically more relevant measures. The relevance of such adjustments is not questioned, but their absence at the micro level is considered to largely reduce their interest for analysts. In essence, these economists find that national accounting is not "concrete" enough.

Within the framework of the neoclassical current, national accounting is viewed from the perspective of abstract theoretical models. Even in this case, attitudes nevertheless vary. The attempts to interpret product or national income in terms of welfare in the 1940s and afterwards are to be found at a high level of abstraction. They hardly consider the actual content of national accounts, without however disputing its interest. Hicks clearly illustrates this position with his 1940 and 1942 papers. Difficulties of interpretation relativize the theory itself as well as national accounting.

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Box 74 (cont'd)

More aggressive is the approach of the optimal long-term growth theoreticians. By placing themselves at the aggregated level of a representative household or a representative enterprise these theoreticians suppose that the micro–macro linkage is solved. Using rigorous theoretical assumptions, which do not aim at a realistic representation, they provide analyses of the aggregated product or income in terms of both welfare and sustainability and deduce from there recommendations that national accounting should follow in order to provide data interpretable from this standpoint.

National accountants object, then, that they are trying to observe actual economies, not to measure ideal virtual economies. They thus react as statisticians. Relevant in general terms, the claim of being in an observer's position cannot always hold, as an answer. When they estimate consumption of fixed capital (chapter 8) or when they establish accounts in volume, "at constant prices" (chapter 9), national accountants introduce into their measures a certain amount of modeling, perhaps without always being aware of it. The debate that keeps going since the middle of the 1980s shows that, concerning the volume–price factoring of investment, choices of principle and sophisticated analyses are inevitable. Business accountants escape from the debate because they hold onto current prices (at historical cost) and they calculate neither changes in volume nor changes in real terms, but this is not the case for statisticians or national accountants. Taking into account capital and the change in the performances of equipment goods (as well as of consumption goods and services) requires them to widen their culture towards that of economists and engineers.

All in all, between business accountants, statisticians, national accountants, and economists the cultures – described here in a schematic way using archetypes – are appreciably distinct. The dividing lines move with time and the same person can successively exercise different functions. The first three categories move primarily in the field of observation, but cannot completely escape the need for analyses. National accounting general practitioners – i.e. those who have a global view – must have a composite culture and take something from all approaches. Economists are in a different position, but their attitudes and relationships with others appreciably differ according to their own connection with "data". In general however, observation and production of "data" are activities less appreciated than their analysis, and this characteristic is accentuated between the third and the fourth quarter of the 20th century (see Griliches' point of view on this topic at the end of chapter 5).

model suggested by Gruson in his 1950 note might have seemed to engage in this direction. At that time though, the lack of time series of accounts excluded, in any event, its econometric adjustment. In fact, from the first economic budgets, the direction taken is that of comparative statics. Economic budgets combine collections of information on the recent past and the immediate future, use of accounting, institutional, structural or, very few, behavioral relationships, intense consultations, reflections on economic policy, the whole in an approach of successive approximations controlled by SEEF's macroeconomists. Its quality depends on their experience and skill. The absence of series and the importance of the structural transformations that France of the post-war period undergoes then, make the forecasters rather skeptical on the interest of the use of econometric models. Still, in 1961, Mayer, answering questions about the economic budgets, passes over this topic in silence. The French experience is not linked then to the current of research on business cycles. Medium-term projections – in volume – follow a similar type of approach as that of economic budgets, though giving a larger place to IOTs, as the problems of development of the productive system remain central.

Other countries follow earlier the approach through econometric models. The Dutch Planning Bureau (Tinbergen is at its head) has done it since 1955, – first example, it seems, of a significant role played by such a model for economic policy purposes –, Norway does so at the beginning of the 1960s. In both cases, short-term planning is internal to central government. However, the use of such models is not limited to a context of indicative planning, as their early development in the USA (Klein–Goldberger model of 1953 shows, based on the investment in econometric methods by the Cowles Commission. They appear as a radical improvement of former research on cycles, based on the use of more abundant and complete economic information, in particular national accounts, which impose the respect of macroeconomic coherences, and the intensive application of mathematical methods. The purpose is to represent the operation and evolution of actual economies: the general test applied to econometric models is their ability to reproduce national accounts of the past.

Even in the USA, the use of these models is not exclusive, as indicates, for example, the role played by the analysis of the difference between actual GNP and potential GNP in official documents. Kendrick, at the beginning of the 1970s, gives a balanced appreciation of the comparative merits of econometric models and judgmental models based on successive approximations: "to draw a sharp distinction between a rigorous, scientific but inflexible econometric approach and a subjective but flexible judgmental approach, is misleading" (Kendrick 1972, p. 283). In any event, in France, the era of formalized models for short-term (ZOGOL, 1966, then DECA, 1968, etc.) and for medium-term models (FIFI, 1968, DMS, 1975, etc.) begins in the mid-1960s. (See Boyer, 1987.)

1.2.3. At the core of economic statistics and public economic information

Though these models are heavy users of national accounts, this new orientation marks in France a change in the position of national accounts. The division of labor evolves significantly compared to the previous fifteen years. Forecasters are no longer themselves producers of national accounts (even if some staff successively occupy these functions). *Ex post*, national accounts and their uses are not as closely mixed as they were before. National accounting is placed at the core of the system of economic statistics in which it will play, starting from its transfer to the INSEE, a unifying role, promoting the extension of statistics, providing conceptual orientation and favoring actual quantitative synthesis (see chapter 5). The outcome of this evolution is the constitution under Vanoli's responsibility of a powerful statistical coordination pole. This is the time of the 1972 reform, known as McKinsey, after the management consulting firm in charge of the project. Jean Ripert, former deputy head and future head of the Planning Bureau – before joining the UN – is then Director General. The pole has responsibilities at the same time conceptual (classifications, statistical and accounting standards), and organizational (relationhips with public statistical services, international relations, except technical cooperation, institutional relations with users and social partners) and is in charge of the numerical synthesis of annual national accounts. National accounting, at this stage of the development of the statistical apparatus, no longer has its place within a pole of studies and projections, as rightly was the case during the previous decades. An exception is made, however, for quarterly accounts. It is thought preferable to bring them closer to the function of elaboration of short-term analyses and syntheses; in this field, great proximity is desirable among the synthesis of short-term statistical data by the accounts, business surveys, economic surveys and quarterly diagnosis of the economic situation. In the mid-1970s, the quarterly dynamic model METRIC uses both the results of business trends surveys and data from quarterly accounts. It is used for both short-term forecasting and economic budgets.

This progressive change of position in France during the 1960s does not entail a weakening of the social recognition which national accounting enjoys since the 1950s, and which soon extends to statistical information in general. The extension of uses is accompanied indeed by a considerable pedagogical effort to develop economic and social knowledge in public opinion. Economic and Financial Reports, submitted to Parliament as a support to the budget proposals, comprise the economic budgets in an annex. Successive Plans and commission reports convey an impressive mass of data and analyses. The *Rapports sur les Comptes de la Nation* [Reports on the Accounts of the Nation] disseminate a vast set of synthesized and harmonized economic information. Training courses from the SEEF, then from the INSEE-DP, introducing the conceptual and practical framework of national accounts, are widely attended. Teaching of national accounting enters academia in 1955 thanks in particular to Jean Marchal. Malinvaud publishes in 1957 his *Initiation à la Comptabilité Nationale* [Introduction to National Accounting] ("This small volume intends to extend the circle of the initiates able to efficiently use the results of economic accounts", p. 7), whose fourth edition will appear in 1973. Economic information is often regarded as a power play. The Commission on Economic Information of the Sixth Plan, at the end of the 1960s, crystallizes an evolution which leads to equitably put this information at the service of the public at large, of society as a whole and not only of government authorities. Ripert opens INSEE to the outside world, and develops the relationships with the press (Jean Broizat, himself an economic journalist, organizes for his fellows training sessions on national accounts and statistics). Specialized accounts commissions are created in certain fields (transports in 1955, trade in 1963, agriculture in 1964). Others will later follow (services, housing, etc.). They bring together representatives of the concerned activities, trade unions, government officials, experts, statisticians in order to examine and promote detailed and developed accounts on certain activities and to improve their understanding. In the case of trade and agriculture, they efficiently contribute to make statistical activities acceptable to sectors that were opposed to them in the beginning, which will facilitate survey operations, and eliminate passion from debates on reports relating to the evolution of incomes. Thus, in the case of agriculture, after a period of tension, at the beginning of the 1960s, during which a research office of the profession publishes agriculture accounts opposed to those of the administration, a technical group in the Commission develops a preliminary reconciliation work on methods and estimates with the purpose of progressively improving the account.

The end of the 1960s and the first part of the 1970s witness the multiplication of macroeconomic analysis based on econometric models. Actually, during this period, the effect of the twilight of indicative planning in the French way combines with the emergence of the preponderance of short-term analysis (initiated since Giscard d'Estaing's 1963/1964 stabilization plan). The focus tends to move from projections into forecasts. The failure of the income policy attempt marked in fact the defeat of the experiment of planning "in value" in favor of a more liberal orientation of the French economy.

However, the topic of the distribution of the fruits of growth – which supposes a voluntarist attitude – does not disappear immediately. Under the impulse of Massé, the method of the "surplus accounts" and the analysis of the distribution of the productivity gains develop both at the macroeconomic level (sectoral) and for large public corporations after the creation of the CERC in 1966 (see chapter 9).

1.3. Uses in very different contexts

The surplus accounts are a good example of differences in approach in the use of national accounts due to different social concerns. The perspective for measurement of the change in volume of the factors of production and the production of goods and services to estimate a change in total (the USA) or global (France) factor productivity, is that of growth accounting. It is focused in the USA and in many studies undertaken then elsewhere on the analysis in volume of the factors of growth. The distribution of productivity gains is not a topic of interest there, as the assumption of the neo-classical distribution theory – equality at equilibrium of factor incomes and their marginal productivity – is usually retained. On the other hand, the French approach of the surplus accounts admits that this distribution is a matter for discussion even when the appearance of the productivity surplus and its distribution are two simultaneous phenomena.

More generally, national accounts are used in a very intensive manner and in different contexts except in the East. The USA does not insert them into a process of concerted collective programming. The nation's economic budget, a simple tool conceived in the 1940s for projection purposes, is not used for the publication of forecasts. But everyone prepares projections of accounts or aggregates, official services as well as business economists, research and market research institutes, etc. In the 1950s and 1960s, the National Planning Association projects long-term GNP (see Kendrick, 1972, pp. 300–304). Econometric models (that of the Brookings Institution is particularly developed in the 1960s) aim at the analysis of business cycles, but many researchers, in particular within the NBER, focus on the measurement of the economic performances in a long-term perspective. An intensive debate, at the beginning of the 1970s, deals with the issue of the slowdown in productivity.

There is no economic programming in the United Kingdom, in spite of the emergence of National Accounting during the war, except for a short attempt at indicative planning (the National Plan) in the first part of the 1960s, the opportunity for the preparation by Stone in Cambridge of a significant work on a developed and integrated system of national accounts (see chapter 3). There is no official economic budget either, though the Treasury has operated its own macroeconomic model since the middle of the 1960s and the concepts of national accounts play a significant role in the analysis (Neuburger, 1996).

2. Crisis of macroeconomic regulation and relative setback of national accounting

Grosso modo, until the first years of the 1970s, the idea of macroeconomic regulation through demand still prevails, even if the economic policy is everywhere a varying combination of different approaches and techniques (the *policy-mix*). In a few decades, however, many changes occurred. Generally, economies opened up and were liberalized. One speaks of their internationalization, shortly later of their globalization. Certain negative effects of growth are under increasing criticism. The long-lasting, largely consensual, objective of growth is questioned. (Some even plea in favor of "Zero Growth", while others have rejected the "consumer society" model.) At the same time, many "southern countries" are at pain to promote their development and are unable to control their disequilibria. Individualism is in progress. The productive system (firms, products) becomes increasingly complex.

Transformations accelerate with the first oil crisis. Unemployment soon increases, while at the same time economies see their growth slow down or stagnate and inflation again reaches a two-digits rate in large industrialized countries ("stagflation"). The crisis is structural and the macroeconomic regulation mechanisms break down.

Hence a decline in macroeconomic theories inspired by Keynes and a crisis of macroeconomic models, an increasing preponderance of the neo-classical theories, the weakening of the role of government and the appearance in the foreground of incentive policies based on microeconomic behaviors in a neo-liberal type of approach.

In the new context of the last quarter of the century, national accounting does not seem to be supported any longer by the Keynesian paradigm and will suffer from the discredit of the latter. Some will even consider that it has been overtaken. Nevertheless, the demand for national accounts continues to increase and, as a discipline, from the 1968 SNA/1970 ESA to the 1993 SNA/1995 ESA, it makes considerable progress. The uses and requests that are addressed to it know notable transformations, and stress different aspects, while at the same time new requirements appear that are difficult to satisfy.

Attention is increasingly paid, on one hand, to short-term economic trends, on the other, to economic and social policies aiming at structural transformation, while growth policies as such become blurred or disappear, the whole in an increasingly international context.

2.1. Emphasis on short-term analysis and expansion of quarterly accounts

The short-term primacy results in an increasing importance given to quarterly accounts viewed as a general indicator of the short-term economic trend. As the detection of turning points is considered to be essential, a request for monthly elements of accounts, monthly GDP in particular, appears (Canada publishes such a series since 1971, Finland since 1986). The purpose of such a monthly GDP is broadly equivalent to that of a general production index, covering all economic activities and using value added as weights. Above all, the timeliness of infra-annual accounts, and more generally of short-term statistics, becomes an element of first importance in the assessment of their usefulness, without a clear trade-off between timeliness and accuracy. A spate of users developed over time. In France, the first circle initially consisting almost exclusively of official short-term economic analysts, grew wider with the plurality of forecasting institutions, a situation which had often a long tradition elsewhere (Germany, the USA, etc.) but was recent in France. Their creation, which was encouraged by the government itself, occurred in the second part of the 1970s (initiatives of the Barre's government, with total support from INSEE and the Directorate of Economic Forecasting, DP). The outcome is in particular the creation of the *Office français de conjoncture économique* [French Office for Short-term Economic Analysis], OFCE, and of an employers' institute IPECODE. Macroeconomic forecasts at two years distance using quarterly econometric models multiply. The approaches are partly competitive and partly cooperative (in France, a technical group of the *Commission des Comptes et des Budgets Economiques de la Nation* [Commission for Accounts and Economic Budgets of the Nation] brings together the principal forecasting centers). Beyond this, banks and many other organizations carry out short-term analysis. The media then echo all of them.

To give analysts an equal treatment, the practice gradually develops of announcing in advance (four months in France, with progressive readjustments) the precise date and hour for the dissemination of the principal statistics. This practice started early in the USA, in particular when the Stock Exchange started to exhibit a great reactivity to announcements of new short-term economic information. The concern for avoiding any charge of favoritism even led there to the decision to sequester the statisticians who make the synthesis of the provisional quarterly accounts for a few hours, in a reserved zone of the service. Financial markets, whose function is rather normally of medium-term anticipation, indeed reveal a high sensitivity to short-term changes in the level of the activity.

Regarding public authorities, attention to very short-term trends is mainly due to the increasingly monetary character of economic regulation policies by central banks where the recourse to interest rate adjustment gradually becomes predominant. In the last two decades of the century, the objective is initially the reduction of inflation, then the prevention of any risk, even weak, of its return.

The emphasis on short-term issues thus generates a new demand for national accounts concerning infra-annual periods. In open and liberalized economies, however, their role in analyses is rather reduced compared to what it was in the first decades after the war. This is due in particular to the growing role of monetary and financial phenomena (interest rates, exchange rates, floating capital movements, etc.), which at the same time relativizes the role of analysts, due to the increasing difficulty of their forecasting activity. In this field, the progress of national accounts in the most advanced countries, incorporating first financial flow accounts, then financial stocks, firstly on an annual basis then later on a quarterly one, rather precedes actual demand, as model builders and analysts encounter difficulties in carrying out the integration of the financial and non-financial spheres.

Gradually one hardly speaks any longer in public of medium term as a whole. Incentive policies in fact fail to prevent the development of situations of massive unemployment. Although the idea of growth itself is not questioned any longer, though some of its characteristics are, discussing the choice of a growth rate is no longer an issue in the social debate. However, almost everywhere, and beyond the forecasts at one or two years distance, medium-term projections continue to be carried out, but remain unpublished, in order to provide a reference framework for long-term decisions. They use the same macro-econometric models as those used for shorter forecasts.

2.2. New but unwitting customers

These models, however, are challenged, for the study of the economic policies aiming at structural transformations, by computable general equilibrium models (CGEM), which have been multiplying since the middle of the 1970s. Based on the construction of a representation of a country's economy starting with a general equilibrium model, and a coherent theoretical microeconomic anchoring applied to intermediate aggregates of goods and representative economic transactors, CGEMs are applied to the study of macroeconomic phenomena and problems concerning resource allocation (sectoral problems – energy and agriculture in particular –, questions of taxation and more generally of public finance, foreign trade issues, such as exchange liberalization, etc.). CGEMs are also large users of data from national accounts, but not in the same way as econometric models. Specifically worked out for each application, they are based only on the accounts of a single year supplemented and developed in the field under scrutiny. In addition their parameters, except for rare exceptions, are not estimated using econometric methods, but drawn from the literature, or determined by calibration so that the model reproduces the benchmark data.

The relationship of CGEM with national accounting is unfortunately presented, in general, in a biased way, because of the use of the unfortunate expression, "social accounting matrix", which conveys the belief that one speaks about something substantially different from a national accounting matrix (see chapter 4, on the SAM dispute). Some national accountants themselves maintained the ambiguity, misled by narrow ideas of national accounting (from which Chapter XX of the 1993 SNA due to Keuning is not totally exempt). Under these conditions, CGEM specialists often insist on the recourse to a Social Accounting Matrix, or SAM, as if it were a procedure different from building a national accounts base for a single year supplemented in a flexible way (on households, for example). In France, where integrated national accounting was strongly developed, while opening flexible prospects regarding, for instance, satellite accounts or intermediate systems, a certain clarification is sometimes carried out. Thus Katheline Schubert rightly states (1993): "In short, a social accounting matrix is a synthesis of IOT and TEE [Integrated Economic Accounts]" (p. 807). However, the clarification seems never to be sufficient because of the use of an ambiguous terminology.

The merit of such matrices is to have allowed the use by CGEMs of a specific base containing more information than that included in the official national accounts of poorly endowed countries [in terms of the development of their system of national accounts], while taking advantage of the potential flexibility of the system (that this time the 1993 SNA directly exhibits). But it is a pity, from the point of view of statistical policy and the badly needed support to the poor (in the literal meaning of the word) statisticians in developing countries, that producers of CGEMs – which belong in general to research institutions – do not seem to realize that by gathering and treating the data of a "SAM", they practice national accounting, though in fact without, by assumption, any concern for the setting up of time series.

From this last point of view, it is not clear from the experiments carried out to date, if it would be feasible to elaborate some kind of standardized recommendation responding to the specific needs of this type of modeling. It would consist of the effective regular building of a set of national accounts, quantitatively completely integrated at a meso-economic level with standardized sub-classifications (for example, for industries, products, factors of production, households groupings, etc.), that the producers of models could supplement according to their particular objectives. The question first arises for households. In spite of introducing a sub-sectoring of households in the 1993 SNA/1995 ESA, nothing is included in that respect in the official data transmission program established in the European Union. French work on household accounts by socio-economic category (see chapter 2 and Box 15) has been discontinued since the mid-1980s.

2.3. Increasing use of micro databases

In developed countries, the trend during the two last decades of the century is to preferably make use of micro-simulation models for the study of structural economic and social policies. Such models analyze the expected effects of intended measures by taking into account, in a detailed way, the characteristics of subpopulations to which, for example, certain legal or regulatory variables apply. They are developed particularly for the analysis of taxation and social transfers. The use of micro databases, thanks to progress in the sources of information and data processing, makes it possible to take into account in the models such detailed characteristics for businesses as well as households. Micro-econometrics makes progress regarding behavioral studies. Economists have thus at their disposal much richer information than before and, in this context, their concern for macro- and even meso-economic level, diminishes.

Micro databases are multiple and their sources diversified, even if, for households, they are generally budget or living conditions surveys or administrative data from income tax returns or social security files. There is no orientation towards the building of a general micro database on households for micro-simulation purposes, and even less towards a micro–macro link totally integrated into national accounts, contrary to certain proposals advanced in the 1970s (by Richard Ruggles for example, see chapter 4). There are doubts that the ambition could be, in principle, “to lead to a ‘total’ modeling, aiming at exhaustively reproducing the diversity of situations and individual behaviors and the interactions between the individual level and the macroeconomic or macro-social constraints” (Didier Blanchet, *Economie et Statistique*, May 1998, p. 34).

That does not prevent wider objectives for certain data bases to develop, either for simulation purposes [as the project of long-term dynamic micro-simulation of the French population and its socio-demographic characteristics (*ibid.*, pp. 95ff)], or else for purposes of statistical synthesis (for example the Canadian project mentioned in chapter 7, see the end of the Annotated Bibliography of that chapter). But trade-offs and interactions continue to occur at the more aggregate levels of the CGEM type (which are not, strictly speaking, general equilibrium models) or econometric models.

Concerning businesses, the use of micro databases involves a paradoxical consequence for national accounting. In fact, analysts wish to deviate the least possible from what can be observed using micro-data, in particular their change over time. But national accounting is obliged to adjust business micro-data, either individually or globally or by sector of activity, for better approximating its own classifications and to end up with economically more significant measurements of key variables such as output, value added, change in inventory and net operating surplus. Because of the reasons indicated in chapter 4, it is unfortunately not possible for national accounting to estimate or allocate at the level of each individual enterprise certain adjustments which it carries out, for example for tax evasion or consumption of fixed capital. It is not possible for it either, by some sort of assumption (indirect methods of estimating tax evasion, modeling of CFC estimate), to rigorously prove the accuracy of the adjustments carried out and especially the relevance of their short-term changes.

Analysts, then, tend to take the evolutions drawn from the direct aggregation of individual accounts as a reference and urge national accountants to approximate as strictly as possible the latter. This means – beyond the welcomed criticism to national accounting methods liable to be corrected – requesting from it to give up the idea of being economically more significant than business accounting. French national accounting developed, more than anywhere else, the use of micro-data for the establishment of its accounts. It also compiled – at the sectoral activity level – accounts for enterprises consistent with global national accounts. With this request, it is taken off-guard and finds itself in a still more uncomfortable situation than countries where national accounts for businesses being more global, there is less intent to reconcile the general results it provides with those micro-data that are scarcely aggregated for the whole economy.

2.4. Considerable extension of the institutional and political role of national accounting

The extension of the analysis based on micro-data reduces the role of national accounting in the research works of economists. Some of its main aggregates are placed during the 1990s in the core of an essential political debate for Europe, with the creation of an economic and monetary Union (EMU) and the introduction of a common currency. Most of the accession criteria within the EMU, the so-called Maastricht criteria, are defined by reference to the ESA (ratios of public deficit and public debt to GDP). Some time before, the fourth resource of the Community budget had been defined in reference to GNP (now GNI). Several uses of certain aggregates (GDP or GNP) for administrative purposes had been introduced here and there over time: calculation of the contributions of countries to international or supranational organizations, determination of eligibility thresholds to preferential measures (loans with lower interest rate from the World Bank). In Europe, within the framework of structural funds for regional development, GDP per capita occupied a central place among the indicators used in territorial delimitation and thus played a significant role in the distribution mechanisms of relevant financial amounts. The debate around the Maastricht criteria marks a qualitative jump in the consideration of national accounting by governments, officers in charge of budgetary and financial matters and public opinion.

This institutional strengthening of the position of national accounting does not go without raising some concerns among national accountants. The document presented by the Austrian statistical office in May 1996 in Geneva (National accounts meeting of the UNECE, Eurostat and OCDE-Room Document no. 4) echoes them. It expresses fears of possible political pressures or self-censorship, efforts focusing on variables thus used, formal rigidity, less attention paid to new developments, etc. The purpose of the system of collective criticism set up within the framework of the GNP Committee created in 1989 (see appendix of chapter 5) and of the Committee on Monetary, Financial and Balances of Payments Statistics (CMFB) organized in 1991 (see appendix of the present chapter) is to avoid or limit such inconveniences.

The European Union, and more critically still the EMU, considerably extends the request for statistics and national accounts, and makes more demanding requirements (see chapter 5), while possibly putting at risk, under certain aspects, the establishment of national accounts (a problem of the observation of intra-community flows of all kind). What is set up in Europe indicates the shift in progress of the regulation centers from the national to the supranational level. The problem extends beyond Europe and the need for regulation on a global scale is increasingly felt. In the absence of an "Economic Security Council", which the meetings of the G7 type do not resolve, the monitoring and intervention function aiming at remedying local and regional crises and at preventing the appearance of systemic crises falls on the IMF, in agreement with the principal economic powers. Hence the IMF's growing role in the supply by Member States of timely and well-documented harmonized information. Thus, in the last decade of the century, the IMF sets up a system of standards to guide countries in data dissemination, the General Data Dissemination System (GDDS) intended for all Fund members, with a particular version, the Special Data Dissemination Standard (SDDS), for countries having or seeking access to international capital markets. Stress is laid on the information (metadata) concerning the characteristics of the data, their quality, their accessibility and their integrity, in the macroeconomic, financial and socio-demographic fields. The synthesizing and structuring role of national accounts is particularly highlighted, when the purpose is to keep watch on a very high number of countries, even if monitoring the world economy calls for a different type of information, more sophisticated and difficult to obtain, regarding variables which are crucial in the appearance of imbalances (international financial flows, in particular short-term debt of corporations, formation of speculative bubbles, etc.). The IMF carries out forecasts, at one or two years' distance, regarding the change in the principal economic variables aggregated at the level of the whole world and its major areas. The OECD, the European Union, the European Central Bank do the same for the countries belonging to their respective zones.

2.5. National Accounting stumbles over certain issues

The joint uses of national accounts (strictly accounts of national economies) are spread more and more in the last fifty years through internationalization, supranationalization, globalization. Even so, no feed-back effect is perceivable which leads to a transformation of these national accounts into something better adapted to a broader perspective. The central difficulty is undoubtedly due to the fact that the complexity of the projects of real (in volume) comparison of national aggregates and purchasing power of currencies has not made it possible to thoroughly overcome the obstacle of exchange rates (see chapter 9). Sometimes conversions according to purchasing power parities and exchange rates coexist, a diversity on which the media frequently stumble. Sometimes only exchange rates are used, for example to convert incomes per capita of very poor countries or wages in transition countries, often leading to very low, obviously unrealistic figures and whose actual meanings are, above all, emotional. Except for some aggregates, thanks to the PPPs, Europe has still not produced, after half a century, Community accounts aggregating the accounts of Member States and European institutions. Things start moving at the end of the century. The European Central Bank undertakes, given the needs of monetary policy, consolidated financial accounts of the EMU as a whole, and it becomes feasible to aggregate national accounts in euros of Member States. Even in this context, the calculation of PPPs continues to be relevant, notably as an element of appreciation of the real convergence of the economies. Indeed the conversion rates retained among the currencies of countries entering the euro zone derive from exchange rates and not from PPPs. The introduction of the euro does not instantaneously make the involved economies homogeneous. Moreover, the existence of the euro does not solve the problem of the combination of national series for the period prior to its introduction. The continuity of national series over time, both in volume, prices and nominal value, requires to convert the series of the past using the exchange rate between the national currency and the euro that was chosen when the euro was introduced. But the series in “euro-francs”, “euro-marks”, “euro-liras”, etc. thus obtained are not directly comparable since the exchange ratios have evolved over time. The methodological issues raised are discussed in the first years of the twenty-first century. Beyond the EMU, problems integrally remain. More generally, one hardly sees how to solve the partial loss of significance for national accounts resulting from the transnational and dynamic organization of an essential part of the system of production and exchange (see chapter 5), in a context of development of intangible investment and assets. To take these elements into consideration, too late in any case (cf. the case of R&D), poses difficult problems (see chapter 8, section 1.5).

These phenomena and the acceleration of technical progress particularly by information and communication technologies, makes economists and statisticians aware that essential elements of economic growth measurement (volume–price factoring of equipment products, estimate of the stock of capital and fixed capital consumption, accounting for human capital, measurement in volume of an increasing part of output, in particular services), were poorly mastered in price, production and national accounts statistics. Consequently, this is also true for the estimates of productivity and growth accounting carried out by economists. However, the social demand strongly short-term oriented is hardly visible in these fundamental variables and the means of statistical services very generally appear far behind the needs for structural knowledge on a longer term, though the USA seems better off in that respect.

The public interest in the structural aspects of national accounts has been considerably oriented by the great debate on the relationship between public and private domains in the 1980s and 1990s and by the importance within this framework of "good governance" criteria, referring to government deficit, debt, and compulsory levies (taxes and social security contributions), for which the accounts are much in demand.

It is true that on certain issues, which strongly emerge at certain times in the social debate, national accountants cannot answer positively to the request for a single indicator synthesizing a set of complex phenomena, as GDP (it should be NDP) does for economic activity considered in a traditional way. This refers, at the end of the 1960s and the beginning of the 1970s, to the estimate of a welfare indicator (see chapter 7) and somewhat later, but especially in the last part of the 1980s and in the following decade, to the estimate of an environmentally adjusted NDP. To these complex questions, national accounting cannot give a simple answer, easy to disseminate through the media. In so doing, and although the answer is dictated primarily by intellectual integrity and not by conservatism, national accounting deceives, and, voluntarily, relativizes itself. It refers to various answers, either the combination of social indicators, as is the case of the Human Development Indicator of the United Nations, or to the design of a system (new or almost completely new) as for instance for the environment, a field in which, beyond the difficulties of basic observation, the questions of valuation and aggregation are particularly complex. National accounting thus offers tools (for instance IOTs, useful for the study of some problems, it is not the case in France), and approaches (satellite accounts for expenditure for example, or natural patrimony accounts), but no global answers, a point on which the ambitious SEEA fails (chapter 8 and Box 64).

Discussions on these complex issues, besides the fact that they carry a latent risk of conflict with politics, potentially looking for a "green GDP", give place to harsh tensions between national accountants and economists – particular active in the World Bank or in its sphere of influence. The latter, within the framework of economic theory, are extremely confident of their capacity to provide answers to the fundamental problems of measurement, thanks in particular to the recourse to valuation methods known as contingent (see chapters 7 and 8). Do these tensions mean that the idyll of the 1930s to the 1950s between national accounting and economic theory is over?

3. Sensitive relationships with economic theories

3.1. Interaction between theories and national accounts measures

That national accounting is from a Keynesian inspiration was considered for a long time as a truism. Historically, its rise and that of Keynesianism are indeed largely concomitant, and national accounting owes its success to the development of applied macroeconomics, dependent on the *General Theory* and its extensions. Don Patinkin (1976), however, shows that in the beginning, in the interwar period, the question is actually less simple. He thinks in terms of the interaction between "the Keynesian revolution" and what he does not hesitate to describe as "the no less significant (though quieter) revolution that began to take place even before the *General Theory*, with respect to macroeconomic measurement". He considers the question of the interrelationship between the two revolutions "an extremely complex and difficult one" (p. 1093). With the second revolution, he associates the names of Kuznets and Clark and notes that the estimates of national income or other aggregates carried out at the beginning of the 1930s were justified, to differing degrees, by the desire to quantify macroeconomic variables (in particular investment) to which the business-cycle theories before the *General Theory* had already attached a crucial importance (p. 1107). Clark (1932) uses his estimates to provide an empirical adjustment of the "fundamental equations" of the *Treatise on Money* (1930). The *General Theory* uses some of Clark's estimates and, without too much precaution (an exchange of letters will follow), some of Kuznets. Keynes provides an estimate of the marginal propensity to consume based on statistical series. The *General Theory* gives a decisive impetus to the subsequent preparation of estimates of aggregates based on the equilibrium equation for goods and services. Statistical measurements and theoretical developments influence themselves in turn. Don Patinkin concludes mentioning "the kind of fertile interaction between theory and measurement which has so frequently characterized the progress of science" (p. 1111).

This idea of interaction between economic theory and national accounting measurement is for decades familiar to theoreticians of national accounting. It is very clearly expressed by Kendrick at the beginning of the 1970s: "Thus there is an interaction of theory, which suggests significant variables, and the accounts, which provide the data with which to test and refine the theory, which may in turn suggest further refinements of the accounts" (1972, p. 236, see also p. 1). Stone, to whom Kendrick refers (pp. 3–4), although he follows this general idea, adopts a more nuanced approach, because he is sensitive to a fundamental duality in economic theories as to their relationship to observation. Hats off to theory: "The facts we present and the way we arrange them depend a great deal on considerations of theory". But "our theories must connect with concepts to which we can give an empirical content [.. . .]. For if this link is missing, we can hold any theory we wish, provided it is logically consistent, but we cannot speak of such a theory as being true or false since it says nothing about the real world and consequently cannot be supported or refuted by an appeal to facts" (Richard and Giovanna Stone, *National Income and Expenditure*, Bowes and Bowes, 1961, 1972 edition, p. 150). In this last section of the book, under the meaningful title "Facts, theories and analyses", Stone's mistrust regarding pure theory is obvious ("Thus, useful theories cannot be developed independently of what can be observed any more than useful facts can be established without some regard to theoretical considerations", *ibid.*). Some lines earlier he mentions "purely theoretical concepts, like utility, which we have not yet learnt how to measure".

A few years before, in *Quantity and Price Indexes in National Accounts* (OEEC, 1956), Stone had explicitly approached the relationship to microeconomic theory in connection with price and volume indices: "The question of whether consumption or production are higher in the current period than in the base period and if so by how much can be made more precise by means of the usual apparatus of indifference curves and production isoquants. These theoretical developments are useful as a guide to the nature of the comparisons sought but from a practical point of view they do not provide the basis for a solution since even in highly simplified cases much too little is known about preferences and production possibilities. If the comparisons made are required to provide unequivocal indications of changes of welfare or productiveness then it is useless to attempt them because the necessary empirical information is not available". Which explains the need "to define the basis of comparison in pragmatic terms which can be given an operational significance" (p. 12). In other words, there is nothing to draw in practice for national accountants from the famous *Economica* debate (see chapter 7, section 1). The term "operational" – i.e. observable and usable – well characterizes Stone's approach in all his work.

3.2. Evolution of the intellectual status of national accounting among theoreticians

Once the idyll between the macroeconomic theory of Keynesian inspiration – what Don Patinkin and Kendrick had in mind when writing – and national accounting is over, the relationships of the latter with economic theory become troubled. In the 1950s and 1960s there is no major problem. Even if the approach recommended by Hicks (1942) is not entirely followed, introductory economics textbooks at universities give an important place to national accounting (for example, Samuelson's *Economics*, 1948, and even more Jean Marchal, *Cours d'économie politique* [Lessons in Political Economy] 1956, which explicitly refers to Hicks, see his foreword, p. 8) and specialized teaching of national accounting is introduced in some countries, in particular in France, or less frequently, in the USA for example. Strictly speaking, theory is not directly tested through national accounting, but the parameters of macroeconomic models are tested on national accounts series that the models must be able to reproduce. Then, from the end of the 1960s and the beginning of the 1970s, economic theory and national accounting tend to be unaware of each other for a time. The 1968 SNA presents the uses of national accounting in operational terms. These uses "are concerned with increasing our ability to understand the working of economic systems and to take beneficial decisions about them" (§ 1.74). However, references to theory are missing. Soon, national accounting disappears from the new classification of the American Economic Association fields (1974) where it previously appeared in a sub-heading under the title "Social accounting". The French Economic Association follows. However, a heading "National Income Accounting Theory and Procedures" remains until 1991 in the classification of the *Journal of Economic Literature* of the same AEA. Since then, it is necessary to seek mainly under the heading: "Methodology for Collecting, Estimating and Organizing Macroeconomic Data". These formal changes reflect the fact that "national accounting no longer has [starting from the middle of the 1970s] the charm of novelty; macroeconomists regard it as a simple technique of data collection and aggregation and micro-economists as an anachronistic discipline" (Edith Archambault, 2001, p. 470).

For most academic economists, national accounting is no longer a branch of the economic discipline as it was perceived for example by Hicks (1942), Malinvaud (*Initiation à la Comptabilité Nationale*, [Introduction to National Accounting], 1957, p. 8) or Marczewski (*Comptabilité nationale* [National Accounting], 1965, p. 3). In short, John C. Dawson – who is in the line of Copeland and the institutionalist current – sadly notes, "U.S. academic economists do not study national accounting, do not use it and do not teach it" (1998, p. 6). Handbooks contain just a short introductory chapter on this topic. In France also the share of national accounting at the university diminishes in the last decades (but it is introduced in secondary school and in management studies). All this happens while, at the same time, practitioners, economists in governments, international organizations and the business world are making an intensive use of the data coming from national accounts and are using them as a framework of observation and analysis of the overall movement of the economies.

This evolution of the intellectual status of national accounting among theoreticians, closely related to the relative depreciation of the role of statisticians, as compared to that of economists, should be associated – beyond the actual transformations of their role as mentioned before – to the increasing preponderance of the microeconomic approach in economic teaching and in many applied analyses. The difficulties present, in fact, several orders of importance. At the beginning, there is a tendency to confuse national accounting with the theory to which its birth was bound, and the models that derived from it. In France, at least, handbooks frequently cover both aspects at the same time (Jean Bénard, *Comptabilité nationale et modèles de politique économique* [National Accounting and Economic Policy Models], PUF, 1972); Alain Pichot, *Comptabilité nationale et modèles économiques* [National Accounting and Economic Models], PUF, 1988). But if national accounting aims at "the establishment of descriptive models of the economy considered as a whole" (Malinvaud, 1957, p. 8), it does not provide, by itself, explanatory or operative models. The relativization of its role over time is thus not surprising. Its relevance completely disappears, on the other hand, for the theoretical current that seeks to carry out "the unbearable ambition of a general microeconomics" (Malinvaud, *Voies de la recherche macroéconomique* [Channels of Macroeconomic Research], 1991, p. 146), therefore eliminating any macroeconomic specificity. Total opposition to those who support that, it is "[...] by a more direct approach to macroeconomic phenomena that main progresses [towards a genuine theory of employment, growth, or inflation] will be carried out" (Malinvaud, p. 147), even if they think that "[...] the transposition from the microeconomic scale to the macroeconomic scale is [...] fundamental in nature" (Malinvaud, "Fondements microéconomiques de la macroéconomie" [Microeconomic bases of macroeconomics], in *Encyclopédie économique*, Economica, 1990, p. 583).

The recourse to observation is again a central element of the debate among economists in the last decades of the 20th century. Malinvaud underlines (*op. cit.*, p. 147) that, in the construction of the theories that he has just mentioned, "[...] the recourse to systematic observation holds a significant place" while "[...] the purely microeconomic approach too often maintains the illusion that one can do without this reference to data". Macro-econometrics is subject during this time to the discussions around the calibration approach, which is opposed to that of a rigorous statistical method for estimating parameters and making specification tests (Eric Renault, "Le calibrage ou une controverse sur la place de la statistique dans la modélisation économique" [Calibration, or a controversy on the role of statistics in economic modeling", *La lettre du CREST*, February 1999; Bernard Guerrien, *Dictionnaire d'analyse économique* [Dictionary of Economic Analysis], pp. 194–196). The CGEMs, as has been already seen, which resort to this approach, use more or less large databases – primarily national accounts data which are adjusted and supplemented – but are not interested in past series (except if required for calculating some multi-annual averages) which they do not seek to simulate. The relationship with economic history is at stake. National accounts series constitute the backbone of the actual quantitative economic history. For the CGEMs, on the contrary, anchoring in the present is not an anchoring in history. A model gives a static representation of the concerned economy that is partly real, partly hypothetical (use for example of estimates of parameters drawn from the economic literature) under the general assumption that this economy is for the base period "at equilibrium". It is often said that CGEMs are long-term models, in the sense though that behavioral reactions, elasticities, substitutions are supposed to have all the time necessary to operate, not in the sense, however, of a global simulation of future economic histories that long-term projections tried, timidly and unsuccessfully, to carry out, as in France, for instance during the 1970s. "The objective of CGEMs is not to forecast, but to analyze policies within a completely coherent microeconomic framework", summarizes François Bourguignon (at the Thirty Years Conference of the Directorate of Economic

Forecasting (DP), 1995, p. 114) for whom the CGEMs "[...] seem to occupy a crucial intermediary stage between, on one hand, microeconomic calculation at the level of projects and, on the other hand, macroeconomic models" and are rather "quantified theoretical representations" (p. 117). He himself tries a "micro–macro" approach not completely orthodox.

In the economic environment of the last quarter of the century, the relationship of interaction between theory and measurement can no longer be formulated in the general terms used by Kendrick or Patinkin, which was even debatable at the time. Macroeconomic measures, or more generally statistical observation, do not influence microeconomic theory, which is deductive by nature. Facts influence the latter *via* the attempts at taking into consideration certain general structural characteristics of the real world, such as imperfect competition, asymmetries of information or the existence of transactions costs, but not as the base of quantitative tests which would be checking it. The question of knowing if economic theory could be falsifiable in Popper's sense, i.e. liable to be declared null, invalidated by the facts, – a condition for a theory to be considered as scientific – was largely debated, in particular in the books by Lionel Robbins (*Essay on the Nature and Significance of Economic Science*, Macmillan, 1932) and Milton Friedman (*The Methodology of Positive Economics*, University of Chicago Press, 1953) [see for a synthesis the methodological postscript by Mark Blaug to *Economic Theory in Retrospect*, Cambridge University Press, 1985]. The neo-classical theory relies on the remarkable intellectual construct that it constitutes and its claiming for the relevance of the recommendations drawn from it. National accounting cannot prove or reject anything in this respect.

3.3. Multiple intellectual sources of national accounting

On the other hand, and by a strange reversal of views, national accounting – which was supposed, in the middle of the century, to be intrinsically linked to the Keynesian macroeconomic theory – is increasingly often judged through its relationship to the neo-classical theory. Thus Charles R. Hulten, a professor at the University of Maryland, greets (1996) what he regards as a kind of rallying (without employing the word) of the SNA to the neo-classical theory. He appreciates as a major progress the fact that "[...] the *SNA* 1993 provides an internally coherent set of guidelines, based on (or at least consistent with) the neo-classical model of consumption and production" and judges that "[...] standard economic theory is the essential foundation on which the *SNA* accounts are erected" (p. 150).

Things do not appear so simple to national accountants, whose views are, however, far from being homogeneous. Filiations of the national accounts system, such as it is presented in the 1993 SNA/1995 ESA, are multiple. The accounting framework itself borrows from various sources. The major aggregates and the equations that connect them are Keynesian, but not the whole system – contrary to what was often written. Thus Guido Ferrari presents, at the 7th ACN Conference in 1998, SAMs – i.e. national accounting – as representing "the entire economic system, whose activity is perceived and interpreted, of course, in the light of the Keynesian macroeconomic theory", p. 300). Input–output tables originate, according to Leontief, in the Walrasian theory of general equilibrium (but historically, reference can also be made to Marx and his reproduction schemes). Leontief thus starts his book (*The Structure of the American Economy*, 1941, p. 3): "This modest volume describes an attempt to apply the economic theory of general equilibrium – or better, general interdependence – to an empirical study of interrelations among the different parts of a national economy [. . .]". The concept of general interdependence is undoubtedly at the root of national accounting as a whole. This leads Pyatt (1994, p. 248) to place SAMs within a Walrasian framework. But the idea of general interdependence is not specifically Walrasian. The restriction introduced by Leontief in the above sentence softens the impact of his reference to Walras. The specificity of the latter, as that of the current that proceeds from him, is to stress the individual choices of economic transactors. Keynes is interested in the relationships between global quantities, Marx like Leontief, in the relationships among sectors of the economy. Leontief's formulation, just mentioned, specifies that the purpose is to study the "interrelations among the different parts of a national economy". For national accounting, an *ex post* system of observation, this does not imply particular assumptions on the individual behavior of households (besides, the individual consumer does not appear in the categories used) or of businesses. In practice, theoreticians and analysts following Walras transpose to the level of these "parts" of the economy considered as representative, the behaviors that they retain in theory at the individual level. This change of scale poses difficult questions, as seen in chapter 7, in the case of households.

Copeland, the inventor of tables of financial flows, by no means conceives of them as an application of the theory of general equilibrium. He himself is primarily an institutionalist, close to Veblen and Mitchell (the latter has requested Copeland, in 1944, to ask the NBER to undertake an exploratory study on monetary flows in the USA), and as such, he is suspicious about abstract economics not capable of empirical testing and favors a science of economics close to other social sciences and dealing with group behavior. He is sharply opposed, for example, to the quantitative theory of money and the equation of exchanges framework.

In addition, the accounting framework of national accounting is also in debt to business accounting, though not slavishly, and to the description of economic institutions in the broad sense. The framework and language of national accounting reflect characteristics of contemporary economies and views, which result from social practices and conventions, and they are actually little connected to particular theories. The 1968 SNA is thus founded to say that "[. . .] a great variety of models can be built, within a common framework" (§ 1.73). The 1993 SNA is even more explicit: "[. . .] the system is sufficiently flexible to accommodate the requirements of different economic theories or models, provided only that they accept the basic concepts of production, consumption, income, etc. on which the system is based" (§ 1.33).

An essential distinction is thus made between the accounting framework seen as an instrument of *ex post* statistical synthesis and the analyses that make use of it, even when they are based on a theory that may have inspired the system. Thus, a descriptive IOT normally does not prejudge at all the assumptions that could be made with regards to the fixed or variable nature of the technical coefficients that it presents, or to the returns to the factors of production. It does not imply any particular production function. Admittedly, as suggested by the condition stated at the end of the sentence quoted from the 1993 SNA (§ 1.33), a national accounting system retains concepts of production, consumption, income, capital, that cannot be defined in a completely neutral way, totally independent from any theory. However, leaving aside the fundamental secular debate on the concept of production and Kuznets' reiterated will to interpret national income in terms of welfare, practitioners since the very emergence of national accounting have been trying to circumvent the theoretical debates. The discussion on the concept of maintaining capital intact, essential for the definition of income, is left for a long time to theoreticians (after Marshall in the past, Pigou, Hayek, Hicks, Samuelson in particular take part in the discussion). National accountants follow Stone's pragmatic and operational approach. The crucial question regarding the definition and calculation of consumption of fixed capital is regarded as a difficult technical problem, but a secondary one, related to the distribution over time of the revalued initial value of assets. The situation changes in the last decade of the century. The theoretical debates ignite around the relationship between income and capital in national accounting. This change results from the former accumulation of pressures coming from economists, during discussions on the environment (Hicks' concept of income is intensively called upon) or on the consideration of technical progress in the measurement of the change in volume of capital formation and stock, and in the measurement of productivity (see chapters 8 and 9), as well as from Hill's effort to clarify (make explicit) the theoretical bases of certain concepts of the 1993 SNA.

3.4. Diverging views concerning the relationships between economic theory and national accounting

Three principal trends seem then to take form inside the national accountants community. The first one, particularly clear for the Dutch, keeps a resolutely empiricist point of view. It considers that national accounting and economic theory have different objects, and that it is useless to try to connect them (closely in any case). The second attitude, on the other hand, privileges theory and especially the aspects concerning the relationship between income and capital. Theory defines what accounts must intend to measure. This tendency is notable among national accountants at the OECD, the World Bank and the USA, the latter being subjected to acute pressure from theoreticians and analysts of total factor productivity. A third, less comfortable, approach considers inadequate a completely empirical attitude, particularly regarding the concept of income. It considers that concepts and aggregates of national accounts have theoretical bases, but states that national accounting's conceptual construct includes autonomous elements compared to theories (and also vis-à-vis business accounting) in that it favors, for instance, the relationship between production and income; hence comes the importance of the distinction between produced and non-produced assets, and between produced and non-produced economic value. There is not necessarily one and only one solution that *the* theory would impose, since statistics is oriented towards the measurement of past economic phenomena, however recent they might be (for a discussion of the relationship between national accounting and the concepts of production, income and capital illustrating this approach, see Vanoli 2001, with main references). National accountants seem, on the other hand, unanimous in rejecting any interpretation of NDP in terms of welfare, and any attempt to adjust it in this direction, and almost unanimous in considering non-insignificant and unacceptable the calculation of an *ex post* environmentally adjusted NDP. They do not follow, in these respects, the proposals made by theoreticians.

At the end of the century, the relationships between national accounting and economic theory are thus formulated in new terms. The point is no longer to stress the kinship with the Keynesian macroeconomic approach. What is at stake is the relationship with microeconomic theory, regarding, in the first place, the valuation problems, primarily of capital and of the link between present and future (for market capital as well as for non-market non-monetary wealth, and for human capital). National accounting cannot escape the discussion of these topics, insofar it does not rely only on observations (of "facts", even if the observation device is built), but – as soon as the volume–price factoring and the valuation of the consumption of fixed capital are concerned – also on a certain amount of modeling concerning key variables (Vanoli, 1998). Agitated seas are forecasted ahead.

Outlook

This chapter is in itself an outlook on the evolution of uses and the intellectual and social status of national accounting, and to put it into perspective would not make much sense. The topics that it treats were approached from other angles in the previous chapters. What is striking is the length of time necessary to implement, even though incompletely, the initial idea. The world, in the meantime, changes.

On one hand, it makes more difficult the project of completely measuring, in a coherent way, the increasingly complex domain that national economies and their interrelationship, even their partial fusion into larger entities (see the last part of chapter 5) represent.

Box 75
Schools of national accounting?

Patricio León, at the time head of national accounts at the Central Bank of Ecuador, told Vanoli in the middle of the 1980s with a touch of humor: "*Nosotros que pertenecemos a la escuela francesa de cuentas nacionales*" ("we who belong to the French national accounting school"). On his side, the German scholar Utz-Peter Reich willingly evokes during the last fifteen years of the century "*the Dutch school*". Except for these two cases, the term seems not to have been applied to other national accounting cultures. Odd Aukrust, in his remarkable historical article of 1994, speaks about the "Scandinavian contribution" not of a Scandinavian or a Norwegian school, although there are common aspects between these countries. Has it only to be seen, in the terms used by León and Reich, an image of the well-known very relative character of French or Dutch modesty? Or is it really possible, without schematizing, to speak of national accounting schools, beyond secondary characteristics, whereas – as has been seen (chapter 3) – the trend is towards convergence?

The idea of school evokes at the same time the existence of a sufficiently typified doctrine, a certain proselytism and a current of influences on people, external to the group where it is elaborated, who share its main lines. It is not by chance that the expression is used in connection with the Netherlands and France at the time when, in the middle of the 1980s, the revision of the 1968 SNA/1970 ESA and the preparation of what will become the 1993 SNA/1995 ESA is beginning.

The young Dutch team then tries to completely revisit the structuring of the statistical system and, in this framework, that of the system of national accounting (Box 29) and proposes by the same token, before any experience of practical implementation of its ideas, that the future SNA be envisioned according to a similar orientation. The emphasis placed on "transactions" in the rigorous sense of the term, as Reich also does it for their "core", and the desire to limit as much as possible imputed values and re-routings (Boxes 24 and 27) evoke favorable echoes among those national accountants who want to remain as close as possible to market transactions and tend to think of the system in such terms, the rest of the system corresponding to elements, only accepted with reluctance. In particular, the Germans, the British, the Norwegians, as in the USA Nancy and Richard Ruggles, more or less share this orientation.

However, as the course of the preparation of the 1993 SNA will show, these tendencies are at the same time irresolute – placed against the wall, no one agrees to reduce imputations and re-routings and the discussion on this subject appears finally vain – and backward-looking, because the general problem of principle was already solved by the first two generations of the standardized international system. The idea to limit the "core" to transactions and to give it a rigorous institutional orientation, in the sense of a maximum respect of national institutional arrangements, transforming then the SNA into a peripheral system (combination of the *core* and imputation modules) does not find followers. Finally the Dutch scheme of the middle of the 1980s will have no influence on the structure of the 1993 SNA/1995 ESA and the role of the Dutch national accountants in the development of the new international system will appear secondary and ambiguous. It is positive on certain questions (development of accounts at previous year's prices and adoption of chained indices for example). On others it will have a highly negative influence (in particular due to its fierce opposition to the treatment of R&D expenditure as investment and, at least until the adoption of the new system, to the allocation among users of financial intermediation services indirectly measured). Frequent conservative attitudes will contrast thus with the innovating activism of initially abstract positions.

On the other hand, the Dutch influence will be very productive for extending accounting instruments under the form of different modules – of the satellite type – especially with the development of a National Accounts Matrix with Environmental Accounts (NAMEA).

In summary, the originality of the Dutch statisticians in the last decades of the century seems

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Box 75 (cont'd)

to mostly consist of their effort for reconsidering and reorganizing, in a long-term prospect, the statistical practice in a coordinating and integrating approach using intensively the possibilities offered by the new data processing technologies (see, at the beginning of the annotated bibliography of chapter 5, the reference to an article on the Netherlands by Alain Desrosières in the *Courrier des Statistiques*).

If there is a French school at the beginning of the preparation of the future 1993 SNA, which it will significantly influence, it appears in four different directions.

First, paradoxically, French national accounting, which had been in the 1950s and 1960s the most particularistic (chapter 2) – apart from Eastern Europe submitted to the MPS standard –, became the most universalistic by the end of the 1960s, a result of a Ripert's, Mayer's and Vanoli's joint choice of statistical policy. Until the middle of the 1970s though, it still implements for internal use the former French national accounting system, and conceptual reflections take place within the framework of the new international system (then the 1968 SNA/1970 ESA). It acts without the usual limitations associated with a past practice, thus without bad habits or hindrances derived from a traditional implementation of the first Standardised System. French national accountants are, with the Scandinavians – in particular the Norwegians – and the British, the most at ease with the 1968 SNA; the trees do not prevent them from seeing the wood. Obviously, the 1970 ESA does not pose any problem for them (see chapter 3 and its appendix). They are probably then the most orthodox, in a framework that could be qualified as a dual membership to both the SNA and the ESA.

Thanks to that and to the characteristics of the former experience of an intense practice that includes annual IOTs, accounts for all institutional sectors, financial accounts and *Tableaux économiques d'ensemble* [Overall Economic Accounts], a genuine school of technical assistance in national accounting emerges just at the very beginning of the 1970s. Long-term programs aiming at the integral implementation of the 1968 SNA will proceed, in general successfully, though unevenly for financial accounts, mainly in Latin America (Colombia, Ecuador, Peru, Brazil), also in Tunisia and, in Southern Europe, in Portugal (on behalf of the OECD) then in Greece (on behalf of Eurostat). This experience of cooperation coadjuvates in training many national accountants, much more open than those who were locked up in a minimalist design inherited from the 1952–1953 Standardised System. It introduces the French ideas and practice beyond the traditional zones of influence bequeathed by colonial history (a rich experience is accumulated, under difficult conditions, in Africa by the British and French technical assistance) and to countries not directly benefiting from this cooperation.

The third characteristic of the French approach then is to have elaborated through the concept of central system or framework and that of satellite accounts, the extension of the field of application of national accounting techniques (see appendix of chapter 4).

At the same time, and this is the fourth outstanding feature, the central framework itself is conceived of as a complete system of integrated flows and stocks accounting. The reference to business accounting is largely present both in the concrete use of accounting sources (from there comes in the course of time the idea of an intermediate system as an unavoidable device in the micro–macro linkage) and in the way of reasoning. This very last point is perhaps more subtle to grasp. It means that while reflecting on the accounting framework as a whole (for example the future 1993 SNA) or on how to treat such or such particular event, one does not narrowly place oneself in the context of a set of "entries to fill" (although this operation must take place). Instead, one takes the standpoint of an accountant who would have the actual possibility to carry out, directly and immediately for the whole economy, the primary recording of all the relevant events. Accordingly, one reasons as if, at any time, balance sheets (assets and liabilities) were established, the series of transactions or other flows affecting them recorded and the revaluation of assets and liabilities made up permanently. The accounting system as a whole and all its parts can be called

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Box 75 (cont'd)

into play at the same time. It is not necessarily in this way that national accounts are compiled *ex post*, but it is the way the system is thought of *ex ante*. This accounting culture and approach hardly seem to be found elsewhere with the same intensity except perhaps, in more limited fields, in the IMF and among the balance of payments or financial accounts experts.

It is obvious however that, even though the 1993 SNA has been significantly marked by a French influence – moreover non-exclusive and partly exerted *via* the ESA –, it takes place in the continuity of the 1968 SNA and consequently of what can be called "Stone's and the 1968 SNA school". The 1968 SNA synthesizes Stone's approach. Well beyond the first 1952–1953 Standardised System, he again takes his 1945 inspiration (appendix of chapter 1) through widening its field to IOTs and a more detailed financial analysis –, and particular national approaches of a few countries which did not accept, more or less radically, the limiting character of the 1952–1953 scheme (in particular the Scandinavian countries, the United Kingdom, France). Their national accounts until then significantly exceeded the standardized scheme and had in common a broad concept of national accounting, often directly oriented by the nature of its actual or potential uses. With the 1968 SNA school, fractures that had appeared with the first Standardised System tend to be reduced. Differences in cultures do not disappear completely (chapter 4) but they essentially will fall within the scope of a common reference accounting system, strongly marked by Stone and on a more limited scale by French national accounting (on the 1970 ESA).

Stone tries to push the integrating approach much further, in particular by using the matrix tool. In the ambitious form of the System of Social and Demographic Statistics (Box 31), the attempt fails. In the more modest and more ambiguous framework of SAMs (chapter 4), a kind of "school of SAMs" is created around Graham Pyatt. The latter is strongly encouraged by the World Bank and the British technical cooperation (in the United Kingdom it does not depend on the Statistical Office, in charge of national accounting and which does not seem to show any particular interest in SAMs, but on specialized statistical teams of the Ministry for Overseas Development). Later, a Dutch link will develop with Steven Keuning. A number of scholars and researchers are tempted, within or outside the context of CGEMs, without well understanding the close connection with national accounting. Before this conversion to SAMs, the Dutch team of the mid-1980s also claimed its kinship to Stone, but in a noticeably different sense. It saw a relationship between the structuring of the statistical system it recommended and that which Stone had attempted in the previous decade, but it did not fall within the more directly integrating format of SAMs. In addition, its concern for micro–macro linking did not correspond to Stone's approach; he was not, after his 1945 proposal, really interested by this issue, as he was outside the direct practical compilation of national accounts. In fact, in the United Kingdom as in the USA, national accountants, although they use business income statistics of good quality emanating from tax authorities, do not have access to the individual returns of firms, and are thus less inclined towards deepening the accounting approach. On this issue, the Dutch joined – without being quite conscious of it – a long-time concern of their French colleagues. Stone's position can also be explained by the fact that he sought to develop articulated tools in a simple way, by crossing rows and columns of matrices, and was definitely less interested, unlike the French approach, by the deepening of a genuine accounting approach. The French 1976 SECN, by clearly distinguishing the central framework conceived of as a strictly integrated and significant accounting system and the peripheral systems or accounts (in short, satellite accounts), made it possible to reconcile the two approaches that the international system of the 1990s has used.

During the 1960s and 1970s and until the middle of the 1980s as international harmonization progresses and many ideas of extending and structuring national accounting and the system of economic statistics are agitated, the official institutions of the USA appear strangely absent from the forefront. They are satisfied with the end-of-war Anglo-American compromise, which expresses the preponderance of the US–English school, and of its translation into the first Standardised System.

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Box 75 (cont'd)

The NIPA's framework (chapter 2, Box 7), in advance at the time, does not evolve and remains in a very particularistic position. It it not a reference, although, because it has to do with the first economy of the world, it is necessary to know of its existence and structure, in the same way as the financial accounts of the Federal Reserve have also to be known.

The fragmented situation of the US statistical system and its small degree of coordination may be part of the explanation of the little attention paid, in any case, to the idea of a development of the NIPA. The few attempts at reforming the statistical system in the sense of more complete integration and coordination fail, the last occurring at the beginning of the Carter presidency. A technical reference in many fields, the US system is not used as a model regarding the institutional organization of statistics or the statistical synthesis within the framework of national accounting. The vast amount of statistical data in the country limits the drawbacks of such a situation, which would be more detrimental elsewhere. A good case is the lack of annual IOTs – the same situation occurs in the United Kingdom until the end of the 20th century –. It might be possible to manage without them in a statistically affluent country, one unfortunately has to do without them if there are hardly any statistics, but they are essential to an efficient work in an only modestly equipped country.

Nevertheless, it is possible to speak of a US national accounting school. A definite characteristic of the US situation is the existence, around the idea of measurement of the economic performances, of a whole series of works of applied economics by scholars and researchers, eager to estimate statistical series beyond but related with the official results of NIPA. The NIPA experts center their efforts on the improvement and continuity of their series. When they are modified, they are systematically re-estimated backwards until 1929. This practice notably reflects, on the one hand, the absence of destruction due to World War II, and, on the other hand, a larger attention paid to the analysis of business cycles in an economy that returned very soon towards a more liberal operation than in Europe. The second reason also explains also the importance attached very early to quarterly accounts. The emphasis placed on series and their continuity, more than on their mutual coherence, explains the US position with respect to the statistical discrepancies between series, which are noted rather than eliminated (a position that has to be softened since only one estimate of GNP is finally retained).

Around this official statistical practice, exerted within the framework of resources that scarcely grow in the 1970s and 1980s, there is a family of scholars and researchers who work within a national accounting perspective. They instigate, for example, works on wealth (Goldsmith, Kendrick), think of a more developed and more integrated accounting framework (the Ruggleses). They propose, by referring to Kuznets, the measurement of a welfare indicator (Nordhaus and Tobin), advocate for the micro–macro integration and the use of micro databases (the Ruggleses), attempt to take into account the environment (Peskin), invest in growth accounting and productivity estimates (Denison, Kendrick, Jorgenson and Griliches), develop measures within extended accounts of a satellite type (Eisner). Among those quoted, only Denison and Kendrick are former BEA staff members. For most of them, those works largely resort to economic theory in order to found or interpret their measures. They are discussed in the meetings of the *Conference on Research in Income and Wealth* of the NBER where the positions of the Bureau of Economic Analysis are often questioned. Thus, to an official national accounting with a rather narrow scope corresponds a generally very dynamic national accounting school in the broad sense. Mostly internal to the USA, this research tends to be disseminated or in any case to resound outside.

If these intellectual investments with practical experiments only rarely lead to a modification of the official accounts, they can nevertheless lead to considerable innovations. This is the case for wealth accounts, and in the last decades, for the measurement of the prices of equipment and in particular those linked to information technologies. This last example illustrates also the importance of methodological research undertaken in the second large area of the US statistical

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Box 75 (cont'd)

system (after the Census Bureau), the Bureau of Labor Statistics. The Bureau is, in particular, in charge of the observation of wages and prices, and regularly carries out productivity estimates. The cross-fertilization, between applied studies, methodological research and statistical production eventually leads, in connection with decisive measures, to an in-depth modification – even if it can only be progressive – of certain NIPA practices. The immediate introduction of the chained indices technique recommended by the 1993 SNA proceeds from a similar approach. Going somewhat backwards in time, the role played by Kravis and the University of Pennsylvania in international price comparisons (about the ICP see chapter 9, section 7) is also to be mentioned.

Putting aside Stone's Department of Applied Economics at Cambridge, nowhere in the world, is it possible to find the equivalent of this US current of research work on national accounting – once over the period of emergence of national accounting during which many research centers (as the ISEA of Perroux in France) were interested in national accounting. Exceptions are rare (the Japanese study on the measurement of welfare, research work of the University of Groningen on international comparisons of output and productivity, for example).

Europe, for a long time ahead during the 20th century, in the developments of national accounting, in particular of the accounting framework, is in danger of slowing down. Its main concern, and with good reasons, is to promote convergence of practices in the implementation of the 1995 ESA. But teams of national accountants tend to weaken and are generally submitted to a rapid turnover, causing breaks in cultural transmissions and difficulties in the accumulation of new experience.

The burden of the immediate European obligations does not leave enough room for innovative methodological reflections. At the beginning of the millennium, the national accounts research unit of the Dutch Statistical Office is, at the time of a general reorganization, transferred to the Development Department of the Directorate of Economic Statistics, which initiates a period of uncertainty concerning its activities. Previously at the INSEE the "concepts" division – which had in particular prepared the SECN, launched the wealth accounts and promoted satellite accounts –, is extremely weakened and must concentrate its efforts on interpretation issues of the accounting system raised by the rapid innovations of the administrative and economic life and the role of national accounts in political decisions due to the intensive use of some of their data.

However, the transformations of the economy lead, at the beginning of the 21st century, to emphasize the need for a radical improvement of statistical measures. The US school, in such a context, might benefit from the accumulated investments and opportunely play the role of leader.

Advances in national accounting (and an essential part of economic statistics) in the first decades of the 21st century might probably depend on a good combination of the principal features of what tends to become the European school – beyond the national cultures which may have emerged in turn during the previous century – on one side, and the new US school on the other. This desirable process will not occur without difficulties, without "school disputes", in particular in connection with potential tensions between theory and observation, and the borderline problems which then appear between what can be regarded as the domain of *ex post* statistics and what constitutes the result of analyses. Jack Triplett, on this particular, in a communication to the 9th ACN Conference – November 2001 ("Did the US have a new economy?") perceives a difference in attitude (p. 22) in connection with the estimates of productivity, regarding whether they must be considered as activities of research (Europe) or as an activity of Statistical Offices (North America and South Pacific). In Europe, the distinction would be rather between the results of activities of analysis and research (Statistical Offices may sometimes be involved in them, as it is the case of the INSEE) among which the estimates of productivity are in general classified, and activities of production of "official" statistics to which they do not belong. No doubt that the estimates of stocks of fixed capital pose, from this perspective, sensitive questions.

On the other hand, it leads to relativize this objective, to give less importance to it, in any case to put less emphasis on it. Symbolically, in France at the end of the century, the term "Accounts" disappears from the heading of the *Commission des Comptes et des Budgets Economiques de la Nation* [Commission for Accounts and Economic Budgets of the Nation], which becomes the *Commission de l'économie de la Nation* [Commission of the Nation's Economy], whereas the requests addressed to national accounts partially take a different nature but continue to grow and, for some, require that which was expected to be its main task be done so with greater rigor.

Obviously, it is hardly possible to distinguish the outlook for this chapter and that of the entire book. Nevertheless, from here it is possible to refer to Box 75, that by treating, in an interrogative mode, the topic concerning the existence of "schools of national accounting?" allows to scan again from a somewhat different angle some of the issues that this book raises.

Annotated bibliography

The subtitle "L'âge d'or de la comptabilité nationale" [The Golden Age of National Accounting] comes from a long-term report by Blanc, Teillet, Muller (see *Courrier des statistiques* no. 50–51, September 1989). Jean Bénard already used it when referring to "L'âge d'or du SEEF" [The SEEF's Golden Age] (*Comptabilité nationale et modèles de politique économique* [National Accounts and Models of Economic Policy], PUF, 1972, p. 144).

François Fourquet's book, *Les Comptes de la puissance* [The Accounts of Power] (referred to in chapter 2) is again very useful for this chapter, in particular parts III, "La conquête" [The conquest] (1950–1961) and IV with the evocative title "La banalisation" [Trivialization] (1961–1980).

The history dissertation of Aude Terray, *Des franc-tireurs aux experts: l'organisation de la prévision économique au ministère des Finances (1948–1968)* [From Forerunners to Experts: the Organization of Economic Forecasting in the Ministry of Finance (1948–1968)], June 2001, (published in 2002, Comité pour l'histoire économique et financière) devotes the first two parts (pp. 31–361) to the SEEF at the time of Gruson on a less epic tone.

The dissertation of Adrienne Van den Bogaard. *Configuring the Economy. The Emergence of a Modelling Practice in the Netherlands, 1920–1955* (University of Amsterdam, 1998), in addition to its analysis of the rich Dutch experience, includes a comparative chapter (pp. 71–103): "Planning packages in Norway, France, and the Netherlands".

Alain Desrosières has intensively worked on the comparative technico-social history of statistics, national accounting and their uses. See for example *La politiques des grands nombres. Histoire de la raison statistique*, La Decouverte, 1993, La Decouverte-Poche, 2000, with a postface by the author. (Translated as *The Politics of Large Numbers. A History of Statistical Reasoning*, Harvard University Press, 1998).

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The history of macroeconomic modeling is the object of a collective book directed by Ronald G. Bodkin, Laurence R. Klein and Kanta Marwah, *A History of Macroeconometric Model-Building* (Edward Elgar, 1991), with a contribution for France by Raymond Courbis, "Macroeconomic modelling in France" (pp. 231–266). A very interesting synthesis by Robert Boyer is found in Joëlle Affichard (ed.), *Pour une histoire de la statistique* [For a History of Statistics] (INSEE, Economica, 1987, tome 2): "Les modèles macroéconomiques globaux et la comptabilité nationale (1950–1980)" [Global macroeconomic models and national accounting (1950–1980)]", with a postface 1981–1986 (pp. 635–660). Many references in these two sources.

Three chapters of the book by John W. Kendrick, assisted by Carol Carson (*Economic Accounts and Their Uses*, McGraw-Hill, 1972), are dedicated to the uses of national accounting ("General survey"; "Short-term forecasts of aggregate economic activity"; "Economic growth analysis and long term projections", pp. 235–303).

For the United Kingdom, a paper by Henry Neuburger, "How far should economic theory and economic policy affect the design of national accounts?" (*24th General IARIW Conference* – Lillehammer, Norway, August 1996) oversees a quick history of a half-century of uses in the United Kingdom, full of quotations (in particular this nice one from *The Economist*, July 1945, "Good statistics are far more important to a country whose economic policy proceeds by guiding and assisting industries and firms whose decisions are free, than one that operates through an imposed plan [...]. The businessman [...] if he is wise, [...] will regard the efficient collection of statistical information as one of the chief safeguards against the totalitarian state". (Henry Neuburger, p. 8).

On the problem of measurement in economics and its relationship to theories, one can refer to a work of Stone 1948–1949 published in 1951 (*The Role of Measurement in Economics*. Cambridge University Press) which clarifies the conclusions expressed in the texts quoted in the main chapter. See in particular sections IV, "Facts and empirical constructs" (distinction between primary facts and empirical constructs as the income of an individual or a nation, which one cannot detect as such in primary recordings), and V, "Deductively formulated theories and their verification" (discussion of the relationships between postulates, theorems and their testing).

The evolution of forecasting and advisory activities in France, and implicitly the relative reduction of the role of national accounting, since the time of the SEEF can be perceived through the valuable *Actes du colloque [20 octobre 1995] à l'occasion du trentenaire de la Direction de la Prévision* [Proceedings of the Conference [October 20, 1995] on the Occasion of the 30th Anniversary of the Directorate of Economic Forecasting] (Les Editions de Bercy, collection "Colloques", 1997). See in particular the introduction by Patrick Allard and Alain Quinet to Round Table no. 1: "Des modèles à la conduite de la politique macroéconomique [From models to the conduct of macroeconomic policy), pp. 26–39.

A review of the developments regarding estimates of monthly GDP (five countries compile them) is to be found in "Monthly GDP: progress and prospects" by Derek Blades and Ronny Nilsson (IARIW 28th General Conference – August 2004, see proceedings at http://www.iariw.org).

An article by Katheline Schubert, "Les modèles d'équilibre général calculables: une revue de la littérature" [Computable General Equilibrium Models: a review of the literature] (*Revue d'économie politique*, Nov.–Dec. 1993, pp. 775–825), gives an overall presentation of them (on data banks and calibration, see pp. 805–810). A short text by the same author is to be found in *La comptabilité nationale, pour quoi faire?* [National Accounting, What For?] (Fourth Conference of the ACN. *Economica*, 1992), on pp. 203–211: "Les modèles d'équilibre général calculables: préalables statistiques et comptables [Computable General Equilibrium Models: statistical and accounting prerequisites]. One will find in the Proceedings of the Conference of the Directorate of Economic Forecasting quoted above different and qualified views on CGEM (pp. 34–35; p. 103, Jean-Claude Milleron; pp. 112–117, François Bourguignon). For a most critical view, see the article by Bernard Guerrien, "Equilibre général calculable (méthode de l')" [Computable General Equilibrium Models (method of)] in *Dictionaire d'analyse économique* [A Dictionary of Economic Analysis] (La Découverte, 2002, pp. 198–202).

The quoted text of Didier Blanchet "La microsimulation appliquée à l'analyse des politiques sociales" [Microsimulation applied to the analysis of social policies] introduces a series of articles in *Economie et statistique* (May 1998), focused on microsimulation models.

The reference to Patinkin (1976) is given in chapter 1.

In August 1998, the IARIW devoted a session, of pessimistic mood, of its General Conference to "The Role of National Accounting in Teaching Economics", with, in particular, a contribution by John C. Dawson. "The role of national accounts in undergraduate teaching in the United States". In January 2000, the ACN also treated the topic, " Comptabilité nationale, enseignement de l'économie et recherche universitaire" [National accounting, teaching in economics and academic research) in its 8th conference. See by Edith Archambault "Le rôle de la comptabilité nationale dans l'enseignement économique en France" [The role of national accounting in economics teaching in France] (she qualifies the period after 1975 as "l'ère du doute" [the time of mistrust], and analyzes the place of national accounting in some recent handbooks of macroeconomics, pp. 470–471) and by Jean Mirucki, “Présence des travaux sur la comptabilité nationale et sur le SCN 93 dans la base de données Econlit” [Presence of works on national accounting and the 1993 SNA in the Econlit Database] (i.e. *Journal of Economic Literature*). These papers are in Edith Archambault and Michel Boëda (eds.), *Comptabilité Nationale. Nouveau Système et patrimoines* [National Accounting. New System and balance sheets] (*Economica*, 2001, pp. 467–479 and 497–506, respectively).

The methodological reflexion by Edmond Malinvaud, *Voies de la recherche macroéconomique* [Channels of Macroeconomic Research] (Odile Jacob, 1991), referred to in this chapter, is in particular valuable for those interested in national accounting and its relationships with observation and macroeconomic theory.

The quoted text by Charles R. Hulten, “Capital and wealth in the revised SNA” is to be found in the collective work *The New System of National Accounts* edited by John W. Kendrick (Kluwer, 1996).

On Copeland, see Dawson’s paper, referenced in chapter 2, p. 81. Reference to Guido Ferrari in chapter 4. Graham Pyatt, “Intellectual foundations for the 1968 SNA”, in Z. Kenessey (ed.) *The Accounts of Nations* (*op. cit.*, pp. 246–250).

References to Vanoli relate to “Modeling and accounting work in national and environmental accounts”, in Kimio Uno and Peter Bartelmus (eds.), *Environmental Accounting in Theory and Practice* (Kluwer, 1998, pp. 355–373, see pp. 356–360: “Modelling in *ex post* Central Accounts”), as well as “Comptabilité nationale et concepts de production, de revenu et de capital: une revue critique” [National accounting and concepts of production, income and capital: a critical review], a large extract of which is reprinted in the appendix of chapter 8, and “Relations production, revenu, capital: notes sur quelques approfondisements en cours” [Relationships between production, income, and capital: notes on some works in progress), in Edith Archambault and Michel Boëda (*op. cit.*, pp. 25–49 and 51–73.)

Appendix. The use of the European system of accounts (ESA) in the procedures concerning accession to the European Economic and Monetary Union

The Maastricht treaty, signed in February 1992, states the accession criteria to the European Economic and Monetary Union (criteria of convergence). Among these criteria, those that will call most attention relate to government deficit and debt. The former should not exceed 3% of GDP and the latter 60%. A protocol on the procedure concerning excessive deficits is annexed to the treaty. It defines the terms "government", "deficit" and "investment" by reference to the 1979 ESA. A Council Regulation November 22, 1993, modified by a February 28, 2000 Regulation relative to the shift to the 1995 ESA, specifies these definitions in reference to the classification codes of the ESA. "Government" means what relates to the general government sector, "government deficit (surplus)" is the net borrowing (net lending) of this sector, interest is interest defined in the ESA, "government investment" is the GFCF of the sector. In each case, the codes of the sector and sub-sectors, balancing items and related transactions follow. The Regulation gives in particular the list of the categories of financial instruments that enter the definition of government debt. For government debt, the nominal value understood as the face value is retained, unlike market prices, which are used in national accounts.

The ESA thus provides a pre-established reference framework, which avoids extended debates. In its absence, Member States would have needed to agree on these concepts on the basis of different government accounts established by finance ministries. Decades of (frequently austere) harmonization work undertaken on this topic by statisticians and national accountants in collaboration with finance specialists, find there, among others, a striking justification.

It is nevertheless necessary to assure that the treatments recommended by the ESA are applied homogeneously among Member States, and, on the other hand, to agree on how to understand concrete "cases" of institutions and budgetary and financial arrangements, which do not correspond to situations already covered by the ESA or for which the conclusions to be drawn from its general rules are debatable. The problem is complicated by the fact that only the 1979 ESA was initially available, and will be applied within the framework of the procedure of excessive deficits until September 1, 1999, whereas the 1995 ESA, which follows the 1993 SNA, is undoubtedly more elaborated, in particular because it comprises a complete accounting framework. In the absence of a precise solution in the 1979 ESA, the 1995 ESA will be used as a guide.

The denominator of the ratios in question, i.e. GDP, is under the responsibility of the GNP Committee (see appendix of chapter 5). The issues raised concern the treatment of general government, with, however, some broader effects, since they concern transactions between general government and other institutional sectors, in particular non-financial and financial public corporations.

The consultation procedure on contentious cases brings into play several regular working groups (national accounts, financial accounts) and task forces, as well as the Committee on Monetary, Financial and Balance of Payments Statistics (CMFB). The final decision falls to the European Commission (Eurostat, in practice).

The CMFB is an interesting creation that appears shortly before (February 1991) the Maastricht Treaty, but as part of the same perspective. Taking stock of new statistical needs, which would result from the Monetary Union, its objective was to promote statistical co-operation between National Statistical Offices, Central Banks and the European Commission (and later the European Central Bank). Within Member States, the relationships between these institutions were of diverse quality, ranging from very good (France in particular, where the Bank of France, in charge for a long time of financial national accounts other than the provisional ones, is a member of the bureau of the *Conseil national de l'information statistique* [National Council for Statistical Information], which comprises a specialized working group on Money, Finance and Balance of Payments Statistics) to frankly bad (Germany). Between Central Banks, in spite of the efforts of the IMF, the harmonization of statistics was still far behind. By creating the CMFB, the Commission sought to avoid the coexistence in the future of two poorly coordinated sets of statistics, one under the authority of the Commission and the Statistical Program Committee (SPC), to which the General Directors of National Statistical Institutes belong, the other under the authority of the European system of central banks and the ECB. It aimed at the development of a single European statistical system. After a phase of initial mistrust and tensions, rather significant on the side of the representatives of central banks, the CMFB proved to be of great importance as an effective place for dialogue. Not surprisingly the representatives of National Statistical Offices in the CMFB were in charge of national accounts, since financial national accounts, financial institutions accounts, rest of the world accounts and balances of payments, and their relationships with other economic transactors, constitute the principal fields of interrelationship between the statistical activities of the National Statistical Offices and those of the Central Banks.

As for the excessive deficit procedure, two documents make possible to have an overall picture of the national accounting issues raised between 1994 and 1999. The first is the *1995 ESA Manual on Government Deficit and Debt* (Eurostat, 1st edition 2000, 2nd edition 2002). "It provides the appropriate answers to most of the statistical and accounting problems posed in the European Union during the last five years" (Preface to the first edition by Alberto de Michelis, p. 3). This document, whose purpose is only to contribute to the application of the 1995 ESA, which is the conceptual framework reference, legally constraining in the European Union, received the approval of the SPC and the CMFB.

The *Manual* presents, for each topic, the problem, the treatment recommended in national accounts, the logical base of this treatment, and finally accounting examples. It treats in particular the privatizations of public enterprises, capital injections and debt assumption, cancellation and guarantee by the government, payments by central banks to governments resulting from transactions on their gold and foreign exchange reserves, or financial defeasance (intervention of government in several forms in favor of financial institutions whose assets have greatly depreciated). A part of the *Manual* specifies the time of recording certain transactions according to the accrual principle. More than twenty pages are dedicated to the recording of interest, due to the great variety of possible cases.

The *Manual*, which presents the final outcome of the exercise, does not indicate which concrete national cases were the source for the analyses carried out and abstains from any comment in this context. Relevant information may be found in the second document, a history of the first eight years of the CMFB, drafted by its first chairman, who participated for many years in its work, Hans van Wijk, former deputy director of De Nederlandsche Bank and head of its Statistical Department (*Bridging the Fault Lines. The Early Years of the Committee on Monetary, Financial and Balance of Payments Statistics*, March 2001, with a foreword by Peter Bull, General Director of the European Central Bank, himself a former member of the CMFB, and Yves Franchet, Director General of Eurostat). On this generally dry subject, the author succeeds in preparing a very useful document for those who, scarcely informed on these topics, seek to understand in particular the role of the different actors. The work (nearly four hundred pages, including a detailed table of contents and an index) follows a plan organized both chronologically and by topics, in particular through summary reports of each meeting of the CMFB and other bodies, be they consultative or decision-making, which intervene in the study of the cases. Each of the twenty chapters ends with a personal comment of the author ("assessment"), composed in italics (shorter comments are sometimes inserted in the main text). This series of comments is particularly interesting, given the fact that the author, already retired when he prepares this book, while making assessments which one feels are carefully considered, speaks more openly than officials normally would. Thus, when he mentions the remarkable increase in political consideration with regards to statistics during the last decade of the century, even though risks remain with the budgetary resources which are allocated to them, he does not hesitate to write: "I think that no government acted as cynically as the Dutch: in 1999, when Statistics Netherlands celebrated its centennial, the minister of economic affairs had no scruples to subject the office to a major restructuring – after a series of earlier budgetary cuts – involving a significant number of jobs" (p. 5).

In connection with the procedure regarding excessive deficits, one can perceive the author's regrets regarding the fact that the CMFB could not generally get to more common positions on issues with major political implications: "[. . .] the CMFB encountered great difficulties every time it was called for consultation on differing interpretations of regulations, as these differences mostly reflected major conflicting interests [. . .]. Nearly all governments tried by some tricks to improve the statistics on their countries' deficit or debt. The committee appeared to be ill-prepared for these nerve-racking consultations, which had to be accomplished on very short notice. In these cases, representatives of the member states, particularly the delegates of the statistical institutes, used to endorse the views of their governments and, invariably, it appeared to be difficult to deliver a unanimous opinion [. . .]; in most cases, the CMFB had at least the satisfaction that its majority view was reflected in subsequent political decisions. Nevertheless, these experiences have taught me that politicians involved in issues of interpretation of statistical standards are seldom inclined to subject their judgements to those of statisticians'. To my mind, in these cases, the main value that the CMFB could add lay in exposing the arguments pro and contra the alternative interpretation, in estimating its quantitative importance and in assessing its likely numerical implications for other statistics, thus reducing the chances for politicians to get their tricks accepted by mere rhetoric" (p. 4).

The document presents (pp. 235–249) a catalogue of the cases that the CMFB had to study:

- *receipts from the privatization of public enterprises* – p. 235 – (the Belgian position in particular which wanted these receipts to reduce the government deficit is not followed);
- *debt assumption and debt cancellation* – pp. 236–237 – (the initial position of Eurostat to simply treat debt assumption like a financial transaction and not like both a transfer of capital and a financial transaction is not followed by the Committee, except in the particular case where debt assumption precedes a future privatization);
- the "*Irish case*" of a court decision with retroactive effect – p. 237 – (the decision is to record the claim thus recognized [this related actually to social security benefits to be paid retroactively since 1985] as a capital transfer in the year of the court's decision);
- *zero-coupon bonds* – pp. 242–244 – (the question was to know whether the difference between the issue price and the redemption price was to be treated or not as interest and, in the event of a positive answer, if it had to be recorded at the time of redemption or distributed over the whole period. It divided countries because the best solution economically – to distribute these interests –, conforming to the recording of *accrued* interest according to the 1995 ESA, was not in agreement with that of interest *due* according to the 1979 ESA);
- *bonds issued at a premium or a discount* – pp. 244–248 – (these pages recall the discussions, rather technical, which are reflected in the pages devoted to the recording of interest in the *1995 ESA Manual on Government Deficit and Debt*);
- *payments from central banks to the state following operations on gold and foreign exchange reserves* (revaluation of the gold stock, sales of reserve assets, profits resulting from interventions in foreign exchange markets) – pp. 248–249 – (these payments are always to be treated as financial transactions; the same solution is adopted – against the Italian position – in the case of taxes on the sales of gold between the Italian foreign exchange office and the Bank of Italy).

The "France Télécom" case (pp. 237–242) was the "*cause célèbre*" (underlined by Hans van Wijk) of the CMFB in the last days of October 1996.

In practice, the French central government pays pensions to France Télécom's retired employees, who have the status of civil servants. Until the reform of this status in 1996, the firm refunds to the government an identical amount.

In national accounts, until then, France treated France Télécom employees' pension scheme as an employers' scheme, in the sense of the ESA, of the non-financial enterprises sector, without the setting up of a pension fund. Within this context, pensions were regarded as paid by France Télécom. Imputed social contributions for an equivalent amount were initially paid to households, which transferred them back to the enterprise.

In practice, the 1996 reform states that the annual France Télécom's contribution to the pension scheme of its former employees having kept their civil servant status – so that central government continues to pay their pensions – will be, beginning in 1997, calculated as a usual social security pension contribution, based on the wages of the employees with civil servant status. As the contributions thus calculated are lower than the estimated pensions to be paid, the future net payment by government will be the object in 1997 of a single lump sum payment of 37.5 billion francs.

In its national accounts, France considers that, beginning in 1997, the pensions paid in the future to former France Télécom civil servants–employees will be recorded as payments of the "central government" sub-sector of general government. The latter will receive from households the actual pension contributions, coming from France Télécom, calculated as indicated above.

The debate related to the treatment to be applied to the payment of 37.5 billion francs to be made in 1997. Should the French position be accepted to treat this payment as an instantaneous capital transfer, thus reducing in 1997 the deficit of the State and increasing it during the following years, or should this amount be considered as an advance payment, recorded as a financial transaction, of a flow of compensatory annual payments? The decision of the Commission, which followed the solution recommended by France and was finally accepted by eleven countries, obviously left a bitter taste to many participants. The investigation of the case was carried out in a few days, as a matter of great urgency; some participants considered the questionnaire of the written consultation of the CMFB by Eurostat as biased, the interpretation of the results of this consultation much debated and the procedure of decision suspiciously considered by some press articles. As a consequence, a great tension resulted between the chairman of the CMFB (then Wolfgang Duchatczek of the Austrian Central Bank) and Franchet.

On the substantive issue itself, and far from the mêlée, there is no doubt that such an exceptional payment should not have selectively influenced the measure of the 1997 government deficit. The most correct solution would have consisted in treating the payment of France Télécom as an advance payment, to be recorded as a financial transaction, corresponding to a series of annual current transfers to government as a total or partial compensation for the net deficit occurred in paying in the future their pensions to France Télécom former civil servants–employees.

A few months later, came the question of the treatment of the Italian *eurotax*, a levy imposed on enterprises based on certain accumulated obligations to their employees. This levy was to be refunded to them later, as the employees would pay the usual taxes on the payment of these wage funds. The national accounts and financial accounts working groups and Eurostat unanimously estimated that it was indeed a new tax and not a kind of financial advance on an existing tax. Van Wijk's comment is somehow disillusioned: "Compared with the agitated scenes that had characterized the deliberations on the France Télécom case, the written procedure on "Eurotax" evoked little emotion. The statisticians have acknowledged their limited influence on political matters and, indeed, the modest scope of their competencies and responsibilities. They had lost their innocence" (p. 244). It should be noted however that this particular case was less clear than the previous one.

The dialogue between statisticians/national accountants and political authorities *via* their advisers must be qualified as very positively in general. "The eight-year period covered in this book witnessed a remarkable political upgrading of statistics in general and European statistics in particular", as the same van Wijk (p. 5) notes.

It is neither surprising, nor illegitimate that the advisers of the decision makers sought to anticipate the treatments that national accountants would apply to the budgetary or financial mechanisms that government department offices were devising to limit or reduce the measure of the public deficit of their country. Government officers in charge of those topics belonging to the Budget and Treasury Directorates of Member States (also those of central banks) were said to have on their desk – a remarkable tribute indeed – the SNA and the ESA. They did not passively wait for statisticians to "read them the law" and they were ready to argue often with talent on ways to understand new or partly new institutional arrangements, according to systems of national accounts which – in spite of great improvements undergone in their last versions – could not, like any system of rules, have obvious answers to all the cases that social life creates. As can be observed in the two documents on which this appendix is based, the question frequently raised (the alternative between a capital transfer with incidence on the measure of deficit or a financial transaction) had generally to do with the relationship between public enterprises and general government. In this context, a similar objective can be pursued using different methods, whose interpretation in national accounting terms is not always obvious. In some cases, solutions based on conventions might be unavoidable, and leave space for more "rhetoric" (Van Wijk, p. 4) in particular when urgency, as it is frequently the case, does not allow sufficiently serene analyses. The political calendar imposes itself.

The political authorities in Europe could have decided with sovereign power how to define and measure the concepts on which the convergence criteria were to be based, and left to statisticians the measurement of the denominator (GDP).

They would then have proceeded, among themselves, with the necessary trade-offs and compromises. If they did not do so, it is because – apart from the burden of such a process in practice – they needed to resort, both between themselves and with respect to public opinions, to a system of references as objective as possible in relationship to them. It was also necessary, in order to avoid later complications, for these references to be also one of the bases of the European statistical information system, an essential instrument for the future management of the euro zone. By doing this, they agreed to limit their freedom of decision as to the measurement of the famous criteria. Incidentally, the measurement of compulsory levies (tax and social security contributions), in France, for example, rests internally on a similar dialectics. For the public discussion to be possible, this measurement should not be open to manipulation by the political authorities, even if they try to influence it.

Because of the sometimes inescapable character of conventions, it should not be inferred that all solutions that have been adopted are subject to a general relativism. As the *1995 ESA Manual on Government Deficit and Debt* shows, the procedure for excessive deficit has allowed, on a whole series of questions, a technical advance of the ESA and beyond it, of the SNA, while avoiding the eventual intervention of political considerations on the adopted solutions, even if they had some role in the debates. It might be observed in this respect that the decision adopted on the France Télécom case, a contingent episode, did not influence any of the clarifications provided in the *Manual*.

The question is then to know whether politicians, since it is the European Council that makes the use of the ESA compulsory at the European level, would then try in the future to influence its front-end content. This is doubtful however for several reasons. The advisers of politicians, who have other concerns, can hardly imagine, a long time in advance, the possible new uses of the ESA within the framework of the definition or implementation of policies. Perhaps statisticians will be more easily able to consult with their respective government offices during the future process of revision of the ESA, a necessary procedure in any event (and that France for example has largely implemented during the development of the first ESA and the preparation of the 1993 SNA/1995 ESA). Besides, as the SNA and the ESA will probably not diverge in the future, the game is among a very large number of actors on a worldwide scale. One of the best guarantees for the professional code of ethics of statisticians/national accountants rests on the quality improvement of their conceptual system and its practical applications and on their capacity to efficiently master all these issues. That is not so simple.

General Outlook – The fortune of a vast enterprise

The great project of national accounting is to conceive and carry out a vast coherent system of representation and quantitative measurement of the economy, considered in its entirety, and its principal components, that includes an actual linkage, or at least a potential connection, with microeconomic units. Even if it has not necessarily been always perceived by all in an identical way, this definition corresponds to what those who conceived of national accounting had in mind. It is located in the field of economic information, before analyses, forecasts and projections and preparation of decisions, even though, in the case of "constant prices" and consumption of fixed capital calculations, a certain amount of modeling has to be used. From this perspective, this vision does not go as far as what a Claude Gruson had in mind (see chapter 10, section 1).

Thus understood, national accounting experienced in about sixty years a remarkable development. This was favored in the first decades of the period by a very supporting political, economic and intellectual context. This context then changed in a radical way. It is rather astonishing to note that national accounting, however, continued to develop in the following decades, and was not reduced to a mere reproduction of its previous achievements. Then, indeed, its conceptual framework, though still not final, experiences an extension and a deepening (the 1993 SNA, the 1995 ESA, the major handbooks of recommendations by the International Monetary Fund) which bring it conceptually quite close to the initial vision. This is due partly to the continuation and deepening of previous intellectual investments. A major factor is also the fact that, from the perspective of its uses, the period of econometric models and Keynesian macroeconomic policies (in certain countries, the period of indicative planning), was relayed by the needs of the international monitoring and regulation function (of the IMF in particular), of the follow-up of global short-term trends of economies more closely dependent on market mechanisms (flourishing development of quarterly accounts everywhere) and – an unforeseeable novelty – of the political role granted in Europe first by the Maastricht treaty for the criteria governing the candidatures for the single currency, then by the Amsterdam treaty for the working of collective disciplines in the euro zone.

The importance of the political uses in the European Union – without forgetting those related to the procedures of accession to the Union of a number of candidate Eastern and South-eastern countries – should not be underestimated. Indeed they reinitiated and extended the use of magnitudes and structural ratios drawn from national accounts in combination with other indicators. At the same time they involved extended examinations, and the implementation of special procedures to verify the actual contents of the accounts of Member States or candidates and as much as possible their actual homogeneity.

The experience of the Maastricht criteria (see the appendix of chapter 10) illustrated *inter alia* two points. First of all, that the response to political requests of such an extent was made possible only because of the pre-existence of a standardized accounting system (directly in these circumstances the ESA) and the experience of its implementation. Discussions around the criteria measures were sometimes fiery. But let us imagine what they would have been, if the ministries of finance of the various countries had been obliged to directly confront their data. Secondly, it confirmed the relevance of the great project, as it has been recalled above, because it showed that it was indeed necessary to cover the economic activity as a whole in a coherent way, and even in certain cases, down to the level of certain single units, as in the case of the relationships between government and public enterprises. The refinements that were required in connection with the accounting for interest whose amount has considerably increased, is a good illustration of this issue. The different methods of recording influence the measure of government debt and deficit, incomes of corporations and households, activities of banks and insurance companies or international debt. The coherence of the treatments to be followed is an essential condition for clarifying the debate.

Finally, an evolution over half a century confirmed the indispensable character of national accounts in controlled but not planned economies, or only with indicative planning, as well as in liberal economies with macroeconomic regulation. Perhaps some economies can go without it, as for instance centrally planned economies relying essentially on the centralization of accounting data – at any rate their accounts were poorly developed –, or perhaps still a purely liberal economy without macroeconomic regulation, if such an economy is conceivable.

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However, these achievements and successes are attained only through great difficulties, so much so that national accounting might be viewed as crossing a period of strong turbulence in the last decades of the century.

To set up a system of national accounts indeed requires the mobilization of a vast amount of economic information, to induce its production when it does not exist, to make sure that it develops according to specifications which allow the system of economic statistics, in the broad sense, to reach conceptual and if possible numerical consistency which, though always imperfect, facilitates subsequent syntheses (see chapter 5, section 1).

As it is necessary to do that for the national economy as a whole with its uncountable number of economic transactors, the transactions that they carry out, and the assets and liabilities they hold, the task is enormous. Made difficult in most countries in the first days by the backwardness in statistics, it is facilitated, after World War II, by the huge increase in statistical information, partly instigated by national accounting itself.

A few decades later however, when much still remains to be done, the economies experience, in the apparatus of production and exchanges, in the financial sphere, in international relations, structural transformations related mainly to the increasing complexity and liberalization of the economies and the forms and speed of technical progress, which makes it increasingly difficult to quantify the descriptive model that national accounting intends to build. The increasing role of intangible investment and assets, the diversification and accelerated renewal of products, the extension of the field of services, the sophistication in often combined pricing techniques applied to goods and services, the tendency towards a globalization of the world economy, the extraordinary development of what has been called the new communication and information technologies, all these constitute the principal features of this evolution (see the end of chapter 5).

This poses some formidable problems for statisticians. To mention only one aspect – though an essential one – the coincidence for computers of both a formidable increase in their effectiveness and a small increase or even a negative change in their selling price led to challenge in their case, but the implications are more general, the method used until then practically without exception to factor the change in the current value of equipment goods into a component of volume and one of price. The approach based on the change in the cost of the resources used to manufacture them, is now opposed by one which aims at measuring the volume of investment in terms of the performance of the constituting goods and services. It is still impossible to appreciate in all their extent the implications of these changes of perspective for the measurement of national accounting, for growth accounting and productivity analysis, and thus for the understanding of economic and social history (see chapter 9, section 6 and Outlook).

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To the increasing difficulty for national accounting to correctly measure its traditional object – i.e. the field of goods and services which are exchanged on the market or whose factors of production are exchanged on the market –, have to be added those which are due to new social concerns. They relate first to welfare measurement, then to accounting for the natural environment, not completely independent topics.

Regarding welfare, national accountants do not unanimously share Kuznets' former position tending to assimilate measurement of national income and the attempt to measure welfare. The interpretation of consumption or income in terms of welfare, which national accounts actually measure (chapter 7, section 1), or the definition and calculation of a composite monetary indicator in adjusting these measures (chapter 7, section 2), clearly indicate that the objective of national accounts never was, and could never be, to measure welfare or its change, even taken in its restrictive sense of economic welfare, which remains ambiguous.

With the exception of certain economists, their partners in the political or civil society, after the usual short-lived fashion effect, follow them. It is due to the fact that the criticism of growth in the name of a broader concept of development, the extension of social statistics, the movement in favor of multiple social indicators, all refuse the use of a single monetary indicator to reflect the so various and complex aspects covered by the concept of individual and social welfare.

The problem raised by considering the environment is both similar and different. Similar, because damages to the environment can directly or indirectly affect the welfare of persons. Different, because destruction or deterioration of assets is at stake. Natural assets are affected in a way observable in physical terms. The debates relate first to the possibility and the manner of assigning a monetary value to the losses of welfare undergone and/or to the damages to natural assets. They relate then to the possibility of calculating national accounts aggregates, net domestic product in the first place, adjusted for the environment. What is typically under discussion is not the case of natural assets extracted as commercial resources. This one could have been treated within the traditional national accounting framework, even though from a methodological point of view it is very conflictual, (see chapter 8, section 3 and the corresponding boxes), and lead to a different measure of net domestic product, possibly of gross domestic product (points of view differ), without the need to qualify it as "environmentally adjusted". The question is really that of non-market natural assets which provide services having traditionally the characteristics of free goods, but the availability of which tends to be limited by the pressure of human activities, at least for some of their qualities, transforming them thus into economic goods.

The views of national accountants on this topic seem to be more hesitant and more balanced than on the issue of welfare, even if most of them refuse to calculate a net domestic product adjusted *ex post* for the environment ("green GDP") [see chapter 8, section 3 and its boxes]. But they have then to face more conflicting situations. Not so much with political leaders who, with the notable exception of the USA during the second Clinton administration, with vice-president Al Gore, hardly show persistence in this direction, mainly worried as they are by the problems of employment and the short-term changes in the economic activity. Much more with certain currents of the civil society on issues which lend themselves easily to emotional attitudes. And this time they must face the uneasiness, which results for them from the proposals advanced by many economists. Either because the latter work out methods to provide a monetary estimate of completely non-market flows, which are however hardly transposable to the level of the whole economy or because, going further, they propose within the framework of neo-classical models of optimal growth a new interpretation of net domestic product in terms both of welfare and sustainability (see the end of chapter 7, that of chapter 8 and its appendix).

Whether the "*non possumus*" of national accountants is judged as founded or not, it means the recognition of the limits of the great project in its capacity to provide certain measurements of economic performances, when the social concerns about them undergo sizeable changes. It is not that national accounting cannot produce useful elements both for those interested in the assessment of welfare and for those who worry about the state of the environment. Although, for that, it would be necessary to effectively implement some of the complementary tools labeled as "satellite", which were outlined, for example, for accounting for the environment or for human resources. However, in any case, national accounting cannot integrate them "to the top" in terms of monetary accounting in its federating project.

*

The aforementioned debates illustrate a new form of the relationships between national accounting and economic theories. Macroeconomics of the Keynesian type or, more broadly, macroeconomics which recognize the specificity of its object and do not estimate that the problem of the micro foundation of macroeconomics is solved, is not very demanding with respect to national accounting measurement specifications. Once it has provided a general reference framework, which legitimates, with some basic equations, the measurement of aggregates, this macroeconomics is to be mostly viewed as a "consumer" of economic measures, which could be described as "empirically significant". The rest is a matter of operationality and statistical rigor (see in chapter 10 Stone's position).

The neo-classical microeconomic theory is more demanding. Having transposed its conclusions to the macro- or meso-economic scale, thanks in particular to the concept of representative agent on these levels, certain economists of this school tend to summon national accounting to measure its empirical magnitudes according to what microeconomic theory prescribes. The methodological gap between the micro and the macro level, the considerable differences that separate the assumptions of the theoretical models regarding the state of the world from the actual prevailing conditions in the real economies do not seem to disturb them. At the turn of the century, a still limited minority of national accountants seems impressed.

Expressions such as: "their measurement [capital stocks and flows] must be firmly grounded in economic theory" (see *Measuring Capital*, OECD 2001, p. 113), are then blooming, far from the general and vague formulations used for example by Kendrick or Stone in the past (see chapter 10, section 3) and that nobody at the time disputed, which were understood as "it is necessary to know what one wants to measure and what one measures must make sense". Those who acknowledge the rule stated above have in mind a much closer and unilateral relationship.

This was particularly illustrated during the debate on the project of integrated environmental and economic accounting (see chapter 8, section 3 and box 64). The method of estimation of the loss in value of the degraded natural assets, based on maintenance or restoration costs, is rejected by certain economists with the argument "that it is not grounded in economic theory", while they support methods which rest on an estimate of the willingness-to-pay or the willingness-to-accept-compensation by economic transactors. It is recognized, however, that in general those are only relevant at the microeconomic and local level.

The unilateral character of the thus postulated necessary relationship between economic theory and national accounting results from the fact, differently from former formulations (see again Kendrick and Stone in chapter 10 and the reference to Patinkin's paper at the end of the chapter), that the possibility of a return effect on the theory induced by the *ex post* measures of national accounts does not seem to be contemplated. At the same time, the potential tensions between observation and theory seem to be silenced.

From what was said before, it should not be concluded that the collaboration between economists and national accountants, or more generally statisticians, is not useful. The revision of the volume–price factoring of investment issue evidently shows the opposite. The impetus was given by economists engaged in productivity measurement and growth accounting. On this specific issue, neither statisticians of producer prices of manufacturing products, a field in which the measurement of the prices of equipment goods lagged far behind, nor national accountants were able to refresh their approach by themselves.

From the fact that the change in the volume of an equipment product should be estimated according to the change in its producing capacities, of its "productive services", one should not slip into the idea that the production account of national accounts at current prices should be presented in terms of labor services, capital services and a term representing pure profit (see in chapter 8 Box 56 and the reference to the handbook *Measuring Capital*). Never, it seems, would a national accountant, in the 1950s to 1980s, have thought of seriously proposing such a solution. Everyone knew, of course, that theoreticians had reasoned in terms of labor services and capital services (possibly with a transitory pure profit item), concerning gross national product or income, or in terms of interest on the capital stock broadly understood, concerning net income, but all had in mind the rigorous conditions that theory supposed, and nobody would have then imagined to propose the direct transposition of such conclusions in an *ex post* observation system.

The conclusion that seems to command attention is that thorough methodological reflections are necessary on the topic of measurement in economy and in this context on the relationships between economic theory(ies), economic statistics and national accounts, without forgetting business accounting in the background. It is not excluded that in such a debate national accountants should exhibit more openness and economists more unpretentiousness than both of them usually do.

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If the uses of national accounting have confirmed the value of its great project, how is it that in statistical offices, generally in charge of the compilation of national accounts, the position of the discipline generally appears to have declined – including as a coordinating framework for economic statistics? In France, the evolution of INSEE's organization is striking in this respect. At the beginning, after the transfer of part of the SEEF (in the early 1960s), the function of conceptual development and quantitative synthesis of national accounts is inserted in the area in charge of economic studies and syntheses. Then INSEE organizes, around national accounting, but not exclusively, a large area of statistical and accounting coordination (1972). National accounting is later on distributed between the department in charge of coordination and the economic statistics department (end of the 1980s). Finally, it is relocated in the area in charge of economic studies and syntheses (mid-1990s). Admittedly, the French experience of the 1970s and 1980s appears exceptional. However, the idea of the dynamic and federating role of national accounting in a statistical system was then broadly shared.

Trying to propose an explanation of the evolutions in the status of national accounting would require research covering a significant number of national statistical offices. For lack of such a study, one can only call forth some elements of explanation: the multiplicity of the instruments of statistical coordination (directories of units, classifications, business accounting standards), the natural tendency within institutions to define exclusive territories, the diversification of the phenomena to be covered and the difficulty of apprehending them in an integrated context, the correlative fears that national accounting might hinder the development of other aspects of the statistical system, even if that is not what has been observed, the extension of its use by analysts of microeconomic data bases, the move of national accounting – rightly – from the side of economists where it was often originally located (the USA, the United Kingdom, France, etc.) to the side of statisticians, whereas, however, the role of the latter tends to being less valued with respect to the former, including in the few national statistical offices, and in the international organizations, which simultaneously carry on statistical and research functions; but the phenomenon is broader: a low level of uses between the moment when growth policies and econometric models enter in crisis and that of the development of political uses in Europe and uses worldwide for its function within the monitoring of short-term fluctuations system; privileged linkage of national accounting with Keynesian macroeconomics which experience difficult times, etc.

Undoubtedly national accounting data have become commonplace and relativized. But at the same time the position of the discipline has been, often voluntarily, exaggeratedly weakened. The mistake has been to shift from the statement of relativization to the idea that too much was done. From there derives, in the context of an often-severe limitation of resources, an undeniable weakening of the teams of national accountants almost everywhere towards the end of the century. However, as this book demonstrates, national accounting is far from being at cruising speed. The problems to be solved are manifold and difficult. They are posed to economic statistics as a whole, and not only to national accounting in a narrow sense (but can it be understood narrowly without denying its very nature?), and also to economists who are interested in measuring actual economies (see in particular chapter 9). They require thorough methodological research.

In a context such as that of North America, such research, which concerns quantitative applied economics often finds its place in research organizations, such as the NBER or the Brookings Institution, a practice that allows for the maturation of certain issues before they may result in regular statistical practice. The case of computers perhaps demonstrated the brightest application of this confluence of interest.

Elsewhere, university economists and researchers in general showed little interest in this type of work. One hardly imagines the publication by one of them of research such as that of Gordon (see chapter 9). Theoretical analyses are privileged. Observation and measurement of "facts" (an epistemologically sensitive term used here on purpose), hardly appreciated activities, are left to statistical offices. In the meantime, the latter, strongly pressed for immediate answers to short-term needs, accompanied the setback in national accounting by a lessening of anticipatory reflections. Paradoxically, the statistical offices whose official role comprises a wide responsibility in terms of study and economic research (France, Norway) do not appear to have invested more than others on certain essential topics regarding statistical production methodology. It is not there that are to be found for example the more noticeable developments concerning the estimates of the stock of fixed assets and the volume–price factoring of investment, and the disparity compared to other offices in the resources dedicated to these issues is striking. In statistical offices with rather abundant human resources but with a narrower role, the progress of statistical methodology appears to have been more privileged (the cases of the USA and Canada for example).

At the end of the century, the topic of the "new economy", irrespective of the question of the existence of such a thing – there is a lot of discussion about it –, has the merit to bring back to the foreground the need simply for improved measurements of the economy. Whether looking at economic statistics in general or national accounting in particular, the debate shows that undoubtedly far from enough is being done. Whether considering how to take into account technical progress, this is a central question obviously, or the globalization of the economies – the need for aggregate European accounts is increasingly felt, for example – or the effects of the structural transformations related to the "transition" of Eastern European economies towards market economy – the opportunity of measuring the enormous loss of capital value which they experienced has been lost –, it is necessary or it would have been necessary to do more national accounting.

In the move from "the golden age" to the time of "commonplace" use, a good balance was not reached. A dynamic overall vision of the systems of economic statistics is still necessary. Developing such a vision is the very objective of an intelligently understood national accounting system.

Postface (in the first person singular)

1. This book results from an initial request made by Jean-Paul Piriou in 1994 for the “Repères” series of the Editions La Découverte. He had seized the opportunity of the completion of the 1993 SNA for this request. J.P. Piriou wanted for his series a history of national accounting, but – as I then spontaneously included in it the long period of national income estimates –, I considered that my knowledge of the latter was not sufficient for this task. After some hesitation, I agreed to draft *La Comptabilité Nationale en perspective* [National Accounting in Perspective], which would cover only the second part of the twentieth century. The estimated completion date was Fall 1996.

However, I had a heavy timetable. In particular, I was deeply committed since 1990 in leading, on behalf of the European Community, a complex project of technical assistance, aiming at a transformation and radical revision of the Greek system of national accounts. To give an idea of what that represented, I may mention that, in parallel to the intensive collective work until the summer 1993 related to the finalization of the SNA, – following differences in opinion between the Greek and French teams – I had to undertake with the Athens statisticians the systematic revision of some five hundred balances of resources and uses of products that were in progress, then to carry out with them the final synthesis of the table of intermediate inputs. This is incidentally mentioned, without any spite, for those who believe – as apparently some do – that I am only interested in the conceptual aspects of national accounting. The Greek endeavor, which required from this moment approximately two and a half months of annual presence in Athens, broken up into several missions, lasted until the beginning of 1998.

In short, other activities considered, the drafting of the book could only start in August 1998. It quickly appeared to me that, however limited the envisaged dimension of the publication (128 small-sized pages) might be, I could not write it based essentially on my direct experience. If the general lines appear rather clear, recordings lack precision, sometimes even accuracy. The relevance of a short book on the topic supposes a solid background. The preparation of each chapter thus involved readings or second readings and checkings to a wider than expected extent.

After one year, having drafted the first chapters, it became clear that in the absence of a pre-existing reference book, the subject could hardly be covered suitably within the limit of a single “Repères” volume. With some hesitation on Jean-Paul Piriou’s side, the decision is then made to envisage two volumes of the “Repères” series. In the meantime, adhering to a suggestion by Alain

Desrosières, the term “history” was introduced into the title that became *Histoire de la comptabilité nationale* [History of National Accounting].

Still a year later, in Fall 2000, a first drafting of all chapters exists without any boxes yet, but Jean-Paul Piriou finds the text too difficult for the principal target population of the series. At the same time, to transform and reduce it appreciably in this direction might imply losing a big part of the investment already carried out, without any insurance regarding its outcome. We thus agree to publish it in another series. The following year is dedicated, except for various activities in the field of environmental economic accounting, to the revision of the chapters, the drafting of the conclusions–outlooks, the preparation of many of the boxes and the final revisions and adjustments.

From the initial constraints associated with the “Repères” series, I kept that of the forbiddance of footnotes. Their absence might cause surprise in such a book. This constraint disturbed me initially, but I finally maintained it. I could remedy this partially by providing precise information, either between brackets, or in the bibliographical references, or also in boxes, which were not subject to the absence-of-notes ruling. As a consequence, a lot of information remained in scattered papers within my preparatory files. Some of them could have been of interest for specialized readers. However, even for the latter, with greater reasons for others, I intended to write a synthesis, not to present a fully comprehensive book. The absence of footnotes facilitated the achievement of this objective. Partly for this reason, the main text of the chapters remained, except for some adjustments and additions, almost identical to what it was in Fall 2000.

2. The title of the book calls for an observation. I am not a historian. I was, I remain, a participant in the field, even one of the most pugnacious ones. These two features might cast an a priori suspicion on the claim of writing a book of history on this topic, especially when dealing with a recent period, but it is this period which sees the emergence and development of national accounting. However, to have been active in this field since the end of the 1950s from very varying points of view (direct elaboration of accounts, systems design, international discussions, technical assistance, broader responsibility for the coordination of the statistical system in France, keeping track of reflections and research in the field, thanks in particular to the biennial General Conferences of the International Association for Research in Income and Wealth [IARIW]) undoubtedly gives me some qualification to do it.

By specifying *a* history of national accounting, even if it is a kind of pleonastic formula since there cannot be a single History of anything, I would particularly like to underline the personal character of the endeavor. Even if I tried to treat the subject rigorously, and if the synthesis is, I believe, balanced, I did not refrain from carrying appreciations, which, coming from a committed participant, could not be written from the point of view of Sirius. In particular, in the case of debates of the most recent period that are not completely closed, as for example concerning environmental economic accounting, I do not claim to have made a completely objective presentation of it, but the principal elements of the debates are put forward.

The "a" of "a history" also reflects the fact that many choices had to be made. To treat in a balanced way all the developments in national accounting that occurred over two thirds of a century would have required the addition of several chapters. One could thus imagine some on financial accounts, input–output tables, regional accounts, the external account and the balance of payments, envisage broader presentations of the uses, analyze the changes in the methods of compiling the accounts linked to the extension of data processing procedures (at the end of the 1950s, I prepared the accounts for agriculture, chemistry or other fields using a slide rule). These topics are to be found in the book, but only from a general synthetic point of view.

The "a" relates also to the fact that the purpose was to describe mainly the internal history, to some extent the technical history, of the discipline. Certainly the external history, i.e. in relationship with the political and social life and intellectual trends of economic analysis, is far from missing. However, these aspects are not the dominant ones, unlike François Fourquet's book *Les Comptes de la puissance* [The Accounts of Power], or Aude Terray's dissertation *Des francs-tireurs aux experts: l'organisation de la prévision économique au ministère des Finances (1948–1968)* [From Forerunners to Experts: the Organization of Economic Forecasting in the Ministry of Finance (1948–1968)] or Alain Desrosières' work on the history of statistics with the evocative title *La politique des grands nombres* [Translated as *The Politics of Large Numbers: A History of Statistical Reasoning*, Harvard University Press, 1998].

3. It is obviously not a history of French national accounting. The point of view is resolutely from a world perspective. Could it then be said "as seen from France"? It would not be exact. Seen by a Frenchman, certainly, who, differing in that characteristic from many of his foreign colleagues, is not unaware of the French experience and contributions to national accounting, but by a Frenchman who, since the early 1960s, has combined national and international activity. It is thus a world-level history. As synthesis is sought, it does not intend to cover in a quasi-exhaustive way all countries and all experiences. The objective is from this point of view very different from Paul Studenski's history of national income estimates (*The Income of Nations*). His work comprises in particular expositions, more or less significant, dedicated to all that was done somewhere or at least it aims at it. For the second half of the twentieth century, an equivalent endeavor would have been enormous and probably very tedious. It is a pity that such raw material does not exist. It would have been most useful, for example, to easily find answers to questions such as "at what moment did the Norwegians start to compile financial accounts or the Japanese to publish annual balance sheets?". If I had been able to envisage at the outset the final dimension and the schedule of the book, I surely would have proceeded to a small systematic survey with a certain number of countries. The temporal horizon, which resulted in always being too short after each metamorphosis of the project, did not make it possible. During the final adjustment, specific requests helped in clarifying some issues.

It is unlikely that the synthesis itself felt it too much. On the other hand the risk exists that the attention was too exclusively related to the experience of certain countries and that others (India, for example) were neglected, though they might have deserved to be mentioned in connection with some topics. I do not underestimate this drawback. If some might feel offended, I would sincerely regret it.

4. The above-mentioned risk also exists of course with regard to individuals, for the very same reason. However, the problem is broader and deserves some attention. From the moment when the compilation of national accounts became a function of often numerous teams working in institutions such as statistical offices, central banks or certain ministries, it acquired an anonymous or quasi-anonymous character. One "does not sign" the national accounts of Germany or Canada. This situation is very different from that of former national income estimates. Most of the research analyzed or mentioned by Studenski, except for the post-war period (his book is published in 1958) but it then refers to national accounts, corresponds to work of individual authors or groups of scholars who publish the results under their own name.

Moreover, since national accounts become regular outcomes, the progress in methods tends to be integrated into the compilation process, in particular when changes in benchmark years occur. Many internal notes are then produced, of unequal length, but mostly valuable, identified most of the time by the initials of their authors (which make them difficult to identify once time has gone by), but hardly publications, even less publications in international journals. This anonymity is also to be found in international organizations. Often the names of external consultants are mentioned, but not those of the members of the secretariats of these organizations. It is then difficult afterwards to identify their contributions. Striking is the case of Abraham Aidenof, of the United Nations Statistical Office, concerning the 1968 SNA (see chapter 3). At the end of the century at the international level the practice tends to be reversed, as can be seen in the Preface of the 1993 SNA. This time everyone or almost everyone is mentioned, which is almost equivalent to anonymity.

All in all, national account compilers write little, unlike scholars and researchers whose careers often depend on publications. From this derives the risk for the one who tries to draft history, to neglect the former and favor the latter. From there also derives the interest for a participant to draft it, as he is more able to combine direct experience and published sources, and in so doing, to better balance the points of view.

In any event, it would be difficult to present a fair balance, except if the objective were to produce a comprehensive survey with the need to undertake a painstakingly deep investigation. The great number of practitioners in the field, the collective character of most of the work, the multitude of often minor differentiations are major obstacles to this endeavor. And yet all that constitutes the humus for later progress. This is why I have here a grateful thought for all those, I knew many of them here and there, though on the whole only a small minority, who contributed to the compilation of national accounts in the twentieth century and those who will continue to do so in the future.

5. Another more substantial factor of distortion must be mentioned. It can be called the perspective effect. Even if the history of the past somehow always depends on the moment when it is written, this dependence is all the more important as the referenced past is more recent and the history that one reports extends to the very moment in which one is writing (worse: if the author himself is a participant!).

As it is the history of a discipline, it is inevitable, and even necessary as it is a living one, to attach a particular importance to the significant methodological debates which are underway at the moment when one writes. It is then possible to sketch a certain interdependency between the past, the present and the future. As they are issues by assumption still unsolved, their presentation points to those who contribute to their discussion, especially of course those who write, including the author of this book.

On the other hand, this book undoubtedly does not give importance, or not sufficiently, to national accounts compilers and scholars whose contributions would have been analyzed, had it been written at some other time, for example that of Jack Hibbert or others when the topic of inflation was hotly discussed at the beginning of the 1980s. More generally and because a thematic approach was followed instead of a chronological one, a certain oblivion of the intermediate period might have resulted to the benefit of the beginning of the history and the end of the century.

Another effect of perspective is due to the choice of the topics covered. This effect, in fact, is twofold. The stress laid on the international harmonization of the systems rather than on a kind of synoptic analysis of national evolutions, the absence of special chapters dealing with financial accounts, regional accounts, etc. might suggest a relative importance assigned to certain topics or participants that other choices would have partly changed.

Still another effect of perspective is the linguistic one. In the international life of the discipline, what is published in English receives – without any doubt – a premium. To publish, and to publish in this language, is essential. Statistics Netherlands provides a marvelous example of encouragement in this direction with its series of National Accounts Occasional Papers. The Netherlands and Scandinavian countries have adopted this practice a long time ago. Others come to it, as is the case of INSEE with the translation of the proceedings of its annual "enterprises" seminars or of the *Courrier des Statistiques* special issues.

6. As I only entered the SEEF (Service des études économiques et financières) [Service for Economic and Financial Studies] of the Ministry of Finance at the beginning of 1957, I did not belong to the team that conceived French national accounting at the beginning of the 1950s, and I thus do not belong to the eminent circle of the founding fathers. Charles Prou, René Mercier had already left the Service. The Service was starting to be staffed, but it was still only a group of about fifty persons.

I spent a few months there before leaving for military service. When coming back, the meeting with Claude Gruson who headed the SEEF was rather peculiar. He was known not to be very talkative at first contact, and I was (still) a very timid young man. We thus spoke little. I remember however that, as he was proposing to assign me to the section which prepared the goods and services and enterprise accounts, Gruson told me that it was necessary in any event to start by "aller au charbon" ("going for coal", that is "grunging") (as my father, then my mother after his death in 1942, sold coal, I knew its color and dust; any way coal after the "battle for production" of the post-war period was still then viewed as a noble material). I wonder finally whether I have ever left this stage . . .

A few years later, I followed Gruson to the INSEE where I remained until retirement.

7. Though being neither a statistician by training, nor really an economist by profession (at the beginning of the 1950s, economics in France was still taught at Law School), I was to make a long professional career in a statistical office.

I always found my activity at the INSEE exciting where, without losing contact with national accounting, it extended to statistical coordination and policy in the broad sense, at the national and international levels. In the mid-1970s, I could have branched out towards statistical activity at the European level, but my candidature to the function of director general of the SOEC, the future Eurostat, was rejected. I thus remained at the INSEE where, as I was neither a professional statistician, nor a recognized economist, I had – except in my own eyes of course – few chances to reach the very top.

8. The consequence of all this was that, among the national accountants in the forefront in the 1960s, I was I believe the only one to take a very active part, in the 1980s, in the preparation of the 1993 SNA. To mention only some names, Richard Stone was ill, Odd Aukrust retired from direct activities, Jacques Mayer also retired after having headed the SOEC (it is him to whom I did not succeed), Jack Hibbert was heading the Central Statistical Office of the United Kingdom, Vicenzo Siesto – away from national accounting following an ethical conflict with a president of the Italian Statistical Office (ISTAT) – became a household survey statistician, and later general director of ISTAT, Hildegard Bartels was retired, after having chaired the German Federal Statistical Office, Gunther Hamer became vice-president of the latter, C. Oomens from the Netherlands also retired, the team of Eurostat was renewed, etc.

The fact of having started early in the field and remained a long time – partly voluntarily, partly involuntarily – explains this situation. And it also explains the fact that no other participant could exhibit such a various range of experiences. I very well understand that it could have been frustrating for others.

There is thus in the particular role which I played in the preparation of the 1993 SNA a contingent element that I am not unaware of. That it might be due or not to the heterodoxy of my career (for somebody who has not an especially adventurous temperament) and to various external circumstances however does not change anything in the nature of this role.

9. The readers may have noticed that in the text of the book nowhere did I employ the pronoun "I". Writing a history of national accounting as an author, I thus had to speak about myself as a participant as if it were about any other. I thus said "Vanoli". As I am finishing the work, I do not know any more if they are one or two, I want to say of course if we are one or two (but perhaps three since while writing this postface I speak about both others). Be reassured. I have read Fernando Pessoa, and I do not seek to imitate him. Moreover we all carry the same name.

This paragraph could be only, too easily, facetious if it did not have a precise goal, which is to explain the uneasiness of the author in speaking about his own contribution concerning the 1993 SNA. This contribution was obvious for many people during the process of preparation of the new system. But it is not written anywhere. However, things are easily forgotten if they are not written. Direct witnesses scatter. Some have already disappeared like Jagdish Kumar, an Indian statistician member of the Expert Group, or Lazlo Drechsler, a Hungarian national accountant, then a United Nations staff member. It also happens that some witnesses skew the facts in order to please such or such of their friends. Most simply have other things to do.

The dilemma of the author was clear: to play the modest one, but then not correctly recall the history of a significant phase in the evolution of the discipline and in addition not be nice and fair to himself (on the other hand Jean-Paul Piriou insisted on getting some developments on the decision-making processes), or to give cause for ridicule in looking to praise himself, moreover without bringing forward any written proofs. The author, who studied law, knows the latin proverb "*testis unus, testis nullius*", "a single witness, no witness". And if the witness called upon is oneself, then ...

Finally I chose the second attitude when writing the annex to chapter 3. "Investigating the decision process". The formulation used, which speaks about the role of "intellectual leader" of the preparation of the 1993 SNA is in fact derived from a private conversation at the end of August 2000. "*Oh! André*", says N. to me, "*M. told me recently that you have been the intellectual leader in the elaboration of the 93 SNA.*" – "*Yes, N.*", did I answer, "*you did not know that? – No, I thought it was Q.*" [the name of a lady follows]. I give him some explanations and add: "*But this is not publicly acknowledged.*" – "*Well, André, it will be progressively known.*" Maybe. It can be easily understood that I can quote neither the name of N. nor that of M.

10. An important part of the book is devoted to concepts and their relationships to economic theory. Fifteen years ago, it is unlikely that in such a work this aspect would have been stressed in such a way. Some general formulas like those of Kendrick or Stone quoted in chapter 10 would have sufficed. I did not consider such an attitude as acceptable, in particular in view of the trend of discussions over the last decade. However my knowledge of economic theories is rather limited. I am aware of the fact that these issues require much more profound analyses than those I made, no matter what one thinks of the theories in question. On the other hand, I am convinced that the dogmatic approaches that are tending to spread are neither productive, nor intellectually acceptable. It obviously was not in the scope of this work to discuss the economic theories by themselves.

11. By dedicating this book to the memory of Claude Gruson, I wanted to pay my tribute by the same token to all those who with him created French national accounting in the 1950s, whether they totally shared his views or not on the problems of our societies (see Box 72, chapter 10). We further built upon what they pioneered, even if the work has experienced significant evolution and profound renewal since then.

Subject Index

Index of Names

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Acronyms

ACN	Association de comptabilité nationale [National Accounting Association]
AEA	American Economic Association
APU	Administrations publiques [General government]
BEA	Bureau of Economic Analysis
BLS	Bureau of Labor Statistics
BRE	Budget de reconstruction et d'équipement*
CEPE	Centre d'études des programmes économiques
CEPI	Centre d'études et de prévisions internationales
CERC	Centre d'étude des revenus et des coûts
CGEM	Computable General Equilibrium Models
CIA	Central Intelligence Agency
CMEA	Council for Mutual Economic Assistance (Comecon)
CMFB	Committee on Monetary, Financial and Balance of Payments Statistics
CNF	Comptabilité nationale française [French National Accounting]
CPEs	Centrally Planned Economies
CREDOC	Centre de recherche et de documentation sur la consommation
CIT	Communications and information technology
CSO	Central Statistical Office (United Kingdom)
DGINS	General Directors of National Statistical Institutes
DP	Direction de la prévision [Directorate of Economic Forecasting]
ECSC	European Community for Steel and Coal
EMU	European Monetary Union
ESA	European System of Accounts
EU	European Union
Eurostat	Statistical Office of the European Communities
FCF	Fixed Capital Formation
Fed	Federal Reserve Board
FISIM	Financial Intermediation Services Indirectly Measured
GDDS	General Data Dissemination System
GDP	Gross Domestic Product
GFCF	Gross Fixed Capital Formation
GFP	Global Factor Productivity
GNI	Gross National Income
GNP	Gross National Product
IARIW	International Association for Research in Income and Wealth
IBS	Imputed Banking Services
IC	Intermediate Consumption
ICOP	International Comparisons of Output and Productivity
ICP	International Comparison Project
ICT	Information and Communication Technology
IEA	Integrated Economic Accounts
IMF	International Monetary Fund

INSEE	Institut national de la statistique et des études économiques [French National Statistical Office and of Economic Studies]
IOT	Input–Output Table
IPECODE	Institut de prévisions économiques et financières pour le développement des entreprises
ISEA	Institut de science économique appliquée
ISIC	International Standard Industrial Classification
ISUP	Institut de statistique de l'université de Paris
LDC	Less Developed Country
MFP	Multi Factor Productivity
MPS	Material Product System
NA	National Accounts, or National Accounting
NAMEA	National Accounts Matrix with Environmental Accounts
NBER	National Bureau of Economic Research
NDP	Net Domestic Product
NI	National Income
NMS	Non Market Services
NNI	Net National Income
NNP	Net National Product
NPISH	Non Profit Institutions serving Households
OECD	Organization for Economic Cooperation and Development
OEEC	European Organization for Economic Cooperation
OFCE	Office français de conjoncture économique
PCG	Plan comptable général [French General Accounting Standard]
PPP	Purchasing Power Parity
QNA	Quarterly National Accounts
R&D	Research and Development
SAM	Social Accounting Matrix
SDDS	Special Data Dissemination Standard
SECN	Système élargi de comptabilité nationale [French Enlarged System of National Accounts]
SEDES	Société d'étude pour le développement économique et social
SEEF	Service des études économiques et financières
SEF	Statistiques et études financières (revue)
SESAME	System of Economic and Social Accounting Matrices and Extensions
SGF	Statistique générale de la France [(former) French Statistical Office]
SNA	System of National Accounts
SOEC	Statistical Office of the European Communities
SPC	Statistical Program Committee
SPC	Social Professional Category
SSDS	System of Social and Demographic Statistics
SUT	Supply and Use Table
TEE	Tableau économique d'ensemble [Overall Economic Account]
TFP	Total Factor Productivity
UN	United Nations
UNECE	United Nations Economic Commission for Europe
USSR	Union of Soviet Socialist Republics
VA	Value Added
vs	Versus
WB	World Bank

André Vanoli

A History of National Accounting

The history of national income estimates has been studied in great detail in Paul Studenski's book published in 1958. He presented very completely the history since the emerging concept of national income at the end of the 17th century until the extension of estimates in the first three decades of the 20th century.

This book fills a large void, as there has not been, curiously enough, a comprehensive work on the history of national accounting. It is written by a notable participant in this history, with a universal and inclusive perspective, even while devoting particular attention to specific French contributions to the development of national accounting.

This volume comprises both a history of national accounting and an advanced manual on the major elements of this discipline. It also sketches the relationship between economic theories and the observation of the present and the past from the perspective of the measurement of the economy. This approach is particularly noticeable in the chapters devoted to the relationship between production, value and welfare, between production, income and wealth, and, finally, between value, volume and price.

From the pedagogical point of view, the backbone of the book is a substantial historical discourse organized by themes and fleshed out by numerous boxes and annexes. An "Outlook" section at the end of each chapter summarizes and relates the information in that chapter to other themes. A selective and annotated bibliography provides additional resources. This volume also includes a very comprehensive and valuable index. The dynamic style gives the book liveliness without sacrificing the robustness expected of a reference book.

André VANOLI, born in 1930, is a former director at INSEE, the French Central Statistical office, where he was in charge of national accounts, statistical coordination, international relations and the consulting body Conseil National de l'Information Statistique. Intensively involved in international activities, he worked from 1986 to 1993 on the preparation of the 1993 SNA, of which he was one of the main authors (earlier, in 1964, he drafted a report that was used as a basis for the elaboration of the first European System of Accounts, the ESA). He guided the development of the national accounts of Columbia, Ecuador, Peru, Brasil, Tunisia and Greece. He served as chairman of the Council of the International Association for Research in Income and Wealth (IARIW) in 1977-1979 and as President of the French National Accounting Association (Association de comptabilité nationale) since its creation in 1983. A member of the Commission for the Accounts and the Economy of the Environment in France, he also chairs the Scientific Board of the French Institute for the Environment (IFEN).

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