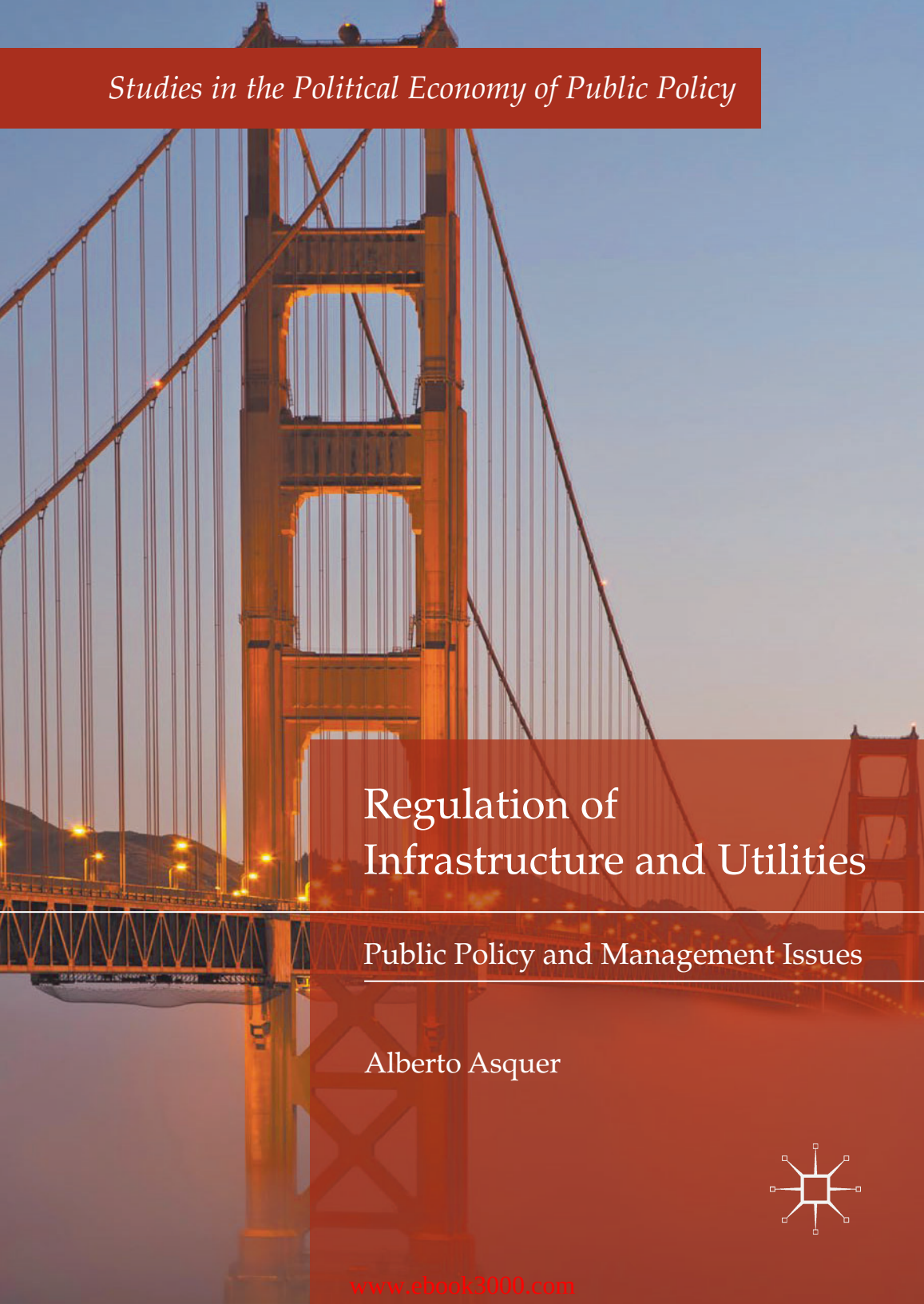

Studies in the Political Economy of Public Policy

Regulation of Infrastructure and Utilities

Public Policy and Management Issues

Alberto Asquer

Studies in the Political Economy of Public Policy

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CHAPTER 1

Infrastructure and Utilities: The Need for Regulation

1 Introduction

Infrastructure and utilities constitute the backbone of contemporary economic systems and an essential platform for the working of societies. The development of infrastructure and utilities marked the industrialization of Western countries and the economic growth that they experienced, especially in the twentieth century. At the time of writing, several initiatives to develop infrastructure and utilities are under way, especially in Asia and Africa and with the support of various international organizations and donor countries. From railways to power grids, from water and sewage plants to telecommunication networks, new infrastructure and utilities are regarded as essential to improve the living conditions of billions of people, open opportunities for business and trade and strengthen the capacity of governments to deliver public policies.

Infrastructure and utilities are complex systems whose development should be accompanied by appropriate regulation. Regulation of infrastructure and utilities is a function that is intended to steer the conduct of entities that operate infrastructure and utilities services. Regulation has many repercussions for the working of infrastructure and utilities systems, including the determination of prices for infrastructure and utilities services, the making of investment in infrastructure and utilities assets, the intensity of competition between infrastructure and utilities service providers, and the conditions of access to services for the users.

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Good regulatory systems result in quality infrastructure and utilities services at affordable prices, while bad regulatory systems lead to mispriced services, under-investment or over-investment, and unfair distribution of costs and benefits across the society.

This book aims to discuss the many policy and management issues related to the regulation of infrastructure and utilities that contemporary societies face. From China's intent to modernize the country and strengthen its trading routes abroad to the USA's efforts to upgrade national infrastructure, from the aims of many African countries to lift millions of people out of poverty to the interest of many Asian countries towards public-private partnerships (PPPs), the field of infrastructure and utilities is a lively arena where many stakeholders seek to pursue their agendas. Different countries face remarkably similar issues, while others deal with quite specific and contingent circumstances. While it would not be possible to discuss any specific and contingent scenario, this book aims to cover the most common problems with infrastructure and utilities that governments, regulators, firms and users typically encounter.

What is regulation? Who regulates what? What is regulatory policy? Before embarking on our travel through the variegated landscape of today's regulatory systems across countries and sectors, we address these fundamental questions (and provide some definitions along the way).

2 What Is Regulation?

Regulation is a term that is used with different meanings depending on the particular disciplinary, institutional and temporal context. Quite often, scholarly works refer to the distinction made by Baldwin et al. (1998: p. 3) among a narrow sense of the term (regulation understood as the promulgation of an authoritative set of rules, accompanied by some mechanism, typically a public agency, for monitoring and promoting compliance with these rules), a middle-range sense (all efforts of state agencies to steer the economy) and a broad sense (any kind of mechanism of social control). The first meaning is relatively constraining because it relates regulation to formal rules only. It papers over the regulatory function played by sources of influence on behavior such as, for example, informal institutions and self-imposed discipline. The third meaning, on the other hand, is too broad because it includes any possible kind of influence on behavior, such as social rejection, shame and ridicule. It is often in the second meaning that regulation is understood

within contemporary scholarly discourses in the disciplines of economics, public administration and political science.

Regulation can also be defined as the diverse forms of intentional use of authority by state and non-state actors to affect a different party (Black 2002; Lodge and Wegrich 2012: p. 6). Authority may take the form of formal legal force or informal inducements that impact on behavior. This definition, therefore, is both wider than referring to formal rules and mechanisms of compliance and stricter than relating to any kind of social influence. We may notice, however, that this definition is "broad enough" to include many different forms of regulation, such as command and control exercised by governmental authorities, price-caps posed by independent regulatory agencies, and the "moral suasion" (that is, the capacity to exert influence without any use of formal authority or force) exerted by authoritative actors.

Regulations are typically assembled into packages of institutions and processes that are designed with the aim of subjecting certain actors to systematic influence. In this sense, common definitions of regulatory systems are the ones used in Organisation for Economic Co-operation and Development (OECD) works as "the processes and institutions through which regulations are developed, implemented, enforced, adjudicated and revised" (OECD 1994, 1997) and in World Bank publications as "the combination of institutions, laws and processes that give a government control over the operating and investment decisions of enterprises" of the regulated sectors of the economy (Brown et al. 2006a). Examples of regulatory systems include public ownership (where processes and institutions provide direct control of firms by state actors), franchise allocation (where the behavior of firms is influenced by *ex ante* competitive pressures for the award of the franchise contract and by *ex post* monitoring and sanctioning by the awarding authority), and discretionary regulation (where the behavior of firms is affected by the use of tools in the hands of independent regulatory agencies, such as price-caps or Rate of Return limits) (Gómez-Ibáñez 2003).

3 Who Regulates What?

Regulation is traditionally divided into three branches, namely, economic, social and administrative regulation. Economic regulation is primarily concerned with correcting market failures and imperfections, such as those that arise from monopolies, asymmetric information among

customers and producers and externalities. Social regulation is fundamentally concerned with the protection of the public interest, in such terms as environmental preservation, workplace safety and consumers' health. It should be highlighted, however, that the regulation of the economic or social behavior is not taken as an end by itself. Regulation is a mean to accomplish desired economic or social outcomes, such as maximizing consumers' surplus, stimulating innovation, protecting the environment, or safeguarding the welfare of workers and consumers. Administrative regulation, finally, refers to paperwork and administrative formalities (so-called "red tape") through which governments collect information and intervene in individual decisions.

Regulation is exercised in many forms and by different actors. In a traditional definition, Selznick conceived regulation as a "sustained and focused control exercised by a public agency over activities that are valued by a community" (Selznick 1985: p. 363). This view entails that regulation is exercised by public agencies, including central government departments and other public bodies, such as independent regulatory agencies. The term "agency" is used here in a sense that is typically attributed in US public administration studies, where it refers to governmental organizations in general. The term may have different meanings in other countries and temporal contexts, however. For example, within the European Union (EU) "agencies" are typically understood as "a structurally disaggregated body, formally separated by the ministry, which carries out public tasks at a national level on a permanent basis, is staffed by public servants, is financed mainly by the state budget, and is subjected to public legal procedures" (Pollitt et al. 2004; Pollitt and Talbot 2004).

Public authorities play a primary role in steering the economy and the society. Regulatory functions, however, can be also performed by industry or corporate self-regulatory bodies, insurance companies, auditors, consultancies, non-governmental organizations (NGOs), standard-setting organizations (such as the International Accounting Standards Board) and professional bodies (such as the Institute of Chartered Accountants) (Hutter 2006). Attention should be placed to the many actors who can play regulatory functions. In some country contexts where public authorities are relatively weak or in some industry conditions where new technologies and services are just emerging, regulation from the regulated themselves (self-regulation) and from the civil society (including the users) can play a very important role.

The specific way in which various state and non-state actors contribute regulating a sector of the economy or a part of social life constitutes a regulatory regime. The term is defined as "a historically specific configuration of policies and institutions which structures the relationship among social interests, the state, and economic actors in multiple sector of the economy" (Eisner 2000). We can use the term regulatory regime to broadly refer to the constellation of ideas that justify the steering of the economy and society and of institutions and policies that structure how regulators affect the conduct of individuals and firms (Harris and Milkis 1989).

This book is especially focused on the regulation of infrastructure and utilities rather than of other economic and social activities (e.g., regulation of banking and finance, welfare and health). The terms infrastructure and utilities are often used interchangeably, but they bear distinctive connotations. Infrastructure is defined as the technical and organizational systems for widespread and continuous public-service provision that extend over a territory and that crucially depend on sunk investments in relatively large physical assets. The original meaning of the term referred to what is underneath the ground (from the Latin prefix *infra-*), such as sewage pipelines, for example, but the contemporary use of the term also includes structures for public service delivery that are visible on the ground—such as railways—or even partially intangible—such as telecommunication networks. Utilities, instead, are understood as those sectors of the economy that are managed in the public interest, such as electricity, gas, postal services, telecommunications, waste disposal, water supply and sanitation services (i.e., the term "utilities" typically does not include transport services). In part, the two terms overlap. As we shall see, principles of regulation typically apply to infrastructure and utilities alike.

4 What Is Regulatory Policy?

Regulation has been a component part of the "toolbox" of government since the emergence of modern statehood (Müller 2002). For example, regulatory institutions have characterized the US system of governance since the late nineteenth century. According to some authors, Victorian-age Britain presented some features of a regulatory system of infrastructure and utilities (McLean 2004; Moran 2003). Within the contemporary political and policy discourse, regulation is generally regarded

as a typical trait of policy reforms made since the 1980s and especially characterized by the delegation of regulatory function to independent regulatory agencies, often in conjunction with privatization and liberalization of sectors of the economy that had been previously subjected to direct public ownership and control. During the 1980s and 1990s, regulation through independent regulatory agencies became a central feature of reforms in member countries of the EU—a phenomenon that was fittingly portrayed as "the rise of the regulatory state" (Majone 1994). Many other countries in the world followed suit, in both Latin America (Jordana and Levi-Faur 2004; Manzetti 2000) and Asia (Jarvis et al. 2011) and in developing countries in general (Cook et al. 2004).

The diffusion of regulation among several countries in the world has been related to the rise of neo-liberalism and the unleashing of economic globalization during the last a few decades. Levi-Faur (2005) highlighted that regulation plays a pivotal role within the contemporary division of labor between the State and the society, where the former takes the role to steer (i.e., to direct and to lead) and the latter to row (i.e., to provide services). The new economic, social and political order—labeled as "regulatory capitalism"—reaffirms the institutional and administrative systems of the modern nation-states, but it distinguishes itself from Welfare State capitalism insofar as public authorities' role in directly producing goods and services is significantly diminished through privatization programs. Other traits of regulatory capitalism include the emergence of international regimes of regulation that span national boundaries and impinge domestic regulatory policies, and the increasing influence of technocrats and experts (and of their international networks) in the policy process.

The emergence of regulatory capitalism is largely related to various reform initiatives that took place in several countries since the late twentieth century. Various regulatory reforms have been made in both OECD countries and elsewhere, and many others are currently under consideration. Regulatory reform is a term that has been used to indicate a policy cycle where policy-makers intend to replace an existing regulatory regime with a new one, typically with the general aim to improve regulatory quality (OECD 1997). Regulatory quality, in turn, is defined as "a regulatory framework in which regulations and regulatory regimes are efficient in terms of cost, effective in terms of having a clear regulatory and policy purpose, transparent and accountable" (OECD 2008: p. 56).

Regulatory reforms have also been related to policy cycles where regulatory regimes are changed for the sake of attaining policy objectives

generally related to improvement of performance of the regulated sector of the economy. Regulatory reforms, in this sense, may include policy content features that relate the liberalization, re-regulation and privatization of industries where policy-makers' concerns are openly directed towards fixing perceived or constructed problems with existing regulatory regimes.

5 Policy and Management Issues: Evidence from Case Studies

This book presents examples of infrastructure and utilities regulation that originate from pieces of academic works conducted in several sectors and countries in the world. Examples consist of cases from such regulatory experiences as water services in Bolivia, telecommunications in Malaysia, electricity in China, district heating in Germany, railways in Portugal and airports in Australia and New Zealand. In order to provide a sense of continuity throughout the book, however, one specific case of regulation is discussed across different chapters. This case consists of the episode of regulating the water and sewage sector in Italy between 1994, when a reform aimed to radically re-structure the regulation of the sector was passed, and 2011, when a referendum resulted in the termination of the privatization of water service provision. The case study is used for instrumental purposes: it allows an illustration of how various regulatory issues (of both policy and management sorts) play out in practice and how they interact with each other.

The episode of the water reform in Italy originated from the enactment of a piece of legislation (Act 36/1994) that aimed to improve the dismal state of water infrastructure and the dissatisfying performance of water services. This policy objective would be attained through the combined effect of three features of the reform policy content, namely to liberalize access to the water industry that had been traditionally dominated by public sector organizations, to re-regulate the provision of water services through combined mechanisms of franchise allocation and discretionary regulation, and to privatize water services by opening ownership of water firms to private operators and investors. The policy reform would be largely executed by sub-national governments, which enjoyed special prerogatives on the provision of local public services within their respective jurisdictions.

The implementation of the water reform unfolded over a period of almost two decades. It consisted of two distinctive and interrelated processes, namely the liberalization and re-regulation part of the reform on the one hand, and the privatization part of the reform on the other one. The liberalization and re-regulation part of the reform mainly consisted of actions that were taken in order to align sub-national legislation with the national reform statute and to establish new regulatory authorities at the sub-national level. The privatization part of the reform mainly consisted of actions that were taken in order to re-incorporate water firms, to open their ownership to private investors, and to award franchises to privatized water firms.

Every part of the reform implementation process was characterized by a first period of slow motion followed by a period of acceleration in the execution of the implementation tasks after "turning points". The liberalization and re-regulation of water services proceeded relatively slowly at first and then accelerated from 1997 onwards. The privatization of water services progressed relatively slowly at first and then gained steam after 2001. The discussion of the case study provides an explanation for why setting up the new water regulatory system was hampered for a number of years, and why—instead—the implementation of the water reform proceeded faster after favorable circumstances materialized.

The implementation of the water reform also exhibited some amount of variation across the country. The liberalization, re-regulation and privatization parts of the policy reform were executed remarkably faster in a particular area of Tuscany, named Alto Valdarno, where the new regulatory regime had been established already in 1999, than they were elsewhere in the country. The episode, therefore, presents some intriguing features—precisely, variation over time (when comparing the trajectory of the implementation episode before and after the "turning points" in 1997 and 2001) and across space (when comparing the trajectory of the implementation of the water reform in Alto Valdarno with respect to the rest of the country).

To be fair, the variety of water reform implementation trajectories across time and space in the Italy water case may not surprise anyone who is familiar with the general scholarly literature on public policy implementation. After all, the episode of the water reform implementation in Italy is illustrative of the well-known obstacles, detours and mixed results that are often encountered when implementing a regulatory reform—if not any public policy (Mazmanian and Sabatier 1981; Pressman and Wildavsky 1973; Sabatier and Mazmanian 1989). The

episode of the water reform implementation in Italy, however, contains more than meets the eye. As we shall see, the difficulties encountered to implement the water reform cannot be fully explained by ordinary administrative factors or by the resistance of policy executors against the reform mandate. Rather, the episode offers the opportunity to investigate the political economy of regulatory reforms, including how stakeholders may block, reinterpret and reshape features of the regulatory system to better serve their interests.

One further reason why the case of the water reform in Italy should be of interest for the study of regulation of infrastructure and utilities is that it took place within the context of a multi-level governance system. Multi-level governance refers to a form of governance where policy and administrative decisions result from continuous negotiation among governments at different territorial levels rather than in any particular single jurisdiction. This definition broadly draws from the one of Marks (1993), who defined multi-level governance, in a more articulated way, as "a system of continuous negotiation among nested governments at several territorial tiers" (Marks 1993: p. 392), "characterized by co-decision-making across several nested tiers of government, ill-defined and shifting spheres of competence (creating a consequential potential for conflicts about competences), and an ongoing search for principles of decisional distribution that might be applied to this emerging polity" (Marks 1993: p. 407). In multi-level governance systems, the constitution of non-unitary states attributes exclusive powers to sub-national governments with respect to the central government. Unitary states, in contrast, are those where the central government is attributed supreme sovereignty and any sub-national government only exercises the powers that are delegated by the central government (Cole and John 2001; Elazar 1997). Federal governments are typically regarded as the clearest form of non-unitary state, although also other forms of non-unitary states exist based on various forms of "regionalism" that is constitutionally sanctioned.

The multi-level governance system of Italy consists of four layers of public authorities, namely the central government, the regional governments, the provincial governments and the local governments (municipalities). The country comprises 19 regions, about one hundred provinces (the total number of provinces varied over time depending of institutional adjustments) and about 8100 municipalities. Each of these layers of public authorities enjoys specific powers on the regulation of the water sector, which originate from constitutional and legislative provisions. Many other countries in the world share similar multi-layered

governance structures, which pose issues of coordination and control of sub-national governments that take part to processes of regulatory reform implementation.

6 The Structure of the Book

The book is divided into three parts, which, in turn, address three different classes of problems of the regulatory process. The first part, titled "Devising Regulation", focuses on relatively high-level issues that relate to the nature of regulation, to the role of institutions, interests and ideas in regulation, and to the formulation and implementation of regulatory strategies and reforms. The second part of the book, titled "Installing Regulation", looks at the tendencies and obstacles that shape the regulatory process. Finally, the third part of the book, titled "Making Regulation Work", pays attention to issues related to the practice of managing infrastructure and utilities regulation. A concluding chapter discusses issues of design of regulatory systems.

The first part of the book (Devising Regulation) begins with Chap. 2, which contains a review of theories of regulation. Regulation became increasingly popular as a tool of government since the 1980s, when governments started combining neo-liberal reforms that aimed at liberalizing and privatizing sectors of the economy with changes of the institutions that were intended to influence, orient and steer their conduct. By that time, several explanations of regulation—such as the public interest theory of regulation, the private interest (or, specifically, the capture) theory of regulation, and the life-cycle theory of regulation—had been already formulated. The rise of regulation as a central feature of public governance regimes, however, triggered further research into the rationales for regulation (which especially focused on the role of regulation in solving the problem of investment in monopolies) and the effectiveness of alternative regulatory systems.

Chapter 3 turns attention to regulatory policies, strategies and tools. The chapter discusses various approaches to regulation—from those where the government plays a central role in directing and controlling infrastructure and utilities to those where public authorities draw back from direct intervention into infrastructure and utilities industries. At one end of the spectrum, the government directs and controls

infrastructure and utilities firms through full ownership. At another end of the spectrum, the government does not play any role in the conduct of industries where firms are only subjected to the discipline of market competition. In between these extremes, the government can exert influence on infrastructure and utilities firms by sharing their ownership with private investors (mixed public-private ownership firms or "institutional PPPs"), by regulating their conduct through contracts (franchises and concessions), by delegating discretionary regulatory powers to independent regulatory authorities (IRAs), and by simulating competitive market pressures through benchmarking and other forms of comparison among firms' performance.

Chapter 4 looks at the issues that arise when the government decides to re-configure existing regulatory systems. Regulatory reforms of infrastructure and utilities have taken place in several countries, for reasons that include evidence of poor performance, favorable ideational climate, external pressures, stakeholders' interests, financial and fiscal conditions, and technological change. Sometimes, domestic factors seem to play and important role towards inducing countries to reform infrastructure and utilities, like, for example, when governments aim to favor the strengthening of "national champions". Sometimes, external conditions seem more important, like when external agents (such as international donors) coerce recipient countries to pass reforms or when other countries provide examples of regulatory reforms that other countries find advantageous to mimic. Finally, the chapter reviews evidence about the effectiveness of regulatory reforms, which often do not seem to deliver the expected performance improvements.

The first part of the book concludes with Chap. 5, which provides evidence of issues that are encountered in devising regulation by looking at the case of the reform of the water sector in Italy in 1994. The chapter narrates how the issue of reforming the water sector gained the attention of the government, what design principles informed the re-configuration of the regulation of the water sector, and how the water reform bill was passed by the parliament.

The second part of the book (Installing Regulation) begins with Chap. 6, which discusses the politics of regulation. In the so-called "age of governance", a common condition for many governments is their relatively weak capacity to command and control sectors of the economy. Governments learn to play "regulatory games" with other actors of

governance arenas, including government agencies, sub-national governments and the regulated firms. One main struggle among these actors is the one of autonomy and political control, which relates to the capacity to determine—among others—investments, prices and service quality conditions.

Chapter 7 turns attention to the issue of regulatory capacity. In both industrialized and developing countries, continuous efforts are needed to strengthen and fine tune regulatory institutions. One main argument for developing regulatory capacity is that relatively "strong" regulatory institutions are associated with better performance of the regulated industries, while relatively "weak" regulatory institutions open room for poor law enforcement, bribery, low service quality and lack of investments in infrastructure and utilities assets. Developing regulatory capacity, however, may be hampered by tendencies to resist the introduction of a new regulatory system because it may pose threats to part of established interests.

The second part of the books terminates with Chap. 8, which illustrates examples of issues related to installing regulation that are drawn from the implementation of the water reform in Italy in the period 1994–2001. During that period, various actors of the national water policy domain—especially including the local governments, which enjoyed constitutionally sanctioned prerogatives on the organization and management of local water services—undertook various political maneuvers that were intended to resist, postpone or re-define the terms of the reconfiguration of the regulatory system of the water sector. Part of these efforts were specifically directed to negotiating the institutions of the new regulatory system, which would provide the foundations for the administration of water services in the decades to come.

The third part of the book (Making Regulation Work) begins with Chap. 9, which focuses on regulatory commitment and investments. Investments in infrastructure and utilities assets play a crucial role in the provision of quality services. When investments are funded by private capital, the regulation of service tariffs becomes of utmost importance. Business firms would not invest if they anticipate that the tariff for infrastructure and utilities services would be set at a level that is too low to generate satisfactory profitability. Regulatory systems, therefore, should include institutions and mechanisms that convince private investors that their investments are "protected" from the possibility that public authorities arbitrarily set tariffs too low and against their interests.

Chapter 10 focuses on the performance of regulated industries. Performance is a multi-dimensional construct that encompasses such diverse criteria as, for example, efficiency, effectiveness and equity. Different methodological approaches exist to appraise the performance of infrastructure and utilities industries and firms. Performance information can be used for several purposes, including the stimulation of performance improvements through mechanisms of benchmarking and yardstick competition.

The third part of the book finishes with Chap. 11, which provides evidence of issues of making regulation work on the basis of the implementation of the water reform in Italy in the period 2001–2011. During that period, many water firms started operating according to the terms of the new regulatory system, which included the award of franchise contracts that specified investment plans, tariffs and service quality standards. Investments in the water sector increased with respect to the past, although, in 2011, a referendum sanctioned the abrogation of the part of the water reform that provided a return on private capital—thus, it effectively discouraged any further private participation into water firms for the years to come.

The conclusions of this book are presented in Chap. 12, which takes a normative approach to the design of regulatory systems. The chapter illustrates prescriptions for the design of regulatory systems of infrastructure and utilities and explains their rationale. Various sources of guidelines for the regulation of infrastructure and utilities exist nowadays from both academic, policy and professional circles. They are important for reviewing and repairing regulatory systems as they become obsolete with respect to contemporary tendencies—from growing expectations of the users, citizens and taxpayers, to emerging technologies that help reconfigure the processes of service delivery. Regulation of infrastructure and utilities is an unfinished business in many countries, and lessons drawn from past experiences can be helpful to suggest ways to further improve regulatory systems and increase the performance of infrastructure and utilities industries.

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PART I

Devising Regulation

CHAPTER 2

Theories of Regulation

1 The Rise of Regulatory Capitalism

Since the 1980s, regulation gained a central place among the repertoire of approaches used by the government to influence, orient, steer and—in some sense—control sectors of the economy and portions of the society. The diffusion of regulatory reforms across Western countries, Latin America, East Asia and developing countries led many scholars to formulate the concept of regulatory capitalism as a new mode of capitalism where regulation plays a fundamental role in mediating the relationships among producers, consumers and the state. Regulatory capitalism is related to the emergence of regulatory governance, a term that encompasses institutions, tools, and practices that center on the use of regulation both within the state (i.e., as a way of administering activities of the government), in the relationship between the state and the private sector, and in the private sector itself (i.e., as a way of self-administering activities carried out by business actors "in the shadow of the state"). Features of regulatory governance include a new division of labor between state and society (especially marked by increased privatization of economic activities), an increase in delegation, a proliferation of new technologies of regulation, an intensification of formalization of regulations, and a growth in the influence of experts, especially embedded in international networks (Levi-Faur 2005, 2011).

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At least two features of regulatory governance are especially noticeable. First, regulation as a mode of governance has spread—and, one could argue, is still spreading—around the world. Several regulatory reforms have been made during recent decades in various countries and sectors of the economy. While some reforms aimed to install regulatory systems in place of traditional "command-and-control" approaches (i.e., state-ownership as a way of directing economic activities), others intended to reconfigure existing regulatory systems (i.e., "re-regulation") and others meant to make regulatory systems less invasive (i.e., "de-regulation"). Often, these reforms were made within a political and ideological climate that was favorably inclined towards so-called "neo-liberal" approaches to political economy, which included greater reliance towards market-based mechanisms for coordinating economic activities.

Second, regulation as a mode of governance has resulted in very complex webs of relationships among actors across multiple levels of government. Rules and regulations are ordinarily produced by both national public authorities and super-national ones, such as the EU; by international public organization, such as the World Health Organization; by international private organizations, such as the International Accounting Standard Board and the International Organization for Standardization; and so on. Rules and regulation made within any particular country and policy domain, moreover, affect rule-making activities in other countries and sectors, especially because of increased technological interdependences and connectivity of international networks of experts (so-called epistemic communities; Adler and Haas 1992).

The global diffusion of autonomous regulatory authorities is the hallmark of the rise of regulatory capitalism. Governance through autonomous regulatory authorities is no longer a peculiarity of Western countries. It is now widely believed that the appropriate way to govern certain economic sectors and to limit some social risks is through the creation of autonomous regulatory authorities. This new approach consists of a delegation of power from central governments to arms-length bureaucracies that are staffed and governed by technocrats and professionals. More generally, regulatory policy is increasingly delegated to experts who are embedded in transnational professional communities and share similar perceptions of the problem of late-modern societies.

2 Explaining Regulation

Why has regulation been adopted across so many countries and sectors—especially, including infrastructure and utilities? What are the rationales that underpin its adoption? There are several theoretical approaches to regulation. Generally, they justify regulation on the basis of two main rationales (Lodge and Wegrich 2012):

- Economic rationales: regulation serves the purpose to fix market failures, which result when scarce resources are not put to their highest valued uses. This typically happens when goods or services are provided under monopoly conditions, or clients do not have adequate information about quality and prices of goods or services, or prices do not signal the costs of the consequences of production or consumption because of externalities, or issues arise in the production of public goods or the preservation of common-pool resources;
- Social rationales: regulation serves the purpose to attain socially relevant objectives that are deemed important within a given historical and political context, such as equity, fairness, access, transparency and accountability.

Several theories help explaining how regulation arises, develops and performs. Most approaches take a positive stance, in the sense that they aim to account for observed features of regulation and of the working of regulatory systems. Some approaches, instead, tend to adopt a normative stance, in the sense that they offer some views about how regulation should be designed and managed in order to attain desired economic and/or social objectives. The main theoretical approaches to regulation are discussed below.

3 Public Interest Theories

Public interest theories of regulation build on the assumption that regulation is made to pursue some desired economic or social objectives that benefit the society on the whole (rather than any particular group, sector, or individual). According to this view, individuals who design, approve and administer regulatory systems are benevolent towards the society: they perceive a "problem" in the working of unregulated

industries or sectors and aim to fix it. A typical problem is the economically inefficient and socially undesirable effects that result from monopolies. Monopolies occur when a single seller occupies the whole market, the goods or services sold are unique and without any close substitute, there are barriers to entry, and exit is hampered by high sunk costs in highly specialized and immobile assets. The monopolist can extract consumers' surplus by charging higher price and providing less output than would be otherwise attained in competitive markets.

Other problems that regulation can fix are (Baldwin et al. 2012; Hood and Ogus 1996):

- Externalities effect that result when the price of a good or service does not reflect the "true cost" to society of producing it, with the effect that consumption is excessive;
- Information asymmetries that impede the consumers to be adequately well informed to evaluate competing goods or services;
- Uncertainty of continuity and availability of service, that arises when producers do not guarantee that goods and services are produced and available for consumers (e.g., to serve peak demand);
- Anti-competitive behavior and predatory pricing, which arise from the abuse of dominant positions in the market and that hamper competition;
- Production of public goods, which cannot be reserved exclusively for those who pay for them and that pose the issue that "free riders" may benefit from others' costs. Similarly, the preservation of common-pool resources poses the issue of coordinating access and use to shared resource pools;
- Unequal bargaining power, that puts one party of negotiation (e.g., workers) in a weaker position than another one (e.g., business companies);
- Scarcity and rationing, that calls for the exercise of public authority for allocating scarce goods or services to the most socially desirable uses;
- Rationalization and coordination of economic activity, especially when high transaction costs hamper the formulation, agreement and enforcement of contracts among private actors;
- Long-term planning, especially in relation to the interests of future generations who have no active voice in the present market.

Public interest theories of regulation suffer various shortcomings. First, issues arise about how public interest is defined, and how policy-makers and regulators resolve the tensions among alternative formulations of economically and socially desired objectives. Second, regulators may act in the pursue of their own benefit rather than in the public interest (e.g., they may be interested in the protection or expansion of their institutional role), or they may lack the expertise to understand how to affect the behavior of the regulated, or they may have insufficient tools and resources to perform regulation effectively. Third, policy-makers and regulators may fall prey to the same regulated, who may offer bribes or other forms of reward for having regulation serve their partisan interests rather than those of the wider public.

4 Private Interest Theories

Private interest theories of regulation reject the assumption that policy-makers and regulators act in the public interest. Rather, all actors are assumed to rationally pursue their own interests, especially including the transfer of wealth and the attainment of rent positions. According to this view, regulation is not really intended to protect the consumers from monopolists or to prevent socially undesirable outcomes, but to pursue the goals of powerful industrial actors. Business companies are interested to induce policy-makers to pass legislations that regulate industries for the benefit of dominant incumbents, and to persuade regulators to make decisions that safeguard the market position of the existing industry players. Policy-makers are interested to gain votes for re-election, and business companies can provide them with financial support for electoral campaigns. Regulators are interested to be re-appointed or to secure a job after the termination of their appointment, and business companies can sponsor them (albeit informally) with relevant politicians or offer them the prospect of consulting or other positions in the future.

5 The Capture Theory of Regulation

One of the most prominent theories within the private interest approach is the capture argument. The capture theory of regulation is mainly associated to the work of George Stigler, who argued that: “As a rule regulation is acquired by the industry and is designed and operated primarily for its benefit” (Stigler 1971: p. 3). The regulated industry

is interested to influence the regulator in order to attain a "regulatory rent". Typically, the regulated industry is characterized by concentrated interests, which mobilize and coordinate their efforts to protect their common stakes more easily than the consumers or citizens at large. Refinements of the capture theory included the works of Gary Becker (who argued that, once an industry had successfully lobbied the regulator, countervailing interests will mobilize in order to contest the acquired rent; Becker 1983) and Sam Peltzman (who argued that the regulatory rent tends to dissipate over time, and that the regulated industry may find it advantageous to de-regulate rather than acquiring more regulation; Peltzman 1976).

6 Interest-Group Politics Theories

Other theories within the private interest approach include the interest-group politics argument. According to this view, regulation results from the interaction between groups of actors within the regulated industry and the regulator. Following this view, Marver Bernstein developed a dynamic theory of regulation, where features and behavior of the regulator change over time (Bernstein 1955). Bernstein (1955) provided a "life-cycle" theory of the regulatory process. Regulation typically begins as a policy response to the requirement to protect the public from unwelcome activity. The first stage of the life-cycle model—gestation—results in the creation of a regulatory body. The second stage—youth—is when the inexperienced regulatory body is outmaneuvered by the regulated. Over time, political support for the regulatory agency fades away. In the maturity stage, regulators start paying more attention to the needs of the regulated. The regulatory body becomes less and less entrepreneurial. In the final stage—old age, the regulatory declines and gives more importance to the interest to the regulated than of the public.

Instead, James Q. Wilson argued that regulation depends on the degree of concentration (or dispersion) of the benefits and costs of regulation (Wilson 1984) (Table 1). The regulated are captured when regulation entails concentrated benefits and diffused costs (e.g., price regulation of a monopoly). Interest-group politics happens when groups of actors within the regulated industry contend the allocation of concentrated benefits and concentrate costs. If benefits of regulation are diffused while costs are concentrated, regulation results from entrepreneurial politics (e.g., a smoking ban, that benefits the public at large at

Table 1 Variants in interest-group politics (Baldwin et al. 2012)

	Concentrated costs of regulation	*Diffused costs of regulation*
Concentrated benefits of regulation	Interest-group politics	Client politics (capture)
Concentrated costs of regulation	Entrepreneurial politics	Majoritarian politics

the expense of tobacco and cigarette producers). If both benefits and costs of regulation are diffused, regulation originates from majoritarian politics.

7 Regulation and Complexity

Other approaches to regulation reject the assumption that regulation plays the function to serve either the public interest or the private one. Rather, regulation is conceived as a social practice that takes place within a specific cultural and institutional context. Much of the interaction between the regulated industry and the regulators consist of making sense of what regulation is, what effects it produces, and how to react to it in an adaptive fashion. According to this view, regulation can hardly be designed to fit an intended purpose. The regulated industry is so complex that the regulators cannot understand all drivers of behavior, collect and process all relevant information, and anticipate likely consequences of regulatory interventions. Accordingly, we are left with a sense that regulatory systems provide only the "appearance" of the capacity of the state to steer industries and sector.

Various factors contribute to the complexity of the regulated industry. First, regulations are made within a context that includes past regulations and institutions, which can interfere with the new regulations in unpredictable ways. Second, regulations made for a specific industry may bear implications for other industries or sectors of the economy in an unanticipated way. Third, regulations may not bear immediate effects on the regulated industry, but they can exert some influence on the long term in less evident ways. A related argument is that regulation always "lags behind" the behavior of the regulated industry. When a regulation

Table 2 Grid-group cultural theory (Douglas 1986)

	Grid		
Group	High Low	Low Fatalism Individualism	High Hierarchism Egalitarian

is made, actors of the regulated industry may adapt their conduct to changed features of the regulatory system in such a way as to circumvent the new rules. After some time only, it becomes apparent to the regulator that the regulated industry found out how to bypass the regulation. A new regulation is made, but again the regulated industry may change its behavior to outmaneuver the regulatory system. Furthermore, regulations require conversations between spheres of interest and policy expertise that build on different epistemological traditions and material concerns. Issues that arise from the translation among spheres of interests make regulation a continuous process of re-negotiation rather than a stable framework for governing industrial behavior.

8 Regulation and the Role of Ideas

Other approaches to regulation hold that actors make decisions by taking into consideration alternative courses of action that are conceivable according to certain ideational frames of mind. Rather than assuming actors rationally pursue well-defined objectives, an ideational approach argues that dominant ideas of the time (e.g., economic policy paradigms) affect the type and extent of regulation that actors consider desirable and acceptable. A variant of this approach relates to the assumption that individuals favor ideas that conform to a taken-for-granted set of values and associated worldview about cause-and-effect relationships. Grid-group cultural theory (Douglas 1986), for example, holds that individuals are inclined towards alternative worldviews, which relate to different assumptions about one's identity (self-referential vs. community-based) and one's standard of conduct (autonomous vs. rule-bound).

Ideas about regulation vary across the resulting four "polar types" of individualism, egalitarianism, hierarchy and fatalism (Table 2). For example, an individualist worldview tends to favor market-based mechanisms of coordination and to reject 'command-and-control' style of industry regulation. An egalitarian worldview would advocate for the inclusion of

principles of participation, transparency and public accountability in regulation. A hierarchical worldview would lean toward regulation based on the execution of top–down flows of instructions that emanate from public authorities. Finally, a fatalist worldview tends to support the adoption of randomized checks and other similar devices.

9 Regulation and the Role of Institutions

Finally, other approaches to regulation highlight the importance of institutions. A central concern of this approach is that the regulatory system should satisfy some fundamental requirements that relate to the minimization of information asymmetries, the provision of credible commitments, the avoidance of blame and the preservation of reputation. Issues of information asymmetry in regulation arise because politicians and the public are not fully aware of what the regulator does (e.g., does the regulator pursue the institutional mandate or any partisan objective?), and because the regulator is not fully aware of the activities the regulated industry performs and to what effect (e.g., does the regulated industry operate at an efficient level of production?). Issues of credible commitment relate to the provision of guarantees that the regulator (or the policy-makers) does not behave opportunistically and "expropriate" the regulated industry of their profits after they make sunk investments. Finally, issues of blame avoidance and preservation of reputation pertain to a politician's tendency to shift public responsibility for poor performance of regulated industries on the shoulders of the regulators and to intervene to fix manageable regulatory problems and take merit for it.

Regulatory institutions play a fundamental role in providing commitment that assures investors that they would get the expected return on investments. Levy and Spiller (1994) argued that the main problem of regulation centers on transaction-cost economics and the view that the regulator and the regulated fundamentally differ in terms of their interests towards investment, performance and return on investments. Political institutions play an important role to affect the conditions to expropriate or manipulate performance and return on investments. If the regulator can make credible commitments that they would not extract return on investment from the regulated, then the regulated may be inclined to invest into the regulated industry Otherwise, the regulated may hold back from investing and the resulting effect is that the regulated industry would not improve (or would, rather, decrease) the

performance over time. To the view of Levy and Spiller (1994), regulatory systems should include mechanisms to contain the arbitrariness of the regulator, especially through (a) substantive restraints on the discretion of the regulator (b) formal or informal constraints on changing the regulatory system, and (c) institutions that enforce the above formal—substantive or procedural—constraints.

10 The Problem of Investment in a Monopoly

The regulation of infrastructure and utilities is primarily concerned with the issues that arise from natural monopoly. In such industries, economies of scale—that arise when average or unit costs of a firm fall as volume increases—result in advantages for larger producers. Economies of scale can relate to the presence of network economies, which consist of advantages that larger infrastructure networks have in connecting a greater number of clients at cheaper cost than smaller ones. In addition, in such industries durable and immobile investments establish tremendous barriers to entry, because any potential competitor anticipates that sunk costs would be lost if the incumbent monopolist engages in a price war.

According to Gómez-Ibáñez (2003: p. 9), durable and immobile investments constitute the core feature of infrastructure monopolies. The investments made by the infrastructure monopolist typically consist of relationship-specific assets, i.e., of capital inputs that have no other alternative use but the production of specific infrastructure or utility services. Once the investment in relationship-specific assets is made, the infrastructure monopolies are exposed to the threat of *ex post* opportunism from the side of consumers (who are interested to re-negotiate the supply contract) or the government (who may "expropriate" the monopolist of its profit) that acts on consumers' behalf. Of course, the consumers also make relationship-specific investments, in the form of sunk costs incurred when setting up their lives in a certain place. Once consumers settle down in their home, they often cannot change the suppliers of infrastructure and utility services and cannot easily walk away to other places. Tiebout (1956) argued that consumers of infrastructure and utility services could "vote by feet" by moving to other places if they are dissatisfied with the services provided by the infrastructure monopolist. In practice, however, few consumers (individuals or families) are willing to conduct a peripatetic life driven by the search for cheaper water, electricity and gas bills.

The threat of *ex post* contractual opportunism may be reduced if the parties agree on a long-term contract, but such contractual arrangements may be too costly or cannot fully guarantee that all contingencies are stipulated. According to this view, the problem of regulation of infrastructure and utilities monopoly basically consists of taming the threat of *ex post* opportunism that arises from investment in relationship-specific assets. At least four solutions exist to this problem:

- Regulation through private contracts: infrastructure and utilities are regulated through private contracts between the infrastructure monopolist and the consumers, who negotiate price and service quality conditions;
- Regulation through concession contracts: infrastructure and utilities are regulated through a concession or franchise that the government awards to the infrastructure monopolist for providing certain services at a certain price for a limited period. In a sense, the government acts on behalf of the consumers by designing the concession contract, calling for tender offer competitions, selecting the winning bidder and monitoring the performance of the concessionaire;
- Regulation through discretionary regulation: infrastructure and utilities are regulated by independent regulatory agencies that hold the power to unilaterally establish tariffs and service standards of the infrastructure monopolist. In a sense, this is a way to deal with the inevitable incompleteness of concession contracts by delegating the independent regulatory agency to make ad hoc decisions (e.g., setting tariff caps) by taking account of the interest of both the general public and of the infrastructure monopolist;
- Regulation through public (or non-profit) enterprises: infrastructure and utilities are regulated through direct ownership and control of the infrastructure monopolist by the government (or a non-profit body).

Regulation through private contracts may not eliminate the threat of *ex post* contractual opportunism, especially if parties are not well informed of price and quality of infrastructure services, if they cannot write and enforce long-term contracts, and if there is no close substitute of the infrastructure service. Regulation through public enterprises may not eliminate inefficiencies that are typically associated to monopoly

positions, especially related to the lack of incentives to contain costs and improve productivity. Concession contracts and discretionary regulation may provide viable solutions to the problem of regulating infrastructure services. They both exhibit strengths and weaknesses, however, which will be discussed in the next chapter.

11 Case Study: Regulating Water Services in Bolivia

Between December 1999 and April 2000, a series of protests erupted in Cochabamba, the third largest city of Bolivia. The protests originated from the privatization of the city's water services, which had been run by the municipal company SEPAMA since 1967. In 1999, SEMAPA was sold to Agua del Tunari, an international consortium led by International Water Limited (UK). After the privatization, the Bolivian government awarded a 40-year concession to Agua del Tunari for providing water and sanitation services to Cochabamba. The concession contract specified that Agua del Tunari would implement an infrastructure development program, which included the Misicuni Multipurpose Project (MMP) that consisted of a dam, a reservoir, and a hydroelectric power plan. Agua del Tunari would be allowed to raise water tariffs up to 35%, which would provide the repayment of debts of SEPAMA and a 16% rate of return on investment.

The Bolivian government expected that the privatization of water services in Cochabamba could help improve the sorry state of water infrastructure in the city. Before the privatization, only 57% of the population of Cochabamba was connected to the water network while others (generally the poorest) had to rely on private vendors. Losses amounted to about 50% of water, and about 5–10% of connections were illegal and not metered. The largest consumers of water, including the municipality and public-sector companies, persistently missed their payments. The financial performance of SEMAPA was severely hampered, and the municipal company was unable to access loan financing and carry out any infrastructure development. The population suffered from acute water rationing in the dry season, with the effect that some consumers had built private water tanks and others relied on private groundwater sources (that posed related environmental health problems).

After Agua del Tunari started operating in November 1999, riots against the concession contract, in general, and the tariff increase, in particular, broke out in the city. Road blocks, strikes and public

demonstrations were occasionally followed by fights with the police, that resulted in six deaths. The protest gathered angry water consumers, small farmers and water vendors, and was fueled by a broader sense of acrimony against the government's neo-liberal economic strategy that was diffused in the population. Widespread civil disorder and public protest induced the Bolivian government to push the water regulator (Superintendencia Sectorial de Saneamiento Básico or SSSB) to overrule the 35% tariff increase in February 2000 and then to cancel the concession contract in April 2000, when the provision of water services was returned to SEMAPA that regained the municipal company status (Nickson and Vargas 2002).

The episode of the "water war" in Cochabamba between November 1999 and April 2000 is exemplar of a number of issues that often arise in the provision of public services. Public sector companies may not be able to provide satisfactory services, in such terms as, for instance, coverage of the user basin, reliability and maintenance and upgrade of infrastructure. Private sector companies may charge increased tariffs and seek to attain profitability targets that may be perceived as unfair by the consumers. Normative and regulatory changes may threaten the interests of incumbent operators, such as, for instance, dominant market players or firms who had positioned themselves in market niches. Political considerations may induce the government to undo regulatory arrangements in face of public protest, with the effect of undermining the independence of regulatory authorities and the credibility of established regulatory institutions.

Regulating the provision of public services is not an easy task. When trying to understand how a policy domain (such as water services in a municipal area) is regulated, attention should be placed, at least, on the following components:

- Stakeholders: Who populates the policy domain? What are their roles, e.g., who are the producers, who are the consumers, who holds rights on natural resources, who has the power to change regulatory institutions? What are their interests? What are their ideological inclinations?
- Objectives: What is the aim to achieve by regulating the policy domain under consideration? What are the socially, economically and politically relevant issues that call for most of the attention?

What is 'desirable' for the stakeholders, taking account of their interests and/or ideological inclinations?

- Regulatory tools: How can the policy domain be regulated? What type of incentives, constraints and control mechanisms can affect the behavior of the regulated? Who has the power to enforce the rules?
- Initial conditions and context features: How do initial conditions affect the implementation of a new regulatory system? How does the broader social, economic and political context affect the management of a regulatory system?

Understanding the experience of the "water wars" in Cochabamba, for example, calls for an identification of the stakeholders involved in the episode, of their interests, and of their ideological inclinations. The government sought the privatization of water services in order to attain a political and economic agenda, which the protesters contested through various demonstrations. In such a scenario, anyone who is interested to better understand regulation of infrastructure and utilities should ask what explains the rise of the "water wars", what are the alternative implications of providing water services through municipal companies or concession contracts, and how should the government ultimately regulate the provision of water services.

These factors—stakeholders, objectives, regulatory tools, initial conditions and context features—interact in complex ways. Stakeholders, for example, may hold conflicting interests and incompatible ideological inclinations. Their objectives may clash against each other, and may change over time depending on circumstances. The introduction of new regulatory tools may conflict with established practices and call for the development of novel administrative capabilities. Initial conditions and context features may interfere with the social dynamics of the regulated policy domain, possibly with the effect of hampering the efforts of public authorities to attain their policy objectives. Explaining regulation calls for the recourse to multiple theories, which can each shed some partial light onto the intricacies of stakes, interests, ideas and expectations that actors of the water sector hold.

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CHAPTER 3

Regulatory Policies, Strategies, and Tools

1 Crafting the Regulation of Infrastructure and Utilities Industries

How can infrastructure and utilities be regulated? As anticipated in the previous chapter, the problem of regulating infrastructure and utilities can be generally conceived as one of designing the institutional framework for taming the threat of *ex post* opportunism that arises from investment in relationship-specific assets. Gómez-Ibáñez (2003: p. 9) argued that at least four solutions exist to this problem, namely regulating the conduct of the infrastructure or utility firm through private contracts, through concession contracts, through discretionary regulation, and through public (or non-profit) enterprises. Throughout most of the twentieth century, public ownership often was the main approach to regulating infrastructure and utilities firms: electricity, gas, railways, postal and other nationwide public services were provided by state-owned enterprises; water distribution and sewage, local public transports and urban waste collection services were delivered by municipal companies. Instead, since about the 1980s, many countries reformed the infrastructure and utilities services by pursuing policies that included privatizing state-owned enterprises and municipally-owned companies, liberalizing access to infrastructure and utilities and adopting various forms of regulation.

Privatizing and liberalizing access to infrastructure and utilities do not entail, by themselves, that these services are provided to users at affordable prices and decent quality if there are no competitive pressures on

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market operators. Indeed, the absence of market competition in infrastructure and utilities has traditionally provided the main rationale for the introduction of regulatory agencies in privatized and liberalized industries in the 1980s: in the words of Stephen Littlechild (Littlechild 1983), regulatory agencies were exactly expected to "hold the fort until competition arrives". The design of regulatory institutions posed various kinds of challenges, including the provision of laws and norms to enable regulators to act independently from both the executive and the regulated firms, the definition of sound and transparent administrative procedures, and the development of a professional bureaucracy for managing the regulatory system.

2 Regulating Through Public Ownership

Once a hallmark of socialist and social democratic regimes, government owned utilities (GOUs) seemed to hold no place within the market-oriented neo-liberal discourse that spread throughout the world from the late 1970s. In many countries, privatization, liberalization and regulatory reforms resulted in novel institutional and industrial regimes where utilities services were largely carried out by business companies subjected to various kinds of regulatory arrangements. Yet, GOUs are still around, especially in sectors such as water, gas distribution, local public transport and urban waste collection and disposal. Why do GOUs exist? What is their nature and performance? What should be done about them?

The historical origins of GOUs can be traced back to particular circumstances (Lawson 1994). Some GOUs, for example, emerged out of the 'publicization' of business utilities companies, such as the municipalization of local utilities in Italy in the first decade of the twentieth century and the nationalization of water and electricity in Bolivia in the first decade of the twenty-first century. Other GOUs, instead, were established by public authorities since the very outset such as, for example, the various undertakings of municipal corporations in the UK, especially in the Victorian period. In some countries, GOUs survived during periods when many public-sector assets and services were privatized and, nowadays, they operate within business environments that are populated largely by private sector competitors. In other countries, some actions have been made to bring back public service provision from private to public ownership, such as in the cases of re-municipalization of water services in various cities around the world—such as in Grenoble and Paris—in recent decades.

The persistence of GOUs suggests that there must be good reasons for considering them as a viable ownership form for the pursuit of public policy and industrial goals. Mountain and Littlechild (2010), for example, argued that public ownership is advantageous because the government owner cares about both monetary and non-monetary dimensions of performance: on the one hand, as an investor the government should design a business model and implement a regulatory framework that ensures revenue streams; on the other one, as a public authority the government should be interested to provide value-for-money and affordable public services, possibly in conjunction with welfare-oriented policies such as retaining public sector workers and making labor more productive by increasing capital expenditure. Others, instead, highlight that public ownership is more of a source of impediments and aberration in the management of enterprises than a blessing, because the government owner contaminates the management of the GOUs in such forms as, for example, policy inconsistencies, politicization of operating and investment decisions, unclear priorities and lack of stakeholder inputs (Berg 2013).

At least three rationales for the existence of GOUs are commonly discussed in the literature. First, GOUs exist because of an economic rationale to provide utilities services in the most cost-effective way. This argument holds that utilities industries exhibit the typical traits of natural monopolies, such as economies of scale, externalities and high entry barriers (Baumol 1977). Under such industrial conditions, no market mechanism provides competitive pressure for the monopolist utility to provide services in a cost-effective way. If a government aims to supply utilities services in a cost-effective way, they should assess the relative net benefits from direct ownership and control of utilities (i.e., the "make" option) and from contracting out utilities to business companies (i.e., the "buy" option). Following Coase (1998, 1992), the government would establish GOUs if these institutions generate less transaction costs for the provision of utilities services than making use of private-sector providers.

For various reasons, the transaction costs of contracting out utilities services are relatively high with respect to "in house" provision. Williamson (1973, 1979) showed that transaction costs especially arise from information asymmetry among parties, environmental uncertainty and bounded rationality. Under such conditions, self-interested parties behave opportunistically and exploit contractual incompleteness to their advantage. Contracting out utilities services is a scenario that includes such conditions, which call for extraordinary efforts to design and

enforce contracts with business counterparts. Direct public ownership and control of utilities can bypass such troubles by internalizing transactions within an organizational context.

Second, GOUs exist because of a strategic rationale to retain real options over the development of utilities services. Real options consist of the possibility to make decisions on investments at present or future time such as, for example, the expansion of production capacity or the diversification into novel business areas. Various works in the field of strategic management showed that real options provide a theoretical approach that clarifies why strategic decisions are made (Luherman 1998a, b). A core component of the argument is that firms should seek to expand the value of their options to make decisions in the future, when environmental circumstances might turn into favorable conditions for investments. A related component of the argument is that firms should not give up their options, that is, the possibility to make decisions at later time.

The establishment of GOUs can be understood as the creation of a portfolio of real options about investments that the government owner holds. Depending on expectations about future conditions of the environment (e.g., changes of demand and technology), the government that owns and controls GOUs retains the possibility to make strategic decisions that would not be possible if utilities services were contracted out to private sector providers. For example, the government might decide, at a future date, to instruct a GOU to expand into foreign markets for pursuing commercial or geo-political objectives, or to undertake preemptive actions against the unwelcome entry of a competitor into the domestic market, or to invest in a novel and relatively risky technology. It would be impossible or unfeasible for governments to make private sector providers (that may be more risk adverse than public authorities; Cuervo-Cazurra et al. 2014) embark in such initiatives.

Third, GOUs exist because of a political rationale to cope with conflicts that arise between various stakeholders in the utilities industries. Many authors highlighted that utilities policies carry significant ideological connotations that appeal to conflicting political views and preferences (Bös 1986; Lawson 1994): for example, Marxists may consider government ownership as a means to attain the demise of the capitalist class, socialists may regard it as a way to attain social goals by directing the economy, labor unions may look at it as a tool to promote self-management and syndicalist principles, and nationalists may view it favorably as a barrier to foreign entrants. Others highlighted that government

ownership is simply a pragmatic approach to pursue political goals such as, for example, regulating natural monopolies, promoting economic development, stabilizing the economy and re-distributing income.

The establishment of GOUs can assist coping with political conflicts in various ways. Thacher and Rein (2004) argued that political conflicts can be dealt with by following three alternative approaches, namely "cycling", "firewall" and "casuistry". A "cycling" approach consists of alternating the allocation of costs and benefits among different stakeholders in turn, with the resulting effect that not any of them is persistently dissatisfied with provisional outcomes. A "firewall" approach consists of drawing boundaries across areas of activities and allocating the net benefits that arise from such partitions to different stakeholders, with the resulting effect of limiting every stakeholder's concerns within a circumscribed range. A "casuistry" approach consists of retaining the discretion to make decisions on a case-by-case basis, with the resulting effect that any stakeholder can be satisfied with *ad hoc* decisions depending on circumstances.

GOUs can be used as a means to implement these three alternative approaches. Following a "cycling" approach, GOUs provide a way to temporarily satisfy some stakeholders' interests in turn within a cycle of privatization-(re-)nationalization policies. Following the "firewall" approach, GOUs help separating commercial and social responsibilities among different institutions, especially when public authorities take charge of attaining public objectives and provide subsidies to the GOUs for the attainment of policy goals (Mallon 1994). Finally, following the "casuistry" approach, GOUs enable the government owner to provide policy inputs on a case-by-case basis rather than committing themselves to explicit contractual expectations as would be the case with a private-sector provider.

GOUs possess specific features that have important repercussions on their conduct and performance. By their very nature, GOUs combine features that originate from two distinct organizational forms, namely state-owned enterprises (SOEs) and public utilities monopolies (PUMs). Like SOEs, GOUs are characterized by government ownership; like PUMs, GOUs operate in monopolistic industries. In contrast, of course, not all SOEs operate in monopolistic industries (many SOEs operate in competitive markets), and not all PUMs are owned by governments (many are owned by private investors while they are subjected to regulation). The combination of these two features results in the unique tendencies that characterize GOUs.

The theory of industrial organization (Tirole 1988) helps explain that the lack of competitive pressures results in allocative inefficiency of PUMs. The argument goes that the public utility monopolist seeks to maximize the profit by setting price above marginal cost. The quantity of service provided to the monopolistic market is lower than under conditions of perfect competition. The public utility monopolist extracts consumer surplus to the advantage of monopolistic rents. As a result, public utilities that operate under monopolistic conditions provide inferior creation of value than those that are subjected to competitive pressures, and allocate the value that they create at the advantage of profit-seeking owners.

New institutional economics (Williamson 1979) help explain that conditions that are conducive to moral hazard result in sub-optimal financial performance of SOEs. The argument can be posed in terms of asymmetry of interests and information between the government owner of utilities (cast in the position of the "principal") and of the company management (cast in the position of the "agent"), which makes the company management undertake profligate expenditures with little concern with the financial self-sufficiency of the SOE because of the "safety net" provided by the government owner, that would subsidize the deficit of the SOE out of the public budget. An asymmetry of interests and information also exists between the government owner and the taxpayers. The government can subsidize the SOE at the expense of the public budget for pursuing partisan goals, such as providing employment opportunities to electoral constituencies and services at below cost.

When PUMs are not owned by government, they do not face the issues of asymmetry of interests and information that affect SOEs. The presence of a private owner, instead, can stimulate PUMs to improve efficiency in order to increase the return on private capital investment. On the other hand, when SOEs do not operate as monopolists, they are exposed to competitive market pressures. The presence of competitors may stimulate SOEs to provide quality services at affordable prices in order to maintain financial self-sufficiency or claim financial support from the government owner on the basis of helping fulfill social and industrial policy mandates. In short, PUMs have tendencies to under-perform with respect to public utilities that operate under competitive conditions and SOEs have tendencies to under-perform with respect to competitors with private owners, but each of these organizational forms does not exhibit the negative tendencies of the other.

It is when the two traits of PUMs and SOEs are combined that special conditions attached to GOUs emerge. In theory, GOUs position themselves at the opposite corner of a matrix constructed along the dimensions of ownership type (private vs. public) and industrial conditions (competitive market vs. monopoly). GOUs seem located in a position where concurrent conditions of public ownership and monopoly result in the interaction of double negative tendencies. In GOUs, conditions of monopoly enable the government owner to extract monopolistic rents, which, for conditions related to the asymmetry of interests and information, are distributed to stakeholders—for example, company managers and employees, in the form of lavish expenditures and job conditions—at the expenses of the customers and the taxpayers.

The conduct of PUMs and SOEs also depends on the inclination of managers to pursue the institutional goals of the organization. SOEs, for example, may perform relatively well (in such terms as, for example, efficiency, service quality and affordability, and innovativeness) when the managers are animated by a "public spirit", which stimulates them to make decisions on the basis of altruism and public service ethics (Hausman and Neufeld 1991). In such a scenario, SOEs assist the governments in the attainment of policy objectives as managers are naturally inclined to align their interests with those of the organization. SOEs, however, may perform relatively poorly when managers pursue their self-interests rather than organizational goals. In this scenario, managers aim to maximize their utility by pursuing bureau expansion (Buchanan et al. 1980; Niskanen 1971), over-investing in capital projects that increase labor productivity, and inflating the role of bureaucracy to stimulate bribe income (Shleifer and Vishny 2002). Such conduct of managers is unrestrained by the government owner, for reasons that include the absence of profit motive, the multiplicity of goals, the long chain of agency relationships, and the lack of transferability of shares. When managers of SOEs are not subjected to effective internal and external control systems and mechanisms, they define and pursue their own goals. In such a scenario, managers are hardly kept accountable for their conduct, especially because they effectively diversify risk across multiple performance targets (Lawson 1994).

PUMs may perform relatively well or poorly depending on circumstances. Like any monopolist, PUMs may deliver sub-optimal levels of services when they pursue profit maximization and avoid investments to improve efficiency and innovate due to lack of competitive pressures. If

appropriate regulatory systems and mechanisms are in place, however, PMUs can be induced to improve operational efficiency, to provide utilities services at affordable prices, and to invest in the expansion and upgrade of the infrastructure. Additional conditions for the positive performance of PUMs include the design of appropriate institutions to prevent regulatory capture, contain interference from public authorities in the day-by-day management of the utilities, and ensure transparency of the regulatory process.

3 Regulating Through Mixed Public-Private Ownership Firms

Another approach to regulating privatized and liberalized infrastructure and utilities is to create mixed public-private ownership. Mixed public-private ownership firms consist of companies whose ownership is shared between public authorities and private investors. Public authorities (e.g., the Ministry of Treasury or a local government) may hold the majority of the infrastructure or utility firm, or not. The infrastructure or utility firms may be privately held or publicly traded in the stock exchange. Sometimes, the company statute may provide that the public authority retains veto power on selected decisions, such as the right to appoint directors or to oppose the appointment of a director.

Mixed public-private ownership firms—also called "Institutional PPPs" in Europe—provide public authorities with the possibility to orient the conduct of infrastructure and utilities firms. On the one hand, the private investor owners expect that mixed public-private ownership firms fulfil profitability expectations. On the other hand, public authorities can influence the conduct of these firms by making them also pursue social objectives, such as limiting tariff increases or providing discounted tariffs to the most vulnerable users. By having voice over decisions that are made in the infrastructure or utility firm, the public authority can avoid the transactions costs that would be otherwise incurred if trying to influence the conduct of the operator through contractual or regulatory means.

Mixed public-private ownership firms pose some special challenges. Company managers are expected to "serve two masters" by pursuing both business and social objectives (Matsumura 1998). The presence of multiple types of shareholders may result in performance that is not satisfying in either the business or the social dimensions. Some studies argue

that there is no conclusive evidence that mixed ownership firms perform any better or worse with respect to full public or full private ownership ones (Gupta 2005). Other works, instead, suggest that the performance of mixed ownership firms may be inferior to both the one of fully privately owned and of fully state-owned enterprises (Backx et al. 2002; Boardman and Vining 1989; Oum et al. 2006).

4 Regulating Through Contracts

Another approach to the regulation of infrastructure and utilities consists of the use of contracts. In a sense, this way of regulating is fundamentally equivalent to the use of public procurement for the provision of public services: public authorities write a contract with a business company for the management of infrastructure and utilities and the delivery of related services. Within this scenario, the contract is essential for orienting the conduct of the infrastructure and utility service provider. The contract stipulates such terms as, for example, the types of services that the business company should provide, the tariffs that should be charged, and the obligations the business company should fulfil in the maintenance of the infrastructure.

There are several types of contracts for the provision of infrastructure and utilities services. Some of these contracts include:

- Management contracts, where the public authority pays a fee to the business company for managing a public service. The public authority retains ownership and control of the infrastructure assets. The fee paid to the business company may depend on some measures of performance. Usually the duration of management contracts is relatively short, typically two to five years;
- Leasing or affermage contracts, where the public authority entrusts a business company to manage an infrastructure or utility service against the payment of a fee. The public authority retains ownership of the infrastructure, although the business company may take care of maintenance and possibly carry out minor investment works. In leasing contracts, the business company collects the revenues and pays a fee to the public authority. In affermage contracts, the revenues from the service are split between the business company and the public authority. The duration of leasing or affermage contracts is relatively long, typically 15–30 years;

- Concession contracts, where the public authority grants specific rights to a business company to build and operate an infrastructure or utility for a number of years. Depending on the terms of the contract, it may be either the public authority or the business company to make a payment to the counterpart. Often, in concession contracts the business company is required to make some investments for the development of infrastructure. The duration of concessions may be relatively long, e.g., up to 50 years. In some types of concession contracts, called franchise, the business company carries on commercial risk for the operation of the infrastructure or utility services, e.g., local public transport or railway services. In other types of concession contracts, such as Build-Operate-Transfer (BOT), the business company is required to carry out a program of investments, and the infrastructure is transferred to the public authority at the end of the contract.

Each country jurisdiction may have particular ways of defining and specifying the terms and conditions attached to any contractual type. Setting legal differences aside, generally regulating infrastructure and utilities through contracts entails a number of issues:

One issue is how business companies should be selected. Public authorities may privately negotiate concession contracts with firms that, especially because of their experience and capabilities, may be expected to perform well in the management of infrastructure and utilities services. Generally, however, public authorities may prefer to vet the business company for the management of infrastructure and utilities services through competitive tender offers, i.e., by making firms bid for entering the contractual relationship. Competitive tender offers are intended to stimulate some competition between the firms that submit the bids, either in terms of lower prices or better service quality or both.

In the EU, for example, a directive issued in 2014 provides member states with directions concerning concession contracts. Until that time, concession contracts had been only subjected, within the EU, to the general principles of transparency and equal treatment. Lack of regulation opened the possibility that concessions for managing public services would not be equally opened to all EU firms, with the risks of national favoritism, fraud and corruption. The 2014 directive granted to member states the discretion to decide how to regulate services of general interest and to define and enforce public service obligations. If public authorities

decide to provide public services through concession contracts, however, they are required to comply with the terms of the directive, that include, *inter alia*, compulsory publication of concessions on the Official Journal of the EU if the value exceeds certain thresholds and fulfilment of obligations with respect to selection and award criteria (which should be objective and non-discriminatory).

Another issue is whether public authorities should retain ownership of the infrastructure or whether this should be attributed to the business companies. Retaining public ownership of infrastructure may be advantageous for various strategic and geo-political reasons, i.e., a public authority may exert close control on the structure, development and functionality of infrastructure networks that may be pivotal for the social and economic activity in the country. Sometimes, however, a public authority may decide to transfer the ownership of the infrastructure to the business company that provides infrastructure or utilities services: in this way, it is the business company that is expected to carry out both ordinary maintenance and infrastructure development work. When the business company makes investments on the infrastructure, then additional issues arise when the contract terminates. In this scenario, the public authorities should pay the business company for the increased value of the infrastructure during the concession period. The business company may be inclined to over-invest in the infrastructure when anticipating that they can claim the increased value of the infrastructure that is returned to the public authority. The risk that the business company over-invests in the infrastructure is heightened, moreover, when concession contracts provide that tariffs for the infrastructure and utilities services are related to the amount of investment made.

Another set of issues arises from the asymmetry of information between the public authority and the business company—precisely, the lack of information for the public authority about how well the business company provides infrastructure and utilities services. If the public authority does not adequately monitor the execution of the concession contract, the business company may be tempted to economize on costs with detrimental effects on service quality. The public authority, therefore, should take care that clear, explicit and measurable performance indicators are included in the concession contract. In addition, the public authority should set up an administrative system for measuring and assessing performance and to call for the compliance with concession contract standards in case of violation of performance standards.

Finally, another set of issues originates from uncertainties that relate to incompleteness of concession contracts. Concessions are complex contractual arrangements that may hardly include provisions for any possible future state of the world. Depending of changed conditions of the environment, counterparts of the concession contract may find it advantageous to call for re-negotiating the contractual terms or, if no agreement is reached on this, undertake a litigation. Sometimes, it is the country-specific legal context that includes sources of uncertainty over the definition of contingencies (e.g., what constitutes "force majeure") or the allocation of rights. In principle, litigations may be avoided if counterparts develop a sense of shared interest to keep the contractual relationship going.

For example, the regulation of electricity distribution in Brazil has been based—since the 1990s—on concession contracts written between the federal or state governments and business companies. Differently from the regulation of the energy sector in other Latin America countries, in Brazil concession contracts were made within a "legislative void" where no laws or regulations specified general terms for concession contracts and tariff criteria. Accordingly, each concession contract was designed as a "stand alone" solution to specific energy distribution services. Over time, issues related to the lack of a legislative and regulatory framework for concession contracts became evident. For example, neither concession contracts nor any legislation or regulation provided how tariffs should be renegotiated. Rules about the transfer of power-purchase costs to retail consumers have been subjected to repeated amendments. When the federal government ordered a mandatory 20% cut in power consumption across most of the country because of a drought in 2001, electricity companies claimed compensations for the loss of revenues that—to their view—was not grounded on any legislative or regulatory or contractual basis (Bakovic et al. 2003).

5 Regulating Through IRAs

Since the "wave" of creation of IRAs in the 1980s and 1990s in many countries of the world, regulating through IRAs is often regarded as "regulation par excellence". IRAs—such as, for instance, in the UK, the independent regulator for water services (OFWAT), the one for energy (OFGEM), and the one for telecommunication services (OFCOM)—consist of agencies that are entrusted with the task of orienting the conduct of business companies that operate public services by means of various regulatory tools. Some tools at disposal of the IRAs include, for

example, defining and enforcing tariffs for the public services, sanctioning for irregular conduct, and exercising various forms of "moral suasion" on public-service providers.

By entrusting an IRA to regulate the conduct of business companies that provide public services, public authorities shift away from themselves the task of monitoring how well business companies provide public services and of deciding on what should be done to steer their conduct. In part, the decentralization of regulatory functions from public authorities to IRAs may be understood because of the technical expertise that is typically required to regulate sophisticated infrastructure and utility services (e.g., the sort of econometric work required to regulate energy tariffs), that sometimes exceeds the capacity of public bureaucracies. In part, the creation of IRAs may be related to the advantages for public authorities to discharge themselves of the responsibility for making decisions that, sometimes, may be unpopular, e.g., a tariff increase. In part, moreover, the creation of IRAs may be justified because of the presumption, or expectation, that the regulatory system can perform better if regulatory decisions are not made by public authorities, which could be affected by partisan or contingent considerations. For example, business companies may feel safer that IRAs have no interest to expropriate firms' rent positions for particular political advantages.

Among the regulatory tools at disposal of IRAs, the determination of tariffs plays a central role. When setting the tariff, IRAs should take various considerations into account. By setting relatively low tariffs (or low tariff increase with respect to previous tariffs), the IRAs help contain the share of the family budget that households spend on infrastructure and utilities services (e.g., utility bills) and stimulate business companies to improve their efficiency as a way to contain costs and attain higher profits. Relatively low tariffs (or low tariff increase), however, may hamper the investments of business companies. IRAs are usually granted the discretion to decide the tariff (or tariff increase), which typically results—*inter alia*—from negotiations that take place between them and the regulated firms (or, sometimes, their syndicate).

The concept of independence of regulatory agencies is central within the system of regulation through IRAs. In general, independence relates to the capacity to select policy objectives without influence from political authorities and to use regulatory tools with discretion. Gilardi (2009) provided a more articulated definition of independence of IRAs, that includes both formal and *de facto* independence features. Formal independence features include, for instance:

- Length of term of office: the longer the term of office, the higher the independence of the regulator because it is relatively immune, for some time at least, from the temptation to make decisions that are more likely to make public authorities inclined to renew the term of office;
- Dismissal procedure: the regulator is more independent if public authorities have no means for dismissing them before the termination of the term of office;
- Compatibility with other offices: the regulator is more independent if they cannot take, at the same time, other offices that could put the regulator in a position of conflict of interests;
- Source of the budget: the regulator is more independent if the budget for the IRAs is ring-fenced and determined in legislation, rather than by public authorities.

De facto independence features include, for example:

- Frequency of revolving doors: the regulator is more independent if they do not take different offices within the regulated industry before or after the term of office (for instance, if a regulator had taken a company role within the industry in the past, or if they are offered or promised a position within the regulated industry after the termination of their term of office);
- Partisanship of nomination: the regulator is more independent if they do not have any party affiliation or if their appointment is not influenced by party affiliation (else, they might be expected to take partisan considerations into account when making regulatory decisions, or they might be put under pressure from party members).

During recent decades, a growing number of IRAs have been established in several countries and infrastructure and utilities sectors. In India, for example, in 2005 the Indian state of Maharashtra established the Maharashtra Water Resources Regulatory Authority (MWRRA). The introduction of the sectoral water IRA became a model for other Indian states, and similar regulators were subsequently established in the states of Arunachal Pradesh (2006), Uttar Pradesh (2008), Andhra Pradesh (2010), and Jammu and Kashmir (2010). The use of IRAs for regulating the water sector was later adopted by the federal government that included the recommendation to establish water IRAs in the 12th Five

Year Plan (2012–2017). In addition, the 13th Finance Commission provided grants for the states that would establish water IRAs. The establishment of MWRRA came together with other provisions that included that water tariffs would follow full-cost recovery principles and that water firms would be allocated water rights (or entitlements) that could be traded in water markets. The 2005 water reform, however, did not include any privatization of water utilities—with the effect that MWRRA would regulate firms that are owned by public sector authorities. In addition, the civil society started campaigning against the trading of water rights, which was conceived as furthering the process of water-grabbing. The role of MWRRA, therefore, remained relatively circumscribed to the administration of water supply and use (Wagle and Warghade 2010).

IRAs have various regulatory tools at their disposal. One of the main ways for them to regulate infrastructure and utilities firms is to determine the tariff charged for the regulated services. Tariffs can be regulated in several ways, but a common principle is the one to set price-caps or maximum tariff increase limits to the present tariff. This method of regulating tariffs originates from the policy proposed in the report "Regulation of British Communications" by Littlechild in 1983. The method is also known as "RPI—X" formula, because it is typically applied by allowing maximum tariff increases equal to the expected increase of the retail price index minus a factor (X) that is intended to stimulate the infrastructure or utilities firm to attain productivity gains (i.e., tariffs are allowed to increase less than average retail price inflation and therefore firms should improve their productivity in order to retain or increase their profit margin). The price-cap method of tariff regulation has been applied in many countries and sectors in the world (Sappington and Weisman 2016).

6 Regulating Through (Quasi-)Market Competition

Finally, another approach to regulating infrastructure and utilities is to make use of competition in the market. This regulatory option may not always be feasible: after all, infrastructure and utilities typically exhibit natural monopoly features, which make it impractical or disadvantageous to have more than one firm operating in the industry. How possible, then, is it that market competition can help regulating infrastructure and utilities firms?

Technological change provides a source of causal factors that may turn a natural monopoly into a competitive market, in part at least. State

monopolies, for example, used to dominate the telecommunications sector until the 1970s. Since the 1990s, a flow of technological developments resulted in the possibility to duplicate parts of telecommunication systems and networks at relatively low cost and to bring a stream of new services to the market. Progressive deregulation of entry resulted in an increased number of telecom operators, and in some parts of the telecommunications industry—such as mobile telephony—market competition resulted in improved consumer welfare (lower prices and more choice of products) without any regulatory intervention (i.e., tariff setting) from the side of public authorities.

Regulation of infrastructure and utilities through market competition builds on the role that consumers play in contrasting and comparing alternative service offerings and selecting the most advantageous combination of price and service quality. In order for the market for infrastructure and utilities services to work effectively, however, firms should have access to the existing infrastructure network or be allowed to build their own. Access to existing infrastructure is typically attained by requiring the incumbent operator, which generally owns and controls the existing infrastructure, to grant competitors the possibility to connect to and use the network. Sometimes, selected parts of the network are opened ("unbundled") to competition, while a public-sector-owned firm retains ownership and control of those parts of the network that are not feasible or advantageous to liberalize (but which may retain the status of "essential facility" for providing infrastructure and utilities services). For example, in many countries parts of the gas industry—e.g., the gas distribution network—is considered an essential facility, while other parts—e.g., gas purchase and resale—are open to competition.

Additional conditions play an important role in enabling the market for infrastructure and utilities services to work effectively. Consumers should incur relatively low switching costs between service providers otherwise they are held "captive" of existing providers. Industry structure should be relatively fragmented otherwise firms can form cartels for keeping prices relatively high. Incumbent firms should not raise barriers to entry otherwise they would not be subjected to the threat of additional competition as their profitability increases.

In economics, a market is contestable (Baumol 1977) if there are no entry and exit barriers, no sunk costs, and firms have access to the same technology. Under these conditions, incumbent firms are kept under the pressure that potential entrants could join the market if they are attracted

by relatively high profitability margins. If, for instance, incumbent firms form a cartel and earn super-normal profits, then firms that do not operate in the market may find it advantageous to launch a competitive attack and to reap some profit (albeit, in the short-term, incumbents may promptly react to the attack by lowering their prices to match those of the new entrant; the new entrant, then, may be thrown out of the market if they are not able to sustain the price war for as long as the incumbents are able to do).

It is questionable whether infrastructure and utilities market are contestable. Entry to the market can be hampered by various economic and institutional impediments, such as high break-even point and restricted number of licenses to operate. Firms may face barriers to exit, such as difficulty to transfer fixed assets if they do not have a liquid market. New entrants may be also cautious to enter the infrastructure or utility market because they anticipate that they would incur sunk costs that may not be recovered after incumbents react to the competitive attack. Furthermore, firms typically have heterogeneous technologies and therefore operate on the basis of asymmetric productivity conditions.

7 Case Study: Regulation of Telecommunications in Malaysia

Since the early 1980s, telecommunications in Malaysia were managed by Jabatan Telekom Malaysia (JTM), a government department of the Ministry of Energy, Telecommunications and Posts (METP). Pressured by twin deficits (current account balance and government budget balance) and external debt, in 1983, the government decided to allow private operators to compete against JTM in the provision of terminal equipment. During the following years, the government also opened the market of mobile phone service providers, privatized part of the government-owned telecom incumbent firm, Telekom Malaysia Berhad (that originated from a demerger of JTM), and started granting licenses to fixed-line phone operators. By 2000, the restructuring of the telecommunications sector resulted in deeper fixed telephone line penetration rate and widespread diffusion of mobile telephony.

The liberalization and partial privatization of the telecommunications sector in Malaysia was accompanied by progressive adjustments to the sector's regulatory framework and institutions. While Telekom Malaysia

Berhad operated telecommunication services, JTM retained the tasks of enforcing sectoral regulations and of advising METP on industry regulation matters, and METP kept control on the licensing of new operators. In 1998, a policy reform replaced METP with the Ministry of Energy, Communications, and Multimedia (MECM) and JTM with the Malaysian Communications and Multimedia Commission (CMC). The CMC, that operated as an agency separated from MECM, carried out public consultations with consumers and telecommunications operators and provided policy recommendations to MECM.

The regulatory system of the telecommunications sector in Malaysia built on various institutions. At the core of the system was the licensing of telecommunications operators. Licenses were granted by MECM with the aim of stimulating competition within each segment of the telecommunications industry, i.e., content application services, application services, network services and network facilities. The number of licenses was set with discretion, with the aim of eliciting enough competition for the benefit of consumers while also providing telecommunications operators with a relatively stable competitive environment for stimulating investments, innovation and network interconnection. Other component parts of the regulatory framework included provisions for the access to the network essential facilities, for the technical inter-operability of network and services and for consumer protection. While mobile rates were fully liberalized, for example, long distance and international calls on fixed-line rates could not be discounted less than 20% of the rates published by Telekom Malaysia Berhad. Universal service obligation was shared between the main telecommunication firms, and a Universal Service Fund was established to provide investments for underserviced areas and customer groups (Lee 2002).

The episode of regulation of the telecommunications industry in Malaysia is illustrative of a radical shift of regulatory approach and strategy. At the beginning of the episode in early 1980s, the regulatory system consisted of full public ownership and control of the only telecommunication firm (JTM). A stream of policy reforms made during the 1980s and 1990s resulted in the liberalization and partial privatization of the industry, together with the establishment of a regulatory framework and institutions that included both a role for competition between telecommunication service providers and a role for the discretionary power of MECM to assign licenses and partially affect rates, and a role for the consultative, advisory and enforcement functions of CMC to supervise

and implement the regulatory policy. The resulting regulatory system, then, provided several mechanisms that were intended to affect the behavior of telecommunication operators:

- A mechanism of market competition that would stimulate investments, innovations and network interconnection for acquiring market share and raising revenues;
- A mechanism of selection (related to the licenses assigned by MECM) of telecommunication operators that would contain market competition and prevent "hit and run" rivalry from other firms;
- A mechanism of indirect rate setting for fixed-lines telecommunications (related to the 20% cap on long distance and international calls with respect to the rates of Telekom Malaysia Berhad) that would prevent the erosion of return on investments in the network infrastructure;
- A mechanism of moral suasion (related to the consultation and advisory functions of CMC) that aimed to stimulate telecommunication operators' participation to attainment of public policy objectives.

The regulatory system of the telecommunications industry in Malaysia did not exclusively rely on the forces of market competition: it also included a role for governmental control of market entry and, to some extent, price setting and quality control (e.g., legislation also provided that content developers must have incentives to invest and innovate in applications and services that promoted Malaysian culture, identity and values; Lee 2002). Also, the telecommunications regulatory system did not primarily build on the role of an independent regulatory authority, as it was the case, for example, of OFCOM in the UK: it confined the role of CMC to consultative, advisory and enforcement functions. The features of the regulatory system of the telecommunications industry in Malaysia should be understood, instead, as a combination of regulatory institutions and tools that were assembled under particular historical and context circumstances.

The case of Malaysia telecom regulation also includes some variation in how two different parts of the country's telecommunication system—the fixed-line and the mobile components—were regulated. Technology and social concerns can help accounting for the different approaches to regulating the two infrastructure services. Fixed-line telecommunications rely

on an extensive network of physical infrastructure that had been largely built when the JTM was the only operator. Access to the network was restricted to a limited number of new operators, whose pricing structure was subjected to price-caps. Mobile telecommunications, instead, relied on an emergent network of physical transceivers (or base stations) that provide radio coverage over a geographical area for the connection of various kinds of portable devices. Any operator was allowed to develop mobile networks and to price their services at will, while consumers would select the preferred value propositions, i.e., types of service packages at the best price. In the mobile part of the telecommunications industry, operators were expected to assess whether the investment in developing mobile networks would be profitable, provided that their prices would be subjected to market discipline fostered by free market entry and low switching costs for consumers. In contrast, in the fixed-line part of the industry the regulatory system was designed so that new entrants would not "cream-skim" the market by exclusively targeting the most lucrative segments of the demand, i.e., long term and international calls.

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CHAPTER 4

Regulatory Reforms

1 What Are Regulatory Reforms?

Regulatory reforms are policy initiatives intended to reconfigure the regulatory systems of specific sectors (or, occasionally, of more than one sector). Regulatory reforms typically include the abolishment of present regulatory institutions, e.g., administrative regulations for setting tariffs by a Ministry, and the creation of new ones, e.g., discretionary regulation of tariffs entrusted to an IRA. More substantively, regulatory reforms generally entail a change of strategy in the way infrastructure and utilities services are provided: for example, a "shift" from a regime of full public ownership and control of infrastructure or utility firms to one where the sector is opened to private ownership of service providers, barriers to entry are removed or reduced, and public authorities play a relatively minor role in steering the conduct of infrastructure and service providers.

Why do regulatory reforms take place? Regulatory reforms often originate from evidence of poor actual or expected performance of the present regulatory system, in such terms as, for example, inadequate investments into infrastructure and utilities, relatively high prices (for example, in comparison to similar services provided in other countries or in relation to household budget), and poor service quality. Sometimes, regulatory reforms are also stimulated by other factors or conditions, such as, for example, a change of the ideational climate that makes

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policy-makers and possibly the public more inclined to favor one way of regulating infrastructure and utilities rather than another one. It is not so uncommon that regulatory reforms are triggered by external pressures to a country, for example, in relation to directives that originate from a super-national entity such as the EU or conditions attached to foreign aid provided by international organizations such as the World Bank or the International Monetary Fund (IMF).

Several regulatory reforms of infrastructure and utilities have taken place in sectors and countries in the world in recent decades. A stream of regulatory reforms that resulted in widespread and radical reconfiguration of infrastructure and utilities took place in Europe since the 1980s, where the termination of former state monopolies, the privatization of state-owned enterprises, and the liberalization (i.e., removal or reduction of entry barriers) of infrastructure and utilities services, resulted in more competitive industries that were often regulated through IRAs or concession contracts. The EU played an important role in stimulating regulatory reforms amongst Member States, with the effect that several authors came to describe the emergent regulatory regime as one of a super-national "regulatory state" (Majone 1994, 1997; Thatcher 2002).

Regulatory reforms of infrastructure and utilities were also experienced in several countries in other regions of the world. Since the 1990s, for example, regulatory reforms took place in a growing number of Latin American countries, where infrastructure and utilities came to be largely subjected to regulation by IRAs. Various conditions are related to the diffusion of so-called "regulatory capitalism" to Latin America, including the crisis of the old developmental model (i.e., intensive state-led industrialization and import-substitution policies), democratization and diffusion across sectors and countries (Jordana and Levi-Faur 2004b). Other regions of the world, instead, have been relatively immune from experiencing regulatory reforms of their infrastructure and utilities sectors. Some authors (e.g., Kessides 2014) argued that reforming the regulatory systems of these crucial sectors of the economy would be beneficial to help facilitate business activity and reduce Africa's competitiveness gap with the rest of the world.

An example of regulatory reform of infrastructure and utilities is offered by the electricity market in Germany. Germany traditionally had an ambivalent attitude towards the regulation of infrastructure industries. On the one hand, as a social market economy the country tended to resist state intervention in the economy; on the other hand, the German

state historically played an important role in in the management of infrastructure and utilities. For most of the twentieth century, public services such as postal, telecommunications, energy, water, transport, radio and television were all state-owned and controlled. During the 1990s, instead, the country progressively introduced privatization, liberalization and re-regulation measures in infrastructure and utilities sectors.

Traditionally, the electricity market in Germany has always been rather fragmented and decentralized. At the national level, eight interconnected utilities used to form the national grid and to account for 80% of generation capacity. About 80 companies operated at the regional level and more than 800 municipal utilities provided electricity distribution services at the local level. The national market for electricity was divided into regional and local monopolies and the industry was not subjected to competition law. The Federal Ministry of Economics was charged with general policy formulation, and the Länder Ministries of Economics took care of enforcing the legal obligations of electricity local monopolists.

In 1998, a new energy law radically reconfigured the regulation—and, relatedly, market conduct and industrial structure—of the electricity sector. The reform opened the electricity market to new entrants and abolished the exemptions to competition law for the sector. Several electricity brokers and traders and energy suppliers entered the industry, where the largest electricity industry consumers started to negotiate price cuts with the providers. Within two years, average industrial consumer prices fell by 28% and household consumer prices had declined about 10–15%. Placed under competitive pressures, several incumbent utilities adopted measures for cutting costs and improving efficiency, including merging with other operators to gain economies of scale and market share (Eberlein 2000).

Regulatory reforms take place within their specific institutional and historical context. The 1998 reform of the electricity sector in Germany took place within a context that included technological changes in energy generation, political discussion around neo-liberal approaches to economic development, and EU-led policy orientations towards liberalization of sectors of the economy that had been managed until that time through state monopolies. In addition, the temporal context of the German electricity reform included the formation of a policy coalition that supported the reform: larger electricity operators anticipated that the liberalization of the electricity sector could be advantageous in terms of opportunities for market growth (both in the domestic market, where

larger operators could acquire or merge with smaller ones, as well as in the international market, where opportunities to expand abroad could be pursued if—for reasons of reciprocity among EU countries—the domestic market was opened up to new entrants). Smaller (i.e., municipal) electricity utilities opposed the reform, because they anticipated that they could lose their monopoly position when facing the competition of larger operators, but they were not effective to resist the reform.

2 Explaining Regulatory Reforms

Regulatory reforms may take place because of several factors and conditions. These include:

- Evidence of poor performance of the present regulatory system: in principle, initiatives to undertake a policy reform should be based on evidence that the present regulatory regime results in dissatisfactory outcomes. This line of argument is consistent with assumptions that posit a rational conduct of policy-makers, i.e., that policy-makers care about the delivery of public value, that they can collect data, analyze them and understand why the present policy does not work, and that they are willing and able to design novel policies intended to improve the present situation of the policy domain of interest. In practice, evidence of poor performance of the present regulatory system may be just one of the many factors and conditions that stimulate a regulatory reform—others being, for instance, the presence of a favorable ideational climate towards alternative forms of regulation, the prospect of material advantages from the reform for influential stakeholders, and possibly the anticipation of political or electoral gains for the policy-makers who champion the reform initiative;
- Favorable ideational climate: ideas can play an important role in framing the understanding of the present situation as dissatisfactory, formulating the possibility of alternative regulatory policies, and persuading others of the relative advantages of pursuing a regulatory reform. Ideas about how infrastructure and utilities can (or should) be regulated originate from various arenas, including political, industrial and academic circles. Whether ideas gain attention and favor among policy-makers, however, depends on various context conditions, such as, for example, the presence of

dominant macro-economic policy orientations (e.g., neo-liberalism). Sometimes, ideas can be accepted because of pragmatic concerns (e.g., a politician may find it advantageous to champion privatization because of prospective electoral gains from blaming a state-owned enterprise for corruption episodes);

- External pressures: regulatory reforms can be stimulated by various types of pressures exerted by external actors to the country. Within the EU, for example, directives issued by the European Parliament in conjunction with the EU Council provide an important causal source for reform initiatives carried out within Member States. EU countries generally tend to comply with the request to implement EU directives (i.e., the "transposition" of EU directives into national legislation), although sometimes they may delay alignment despite policy reform pressures. Transposition of EU directives is generally carried out in consideration of the obligations that originate from EU Treaties. Additional factors that stimulate the implementation of EU reform policies may also include monetary penalties (i.e., infringement procedures if a directive is not implemented by a deadline) and the mutual interest to reciprocate policy measures taken in other Member States (e.g., policy reforms to open sectors of the economy to competition). In many developing countries, external pressures to reform infrastructure and utilities may originate from international organizations, such as the World Bank and the IMF, which may attach the request to reform the regulation of sectors of the economy as aid condition;
- Stakeholders' interests: stakeholders influence the regulatory reform process in various ways, depending on their roles, stakes, resources and access to policy-makers. Incumbents (i.e., the present infrastructure and utilities firms) may have ambivalent attitudes towards the preservation or the reform of the present regulatory regime: sometimes, they enjoy rent positions that could be eroded by reforms that are intended to open the regulated sectors to more competition or to subject the conduct of incumbent firms to greater scrutiny; sometimes, instead, they welcome regulatory reforms that allow them more freedom to undertake business initiatives. Potential new entrants to the regulated sector may welcome regulatory reforms that lower barriers to entry (e.g., a regulatory reform that makes competitive tender offers for concession contracts compulsory, with respect to a previous regime

where concession contracts are privately negotiated between a public authority and selected providers). However, sometimes regulatory reforms may result in the increase of barriers to entry, if, for example, they include provisions that increase technical or financial requirements for eligibility for providing infrastructure and utilities services. Depending on their role and stakes into the sector, and on the resources that they can spend on lobbying efforts, stakeholders may exert influence on policy-makers and try and steer reform decisions in a way that is more advantageous to them;

- Financial and fiscal conditions: sometimes, regulatory reforms of infrastructure and utilities may also originate from the financial state of the service providers and the fiscal state of public authorities. For example, if a state-owned infrastructure firm or a municipal utility has lot of debts and are not able to repay them (say, due to insufficient operational cash flow that may originate from relatively low tariffs and/or operational inefficiency), then the public authorities may find it advantageous to privatize them. As another example, if a government is burdened by a lot of public debt, then public authorities may find it advantageous to sell public sector infrastructure and utilities firms (especially the most profitable ones, i.e., so-called "crown jewels") to earn some capital revenue. It is interesting to bear in mind, however, that sometimes infrastructure or utilities may be nationalized—rather than privatized—due to financial and fiscal conditions: for example, public authorities may decide to take a business company that provides infrastructure or utility services under public ownership if that company goes (or is close to going) bankrupt and there is a threat that provision of public services could be suspended or terminated;
- Technological change: technological change that is relevant here relates to those advances and innovation in technologies that open novel possibilities to produce and deliver public services, or to create new types of services. Technological change can be a powerful causal source of regulatory reform pressure, especially when it results in the possibility to radically re-configure the cost structure of providing the infrastructure or utilities services and to dramatically lower barriers to entry. For example, a new technology that enables firms to produce services with lower fixed costs than previous technology opens the possibility for firms that are relatively smaller than incumbents to fill market niches. As another instance,

a new technology that enables firms to provide services through an alternative infrastructure from the one owned and controlled by incumbents opens the possibility to enter the sector even if firms do not have access to essential facilities.

3 The Diffusion of Infrastructure Regulatory Reforms

During the final decades of the twentieth century, a number of countries embarked in the reforms of regulatory systems, especially of telecommunications and electricity sectors. In part, the reforms of the 1970s–1990s originated from beliefs that widespread state ownership of infrastructure firms had resulted in poor performance—especially during the 1970s oil crises—and that infrastructure and utilities should be exposed to competitive market pressures. Pioneered by Chile under the government of Augusto Pinochet in the mid-1970s, privatization and liberalization of infrastructure and utilities (i.e., "market-oriented" reforms) was later adopted in the UK under the government of Margaret Thatcher and in the USA under the presidency of Ronald Reagan in the 1980s. In the following years, market-oriented infrastructure reforms were adopted in several countries all over the world.

What explains the diffusion of market-oriented infrastructure reforms? Explanations may build on domestic and external pressures. An argument for the role of domestic pressures was put forward by Jordana et al. (2006), who held that countries may have a strong interest to support the development of their "national champions" in various infrastructure and utilities sectors. Governments may pursue privatization, liberalization and re-regulation policies, if they are functional to strengthen the position of incumbent firms in the domestic market and, possibly, to expand their business abroad. Yet, other works hold that external pressures to reform regulatory systems should not be quickly dismissed. Several developing countries have experienced a requirement to adjust the regulatory systems of infrastructure and utilities industries as foreign aid conditions. Others have been induced to emulate the regulatory institutions that a growing number of other countries had adopted, although with relatively little analysis about whether the new regulatory system improves sector performance.

According to Henisz et al. (2005), there are two main forms of external pressures:

- One form is coercion, which relates to actors that tend to conform to institutions that are imposed by other powerful actors. Coercion in the adoption of market-oriented regulatory reforms takes place, for instance, when countries accept conditions for foreign aid even if they collide with principles of sovereignty. For example, in early 2000s the World Bank provided aid to Afghanistan under conditions that included the set up of an Independent Regulatory Commission and the formulation of a Telecommunications Act. The role of international organizations, however, may not be so direct: typically, the prospect to receive foreign aid (albeit under condition that regulatory reforms are made) results in additional resources and support provided to those domestic actors who favor the reform, and who may (or may not) prevail against more conservative actors;
- Another form is emulation (or mimetic behavior), which relates to actors imitating the institutions, conduct and practices of other actors in order to enhance their legitimacy. Mimetic behavior especially takes place in conditions of uncertainty about which institutions, conduct and practices result in more advantageous outcomes. In a sense, imitating what others (or most of others) do is a "safe route" for justifying why a sector is regulated in a certain way. Emulation is typically stimulated by the behavior of other actors with which an actor interacts most often: for example, neighboring countries or main trade partners.

Henisz et al. (2005) conducted a study to test whether coercion and emulation help explaining the diffusion of market-oriented reforms of infrastructure during the period 1977–1999 on the basis of evidence collected from 205 countries. They found strong support for the coercive effect of multilateral lending and reform adoption in both telecommunications and electricity. They also found strong support for the positive relationship between peer countries' adoption of a reform and a country's adoption rate, in both telecommunications and electricity. They also found that technological change was statistically significant to account for market-oriented reforms, while interest group pressures and type of political institutions did not. Another interesting finding was that

countries with larger budget surplus are more likely to reform telecommunications, therefore fiscal pressures may not be so relevant to account for the reform of the sector.

4 The Effects of Regulatory Reforms

Regulatory reforms are generally intended to reorient the behavior of the regulated industry and attain improved performance. An issue arises, then, concerning whether regulatory reforms actually result in the accomplishment of these objectives. Regulatory reforms may encounter several obstacles during the reform implementation stage: for example, incumbent service providers may resist the enforcement of the new regulatory principles and criteria; changed technological or market conditions may make the new regulation irrelevant or ineffective; a subsequent government may repel the reform and possibly restore previous regulatory system. In addition, the regulated firms may adjust their conduct while anticipating the enforcement of the new regulatory system, in a way to elude or bypass those parts of the regulatory system that negatively affect their performance.

A lot of research on the effects of infrastructure and utilities regulatory reform has been done so far. In a review paper by Martin, Roma, and Vansteenkiste (2005), the authors show that regulatory reforms generally result in more positive effects when they increase market competition between service providers. More detailed effects of regulatory reforms, however, are more ambivalent: depending on what performance dimensions we look at (e.g., consumer prices, quality, productivity, service diffusion, output, employment, innovation, etc.), on what is the content of the reform (e.g., liberalization, privatization, re-regulation), and on what is the reformed sector, the effects of regulatory reforms may be positive or negative or neutral.

It seems relevant, therefore, to look at some instances of regulatory reforms and see whether they have been effective or not, and why. This approach suggests that historical and context conditions play an important role on the trajectory of regulatory reforms implementation and, ultimately, on their effects. Historical and context conditions include the specific and contingent reasons that led policy-makers to reform the regulated sector and to those circumstances of the environment that affected the adjustment of the regulatory regime to the new legislation and rules.

The introduction of a credible independent regulator of the liberalized infrastructure or utilities services is an important component of effective regulatory reforms. If incumbent operators are "protected" by the regulator—or by public authorities that keep setting tariffs and access conditions or that can influence the decisions of the regulator—then potential competitors may be discouraged from entering the industry. Barriers to entry may take several forms, such as, for example, mandatory safety or operational standards that competitors may find it harder to pass or disadvantageous allocation of time slots or other valuable components of the service delivery system.

Some primary reasons for the modest effects of regulatory reforms include:

- A source of impediments to regulatory reforms originates from the rent-seeking behavior of the actors involved in the reform process. Part of these actors includes the incumbent service providers, which are threatened by the liberalization (or increased opening to competition) of the industry. Part of these actors may also include public authorities, which may resist giving up their ownership and control (or their influence) on the infrastructure and utilities sectors. Various reasons underpin the stake of public authorities, including, for example, political, financial or electoral advantages;
- Another source of impediments arises from the presence of barriers to entry that are not effectively lowered (or removed) by the regulatory reform. For example, existing concession contracts may last for relatively long time before tender offer competitions for the award of concessions takes place. As another instance, incumbents may enjoy the advantage of exclusive supply contracts or of relatively high installed capacity, which can deter entry due to poor profitability prospects for potential competitors;
- Finally, another source of impediments arises from the collusion between the regulator and the regulated—especially when they share the same public sector owner. As already discussed, in such conditions the independence of the regulator is more apparent (formal) than real. Potential competitors may anticipate that the regulator would not make decisions against the interests of the incumbent and therefore they avoid entering or increasing their investments into the industry.

5 Case Study: The Reform of the Electricity Sector in China

After a period of economic growth in the 1970s, China started expanding its electricity production capacity in order to meet growing demand. Once fully nationalized in 1949, the Chinese electricity sector increased production capacity from 1.82 GW in 1949 to 713.29 GW in 2007. Over time, electricity production also became more and more diversified into hydro-power, thermal, nuclear and renewable sources. At present, the Chinese electricity sector is set on a trajectory of further developments, that includes the creation of an additional 1 GW nuclear plant each year, and the completion of a national electricity grid by 2020.

The development of the Chinese electricity sector was accompanied by a stream of policy reforms during the previous 30 years. Since 1986, when the country was opened to foreign direct investments, electricity policy was primarily oriented towards supporting infrastructure development by attracting capital investment in the industry. In the period 1997–2001, the sector experienced a market-oriented reform of the incumbent state-owned enterprises. Finally, since 2002—after China joined the World Trade Organization (WTO) and started adjusting the legal system to market access commitments—until the present days, policy has been mainly intended to unbundle power generation from the rest of the network in order to introduce competition in energy sources.

Regulation of the electricity sector originated in 1985, when China passed the regulations on "Electricity Regulation and Electricity Supervision and Control" for setting up the basis for an electricity market. In 1995, the Electricity Law was passed to promote the development of the electricity industry, the protection of investors, and the safety of the energy operation system. The year 2002 marked the creation of the State Electricity Regulatory Commission (SERC), and in 2005, new regulations were produced on electricity pricing and the issue of electricity power business permits. In 2008, the country also promulgated the Antimonopoly Law, which intended to prevent and curb the effects of monopolies, to protect fair market competition, and to maintain the interests of consumers and of the public (Ngan 2010).

The case of the stream of regulatory reforms in the electricity sector in China is not exceptional with respect to the general tendency of reforming infrastructure and utilities over time. The context of China included peculiar sources of economic and social change, especially related to

the industrialization and modernization of the country. The need for additional sources of funding for infrastructure development, combined with greater integration with the global economic system (that culminated with the joining of the WTO), stimulated regulatory measures that were intended to facilitate channeling financial resources into the energy sector.

The case of electricity reforms in China suggests that regulation of infrastructure and utilities can be progressively adjusted through a series of reforms that result in the re-orientation of regulatory regimes. The Chinese electricity sector, in particular, moved from a regime of full public ownership and control of electricity infrastructure and utilities to some amount of competition in the energy production and electricity retail parts of the industry. More generally, reforms of infrastructure and utilities typically include pivotal policy events where new legislation provides the re-configuration of regulatory principles and tools. Sometimes, reforms may take place more gradually, also depending on tendencies in the industrial organization of infrastructure and utilities and market conditions.

The case of electricity reforms in China also calls for questioning what are the effects of regulatory reforms. The Chinese electricity sector largely remained under full public ownership after the regulatory reforms of the 1990s and 2000s. Domestic and foreign business faced disadvantages with respect to state-owned enterprises. The separation between energy generation and transmission was not complete, as grid companies (State Grid Corporation of China and China Southern Power Grid) retained ownership of several power plants. The government retained the power to allocate electricity to some large consumers, such as steel factories. By and large, the Chinese electricity sector experienced a limited amount of liberalization and competition only so far, although investments in the sector have increased steadily (Qiu and Li 2012).

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CHAPTER 5

Case Study: The Reform of the Water Sector in Italy in 1994

1 The Origins of Water Regulation in Italy

The reform of the water sector in Italy that took place in 1994 need to be understood by taking, first, a long-term perspective of the way water resources had been managed in the country. In the years that followed the unification of the Kingdom of Italy in 1865, the central government started carrying out public works for protecting people and land from flooding, supplying water for agricultural and civil uses, and exploiting water for hydro-electric power generation (Bigatti 1997; Gilardoni 1935; Goria and Lugaresi 2002; Lugaresi 1995). Water regulation centered on Royal Decree 2248/1865, which drew a legal distinction between public and private water and provided that the latter (which originated from springs, rivers and lakes) could be freely disposed by either the State or private citizens, only subject to limitations to prevent conflicting uses (e.g., allowing free flow of water channels). The use of water was mainly regulated through a system of concessions, which were typically awarded by the Ministry of Public Works (Castelli-Avolio 1936; Vitale 1921).

Local water services were often provided by privately-owned firms, especially in the major cities where resident populations were steadily growing over time. Yet, after a reform of local governments in 1903 (Act 103/1903, also known as "Legge Giolitti"), several privately-owned water firms were acquired by local governments, especially in the

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northern and the central regions of the country. This so-called "municipalization process" of water services resulted in the diffusion of full local government-ownership that became the most common form of regulation of water services in the country.

After the constitution of the Republic of Italy in 1946, water policies focused on developing the infrastructure needed to support post-war reconstruction and to promote the industrialization of the country. In 1950, the central government launched a large public infrastructure development program in the southern regions of the country, which was carried out by the special-purpose central government-owned agency "Cassa per opere straordinarie di pubblico interesse nel Mezzogiorno d'Italia" ("Fund for special public works in the South of Italy", also known as "Cassa per il Mezzogiorno"). For several decades, the agency played an important role in planning and constructing large water public works (dams and long-range aqueducts). Until its termination in 1992, Cassa per il Mezzogiorno played a fundamental role in filling most of infrastructure deficit of the southern regions, and contributed to forming a class of engineers and managers with significant technical expertise and hydro-geographical knowledge (Gualini 2004).

In the 1970s, Italy's water policies started to address issues related to environmental preservation and sustainability, pollution, health and sanitation. Most of these policies originated from the transposition of environmental directives issued by the European Community (EC) (especially in the area of quality standards for drinking and bathing waters, and the discharge of particularly dangerous or polluting substances) into the national legislation. At that time, the EC lacked explicit competences to regulate environmental matters (environmental, water, health and sanitation policies had not been included in the founding Treaty of Rome, in 1957), but the directives were justified on the basis that harmonized environmental standards across EC Member States served the goal of leveling competition in the common market. The directives were also generally received favorably by the public of EC member states. The rise of environmental concerns in the public domain encouraged the creation of further standard-setting directives at the EC level (Knill and Liefferink 2007) and triggered pressure for compliance in the Member States—albeit not so much in Italy, where the transposition of EC directives often lagged behind the deadlines (Börzel 1998, 2000, 2001; Spina and Sciortino 1993).

2 The 1976 Water Reform

In the late 1960s, public opinion in Italy became increasingly disturbed by evidence of water-related dangers. In 1951, the flooding of river Polesine caused 273 deaths and the evacuation of more than 100,000 people from their houses. In 1966, the flooding of the river Arno provoked 34 deaths and over 5000 people becoming homeless, and put the historical and cultural heritage of Florence at high risk. These events dramatically showed that the country lacked adequate defense from water-related hazards, in particular, in highly populated urban areas. Following the river Arno flooding, in 1966, the Minister of Public Works and the Minister of Agriculture and Forestry established an Inter-Ministerial Committee, chaired by MP Professor Giulio De Marchi, which was charged with reviewing the state of the water sector in the country and proposing new policy measures for better protecting people, private property and national heritage.

The De Marchi committee, which concluded its work in 1970 (the committee proceedings would be published later, in 1974), advised that the problems of the national water system (in particular, risks of droughts and flooding) should be tackled through a comprehensive approach to water resource planning at the level of the watershed river basin. The idea of managing water resources at the watershed river basin level had gained attention within international academic and professional water community circles after it had been adopted by various countries, particularly France where six river basin agencies had been established in 1964. In 1974, the idea that watershed river basin management could be the solution to the problems of the water system in Italy was widely discussed at the 4th Conference of FNAMGAV, the main national association of local government-owned water and gas firms. During the conference, speakers from the academic and practitioners' ranks praised the watershed river basin management approach, especially in the relatively decentralized "British variant" (i.e., referred to the experience of England and Wales, where 10 independent authorities had been established in 1973) rather than in the more centralized French one.

After about six years of parliamentary works, in 1976, the government enacted a water reform (Act 319/1976, titled "Norms on the protection of water from pollution"), which contained a new regulation for water resource and service management. The water reform partially decentralized the competences on regulating water resources and service

management to the regions, the provinces and local governments. The central government (precisely, a committee formed by the Minister of Public Works, the Minister of Health and the Minister of Maritime Trade) would provide the criteria for surveying water resources, set and update the standards for wastewater discharges, and issue the general water restoration plan, which included all water infrastructure works that were required to contain pollution. The regional governments were required to map water resources, to organize the monitoring system of wastewater discharges, and to issue, within three years (in agreement with local governments), regional water restoration plans, which provided the re-organization of water technical and administrative offices, detailed the quantitative and qualitative standards for wastewater discharges, and programmed water infrastructure works. The provinces were required to maintain a registry of wastewater discharges and to monitor the quality of discharges. Local government was assigned the task to manage (either individually or jointly through consortia) local water service delivery (supply, sewage and wastewater treatment services). Users of water services would be charged two distinct tariff fees, one for water supply and the other for sewage and wastewater treatment services.

The creation of the 1976 water reform took place at a time when the EC Commission had just started to focus on environmental policy issues. In 1975, the EC Commission issued the so-called "first wave" of environmental directives (Kallis and Nijkamp 1999), which mainly intended to harmonize national environmental laws in order to remove trade barriers and prevent distortion of competition in the Common Market, protect public health, preserve the environment, and promote measures for dealing with regional and cross-national environmental problems. The "first wave" included, in particular, directives COM 75/440 and COM 76/464, which provided an overall regulatory framework for drinkable water and wastewater discharge. COM 75/440 required Member States to monitor surface water and undertake the actions needed to comply with drinkable water quality standards. COM 76/464 required Member States to undertake the necessary actions to eliminate pollution of water from selected dangerous substances, and set up a regime of wastewater discharge permits. The provisions contained in these directives partially contradicted the regulation contained in the 1976 water reform. For example, COM 76/464 provided that wastewater discharge permits would expire after a given deadline, while Act 319/1976 set neither an

expiry date nor any review of the water discharge permits. Since the very origin of EC water policy, therefore, a certain degree of "mismatch" was created between the EC normative system and the national legislation.

Overall, the implementation of the 1976 water reform delivered modest results. Deadlines that had been set for complying with quality standards were repeatedly postponed by the central government. Delays occurred in drafting the regional water restoration plans, because of the emergence of time-consuming technical matters and political issues related to the regulation of competing uses of water resources. Control and sanction systems were not effectively enforced, with the effect that water quality standards were often violated by both local governments and private users alike. No evidence was collected, moreover, about whether the water reform resulted in any improvement of water resource protection and preservation, environmental pollution, and safety for people, property and national heritage.

3 The 1989 Water Reform

During the 1970 and 1980s, the EC Commission issued a growing number of environmental directives. Part of these directives regulated water quality standards, such as COM 80/778 (which set standards for water in the distribution network), COM 76/160 (on water standards for bathing), and COM 78/659 and COM 79/923 (on water standards for supporting fish and shellfish life). Part of them, instead, focused on regulating pollution control and wastewater discharges, like various "daughter" directives which followed COM 76/464 (including a list of dangerous and polluting substances subjected to discharge standards) and COM 80/68 (on discharges to groundwater).

In Italy, most of these directives were transposed into the national legislation with considerable delays. Between 1976 and 1989, only 4 directives were transposed (COM 75/440, 79/869, 80/778 and 86/280) out of 17 that had been issued (Lanz and Scheuer 2001). The transposition of many directives (e.g., those on water standards for supporting fish and shellfish life) was deferred by appealing to a presumed vagueness of the text. The pollution control and wastewater discharges directives were only partially transposed because, for several years, the European Council could not come to an agreement about the detailed list of substances subject to regulation (still two decades after the COM 76/464, standards had been agreed on only 18 of about 130 substances originally listed).

Despite this modest record of transpositions into the national legislation, however, these directives did affect the domestic policy debate on water and the environment. Politicians and the media began to devote more and more attention to issues such as the control of water pollution and of wastewater discharges, which had been largely neglected in the past. Public opinion gradually began to develop a concern with water and environmental problems and to favor the making of new public policies in this field, especially when, in 1988, a massive eutrophication process affected the northern Adriatic Sea and experts imputed the phenomenon to the poor wastewater treatment systems of the Po river valley.

Within this historical context, in 1989, the government came to enact a water reform (Act 183/1989, titled "Norms on the organizational and functional reconfiguration of the protection of the soil") that aimed to provide a comprehensive regulatory framework for pollution control and preservation of water resources. Act 183/1989 centered on the concept that the watershed river basin was the most appropriate territorial unit for planning and managing water resources. The design of the water reform identified 11 watershed river basins of national relevance, 18 watershed river basins of interregional relevance, and provided that the regions would establish local watershed river basins for minor streams. It also provided that newly established River Basin Authorities (Autorità di Bacino) would formulate watershed river basin plans that contained the survey of water resources, the identification of water problems to tackle, and a plan for interventions on water infrastructure and of water resource management.

The 1989 water reform provided that, at the national level, the Chairman of the Council of Ministers would issue plans of the watershed river basins of national relevance (proposed by the Minister of Public Works and approved by the Council of Ministers) and a national program of public works in the water sector. The Minister of Public Works would supervise the design and construction of water infrastructure under the State competence. The Minister of the Environment, which had been recently instituted by Act 349/1986, would exercise powers on pollution prevention and waste disposal. At the sub-national level, the 1989 water reform provided that the regions should define the watershed river basins of regional relevance, establish the regional watershed river basin committees, coordinate the surveying of water resources and the planning of water resource preservation and use, draft and issue the regional watershed river basin plans, and plan and carry out water

infrastructure works and maintenance programs in the regional and inter-regional basins. Local governments were assigned a relatively minor role. The regions would define how local governments could take part in planning water resource preservation and use. Concerning the management of water services, Act 183/1989 also provided for the possibility that the watershed river basins plans could define so-called "optimal territorial areas" where local governments would form consortia for the joint management of water supply, sewage and wastewater treatment services.

The idea that local governments should form consortia for managing the water services had been debated for some time in water policy circles. Since the national meeting held in Trieste in 1977, the association of water and gas local government-owned firms (FNAMGAV) argued that water firms could not improve operational efficiency and cost-effectiveness due to the relatively small territories of the local governments, and because the legislation prohibited local government-owned firms from operating outside the municipal territory of the owner. The formation of consortia of local governments, in conjunction with some relaxation of legislative constraints, could help bypassing these limitations to business growth. The idea of forming consortia, however, was opposed by the association of local government-owned firms operating solid waste disposal and wastewater treatment, which seemed concerned with the loss of control over local public services if they were pooled together with other municipalities.

The 1989 water reform was enacted at about the time when the EU came to consolidate its "image" to the public opinion as a "benevolent protector" of public health and the environment (Knill and Liefferink 2007). After a meeting of the Ministers of the Environment of EU Member States, in Frankfurt in 1988, the EC Commission launched the IV Framework Program for the Environment, which centered on the "prevention at source" principle (which led to COM 91/271 directive on urban and industrial wastewater treatment). A few years later, the inclusion of environmental policy and sustainable development within the action domain of the EU was definitively sanctioned by the Maastricht Treaty, in 1992. By that time, EU Member States and subnational governments had come to experience the role played by EU directives on the national and local water domains, and had started, on the basis of the "subsidiarity" principle, to call for a more decentralized approach to the implementation of the EU directives.

4 The Making of the 1994 Water Reform

During the 1980s, water firms came under mounting financial pressure because of faltering revenue, growing demand for infrastructure development and lack of financing sources. The overall deficit of local government-owned water firms raised from Lire 3.5 billion in 1960 (about 2016 €46.4 million) to Lire 800 billion in 1975 (about 2016 €4.2 billion), to Lire 1800 billion in 1980 (about 2016 €4.39 billion) (Spadoni 2005). During 1970, changes of tariff regulation had provided that water tariffs would be set locally by provincial prices committees (Comitati Provinciali Prezzi) on the basis of actual costs in order for the water firms to achieve financial self-sufficiency. Water tariffs, however, were set relatively cheap because of central government's policies that aimed to contain inflation. Water firms, therefore, were not able to increase their revenue and kept asking the central government to subsidize their net cash outflow. Water firms also needed to carry out investments in water infrastructure in order to comply with rising environmental and quality standards set by EC directives. Access to financing sources, however, was hampered by the heavily leveraged financial structure of water firms, that had formed especially after a change of legislation in the late 1950s that had allowed them to finance their net cash outflows through loans.

Among water firms, those owned by local governments as semi-independent organizations (i.e., so-called "municipalizzate") became particularly active in advocating the need for a reform of the economic regulation of the water sector. At the 1989 national conference of Federgasacqua that took place in Bologna on November 20–22, water policy professionals and delegates of the water firms widely discussed the economic problems of the water sector and the possible solutions. The conference participants came to agree that the water industry's performance was negatively affected by high fragmentation of the sector, lack of unitary management of water services, and inadequacy of the water tariff to cover full costs and provide a return on investments. They called for a drastic reform of the whole water industry based on the principles of integrated watershed management, for the involvement of private operators and investors in the water industry, for improving cost-effectiveness, and for setting adequate water tariffs, if water firms were to improve their performance.

Fig. 1 Total investments in water infrastructure, 1954–1990, constant prices 2010 € million (*source* author's elaboration from Ermano 2012a, b)

At that time, gas firms of Federgasacqua were reputed to achieve better financial performance and customer service than water firms. The performance gap supported the argument that water firms should aspire to the same level of performance that gas firms had been able to achieve. Evidence of poor performance in the water industry had been provided by the national statistics office (Istituto Nazionale di Statistica, ISTAT). Through a survey conducted in 1987, ISTAT showed that most of the country's population suffered from relatively poor water services, supply shortages, leakage, unreliable service and pollution (ISTAT 1991). For example, the survey showed that more than 45% of the population experienced interruptions in water supply and was not served by sewage networks and treatment of water discharges. The share of population affected by poor water services was particularly high in the southern regions of the country, where unreliable service and lack of proper sanitation affected more than 70% of the residents. The northern and central regions, instead, were mainly affected by inadequate wastewater treatment of water used for industrial and civil purposes. Investments in water infrastructure, in addition, were steadily declining during the 1980s and early 1990s (Fig. 1).

The 1991 ISTAT report also showed that the structure of the water industry was highly fragmented and differentiated across the country. ISTAT reported 5500 firms that managed the drinkable water supply, 7000 that managed sewage services and 11,000 that provided water

Table 1 Percentage of operators and percentage of water volume served, per type of water firm (*Sources* ISTAT 1991; Report to the Parliament on the State of Water Services 1997, 1998)

Operators	*% Number of operators*	*% Water volume supply*	*% Turnover*
Local government branches	81.90	34.50	43.90
Municipal companies	1.40	24.00	25.30
Local government consortia	12.40	18.50	18.10
Other public bodies	2.20	17.70	7.70
Private business companies	2.10	4.50	4.90

treatment. In the segment of water supply, water was directly provided by local governments (that delivered about 34.5% of water to households and businesses), local government-owned water firms (24%), consortia of local governments (18.5%) and other public bodies (17.7%) owned by either the regional or the central governments. Privately-owned business companies played a relatively marginal role (about 4.5%) (Table 1). Based in the southern regions of the country, the regional and central government-owned water firms were among the biggest players: the Ente Autonomo Acquedotto Pugliese, for example, served a user basin of about 4.6 million people through a network almost 20,000 km long (the biggest aqueduct network in Europe). Some local government-owned water firms based in the largest cities, such as Rome, Milan, Turin and Genoa were relatively large players too.

The call for reforming the water industry took the form of a proper proposal to the Parliament. In 1992, the Christian Democrat MP Giancarlo Galli filed a reform bill that aimed at changing the economic regulation of the water industry. The task to draft the bill was assigned to the VIII Standing Committee (Environment, Territory and Public Works) of the House, which (during the XI legislature of the Republic of Italy in the period April 23, 1992–April 14, 1994) included MPs from the parties Movimento Sociale Italiano (MSI)-Destra Nazionale, Lega Nord, Partito Repubblicano, Democrazia Cristiana, Partito Socialista Italiano, Partito Democratico della Sinistra, Verdi and Rifondazione Comunista. Also, the sub-secretaries of Public Works, Agriculture and Forestry, and Finance occasionally participated to the drafting process. Reviews of the bill were also conducted by the I (Constitutional affairs), II (Justice), V (Balance), VI (Finance), VII (Culture), X (Productive

Activities), XI (Work), XII (Social Affairs) and XIII (Agriculture) Parliament Committees.

Despite the variety of political affiliations, the members of the VIII Standing Committee shared a broadly consensual view on the principles that the water reform should follow. Since the very first "drawing up" meeting of the committee, on July 30, 1993, Giancarlo Galli highlighted some of them:

> This [bill] is an attempt to dramatically overcome the fragmentation of current management systems in order to re-organize the water service at a scale adequate to the current needs, in the optimal areas, also trying to disentangle the management system from competences based on the administrative jurisdictions. […] Another important point concerns the public status of water. This is an essential element of the bill which allows the State to plan the whole resource cycle, although water is available for any use of the private business. […] With this text we also aimed to provide an overall restructuring of tariffs […] (VIII Standing Committee minutes 1993: p. 235, author's translation).

During the discussion, the MP Rosa Filippini (Socialist Party) remarked that:

> apart from the general principles highlighted [by Galli], there is also the one of the financial self-sufficiency of the water management cycle, which needs to be based on the water tariffs, which should not be used to cover public finance deficit. The overall objective, in fact, is the one to provide a direct link between the level of the tariff and the quality of the service, in such a way as to overcome an outdated idea of intermediation of the State in collecting and re-distributing financial resources. (VIII Standing Committee minutes 1993: p. 236, author's translation)

The MP Valerio Calzolaio (Left Democrats Party) agreed that:

> [The bill] incorporates the fundamental principles of the reform: conceiving water as a good to protect; adopting an efficient policy of scarce resource management; linking the level of the tariff and the cost of service management; charging higher tariffs for non-essential uses; protecting water resources and granting priority to drinking uses; planning of optimal territorial areas and setting tariffs in relation to the actual quality of

> the service provided. (VIII Standing Committee minutes 1993: p. 237, author's translation)

Also, the MP Edo Ronchi (The Greens) pointed out that, "The bill under discussion is to be improved and completed, but the basic underlying concepts and institutions should not be changed." (VIII Standing Committee minutes 1993, author's translation.) After some months of works, the water reform was eventually approved by the House on December 6, 1993 and, with minor amendments, by the Senate on December 16, 1993. After the President of the Republic, Oscar Luigi Scalfaro, signed the bill on January 5, 1994, Act 36/1994 ("Norms on the subject of water resources") was enacted on January 19, 1994.

5 The Design of the 1994 Water Reform

The design of the water reform built on four key principles. First, water services should be comprehensively organized and managed in relatively large territories (so-called Ambiti Territoriali Ottimali, that is, Optimal Territorial Areas or OTA) in order to reduce the fragmentation of the industry and allow water firms to achieve economies of scale. Second, all the segments of water services should be managed "under one roof", i.e., by one water firm only that could better coordinate the stages of the water management cycle than multiple ones. Third, planning and control functions should be separated from those of operational management and service delivery (the former being assigned to local regulatory agencies, named Autorità di Ambito, or OTA authorities, and the latter to the water firms) in order to improve the entrepreneurial management of water firms. Finally, water tariffs should cover the full cost of water services (i.e., including investment depreciation and return on capital invested) in order to allow water firms to achieve financial self-sufficiency (Fazioli and Massarutto 1998; Fontana and Massarutto 1995; Malaman and Cima 1998).

These principles were broadly incorporated in the institutional arrangement contained in Act 36/1994. The regions were required to define the OTAs (either within their own territories or across regional borders), where water services would be comprehensively managed. Local governments located in each OTA would establish local regulatory agencies (OTA authorities). These OTA authorities would plan local water infrastructure development and set the tariff that water firms

should charge. The OTA authorities would also award water franchises to water firms. As a general rule, one water firm only would manage water services in each OTA, although Act 36/1994 also contained some exemptions for safeguarding the position of incumbent water firms that satisfied criteria of efficiency, cost-effectiveness and economy. After the award of the water franchises, the OTA authorities would regulate the water firms by enforcing the tariff regulation and monitoring the implementation of water infrastructure development plans.

The details of this regulatory design also partially reflected political compromises and institutional constraints that had affected the making of the 1994 water reform. During the drafting of the bill at the VIII Standing Committee of the House, four main issues attracted the attention of the MPs. The first issue concerned how the OTAs should be designed. In principle, the VIII Standing Committee agreed that the OTAs should include relatively large territories of about 500,000 water users, which was believed by water policy experts to be the minimum size for achieving economies of scale. The VIII Standing Committee also agreed that the OTAs should be designed according to the hydro-geographical features of watershed river basins, rather than on administrative jurisdictions. However, the VIII Standing Committee could not single-handedly define the boundaries of the OTA territories on the basis of these principles, because it would violate local governments' autonomy (sanctioned by the Constitution) on the organization of local public services. The VIII Standing Committee, then, agreed to require local governments to define the OTA authorities through a consultative process.

The second issue concerned how local governments should establish the OTA authorities. Members of the VIII Standing Committee generally shared the view that local governments should cooperate in order to centralize their water planning and regulatory functions into the OTA authorities. Early drafts of the reform bill provided that local governments were mandated to establish compulsory consortia for pooling their water planning and regulatory functions. During the review of the reform bill, however, the I (Constitutional Affairs) Standing Committee pointed out that requiring local governments to establish mandatory consortia for jointly regulating water services was not constitutionally legitimate. The VIII Standing Committee, therefore, agreed that the regions would select a local government in each OTA charged with the task of leading the negotiations for centralizing the water planning and regulatory functions.

The final decision of the Committee resulted from the anticipation that the local governments would oppose any reform which would threaten their autonomy. Some years later, the Chairman of the Supervising Committee on the Use of Water Resources, Gilberto Muraro, commented on the design choice made by the VIII Standing Committee in these terms:

> At the roots of the reform there is clearly a political compromise, that can be described in this way: the national legislator considered that, without any amendment to the Constitution, it would be necessary to respect the municipal authority on this field [of local water management], and that, in any case, the reform could not be carried out without the [collaboration of the] municipalities. […] In order for the reform to be approved [by the Parliament], therefore, local governments were accepted as main players in the new organization [of the water regulatory system], by requiring them to cooperate and establish together the OTA authorities to which water service planning would be assigned, choose the firms which would manage the water services, and monitor the conduct [of the water firms]. (Muraro 2003: p. 2, author's translation)

The third issue concerned the choice of the criteria for the selection of the water firms that would be awarded the water franchises. In principle, the members of the VIII Standing Committee broadly agreed that water services should be managed with an "entrepreneurial spirit". Anecdotal evidence, instead, suggested them that public officers in local governments often administered water firms with the aim of gaining the electoral support of a local clientele consisting of job-seekers and small-medium construction firms rather than pursuing good service performance. Local governments, however, could not be authoritatively excluded from managing local water services. As pointed out by the I (Constitutional Affairs) Standing Committee during the reviews of the reform bill, local water services had to be managed according to any of the forms provided, at that time, by Act 142/1990, that offered local governments the options to provide local public services (including water) by either tendering out the franchise to business companies, or by awarding it to mixed public-private ownership firms (originally, Act 142/1990 provided that local governments should retain majority ownership, but in 1992 this requirement was removed) or to local government-owned special statute organizations or (in special cases) to local

government departments. The VII Standing Committee agreed that local governments could not be compelled to withdraw from directly managing water service provision, but they limited the range of option choices to two only: water services would be managed either by business companies selected through tender offer competition or by mixed public-private ownership firms. Pressed by local governments' lobby, the VIII Standing Committee agreed to exempt from privatizing water service provision those incumbent water firms that matched criteria of effectiveness, financial self-sufficiency and economy.

Some years later, the Chairman of the Supervising Committee on the Use of Water Resources, Gilberto Muraro, commented on the design choice made by the VIII Standing Committee in these terms:

> A new political culture had emerged since 1992, when, under financial pressures, the government led by Giuliano Amato aimed to establish a clear-cut separation between the regulatory and monitoring activities [on the one hand] and the management activities [on the other one] […] [When Act 36/1994 was drafted,] in order to reduce the opposition [to the reform], and even to gain the broadest support from the political, technical and administrative ranks of public sector companies, which are particularly diffused especially in the center and north of the country, the legislator accepted the compromise of an "optional privatization", thus [it] granted to the public sector the opportunity of retaining involvement in the [direct] management [of water services]. (Muraro 2003: p. 2, author's translation)

This design of Act 36/1994 was criticized, at the time, by the national association of business companies (Confindustria), which complained about the possibility granted to the local governments to prevent business companies from entering the water industry. In an interview with the business press, Il Sole 24 Ore, on October 10, 1993, the Chairman of Confindustria Giancarlo Piombino said:

> We need some clarity about whether water services are open to the market or not. At the moment, we cannot see any clear attitude in this direction. Rather, the House introduced some provisions which allow the local governments, the provinces and their consortia to directly award the concession to manage the water services to their own water firms without any tender offer competition. The tender offer competition, instead, is required in the case of awarding the concession to any third-party business

> company. There is an unfair impartiality here, which lacks any legal or economic ground. There is no equality, and we cannot accept that anyone gains a position of privilege. (author's translation)

The final issue concerned how water tariff should be set. Most of the members of the VIII Standing Committee shared the view that users should be fairly charged for the water services in order to cover full costs, including asset depreciation and fair return on investment. Water tariff setting was designed as a two-stage system, according to which, at the central level, the Minister of Public Works would issue (according to a proposal of the Supervising Committee on the Use of Water Resources) the criteria for setting water tariffs (so-called "metodo normalizzato" or "normalized method", based on an econometric model that estimated the water industry average production costs), and, at the local level, the OTA authorities would set the water tariff according to a calculation based on the normalized method, on the tariff charged in the past (so-called "tariffa di riferimento" or "reference tariff"), and on the tariff proposed by the water firm (so-called "tariffa di progetto" or "project tariff"). In order to provide incentives to improve performance over time, the VIII Standing Committee also decided that annual water tariff increase would be subjected to a cap based on econometric estimates of average efficiency improvements in the industry. The price-cap mechanisms would also consider a fair return on capital invested, in order to elicit water firms to invest in infrastructure development projects.

In terms of allocation of tasks, responsibilities and powers, the 1994 water reform involved entities placed at all levels of the multi-layered governance system of Italy (Table 2 summarizes the implementation tasks and the regulatory functions provided by Act 36/1994). The central government was required to establish a semi-independent authority, called the Supervising Committee on the Use of Water Resources, and to issue regulations concerning, in particular, water tariff setting (the normalized method) and eligibility for the award of the water service franchises through tender offer competitions. The regions were required to define the boundaries of the OTAs, the legal terms of collaboration among local governments, the procedure for awarding water franchises, and the template franchise contract between the OTA authorities and the water firms. Local governments were required to collaborate to define the OTA boundaries and to establish the OTA authorities. Finally, the OTA authorities were required to plan water infrastructure development

Table 2 The implementation tasks and regulatory functions provided by Act 36/1994

References	*Provisions*	*Public authorities involved*	*Deadlines*
Art. 2, par. 2	The Minister of Environment issues a decree that regulates human interventions on the natural water cycle	The Minister of Environment, in concert with the Minister of Public Works	Within six months from the law coming into force
Art. 4, par. 1	The Chairman of the Council of Ministers issues decrees that regulate: (a) general guidelines about the census of water resources, water economy and protection of water from pollution; (b) general methodology about planning the rational use of water resources and guidelines for multiple competing uses of water resources; (c) criteria and guidelines about planning the transfer of water for human resources between regions (ruled in article 17); (d) methodology and criteria for the revision and update of the general aqueduct regulatory plan (regulated by Act 129/1963); (e) guidelines and technical standards for mapping the territories subject to risk of drought with the aim of preventing water emergencies; (f) criteria for the management of the integrated water service, made up of the public services of water catchment, distribution, sewage and treatment; (g) minimum service standards that are to be guaranteed in each optimal territorial area, and criteria and guidelines for water transfer, catchment and storage but for human consumption; (h) financial mechanisms and rules for settlement of water transfers between basins; i) existing systems which allow achieving the objectives of water transfer between regions (ruled in article 17)	The Chairman of the Council of Ministers, following the initiative of the Committee of the ministers for the national technical services and interventions in the protection of the soil, having heard the Standing Committee for the Relationships between the State, the Regions and the Autonomous Provinces of Trento and Bolzano	None
Art. 5, par. 2	The Minister of Public Works issues a decree that regulates the definition of the criteria and methods for measuring the leakage from aqueducts and sewage networks	The Minister of Public Works	–
Art. 6, par. 1	The Minister of Environment issues a technical guideline that regulates: (a) the type of wastewater that can be recycled; the type of wastewater that can be reused; quality and consumption standards; technological requisites of the treatment process; (b) the ways of using treated water, taking into account hygiene and health; (c) the ways of building, managing and upgrading treatment plants and wastewater distribution networks	The Minister of Environment, having heard the Ministers of Health, Public Works, and Industry, Commerce and Handicraft	Within one year from the law coming into force

(continued)

Table 2 (continued)

Art. 7, par. 1	The Minister of Environment issues a decree that lays out a national plan containing the guidelines and requirements for the implementation of the 91/271/CEE directive	The Minister of Environment, in concert with the Ministers of Health, Public Works, and Industry, Commerce and Handicraft, after having received the binding opinion of the Standing Committee for the Relationships between the State, the Regions and the Autonomous Provinces of Trento and Bolzano	Within one year from the law coming into force
Art. 7, par. 2	The Minister of Environment issues a decree that regulates the implementation of the 91/271/CEE directive	The Minister of Environment, in concert with the Ministers of Health, Public Works, and Industry, Commerce and Handicraft	Within 18 months from the coming into force of the law
Art. 8, par. 2	The Regions formally establish the optimal territorial areas	The Regions, having heard the provinces affected, and the competent River Basin Authority	Within six months from the coming into force of the law
Art. 8, par. 5	The Regions approve rules about the control of sewage drainage, pre-treatment equipment, and the detection of compliance with the licensed drainage and equipment	The Regions	None
Art. 9, par. 3	The Regions regulate the forms and ways of cooperation between the local governments among those provided in Act 142/1990 and included in the same optimal territorial area	The Regions	Within six months from the coming into force of the law
Art. 10, par. 5	The Minister of Public Works regulates the re-organization of the water firms under State control	The Minister of Public Works, in concert with the Minister of Treasury, having heard the Minister of Environment and the Regions affected, and the competent Parliamentary Committees	Within twelve months from the coming into force of the law

(continued)

Table 2 (continued)

Art. 10, par. 6	The Chairman of the Council of Ministers issues a decree that lays out a plan about the transfer of the aqueducts, sewage and water treatment plants managed by the consortia of the areas of industrial development to the firm managing the integrated water service	The Chairman of the Council of Ministers, following the initiative of the Minister of Public Works, in concert with the Minister of Environment, having heard the Regions, the provinces, and the agencies affected	None
Art. 11, par. 1	The Regions approve a template contract for regulating the relationships between the local governments setting up the integrated water services. (The same contract also included the conditions for the activation of substitutive powers against the local governments and the provinces, if they did not set up the integrated water service within the set deadline, art. 19, par. 3)	The Regions	None
Art. 12, par. 3	The Regions regulate the forms and ways for transferring the personnel that worked in the incumbent water firms owned and controlled by the local governments to those firms managing the integrated water service	The Regions	None
Art. 13, par. 3	The Minister of Public Works defines the normalized method that determines the cost components to be taken into account and the formulation of the reference tariff	The Minister of Public Works, in concert with the Minister of Environment, following the initiative of the Committee of Supervision of the Use of Water Resources, having heard the River Basin Authorities, and the Standing Committees for the Relationships between the State, the Regions and the Autonomous Provinces of Trento and Bolzano	None
Art. 22, par. 5	The Chairman of the Council of Ministers issues a decree that determines the staff and management positions of the technical secretary of the Committee of Supervision of the Use of Water Resources and the Observatory of Water Resources	The Chairman of the Council of Ministers, following the initiative of the Minister of Public Works, in concert with the Ministers of Treasury and of Public Function	None

(continued)

Table 2 (continued)

Art. 30	The Inter-Ministerial Committee of Economic Planning regulates: (a) the production and transfer of desalinated water by coastal electricity generation plants; (b) the use of water stored in dams for electric generation plans in the case of water emergencies; (c) the protection and reclaim of quality and quantity of water stored in dams for electric generation plants	The Inter-Ministerial Committee of Economic Planning, following the initiative of the Committee of Ministers for the national technical services and interventions in the protection of the soil, having heard the River Basin Authorities	None
Art. 32, par. 3	The government adopts one or more regulations that identify the rules contained in other laws and incompatible with those of Act 36/1994, and sets the deadlines for their abrogation in relation to the stages of implementation of Act 36/1994 in the various optimal territorial areas	The government, following the initiative of the Minister of Public Works, in concert with the Ministers interested in the various subject matters affected by Act 36/1994, having heard the competent Parliamentary Committees	None

and service management improvement, award the water franchises, and monitor the compliance of water firms with the infrastructure development and tariff plan.

In essence, the 1994 water reform provided the centralization of planning and regulatory functions in the OTA authorities and assigned the management of water services to water firms. Local governments were expected to pool together planning and regulation of water services. The OTA authorities were expected to award water concessions to only one water firm within each OTA, either a business company selected through tender offer competition or a mixed public-private ownership firm. The reformed regulatory system, therefore, included both policy tools intended to liberalize water service provision (i.e., the OTA authorities could choose water service providers through tender offer competitions), re-regulate the water industry (i.e., by moving from a system of direct public ownership and control of water firms to one where water firms would be subjected to tariff regulation by local regulatory authorities), and privatize water firms (i.e., private operators and investors could enter the water industry either through water firms selected through tender offer competitions or through mixed public-private ownership water firms).

6 Commentary: The 1994 Water Reform in Italy

The creation of the reform of the water sector in Italy in 1994 can be explained in different ways. Before 1994, the water sector was largely regulated through direct ownership of water firms—a regime that had resulted in poor attention to financial self-sufficiency and service quality. During the 1970s and 1980s, growing evidence of environmental and service quality issues stimulated proposals to re-structure the organization of the water industry, which especially looked at the advantages of integrating segments of the water industry within water river basin areas. Conditions of stress on public finance and declining trend of investment contributed to triggering attention from policy-makers that eventually resulted in the passing of the 1994 water reform.

To some extent, the 1994 water reform originated from genuine concerns to improve the performance of the water sector, especially because of issues of poor water service (from unreliable supply to pollution) that had not yet been solved. To some extent, the events that led to the 1994 water reform also suggest that the water industry itself played an important role in raising the issue of reforming the water sector in the

agenda of the Parliament and in proposing some design features of the reform. The generation and diffusion of ideas played an important role in shaping the reform content as well, such as, for example, those on the principles of integrated watershed management. Another condition that stimulated the water regulatory reform was the financial condition of the state, which (at the beginning of the 1990s) was not able to invest enough resources to comply with raising water supply and sewage standards (that partially originated from the EU context).

A combination of various explanatory factors, therefore, seems important to account for the origins of the 1994 water reform. We should not discount, however, the role played by contingent and peculiar circumstances. An individual, such as MP Giovanni Galli, in particular, played an important role to champion the case for the reform, in such forms as, for example, marshalling consensus among other MPs (across different political parties) about the need to raise the reform of the water sector in the parliamentary agenda. Individual action (or "agency"), therefore, should be appropriately considered among the factors that come into play in regulatory reform policy-making.

The design of the 1994 water reform was inspired by multiple regulatory approaches. The reform statute permitted local governments to pursue alternative institutional and organizational forms for the provision of water services. Local governments were required to award water concessions to firms because of the presumed advantages that would arise from the separation of the ownership and the management functions. The reform also provided for the separation between the ownership and management functions on the one hand, and the regulatory function on the other one. The regulatory function would be centralized into newly established water regulatory authorities (OTA authorities). Within this general template, local government could choose whether to retain ownership and control of water service providers (in the form of full or partially shared ownership), or to completely rely on contracts for regulating the conduct of water service providers.

One particular feature of the 1994 water reform was that multiple systems of regulation would act in concert. Local governments could retain ownership of water firms, whose conduct would be regulated through concession contracts with the OTA authorities. In addition, OTA authorities would play a role of an IRA because of their autonomy from local governments and of their role to set and review water tariffs. In principle, the combination of different regulatory systems could result in

multiple mechanisms to keep water service providers under control. The rest of the narrative of the water reform implementation will show, however, that redundant regulatory systems did not—by themselves—help to drastically improve the performance of the water sector as a whole.

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PART II

Installing Regulation

CHAPTER 6

The Politics of Regulation

1 Regulation in the Age of Governance

Since the early 2000s, some authors (e.g., Jordana and Levi-Faur 2004) have characterized the present arrangement of governance institutions in many countries as the "age of governance". With this expression, they meant the formation of a specific mode of distribution and balance of powers among several actors, where centralized and hierarchical systems of decision-making are replaced by more fragmented and participatory structures. In the age of governance, public authorities share their decision-making powers with other actors, including, for example, IRAs, consultative and participatory bodies, and other public authorities. In part, the emergence of the age of governance may be related to devolution of some of the nation-state powers to the sub-national level (e.g., a greater role played by municipal governments and provincial or regional governments even within unitary states) and some of their transfer to the super-national level (e.g., a greater role played by super-national institutions such as the EU or other international venues for concerted policy decisions). In part, the age of governance may be also related to the proliferation of regulation and regulatory institutions (i.e., a sort of horizontal decentralization), especially where the nation-state delegates IRAs to make decisions concerning the present operation and future developments of sectors of the economy that once had been under pubic ownership and control.

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Regulation forms an important component of the institutional arrangements of the age of governance. The processes of devolution and delegation of nation-state powers, however, resulted in the progressive "weakening" of the very instrument of the rules (and, relatedly, of legislation more generally) for orienting the conduct of actors. For Scott (2004), the terminal effect of the rise of the age of governance is the emergence of what he called the "post-regulatory state", that we can understand as the acknowledgement of the political nature of regulation, where the conduct of individuals and firms is not only controlled by hierarchy and laws but also by various concurrent regulatory processes more generally. It is especially relevant to highlight that Scott's argument includes three forms of limitation to the law:

- The capacity of law to exert control is limited;
- Control based on law is marginal to contemporary processes of ordering;
- State law is only likely to be effective when linked to other ordering processes.

Scott's argument about the limited capacity of law to exert control is especially related to the fragmentation of various social sub-systems. The acknowledgement that the law only provides one among several processes of ordering is related to the multiplicity and plurality of social processes of control, that are also exerted by private actors aside public authorities. Scott (2004) also introduces the role of so-called "responsive regulation", which brings into play the role of the capacity, inclination and willingness of the regulated to comply with regulation.

On the basis of these features of regulation based on the law system, Scott (2004) argued that the fundamental characteristics of the post-regulatory state were variety of norms, variety of control mechanisms, and variety of the controllers and of the controlled. His argument highlights the political nature of contemporary regulatory regimes: does regulation not only result in the "mere" execution of rules provided in legislation; if we are to gain a better understanding of how regulatory regimes work, we should also be attentive to the interplay between regulators and their political environment—especially, with the stakeholders and the institutions of the regulated sectors of the economy.

2 Playing Regulatory Games

The relationships among regulators, public authorities, regulated firms and other actors (e.g., judicial courts and competition authorities) are affected by institutional and historical circumstances. Depending on the features of the constitutional and general legal regime, regulators develop specific ways of relating to their political environment. For instance, if the constitutional and general legal regime provides an important role for the judiciary authorities, regulators are more subjected to the constraints of laws and less able to exercise discretion in their decisions than in alternative regimes where regulators are granted more independence based on their technical expertise and political accountability. The institutional and historical context, therefore, is a primary condition to take into consideration to understand how the regulatory process unfolds.

The relationships among regulators, public authorities, regulated firms and other actors are generally developed around principles of so-called "resource dependency", i.e., the role that resources or inputs provided from other organizations have on the maintenance and growth of other organizations (Pfeffer and Salancik 1978). The general argument is that organizations need support from other organizations, in such forms as, for example, financial resources, information and political patronage, in order to survive and prosper. Within the context of the regulatory process, regulators need support in the form of funding for their operations (which they can primarily receive from the government), information about the conduct, prices charged, and costs of the regulated firms (which they can mostly receive from the same regulated firms), and political patronage to confirm the legitimacy for their activity (which they can receive from public authorities and, in part, from the general public if they acknowledge that the regulators perform an advantageous function). Also, other actors of the regulated sector, however, can rely on the regulator in order to enhance their prospects for survival and prosperity: for example, the regulated firms can enjoy greater legitimacy for their operations if they show that they comply with the rules set by the regulator. The "legitimacy resource" that infrastructure and utilities firms can gain is important, especially in the eyes of the public that would like to see the tariffs charged for the public services justified on the basis of transparent and accountable processes.

The regulator and the regulated firms generally share mutual interest to support each other with flows of relevant resources (e.g., information exchange and legitimacy). The arrangements that provide stability to such a reciprocal exchange of resources typically result from a series of mutual adjustments (Lindblom 1959), where actors explore and negotiate ways of reconciling their conflicting interests. As Coen (2005) argues, the formation of a relatively stable arrangement for the exchange of resources between the regulator and the regulated entails a learning process, where every actor tends to update their knowledge, beliefs and expectations on the basis of past interactions with other actors and their consequences.

3 The Struggle Between Autonomy and Political Control

The behavior of regulatory institutions can be framed, in part, by issues that arise from the struggle between autonomy and political control. On the one hand, regulators should be relatively autonomous (from political authorities) in their decisions: their statutory mandate is the one to regulate the conduct of infrastructure and utilities firms for the sake of the public benefit in the long term, rather than serving any particular or partisan aims; they should base their decisions on specialized knowledge and technical skills rather than on political considerations; and the regulated firms should trust that the regulators do not behave opportunistically to expropriate their efficiency gains and profits by raising tariffs or service delivery requirements unexpectedly. On the other hand, regulators should be accountable to political overseers for their decisions. As a matter of fact, public authorities often seek to retain political control on the activities of the regulators, especially in the form of retaining centralization of some decisions (e.g., appeals to regulatory conduct and sanctions) in the executive.

Regulatory regimes often include institutional arrangements and regulatory practices that result from the struggles—and compromises—over issues of autonomy and political control of regulators. Tensions may arise among the government, regulatory agencies, regulated firms, consumers and super-national organizations over the extent to which regulations are conducted independently from political overseers. Conflicting interests over the degree of autonomy and political control of regulatory agencies also flourish on the top of ambiguity of rules, which create space for the efforts of actors to steer the regulatory process to their own advantage.

Political overseers may often seek to retain some control of regulators, sometimes when they aim to protect the interests of incumbents. This type of scenario, for example, may take place in the regulation of local public utilities—such as local water distribution and sewage services, local public transport and urban waste collection and disposal. In many cities in the world, the regulation of local public services is an area of municipal policy where local governments aim to retain close control (sometimes, both ownership and control) of public service providers. It is not so uncommon that political control of local utilities results in material advantages to the local executive, for example, in terms of influence on public works, employment and—ultimately—electoral prospects. Local government executives exert influence on local utilities through various means, especially including the appointment as managers or regulators of individuals that are selected from party ranks. Occasionally, the "revolving door" mechanism (i.e., the possibility for individuals to alternate their roles among members of the local government executive, of local regulators and of utilities' managers) results in conflicts of interests that undermine the working of formal regulatory institutions.

As an example, small island nations face a scenario where—for reasons mainly related to the relatively small size of the economy—the government often has strong interests to exert influence on the regulators and infrastructure and utilities service providers. During recent decades, several small island nations have introduced market-oriented reforms that make infrastructure and utilities sector more open to competition than in the past. By and large, however, small island nations lack the type of knowledge, resources and institutional asset base for running regulatory systems effectively. The issues of the struggles between autonomy and political control of the regulators, in particular, are especially salient.

Abbott and Ma (2013) provided some evidence on the establishment of 17 regulatory authorities of telecommunications and electricity industries in small island nations. Some of them (e.g., Guam, Barbados, Virgin Islands and Jamaica) established a multi-sector regulator, while others established separate regulators for each sector (e.g., the Cayman Islands, Iceland and Trinidad and Tobago) or the telecommunications regulator only. They investigated the independence of regulators, which is understood as having:

- an arm's length relationship with the firms, consumers and other private interest;

- an arm's length relationship with political authorities;
- the attributes of institutional autonomy; such as earmarked funding, the ability to recruit staff and exemption from restrictive civil service relationships necessary to foster these arm's length relations; and
- independent decision making competencies (Smith 1997).

Most of small island nation regulators consist of regulatory committees, where members are appointed on a part-time basis and for relatively long periods (five years or more). In only a few cases, are regulators formed only of individuals (e.g., Jamaica, Cyprus, Iceland and Samoa). In most cases, the regulators are funded through industry levies or license fees rather than the government budget. These features of the formal regulatory system are consistent with the principles of independence of the regulators: regulators are more independent if they are formed by committees rather than individuals and if their resources are not dependent on budgetary decisions of the government. It is an empirical matter, however, to assess whether independence is met in practice (Abbott and Ma 2013).

4 Case Study: The Regulation of the Electricity and Telecommunication Sectors in Brazil

The Brazilian authorities for the regulation of the electricity sector (ANEEL, created in 1996) and of the telecommunication sector (ANATEL, created in 1997) were designed according to typical features of IRAs as they had been provided—as "standards of best practice"—by the World Bank and global consulting firms. In principle, the two agencies could operate in a fairly similar way, especially in relation of their independence from the executive and the regulated firms. In practice, relatively small differences between the two IRAs and between the industrial features of the two sectors resulted in different exposures of the two regulators to the threat of erosion of their formal independence.

Most of the regulatory institutions of the telecommunications and the electricity sectors in Brazil were the same, but there were some important differences. The members of ANATEL commission, for example, were appointed for 5 years while those of ANEEL for 4 years. It is generally believed that the longer the term of office the higher the independence of the regulatory commission (in the case of ANATEL, the term

of office of the members of the regulatory committee is longer than the term of office of the country president, that is 4 years). Another difference is that ANEEL has overlapping nominations (i.e., three directors are nominated in the first year of the presidential mandate and two directors are nominated in the second year), while ANATEL has not (i.e., the president can nominate one director per year). In principle, overlapping nominations enable the executive to gain the possibility to influence the regulatory commission faster than "staggered" nominations. It seems, therefore, that ANATEL was provided with more formal guarantees of independence than ANEEL.

One possible explanation for the differences in the design of regulatory institutions in the two sectors relates to the attitudes of bureaucrats—who played an important role in drafting the bills for the creation of ANEEL and ANATEL in the 1990s—towards regulatory independence. Bureaucrats of the electricity sector could be less favorably inclined towards regulating this sector through IRAs for several reasons, including evidence of relatively minor performance of electricity IRAs in other countries, industrial conditions related to the predominance of hydropower generation in the country (that entails the presence of delicate consensual agreements between industrial and agricultural stakeholders), and "revolving doors" between government offices and electricity state-owned enterprises (that made public officers suspicious of losing power and influence if the role of the sector regulator and the electricity operators were more clear-cut) (Prado 2012).

The design of the regulatory institutions in the telecommunications and electricity sectors in Brazil is illustrative of a central problem in regulatory regimes: to what extent are IRAs independent from the executive and from the regulated firms? More generally, how can a regulatory system provide guarantees that the conduct of the regulated firms is oriented towards the benefits for the consumers and the society at large, rather than serving partisan interests of the government or the profit interests of the shareholders of infrastructure and utility firms?

In part, answers to these questions should indicate what type of formal institutions provide better safeguards against the misuse of regulations or the violation of regulatory rules for partisan or private interests. The case of the Brazilian regulation of the telecommunications and electricity sectors, for example, includes the role of two among such formal institutions that typically help safeguarding the independence of IRAs from the executive:

- Term of office of the regulator or of the members of the regulatory committee;
- Staggered—rather than overlapping—appointments of the members of the regulatory committee.

Another principle of independence is that it is more likely to have an independent regulator if the regulatory authority is headed by a committee of members rather than by a single person. There are other formal institutions that are generally included in the design of IRAs, such as, for example (OECD 2014):

- Criteria for the appointment of the regulators should be clearly stated in legislation;
- Appointment of regulators should involve the legislative or the judiciary body in order to make the appointment more transparent and accountable;
- Regulators (and possibly senior officers of the regulatory authority) should not be allowed to take on any role in the regulated industry for a period after the termination of their office as regulators;
- Stakeholders of the regulated industry and members of the Ministry that is relevant to the regulated industry should not be part of the regulatory committee (or governing body), although they can be consulted or heard in formal venues;
- Regulators should report publicly and regularly to the Minister on the fulfillment of their objectives and the discharge of their functions, also possibly with the use of performance indicators;
- Regulators should be provided adequate funding to enable them to operate efficiently and effectively fulfill their objectives.

The presence of formal regulatory institutions, however, does not fully guarantee that rules are not bypassed or violated. If the regulatory system does not include appropriate mechanisms of check-and-balance (e.g., mechanisms of review of decisions, detection of violation of rules and sanctions), then individuals can make decisions that deviate from the way in which the regulatory process is supposed to work. Apart from formal regulatory institutions, it is also important to ponder whether actors actually make decisions that are aligned with the intended working of the regulatory system.

Regulators typically make decisions that are politically sensitive: their choices affect, *inter alia*, how much infrastructure and utilities services impinge on family budgets, how profitable infrastructure and utilities firms are, and how infrastructure networks develop over time. Not surprisingly, regulators may be subjected to various sources of pressures, e.g., from consumers' associations, industrial syndicates, individual firms, labor unions and members of the government. This scenario holds, in general, irrespective of the specific way infrastructure and utilities services are regulated. For example, consumers' associations may try and exert some pressure for keeping tariffs low irrespective to whether tariffs are set by an IRA, or by a public authority that awards a concession contract for the provision of public services, or by a public bureaucracy that set the prices charged for the public service by a state-owned enterprise. It is when regulatory functions are performed by an IRA, however, that the issue of the independence of the regulator from political pressures becomes especially sensitive: aren't IRA supposed to be, well, independent, after all?

The role of IRAs should be understood in relation to the political environment where they are situated. The political environment, especially, includes stakeholders and institutions. The relationship between an IRA and the political environment is a complex and evolving one: any IRA plays the role of one among various actors of a system of governance of the public sphere. On one hand, the IRA exerts some sway on the conduct of other actors—especially, of the regulated firms—while, on the other hand, it is exposed to various sorts of influences from others: some of these influences are intended to try and steer the conduct of the IRA in ways that are advantageous to other actors, while some of them are rather intended to empower the IRA with more legitimacy and resources to fulfil the statutory mandate.

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CHAPTER 7

Regulatory Capacity

1 Improving Regulation in Industrialized Countries

Industrialized countries tend to have an extensive experience with regulation, especially because of the relatively long history of state institutions and early exposure to technological breakthroughs that opened advancements in infrastructure and utilities services. State-led infrastructure development, for example, accompanied nation-building in Spain since 1720 (Bel 2011a). Issues of railways regulation were faced in Britain since the Victorian age (Casson 2009). Many Western countries municipalized local utilities in the period from about 1850 onwards (Millward and Ward 1993). Fascist Italy conducted the privatization of state-owned public monopoly enterprises during the period 1922–1925 (Bel 2011b). While full public ownership characterized most of infrastructure and utilities service delivery systems, since late 1970s, many industrialized countries have embarked in a process of re-regulation, typically combining elements of liberalization of state monopolies and privatization of state-owned enterprises.

At present, many industrialized countries are still developing their capacity to administer regulatory systems. For example, the liberalization and privatization of local public services call for building up regulatory competences and skills at the sub-national level—where local governments may lack human resources and administrative traditions

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for managing regulatory tools and techniques. Some countries confront issues of managing regulation in a coordinated way with other nations, e.g., in telecommunications or energy. It is beneficial, therefore, to undertake an explicit and critical reflection upon the achievements of regulatory reforms accomplished so far, and to ponder whether the present state of regulatory regimes is satisfying or not.

An example of international coordination of regulation is provided within the EU. In 1986, EU Commission president, Jacques Delors, signed the Single European Act strategy, which outlined the prospect for the construction of the EU internal market for electricity. The reform of this sector built on various principles, including the unbundling of monopolistic activities, the introduction of competition in wholesale markets, the gradual extension of competition to the retail level, and incentive regulation of network services. The reform (which took shape with three EU directives in 1996, 2003 and 2009, followed by the infrastructure package in 2013) aimed at both economic and geo-political objectives, in the form of achieving competitive prices through market forces and making domestic markets and industries more interconnected.

After about three decades, most of the original regulatory design has been put into place. Nowadays, the EU wholesale and retail electricity markets have been opened, customers have a choice of suppliers, innovative business models have been introduced, and the cost of grid operation has gone down. The implementation of the reform took a relatively long time, but the achievements are remarkable: no such market opening and integration has been achieved in any other internal, continent-wide market in other "federal-style" governments, such as the USA, Canada, India, China, Russia and Brazil.

The project of the EU electricity market, however, is still far from complete. Various sources of change—such as, for example, the increasing role of renewable energy sources, the growth of shale gas, and the introduction of smart grid technologies—pose novel challenges to the traditional industry structure and dynamics. Several regulations provided by most recent EU directives are still to be enforced. There is also still considerable variation in electricity retail prices across EU countries. The construction of the EU internal electricity market, therefore, still needs additional efforts and refinements (Glachant and Ruester 2014).

That regulation should be understood as a process of improving policies, strategies and tools for steering the conduct of infrastructure and utilities service providers was apparent since the early days of modern regulation. Already, Littlechild (1983) had argued that the regulation

of industries has an "exploratory" nature. Business firms and customers engage in a mutual search for what customers want and which provider offers better services, respectively. Rather than assuming a static view of demand and supply, the market should be conceived as a mechanism to facilitate the discovery of possibilities to match business firms' offers with customers' needs and expectations.

Customers' participation can help the understanding of their preferences and facilitate the discovery process. Customers' participation, however, notoriously has some limitations, especially related to the lack of information, competences, experience and time that they (or their representatives, e.g., consumers' focus groups) have with respect to business counterparts, especially on the most technical issues.

2 Improving Regulation in Developing Countries

Nowadays, many developing countries in Africa, Latin America and the rapidly industrializing Asia have acquired many of the typical traits of the "regulatory state" (Dubash and Morgan 2012). Several of these countries have moved away from direct public ownership and control of infrastructure and utilities and have adopted regulatory institutions, tools and techniques combined with various forms of liberalization and privatization of former state-owned enterprises. There are several reasons for this policy orientation, including the presence of external pressures from international financial institutions (i.e., the implementation of so-called "Washington consensus" to integrate national and regional economies into the global economy).

An issue that arises in introducing infrastructure and utilities regulation in developing countries is that many of these countries have relatively "weak" state institutions. An effect of this condition is that a developing country may formally adopt a regulatory system but lack the capacity to make it work effectively. For example, the staff of regulatory agencies and departments may not possess the knowledge, competences and skills to manage the regulatory tools and techniques. Inexperienced and ineffective regulators may not adequately restrain the conduct of forceful service operators, such as multi-national corporations. The administrative and judicial system may not provide adequate guarantees to investors that property rights are protected and returns on investments are not expropriated. In the worst scenarios, loose accountability and control ties may create opportunities for the outright exploitation of infrastructure and utilities firms by powerful elites for their personal benefit.

The specific features of developing countries' context call for a careful consideration of how regulatory systems should be developed. While the experience with regulation gained in industrialized countries might help, when it comes to designing and managing regulatory systems in developing counties' context it becomes apparent that local institutional and industrial conditions make some of the "lessons" learned in Western countries less relevant. Wren-Lewis (2014), for example, discussed whether the UK regulatory experience could be relevant for the regulation of utilities in Africa. He concluded that the difference in context makes the relevance of the British "model" (i.e., the use of price-caps, the establishment of IRAs and the opening of markets to competition) limited. Taking that into account, it seems unlikely that African countries will embark in a massive privatization of their utilities in the near future. He suggested that they could look at how utilities services used to be regulated under full public ownership in the UK rather than at cutting-edge UK regulation today.

Those developing countries that have followed a trajectory towards the formation of a "regulatory state" have encountered various obstacles along the way. For example, domestic factors, including resistance to give up public ownership and control of state-owned enterprises, protection of public sector employment and preservation of areas of influence for politicians, often played an important role to hold back privatization and liberalization of infrastructure and utilities. Mistrust towards independent authorities frequently resulted in resistance to delegate regulatory functions from central government departments to IRAs, although UK-style regulators could be formally established, albeit left without substantive powers.

An example of introduction of regulatory institutions in developing countries is provided by the regulatory reforms of the telecommunications and electricity sectors in Jamaica and Trinidad and Tobago. These countries' experiences are illustrative of the tendency to selectively introduce "regulatory state-style" institutions and to adjust them along the reform implementation process. The formation of "regulatory state" institutions seemed more complete in Jamaica than in Trinidad and Tobago, however. Lodge and Stirton (2006) provided various arguments for this difference, including the role of external constraints, in the form of fund transfers from multinational organizations, that stimulated more focus on efficiency than on redistribution in the infrastructure and utilities sectors. Instead, there seems to be no greater development of regulatory institutions in one sector than the other one.

Lodge and Stirton (2006) also explain the differences between the two countries on the basis of sectoral rules and, in part, of the conduct of the actors involved in the regulatory policy-making process (i.e., "actors' constellations"). In Trinidad and Tobago, the political environment was characterized by one-party government and shared interest between People's National Movement (PNM) and labor unions to protect public employment. In Jamaica, instead, conflicting views towards regulatory reform rested within the same People's National Party (PNP) government, which could explain observed differences in the reform of the telecommunications and the electricity within the country.

The work of Lodge and Stirton (2006) suggests that the formation of "regulatory state-style" institutions in developing countries is sensitive to local domestic factors. External pressures (e.g., conditional aid and fund transfers from international organizations) may play a role to provoke the rise of liberalization, privatization and regulatory reforms in national policy agendas. We also need to take account of the contingent conditions of the domestic political environment, however, for explaining how regulatory institutions develop in a fine-grained way.

Finally, we should also highlight that in many developing countries there is no apparent tendency to develop "regulatory state-style" institutions. Rather, infrastructure and utilities services are provided by either public ownership firms or by private firms under condition of "unregulated" competition that often fails to deliver efficient and effective services. In many cases, the "unregulated" systems of public service provision also fail to satisfy fundamental criteria of equity and integrity. In such conditions, it is commendable that some governments and, occasionally, actors of the civil society try and orient the systems of infrastructure and utilities service delivery towards improved performance.

An example of "unregulated" provision of public services is provided by local public transport in developing countries, which is often carried out by a multitude of relatively small private operators (which may also operate alongside public ownership firms). With respect to public-sector operators, which tend to employ large buses to search for economies of scale, private operators tend to work with many small vehicles (e.g., minibuses and shared taxis) because they provide more flexibility to adjust to demand conditions and require less capital investment. The service of small private operators, however, is often unsatisfactory due to irregularities, overcrowding, congestion, safety issues, poor maintenance of vehicles and discriminatory practices. Private operators may not adequately

invest to cope with the growth of demand and they may 'cream-skim' the market by serving mainly, or only, the most lucrative segments (i.e., routes).

The "weak" institutional endowment of developing countries helps explaining the dismal traits of the systems of local public transport. Countries such as, for example, Sri Lanka and Pakistan provide instances of poor law enforcement (e.g., on driving safety, smoking ban, etc.), the use of unregistered and not-licensed vehicles, unofficial payments to get permits and route allocations, drivers and conductors hired as casual laborers, difficulty to get compensation when involved in accidents with operators, and poor infrastructure and road maintenance (that especially threatens pedestrians' safety). These features of the institutional environment are occasionally accompanied by deplorable conducts, such as drunkenness of drivers and harassment of women and girls. Within such context, performance dimensions such as quantity (i.e., adequate allocation of service capacity) and quality (i.e., safety and integrity) are as much—if not more—important than price as focus of regulation.

Developing regulatory capacity in such type of context conditions is a daunting task, but some initiatives of the governments and the civil society are encouraging. In Sri Lanka, the government took a proactive role in restructuring the local public transport industry, by setting the requirement that private companies should have a minimum capacity of 50 vehicles—although this policy also acts as a barrier to new entrants. In the city of Faisalabad in Pakistan, the establishment of a social welfare company, Faisalabad Urban Transport Society (FUTS), provided a venue for citizens' participation in the design of the local public transport service and the monitoring of service delivery (Sohail et al. 2006).

3 Building Regulatory Capacity

It is generally acknowledged that the institutional endowment of a country is a critical factor in the economic success of the economy. Economists have gradually paid more attention to the role of institutions, which are important because a market economy can work well if there are adequate rules (i.e., constitutional guarantees, laws and regulations on the one hand, and conventions, customs and norms of behavior) in place (North 1990). The institutional endowment of a country is also fundamental for the development of well-working regulatory systems, which should possess these characteristics (Kirkpatrick and Parker 2004):

- regulators should be able make credible commitments;
- political control should not be arbitrarily exercised;
- a developed legal code should make regulatory appeals predictable;
- competition policy should complement sector regulation (e.g., by providing terms for consumers' protection);
- the macroeconomic context should be relatively stable (e.g., low inflation and stable exchange rate).

Building regulatory capacity is sensitive to the "quality" of a country's institutional endowment. It should be highlighted, however, that many obstacles to the construction of regulatory capacity also appear in countries that possess relatively well-developed, fully-fledged political and economic institutions. In any country, sources of resistance to regulatory reforms may originate from vested interests in the preservation of the present state of an infrastructure or utility industry. Also, in many countries the adoption of new regulations often entails the development of novel administrative systems, tools and techniques that the governmental bureaucracy may not possess. Building regulatory capacity, therefore, is a challenge that should be always taken into consideration when reforming the regulation of infrastructure and utilities.

A case about the efforts to develop the capacity to administer a new regulatory system is offered by the introduction of the EU model of electricity regulation in South-East Europe (SEE), a region that comprises several countries (Albania, Bosnia-Herzegovina, Bulgaria, Croatia, Greece, Macedonia, Montenegro, Romania, Serbia, Slovenia, Turkey and—at present—the special administration United Nations Interim Administration Mission in Kosovo). The prospects to "transfer" an external regulatory model (EU electricity regulation) to new countries calls for considerable restructuring of the present institutional and industrial arrangements. Many questions arise, then, concerning how countries should manage the transition to the prospective regulatory scenario.

Pollitt (2009) highlighted numerous issues that SEE countries may encounter when reforming the regulation of their electricity sectors. Generally, SEE countries are characterized by adverse context conditions, in the form of corruption, skeptical public attitudes towards competition, free markets and private ownership, and the realities of political power in developing countries. More particularly, SEE countries should take into consideration that the adoption of the EU model of electricity regulation calls for the development of adequate human resources, in the form

of highly skilled staff of the regulatory agency. Because of the relatively small size of most SEE countries, moreover, they should also consider forming a regional-scale electricity market rather than merely domestic ones, otherwise they would not fully reap the benefits from the regulatory reform with respect to the costs of transitioning and setting up the new regulatory system.

Additional sources of concern arise from the political management of the reform, provided that, most likely, prices are expected to rise in the early post-reform stage (because of the tendency towards full cost recovery) while their reduction—triggered by investments, efficiency gains and competitive pressures—may only materialize at later stage. More generally, managing the transition to new regulatory systems calls for relatively stable governments and consistent policy intention over time, provided that various sources of domestic (e.g., resistance from incumbent operators and labor unions) and international (e.g., international trade, financial and currency exchange conditions) factors expose the course of the regulatory reform to the risk of derailment.

Issues about the development of regulatory capacity are repeatedly encountered in the world. Nepal and Jamasb (2015), for example, explained that the application of market-oriented reforms and re-structuring of the electricity sector in Nepal and Belarus resulted in unwelcome effects in terms of price hikes for reasons that include privatization without adequate measures to liberalize and develop regulatory capacity. They recommend that governance reforms are also needed to reduce corruption and shortcomings in revenue collection.

It should be highlighted that the development of regulatory capacity is an issue that can be faced also in countries with relatively "strong" institutional endowments. In some regions of the world, for example, there have been efforts to establish international agreements for coordinating domestic regulatory systems, especially in the form of "super-national regulators", e.g., in the electricity and telecommunications sectors. The design of such super-national regulatory systems, however, is complicated by the many issues that arise from the political, institutional and operational conditions needed to support such arrangements. Various sources of resistance include, for example, interests to protect national companies from foreign competition, differences between different legal systems and traditions, and diverse technological standards. There seems to be a long way forward before building the regulatory capacity to administer regulatory systems at the super-national level.

Many developing countries have also experienced a tendency towards the delegation of regulatory functions to sub-national governments, which calls for the development of regulatory capacity at the local level. Traditionally, local governments have long been involved in the provision of local public services, such as water distribution and sewage, urban waste collection and local public transports, often through full public ownership firms or municipal departments. The opening of markets for local public services during recent decades, sometimes coupled with the privatization of local utilities, was accompanied by the introduction of novel regulatory tools and techniques—such as, for example, tender offer competitions for the award of franchise contracts, price-caps and performance benchmarking—for which many local governments had relatively little experience in the past. With respect to setting up regulatory systems at the national level, however, in sub-national governments special issues arise from the lack of highly skilled staff and the modest size of local public services markets, which prevent reaching economies of scale in running regulatory authorities.

A case of development of regulatory capacity in an industrialized country is offered by the urban waste sector in Portugal. In the early 1990s, Portugal lacked suitable facilities for urban waste treatment. Also taking account of requirements that originated from EU directives (concerned with deviating biodegradable waste from landfill and recycling and recovering packaging waste), in late 1990s, the central government took the initiative to restructure the urban waste industry by establishing a "two-tier" sub-national system for regulating and managing wholesale and retail urban waste collection and disposal. At the regional level, the state (possibly in partnership with local governments and private business) managed waste treatment, while at the local government level, the municipalities were charged with urban waste collection. The reform also included the creation of a sector-specific regulator (Institute for the Regulation of Water and Waste, IRAR, later replaced by the Regulatory Authority for the Water and Waste Services, ERSAR), which was not given any power to set tariffs (IRAR only provides recommendations in this respect), but it required waste management firms to disclose their performance according to a set of standard indicators that would be publicly disclosed and compared ("sunshine regulation").

After the reform, several private operators entered the sector, in both the urban waste wholesale and retail markets. At the regional level, most of activity was carried out by concessions awarded to mixed-ownership

firms whose majority shares were held by EGF, a state-owned company. The rest of the wholesale market was populated by regional municipal companies, associations of municipalities and (in a few cases) by private companies. At the municipal level, most of activity was directly carried out by local governments, which could contract-out services through short-term contracts. The rest of the retail market consisted of semi-autonomous utilities and municipal companies.

Portugal has made remarkable progress in the performance of the urban waste sector since the 1990s. Many issues are still open, however, especially regarding setting tariffs for full cost recovery, improving efficiency and clarifying regulatory and operational roles among the state, sub-national governments and operators. If the sector is to move towards greater reliance on private concessionaires, moreover, sub-national governments are expected to develop more regulatory capacity, especially with respect to negotiating, setting and monitoring tariffs. At the central level, instead, the capacity of IRAR to conduct performance benchmarking could form the basis for developing stronger regulatory functions (Marques and Simões 2009).

The expansion of regulatory functions at the super-national and the sub-national levels is related to the emergence of so-called "multi-level regulatory governance", i.e., the participation of authorities from different layers of government to the regulatory process (Doern and Johnson 2006; Rodrigo et al. 2009). In principle, multilevel regulatory governance offers the possibility to cope with different issues in the regulation of infrastructure and utilities at the most appropriate level, such as, for example, the provision of uniform standards for the assessment of performance across various jurisdictions, the supply of technical and legal assistance to sub-national governments from central governments and the opening up of venues for participation of citizens and consumers in the regulation of utilities at the local level. In practice, multilevel regulatory governance calls for considerable efforts to induce governments at different levels to cooperate with each other—especially when issues arise concerning the constitutional or statutory competences on regulatory domains—and to coordinate their regulatory activity.

4 Case Study: The Regulation of District Heating in Germany

In Germany, district heating provides service to about one million homes (about 14% of the heating market). In 2012, the industry included about 560 operators with various ownership structures—from large transnational companies to municipally-owned entities. District heating firms are not typically in competition with each other, as each district heating network is isolated and not connected with any other heating source. Customers have no choice of supplier, and there is no wholesale market due to technological limitations. Regulation of district heating is rather simple and mainly consists of controls on prices at end-user level.

The local district heating distribution network is an "essential facility"—a fundamental technological component of service operation system that cannot be conveniently duplicated. There is no law or regulation in Germany, however, that provides potential entrants to a local district heating market the "right to access" the local distribution network. Although, in principle, the right to access was provided by the general national competition law, it was not until a complaint, filed in 2011, by the consumer protection agency, Hamburg, against the district heating company, Vattenfall Europe AG, that the right to access local distribution networks was explicitly acknowledged by the national competition authority.

Additional issues in the regulation of district heating arise from the difficulty to exactly distinguish and quantify the cost of operations from other activities, and the cost of heat production from the cost of heating service distribution. In principle, mandatory accounting unbundling may help clarifying distribution costs and tariff setting. In practice, district heating firms are tempted to "shift" cost from one activity to another in order to maintain as many costs embedded in the end-user district heating price as possible (a conduct known as the "waterbed effect"; Schiff 2008). These issues have been encountered in the regulation of district heating in Germany, and they tend to make the final price control ineffective. Some consideration has been granted to switch from a cost-recovery to an *ex ante* tariff setting method (Wissner 2014).

In regulation, the devil is in the details. As the case of district heating in Germany suggests, we often need to pay careful attention to features of the legislation and of mandatory requirements in order to grasp how a regulatory system works. Sometimes, the regulatory system lacks some

fundamental pieces (e.g., explicit access rules) that throw industry players into uncertainty. Most of the times, uncertainty plays at the advantage of the incumbents because they have already sunk their investments, while potential new entrants into the regulated industry are kept at bay. Sometimes, the regulatory system works based on information that the regulated firms should pass to the regulator (e.g., on operational costs). The regulated firms, however, may find it advantageous to obfuscate accounting or performance information in order to make the regulator believe that they are behaving well and that it is not a case for tightening up regulation.

More generally, the issues encountered in making a regulatory system work relate to building the capacity to administer regulation. With the phrase regulatory capacity, we typically refer to the ability of public authorities to manage and enforce regulations. It relates to the application of the authority of governments and regulators to steer the conduct of target groups, such as, for example, business firms, public service providers, consumers or citizens. A "strong" regulatory regime is one where regulatory policy decisions are followed-up by the targets of regulations (Kjekshus and Veggeland 2011). A "weak" regulatory regime, instead, is one where regulations are not fully enforced, i.e., where target groups do not adjust their conduct in relation to the regulatory tools and techniques that have been adopted. Regulatory capacity also relates, then, to the difference between putting a "formal" regulatory system in place (e.g., the enactment of laws that provide authority to apply regulatory tools and techniques) and the "actual" regulatory practices (e.g., the extent to which regulations affect target groups' behavior). In a "weak" regulatory regime, formal regulatory institutions may be in place but they are irrelevant for target groups, who find their way to bypass or circumvent them.

How well do countries (and sub-national governments) in the world enforce their regulations? There seems to be considerable variety, also across regions and sectors within the same countries. In some cases, the state has been able to set up reasonably well performing regulatory systems, which may be subjected to further "fine-tuning" depending on emergent circumstances. In other cases, the state lacks a well-developed institutional environment and adequate administrative systems for managing the regulatory process. Lot of effort is exerted to help governments (and sub-national governments) strengthen their regulatory institutions: in part, countries may learn from the experiences of

others and pursue the transfer of successful regulatory policies implemented elsewhere; in part, countries also need assistance to build their own policy and administrative capacity to design and effectively enforce regulations.

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CHAPTER 8

Case Study: The Reform of the Water Sector in Italy in 1994–2001

1 The Implementation of the Water Reform in 1994–2001: An Overview

After Act 36/1994 came into force, in January 1994, officers working in both the central and regional governments began parallel efforts to set up the new water regulatory system. At the central government level, officers focused on the formulation of the rules for the eligibility to manage the integrated water service, for the award of water concessions and for water tariff setting. At the regional government level, the main task at hand consisted of drafting bills for "transposing" Act 36/1994 into regional legislation. The water reform provided that regional legislations should include, in particular, the definition of the territorial boundaries of the OTAs and the specification of some parts of the new regulatory system, such as, for example, providing the eligibility criteria for applying the exemption regime to incumbent water firms.

At the local government level, the passing of the water reform did not stimulate much efforts to put the new regulatory system into effect. Local governments were generally reluctant to take part to the consultations on the definition of the OTAs, and regarded the water reform as threatening their established positions within the local water industries.

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Inertia prevailed for a few years, until, in 1997, changed features of water infrastructure policy—namely, new subsidies provided for improving wastewater and sewage networks—awoke sub-national governments from their torpor. Slowly but decisively, from 1997 onwards, a growing number of local governments reached agreement on the OTAs, an increased number of regions passed the required legislations, and a larger number of water infrastructure development plans were prepared. By 2001, relatively little of the new regulatory systems had been put into place, but actions made by sub-national governments suggested that the course of the reform implementation could not be reversed or blocked anymore.

While the establishment of the new regulatory system was under way, various incumbent local government-owned water firms embarked in operations of massive restructuring and consolidation. In Tuscany, for example, several local government-owned water firms re-incorporated as business companies and merged into new entities, such as Nuove Acque (established in 1999 and serving the area around Arezzo) and Publiacque (established in 2000 and serving the area around Florence and Pisa). In other regions, the local government-owned water firms of various major cities, such as Rome (served by ACEA), Genoa (served by AMGA) and Turin (served by SMAT), increased size through mergers and acquisitions and expanded the range of their activities outside the municipal territories. As a result of these operations, by 2001, several local government-owned water firms had positioned themselves as credible candidates for the award of water franchises, once the new regulatory system would be fully established.

The implementation of these parts of the water reform proceeded at different pace in various regions of the country. The region Tuscany, in particular, promptly transposed the water reform into regional legislation in 1995—remarkably faster than any other region. Within Tuscany, some local governments, especially located in the Alto Valdarno area, came to establish OTA authority relatively quickly, and their OTA authority already approved water infrastructure development and tariff plans since 1998 and awarded the water franchise in 1999. During the same period, most of the OTAs in the rest of the country had not been defined yet, nor had other local governments established any OTA authority. Setting the Alto Valdarno experience aside, therefore, by 2001, the implementation of the water reform had proceeded slowly in most of the country.

2 Aligning Regional Legislation to the National Water Reform (1994–1997)

In January 1994, the regional governments invited local governments to participate to the process of drafting the regional legislation, which was required to enforce the water reform at the regional level. According to Act 36/1994, local governments were expected to make proposals on the definition of the territorial boundaries of the OTAs. Defining the boundaries of the OTAs would determine which local governments were to collaborate with others to establish the OTA authorities and pool together their water management and water regulatory functions. The design of the OTAs, therefore, bore important implications for the rest of the water reform implementation. Larger OTAs implied that several local governments would pool together their water functions into relatively bigger firms. Smaller OTAs, in contrast, meant that water services would be provided by relatively small water firms, which would focus their operations in tiny user basins.

When called to take part to meetings with regional governments, local governments contended that they were incapable of making any decision on the definition of the OTAs. They claimed that, since Act 36/1994 did not detail the rules about how the water tariff would be set and what eligibility criteria would be applied for exemption of incumbent water firms from the application of the water reform, they missed some important pieces of the new regulatory system that they would take into account in order to design the OTAs. Such argument, however, masqueraded local governments' deep-seated aversion towards the core principles of the water reform—especially the overturn of the "municipal model" of water service provision. In a later commentary on the attitudes that local governments held towards the new water regulatory system, the Supervising Committee on the Use of Water Resources noticed that, at the local level, there was "a widespread belief that direct management was the best possible way to manage [water services], and that spoiling [local governments] of the direct management of water services was a sort of offence, the effect of a 'self-conscious act of violence': some local governments even referred to it as a 'robbery'" (Report to the Parliament on the State of Water Services 1998).

Generally, local governments tended to rely on the "municipal model" of water service provision for reasons that were deeply rooted in the political economy of the local water industries. Some insights into the

role that water played in local governments' politics was provided by a manager of a water firm, who commented on the behavior of local governments in this way:

> The Galli law affected the vicious circle among politicians, water firms' managers and the voters. The mayor loses power if water is managed by someone else outside the local government, as water has always been important for electoral purposes. We can even quote a movie, 'The Postman' [1994], where a local politician gains the votes for his election by promising to bring water supply to the town. [Local government-owned] water firms were afraid to lose their role and not to be protected, while local politicians perceived that the Galli law could spoil them of their power. (interview with the author, September 2001, Rome)

Rather than defining the OTA boundaries, generally, local governments were concerned with obstructing the establishment of the new regulatory system. They tried to either delay the implementation process, or to exploit the exemption clauses in order to allow their incumbent water firms to retain their position in the water industry, or both.

In April 1995, the Supervising Committee on the Use of Water Resources, which had been established on December 21, 1994, advised Minister of Public Works, Paolo Baratta, that, at that time, no region had passed any legislation to implement the water reform yet. After the notification, Baratta could exercise the substitutive powers of the central government by sending special commissioners to the regions that had missed the deadline set by Act 36/1994, which had expired in June 1994. Baratta chose not to pursue this option, on the basis that most of regional governments were still regaining stability after the corruption scandals, which took place in 1992–1993, and taking over their competences could send a potentially destabilizing signal to the local political environments. Rather, he tried to encourage the regions to pass the required legislation through more indirect means. In August 1995, he led the Committee of Ministers for the National Technical Services to approve various regulations concerning the criteria for the definition of the OTA territories, for the organization and management of water services, for planning water infrastructure development, for drafting the general regulatory water plan and for sharing water resources between conflicting uses. After that, he expected that local governments would have no more excuses for not defining the OTA boundaries. As he said in an interview with the press in August 1995 (La Repubblica, August 15, 1995):

> We have quickly recovered the time lost and completed issuing the required regulations. Now it's the turn of local governments. We have already solicited them and we are available for everyone who needs a technical support on this matter. I hope that it is not necessary, but if it is, we will activate the substitutive powers which are provided by the law and we will eventually propose new rules to facilitate the transition to more effective water service management.

No substantive action was undertaken until a change of government took place in May 1996. After coming to office, the newly appointed Minister of Public Works of the Romano Prodi government, Antonio Di Pietro, reviewed the state of national infrastructure development programs and realized that water infrastructure works had been carried out with considerable delay with respect to the schedule. The southern regions of the country, in particular, risked losing appropriating funds made available by the 1994–1999 Community Support Framework (CSF), a EC program for funding infrastructure development, if they did not speed up submitting funding applications. Then, on June 1, 1996, Di Pietro sent a letter to regional governments urging them "to transmit the projects related to new or ongoing infrastructure development works within 30 days." He also invited the regional governments to a meeting at the Minister of Public Works on June 25, where they would jointly review the state of the implementation of the water reform.

At the June 25, 1996 meeting, Di Pietro recognized that the implementation of the water reform had been largely neglected. At that time, regional legislations had been passed in Tuscany and Lazio only. Some of the regions (Basilicata, Calabria, Piemonte and Umbria) were still debating bills in the respective regional councils. Others (Abruzzo, Campania, Emilia Romagna and Marche) had not even started any debate yet, although the respective regional governments had submitted some bill proposals. In other regions (Friuli Venezia Giulia, Molise, Sardinia, Sicily and Veneto) a proposal had just been drafted by the relevant technical committees. In Lombardy and Puglia, no substantial action had been taken at all. Di Pietro urged the regional governments to move faster in passing the required legislations, otherwise—after a deadline that he set as December 31, 1996—he would exercise the central government's substitutive powers.

The regional governments objected that they could not progress in the implementation of the water reform because no regulation of the new tariff system had been issued yet. Di Pietro, then, turned his

attention to the accomplishment of this task. On August 1, 1996, he issued the regulation of the new water tariff system (the so-called "normalized method"), that included a formula based on an econometric model of the average efficiency of water firms in the country and some discretionary parameters, especially the annual return on capital invested that water firms were allowed to earn. This normalized method would play a key role within the water infrastructure development and water service management plans. Its function was illustrated by Giancarlo Galli, member of the Supervising Committee, in an interview with the press (Il Sole 24 Ore, August 12, 1996):

> We have decided a methodology for calculating operating costs, and also we set the criteria for the maximum allowed increase of the water tariff over time, on the basis of the reference tariff of the specific watershed river basin. The [increase of water tariff] takes into account the production costs, but it is also limited by a price cap in order to protect the users, based on the British model. For example, let's think of a watershed river basin which needs to build new treatment plants and new distribution networks; the local authority may decide to repay the investment in 20 years, by gradually increasing the water tariffs, or to increase water tariffs up to the maximum cap allowed and repay the investment faster. The price of water is going to increase, but in relation to the improvement of the service and the remuneration of the investment made. In the Supervising Committee, we decided to set a 7% return on capital invested.

Even after the approval of the new water tariff regulation, the regions did not progress much further in passing the required legislations, however. While the December 31, 1996 deadline was approaching, Di Pietro repeatedly reminded the regions of the pending threat. In an interview with the press (La Repubblica, November 5, 1996), for example, he said:

> The law gives me the possibility to intervene and I am willing to use the substitutive powers on those regions—most of the regions—which have not established the Optimal Territorial Areas yet, which are needed for the management, control and rationalization of water resources. (…) On January 1, 1997, I'll personally take care of those regions which do not comply with the task of establishing the Optimal Territorial Areas as required by the law. One day only will be enough for me to bring this game to an end.

Di Pietro's threat, however, could not materialize because, on November 14, 1996, he resigned from his office.

In February 1997, Di Pietro's successor, Paolo Costa, who had been appointed Minister of Public Works on November 20, 1996, asked the Chairman of the Council of Ministers to send an intimation to the regions that had missed the December 31 deadline—that is, all the regions except for Tuscany, Lazio, Basilicata (that had established the OTAs with Regional Act 63 issued on December 23, 1996), Piemonte and Abruzzo (whose regional laws were, at the time, under the scrutiny of the government commissioner)—to comply with the transposition of the water reform by the new deadline set as March 15, 1997. The intimation seemed to generate a sense of urgency for transposing the water reform, but only a few regional governments came to pass the required legislations, namely Piemonte, Abruzzo, Calabria, Campania, Sardinia and Umbria. After the expiry of the March 15, 1997 deadline, Costa initiated the procedure for commissioning the defaulting regions.

3 Implementing the Water Reform in Alto Valdarno (1994–1999)

Differently from the rest of Italy, in part of Tuscany the implementation of the water reform proceeded at relatively rapid pace. In one such area, called Alto Valdarno, local governments had been negotiating the centralization of water service provision since 1990 (Lobina 2005). At that time, the gas firm, Coingas, owned by the municipality of Arezzo, had proposed to the mayor of the same city, Valdo Vannucci, to let the firm develop into a multi-utility company operating in both the gas and water industries. Having gained the support of the center-left parties that backed the city executive, in October 1992, Coingas submitted a plan that provided that the firm would be re-incorporated as a municipal company and would be assigned the water concessions of Arezzo (which directly managed water services at that time) and of 24 other neighboring local governments. The Coingas plan was approved, first, by the Arezzo city council in December 1992 and, later, by all the other 24 local governments by October 1993.

Within this historical context, after the coming into force of the water reform, local governments of this part of Tuscany carried out the task of defining the OTA boundaries relatively rapidly. Local governments of the Alto Valdarno area had already agreed to centralize their water management functions in one single water firm, that would service a larger

territory than those of single municipalities. Following the lead of Alto Valdarno, moreover, local governments in other areas of Tuscany had already taken into consideration the merger of their water service providers. More generally, local governments in Tuscany were prepared to define the OTA boundaries, in the sense of having already gone through part of the negotiations needed to agree on the territorial organization of centralized water service provision. Having received the required input from local governments, the Tuscany region already passed the regional legislation in 1995 (Regional Act 81/1995).

In 1995, the support for the Coingas plan dissolved after the formation of a new center-left coalition executive in Arezzo, chaired by the mayor, Paolo Ricci. Following the political orientation of the regional branch of the leftist Democratici di Sinistra (DS) of that time, Ricci favored the formation of mixed public-private ownership companies rather than municipal companies for the management of local public services. The Coingas plan was overruled based on lack of transparency that would arise from cross-subsidization between the gas and water activities, and of the modest experience of Coingas in managing water services. In February 1996, the city council of Arezzo approved, instead, Ricci's proposal to establish a local government majority-owned water company (the local government of Arezzo would hold 95% of the water firm, while the remaining 5% would be owned by local banks), to whom local government would assign the management of their local water services.

Local governments seemed to prefer establishing mixed public-private ownership companies, rather than municipal companies, for a variety of reasons. First, a mixed public-private ownership company allowed a clearer separation between the planning and control functions (retained by local authorities) and operational management (carried out by the firm), as provided by Regional Act 81/1995. Second, the company laws regulating mixed public-private ownership companies allowed more managerial flexibility than the administrative laws that regulated municipal companies. Third, mixed public-private ownership companies could allow local governments to benefit from the expertise of the private owners in managing water services, especially if they included other water companies. Fourth, mixed public-private ownership companies could more easily access financial resources, which were needed to fund local water infrastructure development, than municipal companies. For all these reasons, the organization of local public services through mixed public-private ownership companies elicited the appreciation of

several local governments in Tuscany, and, during the next years, in other regions too. In national academic and professional water community circles, it became to be addressed as "the Tuscany model", because of its very first conception and practical application in this region of the country (this form of organizing water services was later adopted in all the 6 OTAs established in Tuscany).

The decision of the city council of Arezzo could not be implemented, however, because of violation of the terms of the water legislation. In March 1996, the Regional Control Committee (the regional branch of the Court of Auditors, charged with the task of verifying the legitimacy of the decisions of the regional and local governments) declared that Arezzo's city council was not entitled to award any water franchise, because the water reform had assigned this prerogative to the OTA authorities. Promptly reacting to the decision of the Regional Control Committee, Arezzo and the other local governments included in the OTA Alto Valdarno and established the OTA Authority just the day after Arezzo city council decision was annulled. The OTA Alto Valdarno Authority was established as a consortium of local governments, where each municipality participated in proportion to the respective population. The local government of Arezzo, for example, accounted for 31.02% of votes and capital contribution. After the region Tuscany completed all the details of the transposition of the water reform in April 1997, in July 1997, local governments of the OTA Alto Valdarno decided that the OTA Authority would award the water concession to a mixed public-private ownership company and that a minority share of this company would be tendered out to private operators and investors.

Within a couple of years, the OTA Alto Valdarno Authority progressed to complete the implementation of the water reform by awarding the first water franchise in the country. After the approval of the water infrastructure development and tariff plan in June 1998, on October 3, 1998 the local governments of Alto Valdarno published a call for tender offer for selecting the private partner for the water company that they would form by merging their incumbent water operators. The call, that set relatively demanding requirements, was answered by only three applicants: one bid was submitted by a syndicate led by the French multinational, Suez-Lyonnaise des Eaux; another by the French multinational, Vivendi; and another by the water company owned by the municipality of Rome, ACEA. On January 14, 1999, the OTA Authority's selection committee ruled that the tender offer competition had been won by the syndicate

led by Suez-Lyonnaise dex Eaux (that held a share of 51%), which included AMGA (35%), a local artisans' association, Iride (10%), and the banks, Banca Popolare dell'Etruria e del Lazio and Monte dei Paschi di Siena (2% each). After local governments finalized their negotiations for merging their incumbent water operators, on May 21, 1999 they made the OTA Alto Valdarno Authority award a 25-year water franchise to the mixed public-private ownership firms called Nuove Acque, owned by the local government (54%) and by the Suez-led consortium (46%).

This award of the first water concession in the country marked an event of important symbolic relevance. The business press praised the implementation of the water reform in the OTA Alto Valdarno as the "showcase" of innovative practices for water regulation and governance (Il Sole 24 Ore, June 21, 1999 and August 2, 1999), arguing that local governments of the OTA Alto Valdarno would benefit from the award of the water franchise in terms of prestige, attractiveness of investors and high consideration from the regional and the central government. The regional government of Tuscany had succeeded in showing that local public services could be awarded to mixed public-private ownership companies. Most of all, water policy experts heralded the award of the water franchise to Nuove Acque as evidence that the water reform could be implemented, eventually.

4 Aligning Regional Legislation to the National Water Reform (1997–1999)

The implementation of the water reform abruptly accelerated from 1997 onwards, when the central government took the initiative to improve the quality and capacity of sewage and wastewater treatment systems in the country. The policy initiative led to the enactment of a piece of legislation (Act 344/1997) that allocated public funds for a program intended to improve the state of the sewage and wastewater treatment infrastructure. The program also aimed to comply with the environmental standards set by 91/271/CEE directive, that the EC Commission had issued in 1991 and that the Italian government had not implemented yet. The legislation passed in 1997 provided that the central government would assign funds to the regions on the basis of plans prepared on an OTA-by-OTA basis. The definition of the OTA boundaries, then, was an essential requisite for the appropriation of shares of the budget for infrastructure development.

The 1997 legislation also included the provision that, in the event local governments did not come to an agreement on the definition of the OTA boundaries, the water administrative areas would correspond to the territories of the provinces. This provision was included in the bill by the Environment and Environmental Goods Committee of the Senate, who might have considered that the implementation of the legislation under consideration could be blocked by the same constellation of factors that had hampered the implementation of the national water reform. At that time, senators had been informed that local governments were not collaborating to define the OTA boundaries by the Supervising Committee on the Use of Water Resources, that had recently presented to the Parliament its first annual report on the state of water services and the implementation of the water reform. To prevent implementation failure, the Environment and Environmental Goods Committee adjusted the proposed legislation, so that resistance of local governments could be bypassed by imposing the territory of the provinces as "default" definition of the OTA boundaries.

After the enactment of the 1997 legislation, the issue of OTA formation was quickly raised higher in local governments' agendas. Local governments were generally eager to appropriate funds for infrastructure development within their jurisdictions. They were also interested, however, in asserting their prerogatives on the organization of local water services rather than letting the regions sanction the OTA boundaries as corresponding to the territories of the provinces. For some time, local governments engaged in lengthy and fruitless negotiations concerning the design of OTA authorities according to watershed criteria. Eventually, however, they came to agreements by resorting to criteria related to the mere territorial extension of the existing administrative jurisdictions. In twelve regions, the OTA boundaries resulted equal (or very proximate) to those of the provinces, while in five other regions they were set as corresponding to the entire regional boundaries. Only in Tuscany and Campania (that had progressed relatively fast in the design of the OTAs in ways similar to Tuscany) were OTAs defined according to watershed areas.

Special attention to the issue of the definition of the OTA boundaries was placed in the southern regions of the country. In 1998, the central government issued regulations for the appropriation of funds provided by the 2000–2006 Community Support Framework, which established a link between the funding scheme and the implementation of the water

reform. The regulation provided that extra funds would be granted if the regions passed the regional legislations for transposing the water reform, if local governments established the OTA authorities, and if the OTA authorities formulated water infrastructure development and tariff plans. In order to fulfill these requirements, local governments located in the southern regions became especially concerned with speeding up the definition of the OTA boundaries with respect to their central and northern counterparts.

Once sub-national governments settled agreements on the definition of the OTAs, the number of legislations passed by the regions quickly increased. While only three regional legislations had been passed by 1996, the total number of regional laws that transposed the water reform grew to nine by the end of 1997, 13 by the end of 1998 and 18 by the end of 1999. In the north-eastern border region, only Friuli-Venezia Giulia was the water reform not transposed into regional legislation until 2005. Within 1997–1999, then, the regions recovered lost ground with respect to the original water reform implementation schedule.

5 Establishing the OTA Authorities (1997–2001)

After the regions passed the required legislations, the issue of establishing the OTA authorities gained attention in local governments' agendas. Establishing the OTA authorities entailed that local governments included in each OTA negotiated the terms for pooling their water planning and regulatory functions. Local governments should choose whether to establish the OTA authorities as a reciprocal contractual obligation ("convenzione") or as organizations jointly owned by local governments ("consorzi"), and what rules would affect the management of the OTA authorities, the mechanisms for financing them, the terms for awarding the water concessions, and the regulatory powers that the OTA authorities would exercise.

Local governments' attention towards the issue of establishing the OTA authorities grew as they became increasingly exposed to information about other parts of Italy where OTA authorities had been already established. The early experiences of implementing the regulatory reform in Tuscany, in particular, were a common reference within the ongoing discourse of the national academic and professional water community circles. In Alto Valdarno and neighboring OTAs, local governments had progressed relatively rapidly in the establishment of the OTA authorities.

Since then, water policy experts, who maintained contact with each other especially through the association of municipal water and gas companies, Federgasacqua, channeled accounts of Tuscany's experience as an advantageous one for local governments. In Alto Valdarno, indeed, local government-owned firms had merged into a relatively large business company partially owned by the multinational corporation, Suez-Lyonnaise des Eaux and local financial investors. Far from losing their influence on local water industries, local governments understood that they had rather gained the opportunity to generate job appointments and public contracts at a much larger scale than the municipal service areas, setting aside the prospects for a more efficient and effective water service delivery.

The establishment of the OTA authorities proceeded rapidly, especially in the southern regions of the country. As already explained, in 1998, the central government issued regulations for the appropriation of funds for infrastructure development provided by the 2000–2006 Community Support Framework that offered extra funding if local governments established the OTA authorities. Local governments in the southern regions, then, anticipated that, by establishing the OTA authorities, they could benefit from stimulating further infrastructure development within their municipal jurisdictions. Such material incentive made sub-national governments in the southern regions favorably inclined towards establishing the OTA authorities, although such a task was generally performed as an act of fulfillment of an administrative requirement rather than as a component of a deliberate strategy to re-regulate water service provision.

All in all, the number of OTA authorities established in the country grew steadily from 1997 onwards. After the establishment of the OTA Alto Valdarno Authority in 1997, the total number of OTA authorities raised to 20 by the end of 1998, 30 by the end of 1999, to 48 in 2000 and 74 in 2001—out of 89 OTAs that had been defined by that time (Fig. 1). Within a few years' time, then, most of local governments had decided to centralize their water planning and regulatory functions. While the establishment of the OTA authorities had languished during the initial period 1994–1997, after a "turning point" in 1997, the process speeded up and resulted in a partial satisfactory outcome by 2001.

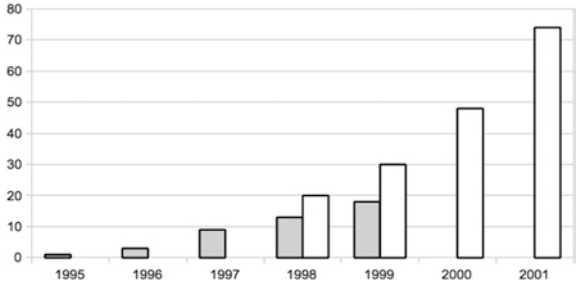

Fig. 1 Total number of regions that passed regional laws for transposing the national water legislation (*grey bars*), and total number of OTA authorities established (*white bars*), per year (author's elaboration)

6 Awarding Water Franchises (1999–2001)

After their establishment, the OTA authorities started to award water franchises. As a preliminary task, OTA authorities first embarked in the survey of the installed water infrastructure. Since the newly established OTA authorities generally lacked resources, surveys were often carried out by local governments or by the regions or, on a few occasions, by the same incumbent water firms. In the southern regions of the country, the survey of water infrastructure was accomplished by Sogesid, a central government-owned agency, which had been established in 1993, and charged with the task of managing the water infrastructure formerly developed within the "Cassa per il Mezzogiorno" program. By 2001, surveys had been completed in 54 OTAs—10 located in the northern regions, 19 in the central ones and 21 in the southern ones.

Once the surveys of the installed water infrastructure were completed, the OTA authorities moved on to draft water infrastructure development and tariff plans. Different OTA authorities confronted specific issues: generally, the OTA authorities based in the southern regions of the country planned water infrastructure development in order to improve water catchment, transportation and sewage networks; those in the central and northern regions, instead, mostly planned investments in sewage networks and wastewater treatment plants in order to tackle pollution issues that arose from intense population density and manufacture. The water infrastructure development plans typically provided that the new investments would be financed by bank loans to be repaid

from operating cash inflows originating from gradual increases of the water tariff over time. Tariff setting rules (issued in accordance to the so-called "normalized method" prepared by the Supervising Committee on the Use of Water Resources), however, placed stringent constraints on the extent to which water tariffs could be increased, at least in the short term.

When drafting the water infrastructure development and tariff plans, the OTA authorities tried to accommodate conflicting pressures from water firms and local governments. Water firms were generally interested in investing in the water infrastructure and charge capital depreciation and remuneration in the water tariff, while the local governments typically aimed to contain water tariff increases in order not to alienate the support of the local communities. Water firms were broadly supported by Federgasacqua, which conducted various campaigns aimed at changing the public perception of "fair" water charges. Local governments, instead, were supported by the central government, that generally aimed to contain inflationary pressures by setting relatively low tariffs for public services. Before the issue of the "normalized method", the Inter-Ministerial Committee on Economic Planning (CIPE) used to set water tariff increase caps up to a maximum of 2.5% per year. Higher water tariff increases could be conceded only if water firms demonstrated that they would not be able to cover full cost of water service provision at a lower tariff level.

Over time, the OTA authorities slowly reconciled the conflicting pressures that originated from water firms and local governments by containing water tariff increase within presumably affordable rates. By the end of 2000, 12 OTA authorities had completed drafting their water infrastructure development and tariffs plans. Out of these OTA authorities, 10 were based in the central regions of the country (6 of them in Tuscany and 4 in Lazio), one in the north (OTA "Valle del Chiampo" in Veneto) and one in the south (OTA "Sarnese Vesuviano" in Campania). Seven of these OTA authorities (those of the OTA "Valle del Chiampo" and "Sarnese Vesuviano", plus five OTAs in Tuscany) had also approved these plans, that provided a gradual increase of water tariff of about 27.1% on average after 5 years, 50.1% after 10 years and 58.9% after 20 years (Report to the Parliament on the State of Water Services 2001).

While water infrastructure development and tariff plans were prepared, local governments did not really urge the OTA authorities to move further towards the award of water franchises. Apart from Alto

Valdarno and a very few other areas (such as the OTA "Latina" in Lazio), most of the OTA authorities did not undertake any action to open the local water industries to private operators and investors. Generally, local governments were reluctant to make the OTA authorities call tender offer competitions for selecting business company that would replace the incumbent water providers, because local governments would then lose much of their influence on local water industries. Somehow, local governments were more inclined towards considering awarding water franchises to mixed public-private ownership firms, that was considered as an ownership structure that allowed them to both retain some control of water management and get private capital and entrepreneurial skills involved in water service provision. The awarding of water franchises was kept on hold, then, while several local governments devoted themselves to restructure their water firms in order to be prepared to fit the requirements for forming mixed public-private ownership firms.

The restructuring of local governments' water firms entailed various efforts to reincorporate, merge, and diversify the range of activities of their water providers. Several local government-owned water firms were re-incorporated as public limited companies, whose statute granted more freedom of action from local government councils than other organizational forms (i.e., local government departments and municipal companies). Many of these firms (for example, the Turin-based firms, Acqua Metropolitana, operating water supply, and Po Sangone, operating sewage and wastewater treatment) merged with each other or acquired other providers in order to secure the size and capabilities needed to be able to manage the whole water services within the OTAs. A number of these firms (for example, ACEA, based in Rome, and AMGA, based in Genoa) also pursued the diversification of their activities into related utility business areas, such as gas, electricity and telecommunications, in order to gain additional revenue sources and economies of scale from complementary services. All in all, these restructuring operations firms gradually re-shaped the traits of the water industry, especially by reducing the long-dated fragmentation of water service providers.

Three examples may illustrate the type of changes that are described here. In Tuscany, in 1997, the 42 local governments located in the provinces of Prato, Pistoia and Empoli started negotiating the merger of their water firms. These local governments intended to create a water company that could be awarded the water franchises in the two most populated OTAs in Tuscany, the "Medio Valdarno" (which included

Florence) and "Basso Valdarno" (which included Pisa). Their strategy was expressed succinctly by the mayor of Pistoia, Lido Scarpetti, who argued that:

> we want to pool together the resources and the managerial capabilities that we accumulated in the past, in order to enter the market in a strong position, and be ready for the opportunities arising from the institutional changes [in the regulation of the water sector]. Nowadays there is a trend towards overcoming particularism and achieving economies of scale in order to optimise costs and services. (Il Sole 24 Ore, April 24, 1997)

In 1999, the water firms of these local governments merged and were re-incorporated into Publiservizi, a holding company that diversified into water (through the subsidiary, Publiacqua), energy (Publienergia) and waste management (Publiambiente). A few years later, in 2002, Publiacqua was awarded the water franchises by both the OTA authorities of "Medio Valdarno" and "Basso Valdarno".

In Liguria, in 1995, the water and gas municipal company owned by the local government of Genoa, AMGA, was re-incorporated as a public limited company, whose shares were floated in the Milan stock exchange in 1996. In 1997, AMGA launched a hostile takeover bid on the business company, De Ferrari-Galliera, which served about 60% of Genoa's water supply system. The offer was not accepted because of a syndicate pact among the major shareholders of the target firm, but the search for new business ventures intensified, both in the domestic and the international markets. For a few years, the expansion of AMGA was constrained by the adverse decisions of regional administrative courts. In Liguria, in 1997, the administrative court ruled that the award of water franchise that AMGA had received from the small municipality of Ventimiglia was illegitimate because AMGA should not operate outside the territory of Genoa. AMGA appealed against this decision, and, in June 2001, the Council of State restored the water franchise award because it acknowledged that AMGA operated as an entrepreneurial entity with relative autonomy from the municipality of Genoa, and therefore its operations should not be limited to the territory of the owner. After this decision of the Council of State, AMGA (as well as other local government-owned firms across the country) intensified their initiatives outside the territories of the local government owners.

In Lazio, in 1998, the water, gas and electricity company of the local government of Rome, ACEA, was reincorporated as a public limited company, whose shares were floated in the Milan stock exchange in 1999. In order to expand its water business, in 1999, ACEA acquired a minority stake in the business company, De Ferrari-Galliera, and later, in 2000, it launched a friendly takeover bid for both De Ferrari-Galliera and Nicolay, another business company managing part of Genoa's water supply system. AMGA reacted to the entry of ACEA into the Genoa water market by acquiring the shares of De Ferrari-Galliera and Nicolay held by its business partner, Vivendi-Générale des Eaux. In turn, ACEA increased its ownership stake in AMGA by buying shares on the stock exchange. The friction between ACEA and AMGA was settled when the management of the two companies agreed on a joint strategy for managing the water supply system of Genoa, which would lead to the merger of De Ferrari-Galliera and Nicolay. The collaboration between the two companies, however, deteriorated from 2001 onwards, and while AMGA regained a prominent role in the water industry in Genoa, ACEA dismissed its stakes in De Ferrari-Galliera and Nicolay and diverted its interest towards other areas of the country.

7 An Assessment of the Partial Water Reform Implementation Outcome (2001)

How would an observer of the national water sector assess the implementation of the water reform in 2001? In an OECD report issued on September 25, 2001, the Supervising Committee on the Use of Water Resources provided an answer to this question (Memorandum for the OECD ERP mission 2002). The Committee summarized what the implementation efforts had achieved so far in these following lines:

> At which stage is the implementation of the law, more than seven years after it was issued? Out of the 89 basins into which the national territory has been divided by regional laws, only 48 have an official governing body already constituted. They include 49% of the Italian population and 44% of the 8102 municipalities of Italy. The situation is very uneven throughout the country: the percentage of ATOs constituted with respect to those that have been planned is 100 in the Centre, 66 in the South and only 30 in the North. In 8 regions (Valle d'Aosta, Lombardia, Friuli Venezia Giulia, Liguria, Molise, Puglia, Sicilia, Sardegna), no ATO is fully constituted.

> The average population of the planned ATOs is around 692,000 inhabitants, with a maximum of more than 4 million in Puglia, where the ATO coincides with the geographical region. As far as the number of associated municipalities is concerned, there is an extreme variability range from a maximum of 377 municipalities in the ATO Sardegna, to a minimum of one municipality for the ATO Milano. Out of 89 ATOs planned, 41 have not started the infrastructure survey yet, 23 are carrying it out and 25 have completed it. Again, central Italy is the leader, followed at a distance by the south, while in the north the process is still at the beginning. At the planning level, 12 plans have already been completed […]; 6 in Tuscany, 4 in Lazio, 1 in Veneto and 1 in Campania. Seven of these plans have been approved by the respective ATO authorities.

The Committee argued that, overall, the implementation of the water reform had achieved disappointing results. The Committee highlighted, however, that the relative pace of the implementation efforts had increased in the last couple of years. The report concluded:

> How to evaluate the implementation process of this reform? We repeat the sequence of figures: 89 ATOs planned, 48 constituted, 25 infrastructure surveys carried out, 12 plans prepared, 7 plans approved, 2 tenders under way and 2 concessions granted. It looks as if a perverse geometric progression at a rate of 0.5 has been in action, with the consequence that half of the subjects were lost at every subsequent step. Therefore, given where we are now, after seven years from the passing of the law, it seems legitimate to speak of failure of the reform, especially since the law established a time span of 12 months for its full implementation. However, the evaluation changes if we consider the dynamics of the events that have taken place in these seven years. Indeed, in the last two years there has been a reassuring acceleration of the process.

The assessment of the implementation of the water reform, therefore, included both positive and negative sides. On the negative side, the intermediate outcome of the water reform implementation in 2001 was a failure in at least two respects. First, the tasks provided by Act 36/1994 (i.e., passing the regional legislations, establishing the OTA authorities and awarding the water franchises) had been only partially executed. In 2001, most of the institutions of the new regulatory system had been established (i.e., regional legislations had been passed and several OTA authorities had been established), but no further substantive change of

the regulatory system of the water industry had taken place yet. Second, the tasks provided by Act 36/1994 had been systematically delivered later than the deadlines set by the water reform statute, or, for certain activities (e.g., passing the regional legislations), by the Minister of Public Works.

On the positive side, the intermediate 2001 outcome of the water reform implementation was a partial success in at least two respects. First, as the Supervising Committee highlighted in the 2000 Report to the Parliament, passing the regional legislation after the definition of the OTA boundaries marked a "point of no return" within the implementation process. The formation of new regulatory institutions (in particular, the establishment of the OTA authorities) started to affect decisions bearing important long-term consequences for the organization of water service provision (e.g., the award of the water franchise in the OTA Alto Valdarno) and the design of public policies for the water industry (e.g., the requirement to implement the water reform in order to access funds for water infrastructure development).

Second, the pace of the water reform implementation had clearly increased from 1997 onwards. The number of established OTA authorities grew from 20 by the end of 1998 to 74 by the end of 2001. In 1998, just a few OTA authorities were drafting water infrastructure development and tariffs plans, while, by the end of 2001, 18 such plans had been formulated. In 1998, no water franchise had been awarded yet, while, by the end of 2001, several OTA authorities were preparing themselves to award the water franchises according to the new regulatory system. All in all, in 2001 there were encouraging signals that an irreversible process had been put in motion for changing the regulation and governance of the water industry in the country. Resistance to privatize water service delivery from the side of local governments, however, still questioned the extent to which the water policy domain would be substantially affected by the implementation of the 1994 reform.

8 Commentary: The Implementation of the Water Reform in 1994–2001

In summary, the implementation of the water reform in Italy in the period 1994–2001 was relatively hesitant at first, while later steadily accelerated. Passing the regional legislations, which were required to make the water reform enforceable at the regional level, was especially

faltering, at the beginning of this period. After the central government passed a legislation that established a linkage between the implementation of the water reform and access to extra funding for infrastructure development, in 1997, local governments intensified their efforts to define the OTA boundaries and cleared the way to passing the regional legislations. By 2001, regional legislations had been passed in almost all the regions of the country.

Also, establishing the OTA authorities progressed relatively slowly in the early years after the water reform was enacted. As for the passing of the regional legislation, after the central government tied the implementation of the water reform to funding infrastructure development, in 1997, local governments intensified their efforts to establish the OTA authorities. By the end of 2001, 74 OTA authorities had been established in the country—out of 89 OTAs that had been provided by regional legislations at that time. Several of the OTA authorities began to carry out their statutory duties by drafting water infrastructure development and tariff plans. By the end of 2001, 18 such plans had been formulated, while many others were being drafted and close to completion at that time.

Awarding water franchises, instead, progressed relatively slowly. Apart from the OTA Alto Valdarno, in the rest of the country local governments generally restrained the OTA authorities from progressing to award the water franchises, and they rather focused on preparing their incumbent water firms to become eligible to manage water service provision in the OTAs. Several local government-owned water firms were re-incorporated, merged with other water firms in order to gain the size and competences to fit the requirements for being awarded the water franchises, and diversified into other utility business areas. This process was particularly evident in the water firms of the main cities in the country, such as Rome, Florence, Pisa and Genoa, whose restructuring contributed to deeply reshape the traits of the water industry.

The Supervising Committee on the Use of Water Resources assessed the outcome of the implementation of the water reform in 2001 as mostly a failure and only partially a success. On the negative side, no substantive change of regulatory regime of the water industry had taken place yet. The intermediate results of the water reform implementation had been systematically delivered later than the deadlines originally set by the reform statute or central government officers. On the positive side, however, the water reform implementation process seemed irreversible.

The formation of regulatory institutions started affecting long-term decisions about the organization of water service provision and the design of public policies. The pace of the implementation process, moreover, had clearly accelerated from 1997 onwards. At that time, however, the opening up of the water industry to private operators and investors seemed beyond easy reach.

The case of the water reform in Italy offers some evidence on issues related to the politics of regulation and regulatory reforms. The implementation of the 1994 water reform was a highly political affair, where contrasts between local governments, regional governments, the central government and water firms resulted in prolonged negotiations and efforts to avoid making decisions that would harm the interests of the incumbents of the water sector. In part, making no decision—hence, deferring the execution of the water reform statute—was a preferred course of action for many actors than making any decision that would compromise existing positions of influential actors.

The case of the water reform in Italy also suggests some consideration about the role of local regulatory agencies and their independence. The water reform required that local governments would establish local regulatory agencies, which would be required to award water concessions and regulate water tariffs. The governance of the local regulatory agencies would have been relatively complex because of the many local governments that would act as owners of the local regulatory agencies—hence, that would have voice over the appointment of the heads of the local regulatory agencies and on the strategic conduct of the local regulators. The establishment of the local regulatory agencies, however, did not happen until the local governments had made preparatory steps to make incumbent local government-owned water firms well positioned to be awarded the water concessions (for example, by making relatively small municipal water firms merge to form larger water providers). In this sense, the extent to which the conduct of local regulatory agencies was "independent" from the influence of local governments is questionable.

The case of the water reform in Italy also provides some relevant evidence around the issue of building up regulatory capacity. Before the 1994 water reform, regulatory functions in the water sector were played by local governments in the form of direct ownership and control of water utilities (that were often established as departments or

organizational units within the same municipalities). The design of the 1994 water reform, instead, provided that newly established entities owned by local governments—the local water regulators or OTA authorities—would perform regulatory functions. Neither the OTA authorities nor the local governments, however, possessed the knowledge and skills to design, negotiate and enforce the type of regulatory tools that were provided by the water reform, i.e., concession contracts with water service providers and the setting and review of water tariffs according to the "normalized method".

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PART III

Making Regulation Work

CHAPTER 9

Regulatory Commitment and Investments

1 Investments in Infrastructure and Utilities Networks

It is in the very nature of infrastructure and utilities sectors that services are provided through the operation of large technical systems. These (either physical or intangible) assets require a flow of investments over time, both to replace existing assets (that are consumed during their use or become obsolete) and to introduce new assets (that help improving the quality or expand the output, or both). Who makes the investments required to keep an infrastructure or utilities system operating at a decent level of performance, or improving over time especially in relation to opportunities related to technological innovations or increased demand? How does the regulatory system affect the amount of investments that are made in the infrastructure and utilities sectors?

In principle, investments in infrastructure and utilities follow the same criteria of economic appraisal of any sort of investments generally, i.e., an investment is made if it is expected to result in a positive net flow of benefits over time that is greater than the opportunity cost of the capital required for the investment. A telecom company, for example, may undertake an investment to upgrade an existing telephone network to digital subscriber line (DSL) communication technology if the company expects that, after the investment is made, the sale of broadband services will generate a flow of profits whose present value exceeds the

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capital cost of the investment. This principle entails that investments that are not profitable should not be undertaken. If this principle had been always followed in the past, however, lot of the asset base that we see in many countries nowadays would have not been built: for example, several dams, aqueducts, roads and highways were built over the decades (or centuries) by governments or state-owned enterprises (or public-sector bodies, more generally) without any financial return on their investments.

Some may argue that investments in infrastructure and utilities result in improved conditions for the economy and the society to operate in a more productive, healthy and safe way, and that, therefore, the returns on such investments should be assessed based on general net benefits rather than narrow financial returns. Indeed, this argument often justified direct governmental interventions to build infrastructure and utilities assets, whose capital cost was funded from general taxation (and public debt). Since the diffusion of neo-liberal regulatory reforms in the 1970s, however, there has been a general tendency to relate investments in infrastructure and utilities to investment-specific means of financing: rather than placing the financial burden of new investments on taxpayers, infrastructure and utilities firms started charging users of their services for the cost of operating, maintaining and expanding their asset base. Infrastructure and utilities tariffs, therefore, have come to include charges for capital investment depreciation and for the specific cost of funding infrastructure assets maintenance and development.

A number of issues arise when investment decisions are taken by infrastructure and utilities operators. On the one hand, firms may be worried that they do not cover investment and financing costs if the tariffs for infrastructure and utilities services are too low (e.g., when tariffs are set by public authorities or by an independent regulatory authority), or that public authorities may require transferring infrastructure and utilities assets at a price too low (e.g., at the termination of a concession contract). On the other hand, governments may be worried that, if the tariffs are set at a fixed rate, then infrastructure and utilities firms may seek to enhance their profitability by cutting investment costs. In both cases, firms may undertake less investments than would be desirable for the infrastructure or utilities sector. If, instead, tariffs are set in a way that includes the return on investments that operators carry out, then infrastructure and utilities firms may exaggerate investments in unnecessary assets (i.e., a conduct called the "Averch-Johnson effect"; Averch and

Johnson 1962). In this scenario, firms may over-invest and divert capital from more profitable uses. Any regulatory system, therefore, should contain a careful consideration for the drivers that orient investment decisions, otherwise any infrastructure or utilities industry may suffer from too little or too much investments. In addition, as we shall see in the rest of the chapter, the regulatory system should be administered by actors who can make credible promises (i.e., regulatory commitment) that the rules that affect investment decisions are not opportunistically changed in order to take advantage of the irreversible decisions made in investment choices.

2 Tariffs and Infrastructure Development

In economic terms, infrastructure and utilities are characterized by the presence of relatively high average costs with respect to marginal costs. This feature originates from their cost structure, namely the presence of relatively high fixed costs (i.e., the investments made in assets) with respect to variable costs (i.e., the cost of operating infrastructure and utilities systems). For example, the cost of installing a water catchment, transport and delivery system (i.e., dams, aqueducts and local distribution networks) is considerably higher than the (variable) cost of operating the water supply service (e.g., the cost of pumping and cleaning water). With such cost structure, firms should charge consumers at the average cost level as stipulated in long-term contracts if they are to break-even. If customers are charged at marginal cost, then the firm would make a loss because of the high incidence of average fixed costs. If customers are not "locked-in" through long-term contracts, then—in principle—they may threaten to switch to another service provider or to abstain from consumption if the firm increases prices above marginal costs (i.e., the minimal cost coverage for the service provided to the marginal customer so that the firm remains in the market). In practice, consumers may have no alternative to the present infrastructure or utilities firm, which often acts as a monopolist within a specific service catchment area (e.g., the city serviced by the only local water utility or the railway route serviced by the only railway operator).

Considerations about the cost structure of infrastructure and utilities firm are important to make sense of the incentives that come into play when making investment decisions. If these firms do not have guarantees that they can price their services at the average cost, then they do

not invest. Investments are sunk cost, i.e., the investment decisions are irreversible, and therefore, once the investment is made, the firm cannot change its cost structure (especially, it cannot reduce investment-related fixed costs) depending on market conditions. If, instead, firms believe that they can charge services at a set price that is higher than average cost of present and future investments, then they can undertake investments, especially if they help expanding market demand or improving operational efficiency. It is apparent, then, that the expectations of firms about future prices for infrastructure and utilities services are crucial in their investment decisions—and the regulatory system plays a pivotal role in the formation of their expectations.

In order to understand how the regulatory system affects investments through the formation of expectations on future prices for infrastructure and utilities services, we need—first—to clarify how tariffs are set. Price regulation of infrastructure and utilities may take place in various forms, but the most common methods are the so-called Rate of Return and RPI-X (or price-cap or incentive regulation) (Bös 2015).

3 Tariff Regulation: Rate of Return

In the Rate of Return method, prices are not really fixed but the regulatory authority only provides that an infrastructure or utility firm is allowed to earn a profit that should not exceed a given return with respect to capital invested. This system of price regulation is relatively straightforward and simple to administer: a firm anticipates that the regulatory authority allows earning a certain maximum amount of profit (for example, 7% of capital invested). Given the firm's cost structure, this rule prevents the firm to over-charge customers for the infrastructure and utilities services, because the firm would not be allowed to retain profits in excess of the set rate. In addition, the firm has an incentive to invest, which results in a higher profit than the firm is allowed to retain.

One well-known problem with the Rate of Return method is that it may induce firms to over-invest (Averch and Johnson 1962), because higher amounts of capital invested result in greater returns that the regulator allows service providers to earn. The so-called "Averch-Johnson effect" has been observed on many occasions, such as, for example, when highways or motorways concessionaires frequently maintain road

pavement or embellish the transport infrastructure with superfluous amenities (sometimes, it is told that the regulated infrastructure is "gold plated"). If tariff regulation does not take into account the "Averch-Johnson effect", then the regulated sector may end up with sub-optimal (i.e., too much) investments.

4 Tariff Regulation: RPI-X or Price-Cap or Incentive Regulation

The alternative method, RPI-X, was designed precisely to counteract the "Averch-Johnson effect" (Littlechild 1983). In the RPI-X method, the regulated firms are allowed to increase tariffs each year only up to a given threshold, that is set as equal to an index of inflation (RPI, or retail price index) minus an amount (X) that is arbitrarily set by the regulator. The part of the tariff regulation that provides the tariff increase up to the RPI allows the service provider to maintain constant revenues in real terms, *ceteris paribus*. The part of the tariff regulation that subtracts the X amount from the RPI makes the service provider seek other ways to reduce costs (i.e., to increase efficiency), if the service provider aims to attain (at least) constant profitability over time. The RPI-X method provides an incentive structure to the service providers to invest in cost-saving technologies (i.e., technologies that provide cost savings that are greater than the minor revenues that result from the X factor). As the method does not include any cap to the return on capital invested (differently from the Rate of Return method), the service providers can retain any profit that they make, provided that service revenues comply with the RPI-X formula.

One issue that arises from the RPI-X method is the relatively high administrative and regulatory cost. The method requires that the service operator and the regulator keep track of past tariffs and compute average weighted tariffs in order to determine whether the RPI-X formula is complied with. The application of the method is also considered rather "intrusive" as it requires that the regulator can access accounting data of the service operator. In contrast, the Rate of Return method is simpler to administer, as the regulator only considers invested capital and profits while there is no detailed attention to containing increases of service tariffs.

5 The Importance of Credible Commitments

In both the Rate of Return and the RPI-X methods, commitment of the regulators is pivotal. Infrastructure and utilities service operators need to form expectations that tariff rules are not subverted in the future if they are to anticipate plausible consequences of investment decisions. In either of the two methods, regulators can exercise discretion in setting either the maximum allowed rate of return or the X factor in the RPI-X formula. Discretion is generally positive because it enables regulators to adjust tightness of regulatory requirements to changed market and technological conditions. If discretion results in arbitrary imposition of profitability or tariff rules, however, then service operators fail to undertake investments due to anticipating that the regulator may behave opportunistically and adjust regulatory requirements to their advantage.

It should be noted that nowadays many tariff regulatory systems consist of some form of combination between the Rate of Return and the RPI-X methods. A typical form of tariff regulation would include both a "cost pass-through" component, i.e., the tariff includes coverage of operating and maintenance costs, and a Rate of Return regulated component, i.e., the tariff includes coverage of depreciation of existing and new investments in infrastructure, plus an amount of allowed profit. The value of existing infrastructure is often referred to as a "Regulated Asset Base", or RAB. The amount of profit that the operator is allowed to earn on the basis of existing and new infrastructure investments is typically related to the average cost of capital financing of the operator (i.e., the operators' Weighted Average Cost of Capital or, WACC). Figure 9.1 below illustrates the components of such tariff (Alexander and Harris 2005).

The lack of credible commitment to abide to the terms of a tariff scheme has negative repercussions on investment decisions. For example, Helm (2009) provided a critical assessment of tariff regulation in the UK, and he concluded that technical conditions and economic performance of British infrastructure did not dramatically improve despite all the privatization, liberalization and re-regulation policies of the 1980s and 1990s. The present infrastructure regulatory regime in the UK builds largely on the RAB, which is the accounting value attributed to existing infrastructure assets. RAB provides the basis for solving the problem of opportunistic expropriation of the service provider's rents because the regulator commits itself to grant a return on investments in RAB. This source of regulatory commitment, however, did not

Operating and maintenance costs

+

Return on existing assets

(= depreciation + allowed profit given by RAB x WACC)

+

Return on new investments

(= depreciation + allowed profit given by new investments x WACC)

=

Allowed tariff revenue

Fig. 9.1 The components of a tariff scheme that includes a "cost pass-through" component and a Rate of Return component

encourage infrastructure and utilities firms to undertake balanced programs of infrastructure development. Helm (2009) noticed that the balance sheets of infrastructure firms are "exhausted", in the sense that they include relatively high debt-to-equity ratios (this was not the case when infrastructure firms had been privatized; indeed, the government had left them relatively "ungeared" to allow them to increase their debt for funding capital investments over time). In Helm's (2009) view, the capacity of infrastructure and utilities firms to take on debt was rather used for financial engineering operations that benefitted the shareholders at the expense of investments—hence, of consumers.

Helm (2009) also discussed the options for financing infrastructure development, which included:

- rights issues: these consist of issuing shares at a special price to the existing shareholders in proportion to their holding of shares. It is a way of increasing equity financing, that could be also attained by placing caps to distribution of dividends;

- pay-as-you go: this consists of making present customers pay for the financing of infrastructure, although the new infrastructure may largely benefit future—rather than present—users;
- just debt: this form of financing is viewed as akin to the nationalization of the infrastructure, although risk of default of the infrastructure firm is sustained by the customers rather than by taxpayers.

Helm (2009) also highlighted that the financing of infrastructure is a matter of politics as much as of financial engineering. When the funding of infrastructure is based largely on debt or nationalization, then the media and political pressures may induce a reduction of investments.

6 Institutions and Infrastructure Development

The financing of infrastructure development is largely dependent upon conditions of the institutional context. That institutions play a pivotal role in economic performance has been long discussed within the academic circles. North (1990), for example, highlighted that institutions provide fundamental conditions for stimulating cooperation between individuals. Depending on the type and quality of institutions, economic systems experience favorable conditions for economic growth or for stagnation. Favorable institutions provide a stable system of rules, that individuals can rely on when anticipating future effects from the negotiation of economic activities. Adversarial institutions, instead, do not help solving those issues that arise from contractual opportunism, that undermine the social basis for collaboration and for the respect of mutual obligations that are typically present in joint human endeavors.

Institutions are no less important in affecting the level of investment in infrastructure. Some evidence in this respect is provided, for example, by Henisz (2002), who showed that the quality of political institutions is related to infrastructure growth rates in over 100 countries and for about one century. Similar evidence is provided by Banerjee and Oetzel (2006), who showed that property rights and bureaucratic quality play an important role in promoting private infrastructure investment. They also found, however, greater participation of private finance in infrastructure development in relatively greater corrupted countries—a result that may be related to various sources of explanation, including, for example, that greater investment opportunities simply rested in countries with

higher corruption, where private investors would take corruption-related risks into consideration in return expectations.

How exactly do institutions affect investments in infrastructure? In general, institutions provide sources of orientation and constrains to individual conducts that help reducing sources of uncertainty and risk. Formal institutions, such as, for example, laws, regulations and contracts, specify the attribution or exchange of rights and obligations, determine the conditions under which certain activities should or could be done, and sanction how controversies should be settled. Informal institutions, such as, for instance, customs, conventions and business practices, inform individuals' judgement when taking decisions. Formal and informal institutions provide individuals the sense of the "rules of the game" where economic activity takes place. They largely affect how individuals anticipate the consequences of their decisions, how they expect that others (especially, counterparts in a transaction) behave in the future, and how much risk they are exposed to when making decisions.

Institutions provide sources of stability and predictability in the social world. Without institutions, individuals would hardly anticipate what to expect from the conduct of others: their decisions and actions would seem largely the result of arbitrary choices, with little if any consideration to traditions, commitments, agreements, laws, regulations and the like. Institutions reduce the uncertainty that individuals face when making sense of the social and economic environment. When individuals make decisions, they often resort to the role of institutions for drawing reasonable expectations of future outcomes, e.g., they rely on legal and other binding promises for anticipating payoffs, such as, for example, revenues, costs, profits and benefits, and for estimating risks (typically in the form of probabilities associated to likelihood of future events). Institutions, in this sense, enable calculations that support economically rational choices.

Decisions to invest in infrastructure are largely dependent on both formal and informal institutions. For example, a utility firm that operates an infrastructure service under a concession contract looks at institutional conditions in the environment before making important decisions. A decision to invest in infrastructure is dependent upon expectations that the firm would gain an adequate return on investment. Return on investment is dependent on the tariff rules and tariff setting regime that is specified in the concession contract and, possibly, in sectoral laws or regulations. In addition, return on investment is affected by political

conditions that favor that stability of tariff rules and tariff setting regime, i.e., that public authorities do not change tariff policies against the interest of the investors. In relation to this, return on investment is also affected by features of the juridical system that would assure that the concession contract is duly executed. The decision to invest, moreover, is dependent on the utility firm's understanding of how other actors, e.g., public authorities and the judiciary, behave towards infrastructure investment, i.e., how reliable are their promises not to opportunistically decrease expected tariffs after the investment is made.

There are several examples of the role of institutions on infrastructure development. The development of the natural gas transportation network in countries such as Brazil and the USA, for example, was largely dependent on the type of formal institutions in place and how these contributed to setting up (or not) the conditions for investments in the natural gas sector. The Brazilian case (Ferraro and Hallack 2012) was characterized by the dominant position of Petrobras, that resulted in high vertical integration of the industry. The US case (Hirschhausen 2008), instead, included a competitive environment, whose features originated from the particular historical development of the natural gas sector in the country. In Brazil, the legislation tried to stimulate entry and investments into the natural gas industry but with limited effects. In the USA, a relatively "light-handed" regulatory approach resulted in a favorable environment for investments and innovations (including creative financial and risk management schemes). Different institutions, which partially originated from the historical development of the sector in the two countries, help accounting for the differences in the industrial behavior and performance between the Brazilian and the US cases.

A comparison between these cases supports the role of institutions in investments. In Brazil, recent legislation provides instruments for coordination of investments in production and transport. In principle, this legislation should reduce uncertainty that is typically associated with scenarios where different operators should undertake mutually dependent investments. In practice, however, Petrobras' dominant position in the industry poses serious threats of ex post contractual opportunism that keeps investors at bay. In the USA, instead, the regulatory regime—that includes Rate of Return regulation in combination with an unbundled industry structure—provides investors the prospects to retain temporary rents from innovations.

7 Stimulating Investment in Infrastructure

Investment in infrastructure is very important for the economic and social development of any country (Berg et al. 2002). Adequate investments in water, electricity and transport, for example, facilitate the undertaking of business and the attainment of a decent quality of life. Investments in information and communication technology (ICT) networks, power generation and grids and airports give the possibility to develop high added-value economic activities. Devising policies that stimulate investments in infrastructure, accordingly, is pivotal for any government that cares about the economic and social prospects of a country or community.

How can public policies influence investment in infrastructure? A study of Sutherland et al. (2011) provides some evidence on the basis of a questionnaire survey conducted in 2007. Some of the main results of their study were:

- There is a general tendency to withdraw from public ownership and direct public sector investment in infrastructure. Public provision of infrastructure is often related to inefficient investments, either in the form of excessive or misplaced investments (e.g., "empire building" behavior with the aim to attract and satisfy a political clientele) or under-investments (e.g., lack of concern with the long-term benefits of infrastructure development while preferring funding for other programs or projects that provide more short-term advantages);
- There are advantages from the unbundling of industry segments, because competition may develop in those parts of the infrastructure or activities among infrastructure services that have lower barriers to entry. If the industry is unbundled, industry operators have incentives to invest in technologies that result in temporary rent positions or in cost savings with respect to competitors;
- Regulator's independence is central to preventing regulatory capture and to enhance the stability and credibility of the regulatory system. Ways for maintaining regulator's independence include, for instance, strict definition of the duties of the regulator in the legislation, of the requirements of the concessionaires and procedures for dispute resolution, of the administrative procedures that determine how regulators act and their decisions should be taken, and of how decisions of the regulator could be appealed;

- There are advantages from clear and permissive rules to access to the network. Barriers to entry and anti-competitive behavior discourage investments. It is important, therefore, to create a "level playing field" between the incumbents and the potential entrants by removing obstacles that those who control core parts of the network may impose on other industry operators who would like to develop services in the network. Obstacles to network access ("Third Party Access" or TPA) include excessive access prices, that are typically subjected to regulation, but also "pretentious" technological or administrative requirements that are mainly intended to make it harder for a competitor to enter the industry;
- If infrastructure investment is funded by private investors, it is very important to regulate prices of infrastructure services in such a way to provide adequate return on investments. In principle, prices for infrastructure services can be set at the marginal social cost. If the investment is characterized by increasing returns to scale, however, then marginal cost pricing does not cover capital (investment) costs. It would be necessary, then, to provide government subsidies for investments or to design a tariffs structure that includes coverage of investment costs. For example, the so-called Ramsey pricing rule sets different prices for different infrastructure services in relation to the different demand elasticity for each of them.

Other works suggest that policies for stimulating investments in infrastructure should carefully consider issues that originate from countries' context conditions. As discussed by Estache (2010), developing countries present peculiar features of the social, political and financial context that pose special issues and constraints to funding infrastructure development. First, developing countries experience a huge infrastructure gap with respect to the more developed and industrialized nations: for example, almost all of the about 1.5 billion people (22% of the world population) who have no access to electricity live in developing countries; there are about one billion individuals have no access to safe drinking water and three billions lack access to improved sanitation facilities; and poor transport infrastructure hampers economic development by raising up transport costs, especially in landlocked countries.

One main issue that developing countries face in infrastructure development is the affordability of closing the infrastructure gap. Estache (2010) provided estimates of the per capita expenditure needed and

showed that cost recovery efforts are harshest in the poorest regions of the world, where the infrastructure gap is largest. If citizens were asked to pay for infrastructure development, then they would need to spend about 25–35% of their income for their share of total infrastructure cost—a highly unrealistic and politically contentious amount of money. Funding infrastructure development would call for government subsidies, but many developing countries lack sufficient tax revenues or lack a competent public financial administration. Many among the poorest countries simply fail attaining full cost recovery of their infrastructure services.

In part, infrastructure development has been also funded through private sources and Official Development Aid (ODA) programs. More recently, there has been an increased role for foreign governments, e.g., investments led by the governments of China, India, Brazil and Arab funds in Africa. Also, private participation in infrastructure investments in developing countries plays an important role to support filling the infrastructure gap. This source of financing, however, tends to be relatively volatile and cyclical. When private funding takes the form of loans, grants or bonds issued by the developing countries' governments, moreover, then infrastructure development is essentially charged on the next generation's taxpayers. This funding scheme obviously poses some issues with respect to the developing countries' capacity to service debt repayment and to their budget constraints in the future.

Estache (2010) also commented that the type of regulatory policy should consider the level of development and the type of issues experienced in specific country contexts. He considers the 1990s reforms of the electricity sector in Latin American countries, where the adoption of the Rate of Return tariff regulation method resulted in no labor productivity improvements of privatized electricity utilities with respect to public-sector owned ones. The adoption of incentive regulation (i.e., RPI-X method), instead, tends to result in higher labor productivity. If the central problem of managing the infrastructure service is poor productivity rather than filling an infrastructure gap, therefore, incentive regulation would fare better than a Rate of Return one.

An example of the role of tariffs and investments is provided by the development of expressways in Indonesia (Davidson 2010). This study offered evidence for several impediments to expressways infrastructure development: weak state institutions captured by predatory elite interests, ineffective bureaucratic implementation, business-government

relationships that swing between collusive and agonistic, incapacitated rule of law and uncertain investment climate. In part, some of these impediments to attract private participation to investments in the Trans-Java Expressway originate from features of the political, legal and administrative context of the country. Under the Suharto government, toll road concessions had been granted following cronyism and nepotism criteria. The 2004 Road Law did not dismantle the existing regime of concessions, with the effect of limiting business opportunities for potential new entrants to the transport sector. In addition, private investors were kept at bay by uncertainties related to the appropriation of land where the transport infrastructure should be built. Consequences of the 1997–1998 economic crisis, moreover, included a diminished capacity and attitude to undertake entrepreneurial risk among concessionaires.

It is difficult to understand how the present impediments to expressways infrastructure development can be overcome. A starting point could be to agree with Davidson's (2010) argument that we need to understand the features of the Indonesian transport sector by paying attention to the asymmetric power relations among investors, regulators and state officials, which originate from a long history of social conflicts. A detailed analysis of stakes, incentive structures, social roles and expectations can help figuring out sources of stability (i.e., including rent-seeking behavior) in the Indonesian transport policy sub-system. Some effort would be needed, then, to devise regulatory and financial schemes that could result in mutually advantageous arrangements for key stakeholders or veto players of the expressways infrastructure project.

8 Case Study: Regulation and Investment in Broadband Networks

Broadband communications play an important role in technological and economic development, and broadband penetration is considered an important indicator of the prospects for economic growth. The largest broadband market in the world is in the USA, where, since 1996, legislation required unbundling the networks of incumbent local exchange carriers (ILECs) and making the unbundled network elements open to competitors at regulated wholesale rates. The regime was criticized because it apparently did not provide incentives to incumbent operators to upgrade their networks or for competitors to build their

own networks rather than leasing existing ones. In 2005, the Federal Communications Commission eliminated the unbundling obligation in the broadband market.

Another part of the world where broadband markets flourished is East Asia, especially in Japan and South Korea. The development of broadband in South Korea was triggered by government policy interventions, in the forms of investments and subsidies, while no unbundling requirement was in place until 2002. In Japan, instead, unbundling requirements were introduced in 2000, but the development of broadband was stimulated by government support in the form of subsidies, tax incentives and cheap loans.

In the EU, the development of broadband originated from a regulatory approach that falls midway between full deregulation and government interventions. In the 1990s, the EU Commission left the decision to unbundle local networks to Member states. In 2000, EU legislation provided that telecom operators should be unbundled only if the respective national regulatory authorities had declared them as having significant market power. In 2002, a so-called "New Regulatory Framework" clarified that the degree of regulation of the market was related to the presence of significant market power that could threat customers and competitors because of dominant positions.

While countries and regions of the world differ in the way they regulate broadband, there is a general trend worldwide that that telecom companies generally carry out investments in broadband communications. Broadband penetration has increased over time, although investments in this area have decreased for reasons that especially relate to the relatively small investments required to upgrade traditional telecom lines to DSL systems (Cambini and Jiang 2009).

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CHAPTER 10

The Performance of Regulated Industries

1 Appraising the Performance of Regulatory Systems

The performance of a regulatory system for infrastructure and utilities can be appraised in different ways (Jarvis et al. 2011). We should define, first, what are the performance dimensions that are important to stakeholders of the regulated sector. These may include, for example:

- operational or technical efficiency (i.e., the capacity of the regulated firms to convert inputs into outputs);
- allocative efficiency (i.e., the capacity of the regulated sector to result in production and exchange decisions as if they arise from competitive market conditions);
- equity (i.e., the capacity of the regulated system to provide equal conditions to individuals under similar circumstances);
- effectiveness (i.e., the capacity of the regulated system to help attaining public policy goals, e.g., affordability of the infrastructure or utilities services for the weakest part of the population).

Another issue is to define what constitutes a standard of satisfactory regulatory performance. This may be hard to assess, as regulators (and other stakeholders) suffer from information asymmetry with respect to how well infrastructure and utilities service providers work. Regulators may

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"push" infrastructure and utility firms to deliver better service at lower cost, while the regulated firms may claim that they already do the best they can. Comparisons between the performance of different service providers (benchmarking) may help regulators to "fine tune" the requirements that service providers should fulfill.

Regulators have different tools at their disposal to provide stimuli to infrastructure and utilities firms to improve their performance over time. Incentive regulation precisely refers to the design of incentive systems that induce—in principle at least—service providers to deliver better services at lower costs.

2 How Well Do Regulatory Systems Work?

We can conceive regulatory systems as human artefacts that include institutions that have been designed to achieve intended industrial and service provision purposes and techniques that have been crafted for administering regulation. As any other human artefact, regulatory systems may work well or not—depending on whether they result in the intended or desired performance effects. When we ask how well a regulatory system works, we are posing an evaluative issue. An answer to this question takes the form of an argument where a regulatory system is assessed based on explicit criteria and performance standards. Much theoretical and empirical work has been done to produce evaluative arguments of infrastructure and utilities systems around the world. In this section, we review some of the methodologies that have been suggested to conduct evaluations.

First, however, let us be more explicit about why evaluations of infrastructure and utilities systems are conducted. The governments may be genuinely interested to know whether a regulatory arrangement delivers satisfactory results because of their concern with public wellness. More often, the governments may be induced to evaluate a regulatory arrangement because of pressures that originate from the citizens (e.g., consumers' associations that complain about high tariffs and low quality) or from businesses (e.g., companies that complain about incumbents' resistance to provide access to "essential facility" networks). On some occasions, evaluations of the regulatory systems are carried out because of requests that originate from outside the country of interest, e.g., from the World Bank or other international organizations (multilateral lenders and bilateral aid agencies) that typically require the set-up of a regulatory

system as a condition attached to financial aid. On other occasions, evaluations are the by-product of academic research that aims to identify what causes the performance of regulatory systems.

The World Bank provides an instance of methodologies to follow for conducting infrastructure and utilities evaluations. In a World Bank publication, Brown et al. (2006) propose that such evaluations should be based on three "meta-criteria", namely:

- Credibility: investor must have confidence that the regulatory system will honor its commitments;
- Legitimacy: consumers must be convinced that the regulatory system will protect them from the exercise of monopoly power, whether through high prices, poor service, or both;
- Transparency: the regulatory system must operate transparently so that investors and consumers "know the terms of the deal" (or "rules of the game").

They propose three methods for conducting evaluations:

- Type I: Cross-country statistical analysis, where econometric and other quantitative techniques are used to test whether any specific feature of regulatory systems, or of the country context, help explaining observed variation in any performance dimension of the regulatory systems of interest across countries;
- Type II: Cross-country descriptive analysis, where systematic comparisons are made between the formal institutions of regulatory systems adopted in different countries and features of the country contexts;
- Type III: Single-country structured case studies, where detailed data collection and analysis are conducted in individual countries with the aim of providing a rich and comprehensive account of how a regulatory system works.

Academic research on the performance of regulatory systems tends to follow any of these three types of method. An instance of Type I method is provided by the study of Wallsten (2001), who conducted an econometric analysis of competition, privatization and regulation of telecommunications in 30 African and Latin American countries in the period 1984–1997. Through an econometric analysis, he found that the

combination of privatization and an independent regulator results in better industry performance in terms of per capita number of mainlines, payphones and connection capacity. Privatization alone, instead, results in fewer benefits and it is even negatively correlated with connection capacity.

Another instance of Type I method is offered by the research work of Guerrini and Romano (2011), who tested factors to explain the performance of water utilities companies in Italy. Among the factors that explained the observed performance variance—including size of the utility firms, diversification and geographical location—they also found that ownership structure significantly affects companies' performance. To reach these results, they analyzed a dataset of 80 water utility companies in the period 2004–2008 through various statistical methods. They concluded that local authorities should consider entrusting water services to fully publicly owned companies because they apply lower tariffs and make higher investments *pro capital* on the pipe network.

An instance of Type II method is provided by (Levy and Spiller 1994), who analyzed telecommunications regulation in Argentina, Chile, Jamaica, the Philippines and the UK. For each country, they collected evidence about the country context in terms of legislative and executive institutions, judicial institutions, social conflict, social norms and administrative capabilities; and about the country telecommunication regulatory system in terms of ownership, regulatory history, private performance and types of "restraining mechanisms" (i.e., procedures that contain arbitrary administrative actions). Based on comparison among the country cases, the authors argued that the presence of restraining mechanisms is associated with aggressive investments of private utilities (although Argentina experienced high investments while the restraining mechanisms were not in place). They also observed that all those countries where the restraining mechanisms were in place had independent and well-regarded judiciaries, although in a couple of cases—Jamaica in 1962–1975 and Chile until 1967—there were sound judiciary systems but the countries missed the opportunities to develop effective restraining mechanisms. In summary, research such as that by Levy and Spiller (1994) helps to evaluate the performance of regulatory systems by identifying conditions—especially in the form of countries' formal institutional endowments—that facilitate the working of the regulatory process.

Finally, an instance of Type III method is offered by Borenstein and Bushnell (2015), who provided an assessment of the regulation of the US electricity industry after two decades of regulatory reforms and

sectoral re-structuring. They noticed that, before the 1990s, most electricity customers were served by vertically integrated monopoly utilities that handled generation, transmission, local distribution and billing and collections. Over time, this industrial organization was disrupted by changes in both "upstream" (e.g., non-utility generators started producing and selling electricity) and "downstream" segments (e.g., retail service providers started purchasing electricity from generators and selling it to retail customers) (Joskow 1997, 2005). The authors argue that the restructuring of the electricity industry resulted in efficiency improvements in generation, but the intended reduction of electricity prices did not materialize—if not for exogenous factors such as technological improvements and international natural gas price fluctuations.

It should be noted that any method has some pitfalls. Studies done on the basis of cross-country statistical analysis result in the identification of correlations that can corroborate beliefs on causal arguments, but they may miss articulating the detailed chain of interactions among different components of regulatory regimes. Studies conducted with cross-country descriptive analyses build on the features of formal institutions, but they may lack acknowledging the role of informal arrangements and actual practices when they are not so easily detected. Finally, studies carried out as single case studies provide a detailed account of specific regulatory regimes, but they may result in mere descriptions rather than explanations for the reasons why regulatory systems work, or not.

Another source of guidelines for conducting evaluations of infrastructure and utilities regulation is offered by the OECD (2014). The OECD Framework for Regulatory Policy Evaluation provides the methodological tools for evaluating the design and implementation of regulatory systems and policies. Conducting such evaluations is not easy, for reasons that especially include:

- The definition of what should be measured to appraise the performance of the regulated industry;
- The formulation of tentative causal relationships between the features of the regulatory system and industry performance, including ways to distinguish the role of "confounding" factors (i.e., contingent conditions that affect industry performance);
- The collection of timely and accurate data.

The OECD Framework for Regulatory Policy Evaluation includes recommendations for each stage of the evaluation process:

- Stage I. Input: What resources are committed to the regulatory policy? (e.g., budget and staff employed in the regulatory agency);
- Stage II. Process: Are requirements for good regulatory practices in place? (e.g., objective-setting, consultation with stakeholders, evidence-based analysis, administrative simplification, risk assessment, alignment to international regulatory changes);
- Stage III. Output: Have good practices been implemented? (e.g., percentage of Regulatory Impact Assessments or RIAs that comply with a government's formal requirements).
- Stage IV. Intermediate outcomes: Have good practices helped to get quality regulation? (e.g., percentage of participants who think that RIA has improved the quality of regulation);
- Stage V. Strategic outcome: Have strategic objectives for regulatory policy in general been achieved? (e.g., indicators of whether strategic objectives of regulation have been achieved).

OECD's guidelines highlight the role of RIA in the evaluation. RIA is a method of policy analysis that is intended to assess policy-makers in the design, implementation and monitoring of the improvements to regulatory systems by providing a methodology for assessing the likely consequences of proposed regulation and the actual consequences of existing ones (Kirkpatrick and Parker 2014). Originally, RIA was conducted to anticipate the costs of regulation on businesses. At present, RIAs are regarded as a desirable practice to follow whenever existing regulations are evaluated or new regulations are under consideration in many industries.

3 Benchmarking and Yardstick Competition

Evaluating the performance of regulatory systems is important for consumers—who want to know about the quality of the services that they receive and whether they pay a fair amount of money for them, businesses—who want to know about their relative performance with respect to industry tendencies, especially of the direct competitors, and regulators—who want to know whether the regulated firms could provide their services at cheaper price and/or better quality. Benchmarking is a business practice that is precisely intended to review firms' performance in relative terms. By benchmarking a firm's performance, we compare some dimension of a firm's conduct (e.g., tariffs, reliability of supply, timeliness of

customer assistance, etc.) with those of other firms and we gain indications of how well the firm scores with respect to others. Benchmarking may be expensive and time-consuming because it requires the collection of industry and market data, which may not be easily made available by other firms or industry regulators. The results of benchmarking, however, are valuable for informing a relative assessment of an infrastructure or utility firm, or of the effects of a regulatory system overall.

Benchmarking has been applied to assess the performance of various infrastructure and utilities firms. Jamasb and Pollitt (2000), for example, applied it to the electricity distribution sector in Europe and argued that benchmarking utilities across countries can help regulators assess utilities' performance, especially when there are just too few regulated firms within the regulator's jurisdiction to make meaningful comparisons. An international or cross-border benchmarking can help contrasting and comparing the performance of a larger number of utilities. When a utility firm's performance is benchmarked with others, regulators can gain a better understanding of whether the regulated firm is run at a reasonable (i.e., average) level of efficiency, or whether improvements could be attained.

The work of Jamasb and Pollitt (2000) also shows that a number of technical and practical issues are to be faced (e.g., checking reliability of data, making data commensurate with each other, etc.). One of the most intriguing findings of their study is that different techniques may result in different assessments of relative performance: a disturbing finding, in a sense, that—according to the authors—this could be solved by simply averaging the results of the different techniques.

Since benchmarking results in the identification of relatively well- and poor-performing utilities, some authors suggest that it can be used for stimulating relative performance improvements across the regulated firms. In so-called yardstick competition (Shleifer 1985), regulated firms are provided incentives to perform better than the average firms (or of any industry indicator): utilities that perform better than the regulated industry mean are rewarded while those that perform worse than average are penalized. Within such an incentive structure, the regulated firms are induced to improve any performance dimension that is subjected to scrutiny, e.g., technical efficiency, prices, service quality, etc.

Another example of the use of benchmarking and yardstick competition is provided by Marques (2006), who argued that the method can be beneficial for the regulation of the water sector in Portugal. Notoriously,

the water industry includes relatively high barriers to entry that make the industry a natural monopoly and prevent the rise of market competition among service providers. It seems encouraging, then, that yardstick competition can "mimic" the presence of market forces and stimulate performance improvements in the regulated water firms. As the two papers by Jamasb and Pollitt (2000) and Marques (2006) suggest, however, setting up the institutional, organizational and administrative system for benchmark and yardstick competition is not an easy task. Policy-makers and regulators should anticipate, *inter alia*, the cost of running benchmark and yardstick competition, the information requirements, and the many ways in which the regulated firms may try and "game the system" to avoid unwelcome punishment in case of poor performance.

4 Regulatory Governance and Performance

By regulatory governance, we refer to the policies, institutions and tools used in the design and administration of a regulatory system. A central idea is that features of regulatory governance affect the performance of the regulated firms and industry. The regulatory system, for example, should possess adequate institutions that help assuring investors that the returns on investments are not expropriated. This effect can be attained if the regulation of the industry builds on formal institutions that acknowledge property rights and provide an efficient juridical system. This condition, however, is not sufficient: in addition, there should be credible regulatory policies that the government does not play the regulatory game at its advantage (or at the advantage of government-linked firms). When arguing about the relationship between regulatory governance and performance, then, we think of the role played by both formal institutions and actual practices in effecting how the regulatory regime operates.

Significant policy-making and regulatory efforts are exerted to design and implement systems of regulatory governance that result in improved performance of the regulated firms and industry. Theoretical knowledge informs how infrastructure and utilities firms should be regulated, in principle. In practice, policy-makers and regulators must learn how better to regulate particular sectors of the economy depending on specific historical, institutional and cultural conditions. The systems of regulatory governance change over time as regulators, the regulated firms and the consumers of infrastructure and utilities services learn to adjust their conduct when they aim to attain their objectives.

In the UK, for example, over time, policy-makers and regulators sought to devise better solutions for the improvement of the operational performance of the railway infrastructure (Gibson 2005). A central issue in the regulation of the railway sector is the maintenance of high-quality infrastructure, which affects the performance of services. If ownership of the infrastructure is separated from ownership of service operators, then issues arise from the divergent interests that the infrastructure firm and the service operators have. For example, service operators may benefit from investments in the infrastructure if they enable them to run services more efficiently. The infrastructure firm, however, may not be interested to invest in the infrastructure if efficiency gains do not result in improved return on investments. In principle, a long-term contract between the infrastructure firm and the service operators may provide assurance that investments are not expropriated by opportunistic service providers. In practice, the regulation provides different incentives to the infrastructure firm and the service operators to make decisions that are functional to the overall improvement of the operation of the network system.

As the episode of the railway Hatfield accident in the UK on October 17, 2000 showed, changes in regulation may result from occasional and unanticipated—sometimes tragic—events that place the present regulation into question. Such events suggest that regulation and regulatory governance are not always driven by any "evolutionary" or "progressive" tendencies, i.e., a steady flow of adjustments of regulations that improve the performance of the regulated firms over time. Rather, regulations may be occasionally corrected in unexpected or unplanned ways, depending on circumstances that impact upon the policy domain.

Regulations also largely depend on the institutional base (or "endowment") of a country or policy domain. Existing institutions tend to affect policy decisions in ways that preserve some institutional features over time and prevent radical shifts from one institutional arrangement to another. Generally known as "path dependency", this argument helps explaining the persistence of differences in sectors' regulatory governance across countries despite apparent efforts to reform them along similar principles. For example, in a study on regulation and performance of the railways sector in the Netherlands, France, Germany, Sweden and the UK, Finger (2014) observed:

> The first striking observation pertains to the variety of approaches developed by the five different countries and, more generally to the fact that,

> after more than 10 years of restructuring in most cases, and up to 20 in one case, national institutional arrangements (that is, the governance of national railway competition) have only somewhat converged. Rather, institutional developments continue to evolve, if not accelerate. None of the countries has reversed its course. Also, no institutional arrangement appears to be settled. This leads to the intermediary conclusion that each country actually constitutes a type in itself, and that it is, as of now, impossible to group countries into similar types. This conclusion is unlikely to change even if we were to include other European countries in our sample. Nevertheless, there is some convergence in specific areas, notably in the institutional arrangements of the freight segment, as well as in the area of regulation, where European efforts towards harmonization are particularly important. (Finger 2014: 281)

The study by Finger (2014) is of interest because of some conclusions about the relationship between regulatory arrangements and performance of the railways sector. The study concluded that:

- The relationship between regulatory reforms and performance improvements of the railways sector in the five country case studies is not straightforward;
- It is not so clear whether we are using the most appropriate performance indicators for understanding whether there is any consistent improvement in railways performance;
- It is not so clear how long we should wait before we observe any performance effects that could be imputed to the regulatory change that has been implemented;
- Confounding factors abound, including both (a) the overlapping effects of different regulatory changes that take place while the regulated industry is still adjusting to previous regulatory reforms, and (b) the role of other industrial, policy or contingent conditions.

However, these conclusions should not demotivate us from searching for better regulations. Rather, they suggest that policy-makers and regulators should pragmatically consider the present state of regulatory governance arrangements and think about targeted interventions that could reorient the performance of the regulated firms in the desired way.

An additional example of ways to assess the performance of infrastructure and utilities firms is provided by the regulation of local public transport in Barcelona. This case is illustrative of a “mixed form” of public-service delivery, where different regulatory approaches are combined

in creative ways. The study of Albalate et al. (2012) provides an instance of such mixed forms of public-service delivery, where public-sector local public transport firms operate alongside private companies: the former mainly run downtown and day-time routes, while the latter tend to serve the periphery and night-time routes. Evidence of performance of all operators is collected and compared in ways that enable to assess relative achievements and identify service deficiencies.

The system of local public transport in Barcelona provides various advantages, which include:

- The possibility to contrast and compare the performance and costs of service operators that serve different districts;
- The possibility to privatize some market districts while retaining public ownership of the service provider in at least one district, so that the strategic option to reverse privatization is kept open;
- The possibility to contrast and compare work conditions in the public and private sector providers of the transport service, with the effect of calming-down demand from public employees;
- The possibility to separate profitable routes as distinct market districts, and to ask private service operators that serve the profitable routes to pay a fee (rather than being subsidized for the service).

The experience of mixed form of local public transport in Barcelona, however, is also characterized by the lack of turnover of private service providers because it seems extremely difficult for new entrants to win any tender offer competition for a concession. This pattern is not original. Incumbents often enjoy various informational and strategic advantages (e.g., private information on operational costs, better understanding of market demand, reputation, etc.) with respect to new entrants, which they can bring to bear in the bids for the concessions. From the perspective of the concession awarding entity (called EMT in the Barcelona case), the presence of bids from (would-be) new entrants are helpful to keep the incumbents under pressure that—if their performance deteriorates—a competitor could replace them. The concession awarding entity, however, may be generally happy with renewing the concession to (reasonably well-performing) incumbents rather than facing the uncertainties that arise from an "untested" provider.

The Barcelona system of local public transport also has some shortcomings. Most of local public transport services are provided by the public-sector operator that is not subjected to effective controls and

is exposed to political influence. Albalate et al. (2012) argue that the presence of private operators helps calming down the demands from public employees, but they do not provide evidence for this. They also suggest that the policy to award concessions to private operators provides a threat that the service area of the public-sector operator could be privatized, if the performance of the public-sector provider deteriorates. How credible is this threat? It is not difficult to figure out various sources of resistance to the privatization of local public transport providers, including the role of trade unions, consumers and politicians. The privatization of the public-sector transport operation might take place under favorable political circumstances, but evidence of poor performance may not be the only condition to induce local governments to give up direct ownership and control of a large part of Barcelona's system of local public transport.

5 Case Study: The Regulation of Railways in Portugal

Since the 1970s, railways in Portugal were managed by the state-owned monopolist Caminhos-de-Ferro Portuguese (CP). In 1997, CP was split into two companies—the National Rail Network responsible for the operation, maintenance and renewal of the rail infrastructure (Rede Ferroviària National—REFER), and the company Portuguese Trains Comboios de Portugal (CP) as the public rail undertaking. In 1998, the government created the National Institute of Rail Transport with the functions of regulation and supervision of the sector. The relationship between REFER and the government is defined in a 6-year contract, that includes details about financing and strategy for maintenance and upgrading of infrastructure. REFER is expected to improve the state of railways infrastructure, although lack of state and EU funds and partial coverage of operating cost from passenger and cargo revenues results in financial losses and high debt ratio. Also, the operator, CP, is not able to cover operating costs from income.

Railways tariffs have been regulated through a price-cap system since early 2000s. Tariff increases are set at maximum CPI-X (where CPI is the Consumer Price Index). The definition of X was highly controversial. Portuguese regulations provided that the incentive regulation is applied to each homogeneous group. REFER, instead, argued that the cap should be set on average changes in order to allow for cross-financing among different homogeneous groups. The value of X was set at 1% in 2005—a

relatively low value, which could be justified by the limited resources of the regulator to conduct a precise estimation of prospective efficiency gains and by the expectation to review tariffs at later stages. As REFER failed to delivery annual productivity reports on time, however, the value of X was retained at 1% in subsequent years.

How did the regulation of Portuguese railways perform after the reform of late 1990s—early 2000s? Based on 2001–2006 data, Santos et al. (2010) showed that, on average, REFER had 0.89% productivity losses. Also, on other dimensions, the regulatory system did not perform well: demand for railways services did not grow, the deficit of the railways companies increased, and the railways sector was not exposed to any competitive pressures. Some corrections to the present regulatory system are needed, if the Portuguese railways sector is to attain infrastructure development objectives and financial self-sufficiency (Santos et al. 2010).

In principle, regulation and regulatory reforms of infrastructure and utilities aim to attain improved conditions in the performance of the regulated sectors. In practice, they may fail to achieve these aims, as it was the case of the railways regulatory system in Portugal. It is very important that the performance of regulatory systems is appraised in order to understand whether the present regulation delivers the expected or intended improvements, or not. If the regulatory system does not deliver satisfying results, then action should be taken to improve the management of the regulatory system or to reform the system itself.

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CHAPTER 11

Case Study: The Reform of the Water Sector in Italy in 2001–2011

1 The Implementation of the Water Reform in 2001–2011: An Overview

This chapter narrates the implementation of the 1994 water reform in Italy in the period 2001–2011. Until 2001, the privatization part of the water reform had been fully implemented only in the OTA Alto Valdarno. In late 2001, instead, the privatization of water service provision abruptly accelerated. Several OTA authorities completed surveys of the installed water infrastructure, formulated water infrastructure development and tariff plans, and awarded water franchises to mixed public-private ownership firms. These efforts took place especially from December 2001, when the Parliament passed a reform of local public services—a category of local governments' field of action which comprised local water services together with others, such as urban waste collection and local gas distribution. The 2001 local public-services reform provided the general rule that water franchises should be awarded to business companies selected through tender offer competitions. Alternatively, special provisions were allowed to bypass this regulation and award the water franchise to mixed public-private ownership firms, if certain requirements were met within a deadline. In order to exploit these special provisions, a number of OTA authorities speeded-up the privatization process and assigned water service provision relatively rapidly.

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In 2003, the central government passed another reform of local public services that brought about further stimuli to the privatization of the water reform. The 2003 local public services reform re-stated the general rule that local public services should be assigned to business companies selected through tender offer competitions. In the water sector, however, this reform also allowed the OTA authorities to directly assign water franchises to either mixed public-private ownership firms or to fully local government-owned firms, if they only serviced their proprietors and if they were controlled by local governments as tightly as local government departments—the so-called "in house" firm. The "in house" provision clearly offered the opportunity for local governments to make their water firms retain their positions in the local water industries rather than opening access to the water sector through tender offer competitions for the water franchises. After the 2003 local public services reform, several OTA authorities directly assigned water franchises to "in house" firms that were established through the merger of incumbent local government-owned water firms.

On the whole, the implementation of the water reform led, during the course of the 2000s, to the setup of the new regulatory system over most of the country and to considerable consolidation of the water industry. In the report to the Parliament in July 2006, the Supervising Committee on the Use of Water Resources highlighted that the water reform implementation had resulted in the establishment of 87 OTA authorities, out of 91 provided in the regional legislations at that time (the total number of OTAs fluctuated over time as more regions passed regional legislation and some OTAs merged with each other; the total number of OTAs later reduced to 72 by 2011); in the approval of 80 water infrastructure development and tariff plans; and in the award of water concessions in 47 OTAs. The fragmentation of the sector had been largely reduced through the formation of relatively large water companies, although the Supervising Committee estimated that water service provision was still directly managed by at least about 1480 local governments.

The water regulatory system that had been put into place seemed to deliver some welcome effects in terms of investment in water infrastructure. On average, water investments increased after 2001 with respect to the previous decade, although in many areas of the country water tariffs sharply increased with respect to the past. The effects of the reform on water tariffs, however, should also take into consideration that, before the 1994 water reform, many water firms charged relatively low tariffs, which did not help attaining full cost recovery.

2 Awarding Water Franchises (2001–2003)

In May 2001, the Minister of the Environment and the Safeguard of the Territory of the Berlusconi government, Altero Matteoli, realized that some OTA authorities had directly awarded water franchises to local government-owned firms in apparent violation of the water reform statute. In his view, the water reform strictly implied the application of EU regulations on tender offer competitions for public sector contracting. Local governments, instead, claimed that the direct award of water franchises was legitimate, according to general rules concerning the provision of local public services contained in Act 142/1990, which the water reform explicitly recalled. Determined to impede any further direct award of water franchises, on October 17, 2001, Matteoli issued a directive where he urged the OTA authorities to award the water franchises through tender offer competitions and to limit the application of direct awards only to firms which qualified according to criteria of efficiency, effectiveness and financial self-sufficiency. A warning to initiate an infraction procedure against the government of Italy, sent by the EU Commission on November 8, 2000 on the basis that some provisions contained in Act 142/1990 violated EU directives on public-sector contracting and the general EU Treaty rules on non-discrimination and transparency, provided Matteoli grounds for publicly justify his efforts to steer local governments' actions.

After a few days, Matteoli filled a gap that had still been left open in the new regulatory system. On November 22, 2001, he issued the regulation of the procedure that the OTA authorities should follow for conducting tender offer competitions for awarding water franchises (this regulation was required according to article 20 of Act 36/1994, but former Ministers of Public Works and Ministers of the Environment had never approved earlier drafts). On the same day, he also issued another directive where he recommended that the OTA authorities should apply the regulation of tender offer competitions for awarding the water franchises. In this directive, he also reminded them that the EU Commission had warned the government of Italy to begin an infraction procedure due to mounting evidence of non-compliance with EU competition rules in public sector contracting.

Local governments reacted to these directives by questioning the legitimacy of the Minister of the Environment's authority to regulate how water franchises should be awarded. In an interview with the

business press, for instance, Leonardo Dominici, Chairman of ANCI, the national association of local government, said: "the directives [provided by the Minister of the Environment] are confusing and contradictory. The laws currently in force do not compel to do any tender offer competition. We need to distinguish the award of the water franchise to a public-sector-owned firm from the selection of a business company. In the second case only is a tender offer competition required." (Il Sole 24 Ore, December 5, 2001). More generally, local governments claimed that the OTA authorities had the right to directly assign the water concessions to local government-owned water firms, as the tender offer competition rule only applied in case they wished to award of the water franchises to fully privately-owned business companies.

Shortly after Matteoli issued these directives, in December 2001, the Parliament passed 2002 Budget Law (Act 448/2001), which contained, in article 35, a reform of local public services. Until that time, the organization of local public services had been ruled by Act 142/1990 (later amended by Legislative Decree 267/2000), which provided that local governments could assign them to either local government departments, or to municipal firms, or to mixed public-private ownership firms, or to business companies selected through tender offer competitions. Instead, the 2001 local public services reform provided the general rule that local public services should be contracted out through tender offer competitions only. Special provisions, however, allowed exemption and transition regimes, under particular conditions. These exemption and transition regimes had been introduced in the reform package by the most conservative wing of the Berlusconi-led coalition, which, lobbied by local government-owned water firms, was concerned that incumbent water firms might not win the tender offer competitions if challenged by business companies—especially, water multi-national companies.

The application of the exemption and transition regimes provided by the 2001 local public services reform required that specific conditions were met. The exemption regime consisted of the possibility to postpone tender offer competitions for a period from three up to nine years, if water services were managed by relatively small firms that operated only in local governments with up to 5000 inhabitants. The transition regime provided the possibility to postpone the tender offer competitions if water firms were restructured into larger operators. According to this regime, the OTA authorities could directly award water franchises lasting 5 years within 18 months after the enactment of the reform (i.e., by June

30, 2003) to companies entirely owned by the local governments of an OTA, provided that local governments select a private operator or investor as a partner in the ownership of the water firm within 2 years after receiving the franchise. The duration of the franchise could be increased by one year if the local government-owned firms merged with other firms to form a new company which would double the user basin. The duration could be further increased by two more years if the new companies operate in at least one provincial territory, one further year if at least 40% of the companies is owned by private investors, and one additional year if 51% of the companies is owned by private investors. These extensions could be accumulated—so that the direct award of water franchises to local government-owned water firms could extend up to 10 years (Petretto 2001). The local government-owned water firms that benefited from the transition regime were subjected to some limitations to their operations, however. For example, they could not participate in tender offer competitions if they had received direct concessions without tender offers (the same rule applied to their subsidiaries or controlling entities). This rule, however, only applied at the end of the transition period.

As soon as the Parliament passed the 2001 local public-services reform, some local governments urged their OTA authorities to speed up the procedure for awarding water franchises before Act 448/2001 came into force. Within a few weeks, in December 2001, most OTA authorities based in Tuscany rushed to award water franchises to local government-owned water firms, whose minority shares would be later tendered out to private operators and investors. In this way, local governments could preserve the position of their water firms in the local water industries while bypassing the tender offer competition rule for awarding the water franchises, and they could also avoid complying with the strict requirements set in order to benefit from the transition regime provided by the 2001 local public-services reform. As a result of this acceleration of the awarding process, by the end of 2001, water concessions had been granted in 5 out of 6 OTAs in Tuscany.

After the 2001 local public-services reform came into force, several local governments sensed the opportunity to protect the incumbent position of their water firms in the local water industries by exploiting the exemption and—mostly—the transition regimes. To accomplish this objective, local governments first required the OTA authorities to speed up the completion of water infrastructure development and tariff plans. While only 11 such plans had been formulated by the OTA authorities

by the end of 2001, the number of approved water infrastructure development and tariff plans increased to 38 by the end of 2002 and to 55 by the end of 2003. Local governments also made their water firms re-structure to match the requirements set to apply the transition regime. Several local government-owned water firms were re-incorporated as business companies, including those based in Milan, Brescia, Monza, Parma, Verona, Modena and Bologna. Some of these companies also floated their shares on the Milan stock market, such as Brescia's ASM in July 2002 and Bologna's Hera in June 2003.

After the water infrastructure development and tariff plans were formulated and the water firms had been re-structured, several OTA authorities proceeded to the award of water franchises. While only 6 water concessions had been awarded by the end of 2001, their number went up to 9 by the end of 2002 and to 17 by the end of 2003. All but one of the new water franchises were awarded to local government-owned water firms. Only the OTA "Frosinone" Authority, in Lazio, launched, in May 2001, a tender offer competition for the selection of a business company to which the water franchise would be awarded. In April 2002, the OTA Frosinone Authority granted the water franchise to a consortium led by Rome's water firm, ACEA.

The direct award of water franchises according to the terms provided by the transitory regime was opposed by the Minister of the Environment, Matteoli. In an interview with the business press, he said:

> From Piemonte to Campania, passing through Tuscany, there are many instances of firms that define themselves as the legitimate operators in the OTAs in accordance with law 36/1994, but their franchises have been awarded through procedures that have bypassed the tender offer competitions, made possible by the presumption, contrary to the law and counterproductive for the citizens, that public-sector-owned companies have the right of exemption [from the tender offer competition rule]. (Il Sole 24 Ore, November 21, 2002)

Despite Matteoli's concern, during the following months the local governments persisted in making the OTA authorities directly award the water franchises to local government-owned firms.

The direct award of water franchises was strongly supported by local governments, by the association of local government-owned public-service firms (Confservizi), and by the association of local government-owned water firms (Federgasacqua). These organizations justified the

direct award of water franchises on the basis of four arguments. First, they argued that the EU Commission had never issued a directive on the liberalization of water services (while it did so for other infrastructure industries), and that the EU directive on liberalization of service contracts (which Matteoli had invoked) regulated competition between business companies rather than public services delivered to the citizens. Second, the 2001 reform of local public services ruled out the application of the provisions contained in the national water reform that referred to tender offer competitions, which should no longer be considered enforceable. Third, the Minister of the Environment and the Safeguard of the Territory did not have competences on regulating water services, because a reform of the Constitution of Italy, which came into force on November 8, 2001, limited the State's competences to a strict list of subjects that did not include the water domain. In the article published in Il Sole 24 Ore on November 21, 2002, Fulvio Vento wrote:

> We should remember that an article of the constitution, numbered 117, which has been recently modified [by the November 2001 reform], does not explicitly give to the State the competences on water services, therefore it assigns them to the regions. Then we should deduce that the Minister of the Environment and the Safeguard of the Territory is spoiled of any such competence. We should also remind that local governments enjoy an autonomy acknowledged by the constitution.

Finally, the direct award of water concessions was justified because domestic water firms did not want to be exposed to the threat of competition from foreign companies, while other countries did not provide equal opportunities to expand their business. In an article published in the business press Il Sole 24 Ore on November 21, 2002, Andrea Lolli, Chairman of Federgasacqua, wrote:

> If the Parliament decides to open the [water] market, the water firms will not withdraw from competing [for the franchises]. However, we [as a country] should not be the 'only and unique in Europe' following this route. It would be better, as we can learn from foreign experiences, to allow the time needed to favor the construction of national competitors through mergers and public-private partnerships. […] There is the real risk of a colonization of the national water market—affected by large size firms based in countries where there is actually no competition.

Thus, local governments' efforts to preserve the position of incumbent water firms were also related to the public discourse concerning the industrial development of the domestic water firms with respect to other EU countries.

3 Awarding the Water Franchises (2003–2006)

In September 2003, the central government passed another reform of local public services. The 2003 local public services reform originated, in part, from pressures of the most conservative wing of the governmental coalition, which was interested to provide local governments with legal ways to bypass the application of tender offer competition rules after the expiry of the June 30, 2003 deadline. The reform also originated, in part, from a request to amend the 2001 local public services reform sent by the EU Commission, that, on June 26, 2002, had warned the government of Italy to start an infraction procedure against some cases of direct award of water franchises that violated EU legislation on public-sector contracts (in particular, directives 92/50/CEE and 93/38/CEE, and the general rules of the EU Treaty on non-discrimination and transparency, that contradicted the transitory regime provided by the 2001 local public services reform in the part that allowed postponing tender offer competitions for several years). In a relatively short time, then, the central government drafted a revised regulation of local public services, and this new reform was approved by the Council of Ministers with the Legislative Decree no. 269.

The 2003 reform re-stated the general rule that local public services should be awarded through tender offer competitions. It also provided that all franchises that had been awarded without any tender offer competition would automatically expire on December 31, 2006. However, the reform also allowed, in accordance with EU legislation, that franchises for local public services could be legitimately awarded in a direct way either to mixed public-private ownership firms, where the private partners were selected through tender offer competitions, or to firms fully owned by local governments, provided that these firms deliver most of their services to the same local governments and that local governments exercise on these firms a control as tight as the one exerted on their own divisions (the so-called "in house" arrangement).

The automatic expiry of franchises awarded without any tender offer competition on December 31, 2006 alarmed several local

government-owned water firms, which had directly received the water franchises in accordance with the transition regime provided by the 2001 local public services reform. Pending the threat to lose their water franchises, local government-owned water firms lobbied the central government to amend the 2003 reform and, in December 2003, their efforts succeeded in making the central government introduce an exemption rule to the expiry of franchises. The exemption rule provided that no automatic expiry on December 31, 2006 would apply to those franchises that had been awarded before October 1, 2003 to firms whose shares had already been floated in the stock exchange. Furthermore, the December 2003 amendment also contained the provision that the firms that had been directly awarded local public-service franchises could take part in tender offer competitions for other local public services, an option that the 2003 reform had banned.

After the 2003 reform and the December 2003 amendments, several OTA authorities began to award water franchises in accordance with the new rules. Most of these franchises were granted to "in house" firms, which secured local governments' influence on the local water industries. The provision concerning "in house" firms originated from European Court of Justice case: C-107/98, Tekal vs. local government of Viano (Italy), on November 18, 1999. The case related to the appeal of Tekal, a business company, against the direct award of heating services for certain municipal buildings from the local government of Viano to a fully local government-owned business company. The Court ruled in favor of the local government, on the basis that the local government can contract out the local public service to a third party, legally distinct from itself, without any tender offer competition and in derogation to sector-specific rules, if the local government is able to exercise a control on the entity analogous to the one on its own departments, and the other entity delivers most of its services to the controlling local government.

The "in house" provision was introduced in the 2003 local public-services reform as a way of providing legitimacy to franchises already awarded to fully local government-owned water firms. The Italian Council of State, Section V, in the sentence 19/2004, n. 679, explicitly commented that the provisions contained in the 2003 reform of the local public services had been written with the aim to safeguard the legitimacy of local public-service franchises awarded to fully local government-owned firms and to those awarded in accordance with the special transition regime provided in the 2001 local public-service reform.

Instead, from December 2003 onwards, the OTA authorities started to apply the "in house" provision for awarding new water franchises to fully local government-owned firms. It became apparent, then, that the "in house" provision was exploited as a way to bypass the tender offer competition rule or the requirement to partially open the ownership of the water firms to private operators or investors.

The diffusion of "in house" water firms eventually attracted the attention of the Minister of the Environment, Matteoli. On December 6, 2004, he issued a directive that aimed to constrain the applicability of this kind of water franchise. This directive ruled that the OTA authorities could apply the "in house" provision only if three requirements were met. First, the statute of the local government-owned water firms had to explicitly limit the company's objectives to serving the proprietors (hence, the directive limited the possibility that local government-owned water firms could be awarded concessions in other OTAs). Second, all (and only) the local governments included in the OTAs had to own stakes in these water firms. Third, the OTA authorities had to provide an explicit rationale for applying the "in house" provision in the deliberation of the direct award of the water franchise, and they could extend the franchise duration only for a reasonable time needed before the launch of tender offer competitions.

On December 6, 2004, Matteoli issued a second directive, that ruled that water franchises could be directly awarded to mixed public-private ownership firms only after local governments had selected a business partner through tender offer competitions. Generally, the OTA authorities had directly awarded the water franchises to local government-owned firms whose minority share were later tendered out or floated in the stock exchange. This procedure, for example, had been followed for the selection of the business partners of water firms in the OTAs "Medio Valdarno" and "Basso Valdarno" in Tuscany, and in the OTA of Rome. By issuing this second directive, Matteoli intended to make water franchises, which had been awarded to local government-owned water firms without any prior tender offer competition, illegitimate.

Matteoli regarded the "in house" provision as a scheme for awarding water franchises to use only in exceptional and residual cases, and based on a justified and proved reason of public interest that objectively prevented any possibility to make use of a tender offer competition. These conditions were specified in a Directive of the Minister of the Environment and the Safeguard of the Territory issued on December

6, 2004. The stringent conditions when the "in house" provision could be applied were later re-stated by the European Court of Justice in the sentence C-458/03, Parking Brixen vs. local government of Bressanone (Italy) on October 13, 2005. The sentence originated from the appeal of Parking Brixen against the direct award of the parking services from the local government of Bressanone to a fully local government-owned business company. The Court ruled against the local government, on the basis that, despite the full ownership, the local government-owned firm enjoyed considerable autonomy and the control that the local government exerted over it could not be assimilated to the one it could employ on its own departments. Thus, failing to launch a tender offer competition for the parking services violated the rules of the EC Treaty referring to non-discrimination and transparency.

Despite Matteoli's directives, the OTA authorities persisted in directly awarding water concessions to "in house" firms. Local governments and OTA authorities effectively contended that the 2003 local public services reform did not explicitly limit the applicability of the "in house" provision to any condition. Matteoli's efforts to influence the award of water franchises were also formally counteracted by the region Tuscany on legal grounds. On January 21, 2004, the regional government of Tuscany appealed to the Constitutional Court against the part of the 2003 reform of the local public services that provided a detailed regulation of how franchises for local public services should be awarded to business companies selected through tender offer competitions. The regional government of Tuscany claimed that these provisions violated the Constitution of Italy as modified by the 2001 constitutional reform, which granted competences on local public services to the regions. After the Constitutional Court accepted most of Tuscany's appeal on July 27, 2004 (sentence no. 272), Matteoli's directives lost much of their relevance.

By awarding water franchises to either mixed public-private ownership firms or to "in house" firms, local governments maintained much of their influence on the local water industries. To some extent, local governments even showed to prefer to manage water services through (fully or partially) local government-owned water firms than through their own departments. An illustrative description of this view was provided, for example, by the major of Grosseto (a municipality located in Tuscany) and chairman on the Local Public Services Committee of ANCI, Alessandro Antichi, during a conference of Federgasacqua held in Trieste on September 24–26, 2003, where he said:

> We know well, we mayors, that a tight control on third entities, like the companies which provide local public services, is actually more effective than the one we have on our own managers, that we find in a local authority because they won a public selection, they chair a division which is only respondent to them, and, as a matter of fact, for us it is much easier to manage through the companies than through the managers [of the local governments].

The award of water franchises to "in house" firms, then, seemed to allow local governments to retain influence over the management of local water services in the same way—if not more—than the direct management of water services through local government departments.

During following years, several local governments followed the common pattern of making their water firms restructure, grow in size and directly receive water franchises from the OTA authorities. In the north of the country, most profound changes in the industrial organization of the water sector took place especially in Piemonte, Liguria and Lombardy. In Piemonte, in October 2004, the water firms of Genoa and Turin, AMGA and SMAT, jointly acquired the majority stake of the water firm, Acque Potabili, from the gas company, Italgas, resulting in the creation of the third biggest water firm in the country. Later, in October 2006, AMGA merged with AEM, the electricity and gas company of Turin, leading to the incorporation of Iride, a multi-utility company also operating water services through 17 subsidiaries. In Liguria, in July 2005, AMGA acquired ACEA's stakes in the water companies De Ferrari-Galliera and Nicolay, which later merged in December 2005. In Lombardy, parallel efforts to merge local government-owned water firms took place among the cities of Cremona, Mantova, Lodi and Pavia (resulting in the incorporation of the multi-utility Linea Group company), Brescia and Bergamo (which merged their water companies, ASM and BAS, in May 2005), and Brescia and Milan (whose mayors in September 2006 agreed to merge the water companies of the two cities, ASM and AEM). Since 2004, moreover, the regional government of Lombardy started sponsoring a project to merge the water, electricity and waste management firms of most of the region.

In the central regions, the most apparent efforts to re-structure the local water industries took place in Emilia Romagna, Tuscany and Lazio. In Emilia Romagna, in November 2002, 14 local government-owned water firms (in particular, those of the cities of Ferrara and Modena)

merged into HERA, and, in March 2005, the multi-utility firms of Piacenza, Parma and Reggio Emilia merged into ENIA. The regional legislation that transposed the national water reform in Emilia Romagna, Act 25/1999, had provided that water franchises could be awarded to business companies selected through tender offer competitions or to local government majority-owned companies. In order to comply with these requirements, the shares of HERA and ENIA were partially sold to private investors by floating them in the Milan stock exchange in June 2003 and June 2007, respectively. In Tuscany, where about 230 firms originally operated, the consolidation of the local water industry led to only six water firms operating in 2003, i.e., one for each of the six OTAs established in the country. Aiming to push the consolidation even further, from 2004, the regional government started promoting among local governments of the main cities (Florence, Pisa, Pistoia, Prato, Empoli, Grosseto and Sienna) the idea to merge their water firms into a large "regional player" water firm. In Lazio, from 2001 onwards, the water and electricity firm of Rome, ACEA, carried out a series of mergers and acquisitions that led the company to become, in February 2003, the biggest player in the country's water sector, overcoming Acquedotto Pugliese.

In the southern regions of the country, part of the water industry consolidated around relatively large incumbents, such as Acquedotto Pugliese and Acquedotto Lucano (originally owned by the State and later transferred to the regions Puglia and Basilicata, respectively), ESAF (based in Sardinia) and EAS (based in Sicily). In Sicily, however, the water industry remained rather fragmented. Several OTA authorities there launched tender offer competitions for the selection of private operators, but often no applications were received, mostly due to the vagueness of the calls, the difficulty for the applicants to assess the risks and returns from investments, and the lack of credibility of the OTA authorities in regulating the water tariff according to the franchise terms (Antonioli 2006; Massarutto 2007). However, the difficulty of attracting private operators when conducting tender offer competitions for the selection of partners for local government-owned water firms had also been experienced in other OTAs in the country. On average, tender offer calls for selecting private operators as partners of local government-owned water firms received 1.6 applications, and those for the selection of business companies for managing the water services counted 1.2 bids (Anwandter and Rubino 2006a, b).

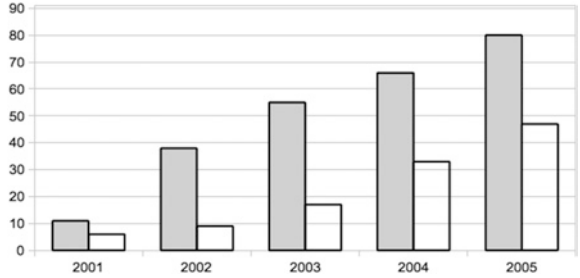

Fig. 1 Total number of water infrastructure development and tariff plans (*grey bars*), and total number of water franchises awarded (*white bars*), per year. *Source* Supervising Committee on the Use of Water Resources (2001–2005)

Overall, by the end of 2006 the water reform had been largely implemented. At the end of 2001, 11 water infrastructure development and tariff plans had been approved and 6 water franchises had been awarded. The number of plans approved rose to 38 in 2002, 55 in 2003, 66 in 2004 and to 70 in 2005. The number of OTAs that had awarded water franchises increased to 9 in 2002, 17 in 2003, 33 in 2004 and to 47 in 2005 (Fig. 1). A survey of water firms conducted by the author in December 2009 showed that water franchises had been awarded in 67 OTAs to a total number of 102 water service providers (the total number exceeded the one of the OTAs because, sometimes, the same OTA authorities had jointly awarded water franchises to more than one water firm within the same OTA). Most of the water franchises were awarded to "in house" water firms (58) and to mixed public-private ownership firms (27). In 11 cases, water concessions were assigned to public-sector firms that enjoyed transitory or exemption regime, and in only 6 cases were they awarded to business companies (5 of these were selected through tender offer competitions, and one was granted the water franchise in a negotiated temporary regime).

4 Terminating the Implementation of the Water Reform

In 2006, the implementation of the water reform appeared to come to an end. On October 23, 2000, the EU Commission had issued the Water Framework Directive (WFD) (2000/60/CE), which provided a regulatory framework for the protection of the aquatic environment and for the

sustainable, balanced and equitable water use. The WFD provided, in particular, that water resource planning would be conducted by the authorities of water districts, that is, new jurisdictions that the Member states were mandated to establish according to the hydro-geographical features of the territories. The transposition of the WFD into the Italian national legislation had begun in October 2001, when the central government submitted a bill to the Parliament. Since the WFD was not transposed within the deadline set on December 22, 2003, the EU Commission started an infraction procedure against the government of Italy. After the European Court of Justice sanctioned Italy on January 12, 2006, the central government sped up the transposition of the WFD, which was accomplished on April 3, 2006 (Legislative Decree 152/2006).

The legislation that transposed the WFD introduced several changes into the regulatory framework of water management and various other water-related areas, such as waste collection, protection of the territory, quality of air and management of natural and marine parks. In the area of water management, Legislative Decree 152/2006 provided the establishment of eight water districts in the country, whose authorities would plan the interventions needed for the preservation of water resources and the development of water infrastructure. For what matters, the implementation of the water reform enacted in 1994, Legislative Decree 152/2006 also abrogated Act 36/1994, hence, putting an end to a process that had deeply affected the organization and management of the water industry in the country over the previous twelve years.

With the abrogation of Act 36/1994, the main institutional framework regulating the organization and management of the local water services became the Legislative Decree 152/2006 and the 2003 local public services reform. Part of the acrimony towards the reform of the water sector that had mounted in part of the country during the years, then, coalesced into a political movement that successfully triggered the call for a referendum on June 12–13, 2011. The referendum asked voters (among other questions) whether they agreed to abrogate the part of Legislative Decree 152/2006 that provided that the water tariff should also remunerate the capital invested by water firms for the construction and maintenance of infrastructure. Framed as a political issue about the pervasiveness of capitalism into public services, the referendum succeeded in removing remuneration to capital invested in water. After this referendum, therefore, the regulation of the water tariff lacked providing adequate incentives for the participation of private operators and investors in the water industry.

5 An Assessment of the Water Reform Implementation Outcome (2011)

The prolonged efforts to devise, install and make the water reform work from 1994 resulted, after almost two decades, in a fragmented and variegated condition of the water industry of the country. As illustrated in Fig. 2, the diverse trajectories of implementation of the water reform at the sub-national level led to different institutional and organizational forms of water service provision. In large part of the country, water services were provided by "in house" water firms—an organizational and industrial arrangement that retained continuity with the past local public ownership of water firms although resulted in more concentrated industrial organization. In another part of the country, water services were provided by mixed public-private ownership water firms or firms that were traded in the stock exchange (with a stake in local governments). Only in a few cases were water services provided by business companies that had been granted water concessions or by local government-owned entities that had managed to benefit from exemption or transition regimes. Instead, in part of the country water reform was never really executed.

Evidence on the performance effects of the reform was provided by a study of Ermano (2012). Based on ISTAT data, the study calculated *pro capita* investment in water infrastructure during the period 1954–2010, grouped into periods approximately a decade long each (Fig. 3). This figure shows that, after the relative decline of *pro capita* investment during part of the 1990s, both planned and realized investments in water infrastructure increased remarkably after the new regulatory regime was put into place in large parts of the country. Based on ISTAT data, however, some documentary sources (CGIAMestre 2011; Cittadinanzattiva 2011) also highlighted that water tariffs increased sharply during the 2000s (about 64.4–70%).

6 In Summary: The Implementation of the Water Reform in 2001–2011

The liberalization, re-regulation and privatization parts of the water reform were largely implemented during the period 2001–2011. The implementation of water reform, moreover, proceeded together with significant changes in the industrial organization of the water sector.

Fig. 2 Institutional and organizational forms of water service provision in Italy, 2011. *Source* own elaboration from data from Federutility

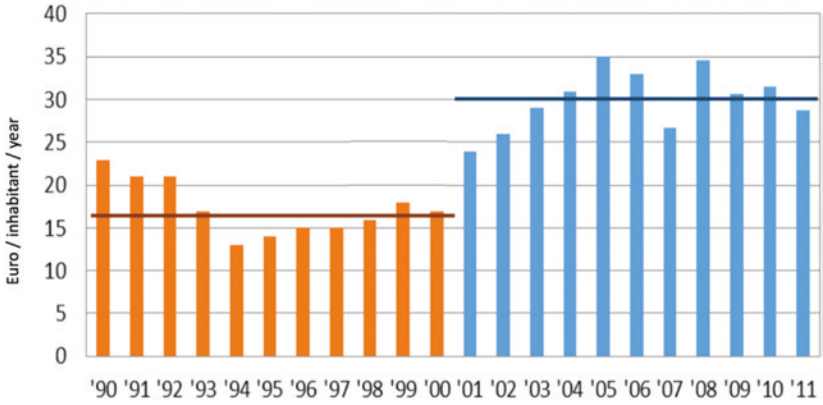

Fig. 3 Investments in the water sector, €/inhabitant/year, 1990–2011. *Source* own elaboration from data from Ermano (2012)

The fragmentation of the water industry, in particular, was significantly reduced through several mergers and acquisitions that took place between local government-owned water firms. All in all, in 2011, the water industry and its regulatory system looked significantly different than they had been before the enactment of the water reform in 1994.

In the period 2001–2003, the implementation of water reform largely resulted in the award of water franchises to mixed public-private ownership firms. The period began with the enactment of the 2001 reform of local public services, which provided the general rule that franchises of local public services should be awarded to business companies selected through tender offer competitions. The 2001 reform, however, also contained provisions for derogating to the tender offer competition rule by applying an exemption or a transition regime to water firms. In order to take advantage of these provisions, several local governments re-structured their water firms, opened them partially to private ownership, and made the OTA authorities directly assign them the water franchises.

In the period 2003–2006, the implementation of the privatization part of the water reform sped up further. The period began with the enactment of another reform of local public services, which restated the general rule that franchises of local public services should be awarded to business companies selected through tender offer competitions. The 2003 reform, however, also allowed that the franchises were awarded to mixed public-private ownership firms or to fully local government-owned firms that complied with the requirements of the "in house" model. From 2003 onwards, a growing number of water franchises were awarded in the country especially to "in house" firms, despite efforts to open the sector to the participation of private operators and investors, from the opinion of the Minister of the Environment.

The implementation of the water reform terminated in 2006, when Legislative Decree 152 abrogated the national water reform statute (Act 36/1994). The outcome of the process of implementing the water reform in 2006 was, according to the Supervising Authority on Water Resources and Urban Waste (which took over the tasks of the Supervising Committee on the Use of Water Resources), a mix of success and failure. On the one hand, the water reform had eventually been implemented over most of the country and had been accompanied by significant changes in the industrial organization of the water sector, whose fragmentation had been largely reduced. On the other hand, local governments still dominated, either through full or partial ownership of

water firms, the water industry, while the presence of private operators and private investors was minimal. Incumbent local government-owned water firms had effectively preserved their positions in the local water industries, while no-competition mechanisms had been substantially put into place, relatively little private capital had been attracted for investments in the water infrastructure, and little pressure had been put on water firms to improve their performance.

7 Commentary: The Implementation of the Water Reform in 1994–2001

The case of the water reform in Italy illustrates the importance of water tariff regulation in stimulating investments. The design of the 1994 water reform included the provision that water tariffs should be based on an estimate of the costs incurred by the water service providers, including a fair return on investments. This design principle seemed to result, once the regulatory system was installed and put into operation, in a tendency to increase investments in the water sector. The extent to which the tariff system delivered adequate incentives to invest is questionable, especially because, in the past, there had been a lack of investments in the water sector and water tariffs had been kept relatively low. When the referendum, in 2011, removed the provision about the return on investments made by water firms, however, the water sector seemed to lack the capacity to attract financial resources to fund further investments in water infrastructure in the future.

The case of the water reform in Italy also suggests considerations about the appraisal of water service performance in the country. Evidence of dissatisfactory performance seemed to play an influential role in the making of the 1994 water reform, especially based on reports that were published by the ISTAT. Throughout the implementation of the water reform, there seemed to be relatively few indications of whether the performance of the water sector was improving. No systematic collection of data on the performance of water service providers was collected. Policy-makers, regulators and consumers were offered no means to assess the relative performance of water firms.

The 1994 water reform resulted in some increase of investments (together with an increase of water tariffs) with respect to the past (although investments and water tariffs had plausibly remained relatively

law in the previous years). To some extent, the entry of private investors into the water sector triggered greater concern for the financial performance of water firms and the profitability of water service provision. By and large, however, only marginally was the water sector affected by neoliberal principles of "commercialization" of water services. The many efforts to reform the regulation of the water sector led to some amount of re-structuring of the ownership of water firms (which generally merged into larger water utilities) and to the introduction of a contractual regime to plan investments and set water tariffs and service quality standards. Because of both external pressures (such as the adoption of the EU WFD) and internal conditions (such as local governments' interest to retain control of water firms), on the other hand, the implementation of water reform came to an end without fully re-configuring the system of delivery of water services within the country.

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CHAPTER 12

Conclusion: The Design of Regulatory Systems

1 Prescriptions for Designing Regulatory Systems

A source of general guidelines for regulatory reforms of infrastructure and utilities industries is provided by so-called "standard prescriptions" (Joskow 1996, 1997), that comprise:

- The privatization of incumbent state-owned enterprises;
- The unbundling of potentially competitive segments of the industry from the natural monopoly ones;
- The regulation of access prices in order to prevent discrimination;
- The provisions for ownership separation between vertical activities;
- The deregulation and facilitation of market entry in the competitive segments of the industry;
- Incentive regulation in the natural monopoly segments of the industry;
- Direct access of retail customers to wholesale markets.

Some studies, however, suggest that the timing and sequencing of regulatory reform actions matter too: for example, it may be pointless to open up a sector to new entrants if the regulated industry is dominated by a powerful state-owned incumbent that retains control of essential facilities and that can hamper new entrants' access to the network. Wallsten (2002) suggested that, in telecommunications regulatory

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reforms, establishing an independent regulator before privatization results in more investments, fixed lines penetration and mobile lines penetrations than alternative reform patterns. Zhang et al. (2005) found that establishing an independent regulatory authority and introducing competition before privatization are correlated with higher electricity generation, higher generation capacity and—if competition precedes privatization—improved capital utilization. While general principles or "prescriptions" for reforming infrastructure and utilities industries provide helpful guidance, it is also important to be sensitive to the sequence of reform steps that should be taken.

The design of regulatory systems is typically assisted by methodologies that help policy-makers to analyze and assess the present conditions of the regulated industry and to devise strategies for reforming them. In the rest of this chapter, we will focus, first, on so-called RIA and, then, on regulatory design guidelines provided by international and super-national organizations such as the OECD and the EU. Later in the chapter, we will discuss how regulatory systems may become obsolete over time.

2 Regulatory Impact Assessment (RIA)

RIA is an approach to analyze and assess regulatory systems that has gained lot of traction during the last decades (Radaelli 2004, 2005). RIAs aim to assist policy-makers in the improvement of the quality of regulations and reduce the costs of regulation (e.g., the "regulatory burden" in terms of compliance costs on businesses). RIAs can be conducted in many different ways, depending on the purposes and interests of the policy-makers. In fact, RIA refers to a broad collection of techniques and methods rather than to any specific way of analyzing and assessing regulations: RIAs encompass, for example, business impacts, administrative and paperwork burdens, benefit-cost analysis, environmental and social impact assessment, etc. (Jacobs 1997). A common trait of RIA's approaches, however, is that they are intended to inform policy decisions on the basis of evidence. The contribution of RIAs, therefore, complements the role of other factors, such as, for example, political views and values, that may affect regulatory policy-making.

The use of RIA can serve different purposes. In part, RIA produces information that feeds into the regulatory policy-making process. For example, a RIA can suggest the net benefits of proposed regulations, or how costs and benefits would be distributed among businesses and

customers. In part, RIA stimulates rigorous thinking about the effects of proposed regulations. For example, when conducting a RIA, analysts should carefully consider as many possible effects and side-effects of the proposed regulation that can impact on the target population. As an OECD publication put it, "… RIA's most important contribution to the quality of decisions is not the precision of the calculations used, but the action of analyzing—questioning, understanding real-world impacts and exploring assumption" (OECD 2002: p. 47). One of the potential benefits of RIAs, for instance, is to elicit public participation in the decision-making process, through various forms of consultation during the RIA and on the results of the RIA.

There is no paucity of guidelines and handbooks that assist RIA analysts. Since 1995, the OECD provided the following checklist for the assessment of regulations:

1. Is the problem correctly defined?
2. Is government action justified?
3. Is regulation the best form of government action?
4. Is there a legal basis for regulation?
5. What is the appropriate level (or levels) of government for this action?
6. Do the benefits of regulation justify the costs?
7. Is the distribution of effects across society transparent?
8. Is the regulation clear, consistent, comprehensible and accessible to users?
9. Have all interested parties had the opportunity to present their views?
10. How will compliance be achieved?

In the UK, the National Audit Office (NAO) indicated, in 2001, what a RIA is expected to cover (Table 1).

3 Regulatory Design Guidelines

Some guidelines for the design of regulatory systems exist that have been formulated by international and super-national organizations. One of these guidelines originates from the Recommendations of the Council on Regulatory Policy and Governance of the OECD (2012). These recommendations comprise twelve general guidelines to member countries:

Table 1 Requirements for a RIA. (*Source* NAO 2001)

Purpose and intended effects	Identifies the objectives of the regulatory proposal
Risks	Assesses the risks that the proposed regulations are addressing
Benefits	Identifies the benefits of each option including the "do nothing" option
Costs	Looks at all costs including indirect costs
Securing compliance	Identifies options for action
Impact on small business	Using advice from the Small Business Service
Public consultation	Takes the views of those affected, and is clear about assumptions and options for discussion
Monitoring and evaluation	Establishes criteria for monitoring and evaluation
Recommendation	Summarizes and makes recommendations to Ministers, having regard to the views expressed in public consultation

- Commit at the highest political level to an explicit whole-of-government policy for regulatory quality. The policy should have clear objectives and frameworks for implementation to ensure that, if regulation is used, the economic, social and environmental benefits justify the costs, the distributional effects are considered and the net benefits are maximized;
- Adhere to principles of open government, including transparency and participation in the regulatory process to ensure that regulation serves the public interest and is informed by the legitimate needs of those interested in and affected by regulation. This includes providing meaningful opportunities (including online) for the public to contribute to the process of preparing draft regulatory proposals and to the quality of the supporting analysis. Governments should ensure that regulations are comprehensible and clear and that parties can easily understand their rights and obligations;
- Establish mechanisms and institutions to actively provide oversight of regulatory policy procedures and goals, support and implement regulatory policy, and thereby foster regulatory quality;
- Integrate RIA into the early stages of the policy process for the formulation of new regulatory proposals. Clearly identify policy goals, and evaluate if regulation is necessary and how it can be most effective and efficient in achieving those goals. Consider means other than regulation and identify the trade-offs of the different approaches analyzed to identify the best approach;

- Conduct systematic program reviews of the stock of significant regulation against clearly defined policy goals, including consideration of costs and benefits, to ensure that regulations remain up to date, cost justified, cost effective and consistent and deliver the intended policy objectives;
- Regularly publish reports on the performance of regulatory policy and reform programs and the public authorities applying the regulations. Such reports should also include information on how regulatory tools such as RIA, public consultation practices and reviews of existing regulations are functioning in practice;
- Develop a consistent policy covering the role and functions of regulatory agencies in order to provide greater confidence that regulatory decisions are made on an objective, impartial and consistent basis, without conflict of interest, bias or improper influence;
- Ensure the effectiveness of systems for the review of the legality and procedural fairness of regulations and of decisions made by bodies empowered to issue regulatory sanctions. Ensure that citizens and businesses have access to these systems of review at reasonable cost and receive decisions in a timely manner;
- As appropriate apply risk assessment, risk management and risk communication strategies to the design and implementation of regulations to ensure that regulation is targeted and effective. Regulators should assess how regulations will be given effect and should design responsive implementation and enforcement strategies;
- Where appropriate promote regulatory coherence through coordination mechanisms between the supra-national, the national and sub-national levels of government. Identify cross-cutting regulatory issues at all levels of government, to promote coherence between regulatory approaches and avoid duplication or conflict of regulations;
- Foster the development of regulatory management capacity and performance at sub-national levels of government;
- In developing regulatory measures, give consideration to all relevant international standards and frameworks for cooperation in the same field and, where appropriate, their likely effects on parties outside the jurisdiction.

Another source of guidelines for the design of regulations is provided by the EU in the Better Regulation Guidelines issued in 2015. By "better regulation", the EU commission understands "designing EU policies and laws so that they achieve their objectives at minimum cost. Better Regulation is not about regulating or deregulating. It is a way of working to ensure that political decisions are prepared in an open, transparent manner, informed by the best available evidence and backed by the comprehensive involvement of stakeholders" (EU 2015: p. 5). The guidelines are intended to inform the process of regulatory policy-making in the stages of preparation, adoption, implementation and application of regulations, taking into consideration stakeholders' inputs and by following sound impact assessment and monitoring and evaluation practices. The guidelines (that are also complemented by a Better Regulation "Toolbox" online tool that helps following the recommendations through diagrams and other models) include generic recommendations such as:

- Start regulatory design with forward planning and political validation to develop the idea further;
- Consult stakeholders as early as possible in order to maximize the usefulness of the consultation and to promote an inclusive approach;
- Support policy preparation with both retrospective performance evaluations and forward-looking impact assessments;
- Conduct an impact assessment to identify and describe the problem to be tackled, establish objectives, formulate policy options and assess the impacts of these options;
- Produce quality working documents to ensure quality control;
- Take into account implementation and enforcement issues.

How sound is the advice offered in these authoritative sources of knowledge? It seems fair to acknowledge that the guidelines for the design of regulations provide a valuable support to structure the policy-making process, to orient the activities that should be done to formulate regulatory policy decisions, and to promote transparency and public participation. Some authors, however, also suggest to critically assess the weaknesses and limitations of these approaches. Lodge and Wegrich (2009), for example, distinguish between different views towards RIA and other methods that are intended to guide the regulatory

policy-making process. For each of them (RIA, standard cost model and regulatory governance), they highlight some critical points regarding the meaning of the practice for analysts, technocrats and other relevant stakeholders. It may difficult to anticipate which viewpoint might come to dominate others and where practices for high-quality regulation are heading. The scenario of "tombstones and ghost cities", where efforts to produce high-quality regulation are rapidly superseded by novel policy initiatives, may result in growing indifference towards these approaches. The scenario of "codification", where high-quality regulation takes the form of bureaucratic compliance and red tape, may produce the de-coupling of formalistic analysis and assessment practices from substantive policy-making activities. The scenario of "embeddedness", finally, relates to the actual incorporation of high-quality regulation practices into the policy-making process. The last scenario looks the most desirable from many respects, but it is unclear whether it is the most likely one and how to make it materialize.

4 Regulatory Obsolescence

Regulatory systems may become increasingly inadequate to steer the conduct of the regulated industries over time—a tendency that we could characterize as "regulatory obsolescence". There are many reasons for this. In some scenarios, the regulated firms or target groups may find ways to bypass regulations (e.g., by finding loopholes in the provisions or shifting their activities to unregulated areas). In other scenarios, technological advancements make the present regulation irrelevant or inapplicable to novel products or services. In other scenarios, the successful lowering of entry barriers makes the industry "flooded" with new entrants up to the point that regulation is not serving anymore the purpose of steering the conduct of one or only a few market players. When regulation does not serve the purpose for which it was designed (notice that a RIA should disclose this), then the present regulation should be cancelled or replaced with a new one. Getting rid of obsolete regulations and designing novel, more effective, ones is important to sustain innovative and well performing regulated industries. Obsolete regulations may impose fruitless burdens on business, while regulations that are attuned to present industrial conditions may boost economic development.

An example of regulatory obsolescence is offered by the electronic communications sector in the EU, where a regulatory system that was

intended to stimulate industrial development turned into a bunch of rules that lacked provision for adequate incentives to make industry players invest and follow the trajectory of technological developments. In part, lack of investments and innovation may be understood due to the rapid pace of technological change, which made previous technologies and standards (e.g., GMS) outmoded by novel ones (e.g., 3G, 4G and next generation broadband), and by fiscal conditions in the 2010s, which included a reduction of subsidies and public spending on infrastructure networks. A study by Bauer (2013) argued that the reduction of EU investments and innovation in electronic communications relates to the persistency of an outdated regulatory system, which arises from the inability of EU policy-makers to resolve the dilemma between two alternative functions of regulation. On the one hand, regulation can be understood as a way to coordinate public and private investments; on the other one, the role of regulation can be the one to contain market power of a monopolist or a few dominant industrial players (in the EU case, in conjunction with antitrust policies). The intellectual orientation towards the second kind of functions of regulation, Bauer (2013) argued, made the EU regulatory system unfit to accommodate industrial policies (i.e., more "interventionist" measures) that would be needed to assist the development of the electronic communications sector.

Another example of the importance of regulatory design is offered by the case of the regulation of airports in Australia and New Zealand. Airports constitute a fundamental transport infrastructure in the nowadays' global economy. Airports are subjected to different forms of regulation around the world. Some airports are fully owned, controlled and operated by public authorities (often in the form of enterprises owned by governments or sub-national governments). Many airports around the world, however, have privatized the commercial parts of their operations (often in the form of franchise contracts) while public authorities perform functions of public interest (e.g., air traffic control). Some airports—like the main global hubs that have substantive market power—are typically subjected to strict regulations to limit market abuse. Other airports—like those that are exposed to competition from other proximate ones or from substitute transport modes, such as railways—are relatively less regulated.

In Australia and New Zealand, airports provide an important component part of the national transportation networks due to the insularity and the relative distance between domestic cities and other international

hubs. Although airports possess significant market power, the governments of both nationals have adopted a "light-handed" approach to regulation, i.e., a regulatory approach that leaves airport management free to set prices and service conditions, provided they supply to the sector regulator adequate information about their conduct and performance. In light-handed regulation, airports are not subjected to regulatory tools such as, for example, price-caps or Rate of Return. How is it possible, then, that they do not abuse their market power?

The case study illustrated by Arblaster (2014) explains the light-handed regulation adopted in Australia and New Zealand and the differences between the two. New Zealand started experimenting with the minimal intrusion of public authorities in the conduct of public services since the 1980s (when the country was at the forefront of the New Public Management and neo-liberal ideas trend). They pioneered the removal of price and other controls of airports and reduced the regulatory burden to data collection and reporting requirements only—although they intensified disclosure after 2008. Australia first adopted a regulatory style, similar to the UK, but then moved to a light-handed approach after experiencing issues with the administration of the price-cap scheme and the reduction of air traffic in the early 2000s.

The light-handed approach to regulation in Australian and New Zealand airports is relatively simple: it includes certain requirements to collect data on prices and service quality and to report them to the sector regulator. A fundamental component of the system, however, is that—in principle at least—airports could be always subjected to more stringent regulations (i.e., that the regulator reverts to a price-cap system, for example) if they convey the impression of abuse of their market power. If the threat of more stringent regulation is credible, then airports would "self-contain" their tendency to gain super-normal profits from the transportation services. Certain conditions are needed, however, for the credibility of the threat: regulators must be able to appraise airport performance (i.e., they should be provided timely and accurate information), and either the political environment must be supportive of more stringent regulations or the regulator should be able to make the decision to tighten up regulation independently from political pressures (that might side with the interests of the airport).

There is some evidence that the light-handed approach to airport regulation works satisfactory, although the case study of Arblaster (2014) contains some indications of limitations of the present regulatory

arrangement in Australia. As she notices, the national Productivity Commission Inquiries did not make any definitive conclusion on whether airport performance could be considered economically efficient. It seems that the New Zealand regulatory system, especially after the 2008 reform, is better positioned to overcome the information asymmetry of the regulator towards airports' operations and performance.

Could the airport experience of light-hand regulation be replicated in other countries, and even in other sectors? Light-hand regulation seems to delivery advantageous effects: on the one hand, the regulated firms are "disciplined" by the threat that the regulators could make regulations more stringent if they abuse their market power; on the other hand, the regulated firms are left relatively free to manage their activities with minimal intrusion from the side of the regulator, which can save resources that would be otherwise needed to administer more complicated regulatory tools. For light-hand regulation to be effective, however, the regulated firms must believe that the regulator can switch to stricter regulations if they abuse their market power. A well-crafted system of accounting and performance information disclosure, moreover, should be in place to prevent the regulated firms from obfuscating the presence of super-normal profits.

5 Case Study: Regulating Telecommunications in South Africa

After the first democratic elections, in 1994, South Africa passed a legislation, in 1996, that was intended to radically reform the regulation of the national telecommunications sector. The reform intended to establish an independent regulator (South African Telecommunications Regulatory Authority, SATRA, later the Independent Communications Authority of South Africa, ICASA). The government sold 30% equity stake in the state-owned telecommunication incumbent network operator, Telkom, which was given a 5-year period of exclusivity to expand the network and prepare itself to eventual competition.

The performance of the telecommunications sector after the 1996 reform was disappointing in many respects. Telkom fulfilled the mandate to expand the network with a massive investment program, but the number of fixed-line subscribers merely grew from 3.9 million in 1996 to 4.7 million in 2006 (out of a population of about 44–47 million people).

In the same period, mobile subscribers grew from about 1 million to 19 million, but prices were relatively high with respect to other countries with similar characteristics.

There are many reasons for the dismal results of the South African telecommunications reform, which can be partially related to failings of the regulatory design. The role of the regulator was impeded by the bureaucratic structure of the Ministry of Communications. The government mistrusted the regulator, stifled its independence, and occasionally (through the Minister of Communications) cancelled some of its regulations. Entry of competitors was hampered by delays in the award of concessions to both land and mobile lines operators and various strategic and legal actions taken by Telkom. In part, policy decisions may be related to rent-seeking behavior of a relatively circumscribed circle of extremely wealthy black businessmen linked to the African National Congress party (Horwitz and Currie 2007).

The case of dissatisfactory telecommunications reform in South Africa is an instance of poor regulatory design mixed with ambivalent regulatory policies. On the one hand, it is apparent that vested interests (from the side of the government, of government-linked businessmen and of the incumbent Telkom) contrasted the principles of liberalization of the telecommunication sector. On the other hand, it is also evident that the design of the reform included some features, e.g., the partial privatization and the subjugated role of the regulator, that undermined the opening up of credible competitive pressures on industry operators.

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Glossary

Administrative regulation Administrative regulation refers to paperwork and administrative formalities (so-called "red tape") through which governments collect information and intervene in individual decisions.

Benchmarking Benchmarking is a business practice that is precisely intended to review firms' performance in relative terms. By benchmarking a firm's performance, we compare some dimension of a firm's conduct (e.g., tariffs, reliability of supply, timeliness of customer assistance, etc.) with those of other firms and we gain indications of how well the firm scores with respect to others.

Capture theory of regulation The capture theory of regulation is a type of private interest theory of regulation that posits that regulators behave in the interest of the regulated, who are able to "purchase" the regulations that are most advantageous to them.

Concession (also Franchise) Concessions and franchises are ways to regulate infrastructure and utilities by having the government award a contract to the infrastructure monopolist for providing certain services at a certain price for a limited period of time.

Discretionary regulation Discretionary regulation is a way to regulate infrastructure and utilities by having independent regulatory agencies that hold the power to unilaterally establish tariffs and service standards of the infrastructure monopolist.

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Economic regulation Economic regulation is primarily concerned with correcting market failures and imperfections, such as those that arise from monopolies, asymmetric information between customers and producers, and externalities.

Franchise (also Concession) Concessions and franchises are ways to regulate infrastructure and utilities by having the government award a contract to the infrastructure monopolist for providing certain services at a certain price for a limited period of time.

Incentive regulation Incentive regulation is generally understood as the design of incentive systems that induce—in principle at least—service providers to deliver better services at lower costs.

Independent regulatory agencies (IRAs) Independent regulatory agencies are agencies that are entrusted with the task of orienting the conduct of business companies that operate public services by means of various regulatory tools.

Infrastructure Infrastructure can be defined as the technical and organizational systems for widespread and continuous public service provision that extend over a territory and that crucially depend on sunk investments in relatively large physical assets.

Life-cycle theory of regulation The life-cycle theory of regulation, which mainly related to the work of Bernstein (1955), posits that regulatory agencies behave differently depending on the stage of their life—from their creation to their maturity and decline.

Price-cap regulation (also RPI-X regulation) This method of regulation consists of having the regulator place a limit (threshold) to the yearly increase of tariffs that infrastructure and utilities firms can charge. The limit to tariff increase is typically set as equal to an index of inflation (RPI, or retail price index) minus an amount (X) that is arbitrarily set by the regulator.

Private interest theories of regulation Private interest theories of regulation reject the assumption that policy-makers and regulators act in the public interest. Rather, all actors are assumed to rationally pursue their own interests, especially including the transfer of wealth and the attainment of rent positions.

Public interest theories of regulation Public interest theories of regulation build on the assumption that regulation is made to pursue some desired economic or social objectives that benefit the society on the whole (rather than any particular group, sector, or individual).

Rate of return regulation Rate of return regulation is a method to regulate prices of infrastructure and utilities industries where the regulatory authority provides that an infrastructure or utility firm is allowed to earn a profit that should not exceed a given return with respect to capital invested.

Regulation Regulation is defined in many ways, but it is generally understood as all efforts of state agencies to steer the economy. A traditional definition of regulation is a "sustained and focused control exercised by a public agency over activities that are valued by a community" (Selznick 1985: p. 363).

Regulatory asset base (RAB) Regulatory asset base is the accounting value attributed to existing infrastructure assets. RAB provides the basis for solving the problem of opportunistic expropriation of service provider's rents because the regulator commits itself to grant a return on investments.

Regulatory capacity Regulatory capacity is the ability of public authorities to manage and enforce regulations. It relates to the application of the authority of governments and regulators to steer the conduct of target groups, such as, for example, business firms, public service providers, consumers, or citizens.

Regulatory capitalism Regulatory capitalism is a new economic, social, and political order that is different from Welfare State capitalism insofar as public authorities' role in directly producing goods and services is significantly diminished through privatization programs. Other traits of regulatory capitalism include the emergence of international regimes of regulation that span national boundaries and impinge domestic regulatory policies, and the increased influence of technocrats and experts (and of their international networks) in the policy process.

Regulatory commitment Regulatory commitment refers to the capacity of the regulatory to provide assurance to investors that return on investment is not expropriated.

Regulatory governance Regulatory governance refers to the policies, institutions and tools used in the design and administration of a regulatory system.

Regulatory Impact Assessment (RIA) Regulatory Impact Assessment refers to a broad collection of techniques and methods for analyzing and assessing regulations: RIAs encompass, for example, business impacts, administrative and paperwork burdens, benefit-cost analysis,

environmental and social impact assessment, etc. (Jacobs 1997). A common trait of RIAs approaches is that they are intended to inform policy decisions based on evidence.

Regulatory obsolescence Regulatory obsolescence refers to the tendency of regulatory systems to become increasingly inadequate to steer the conduct of the regulated industries over time.

Regulatory quality Regulatory quality is "a regulatory framework in which regulations and regulatory regimes are efficient in terms of cost, effective in terms of having a clear regulatory and policy purpose, transparent and accountable" (Jordana and Levi-Faur 2004; OECD 2002, 2004).

Regulatory reform A regulatory reform is a policy initiative that is intended to reconfigure the regulatory systems of a specific sector (or, occasionally, of more than one sector). A regulatory reform generally entails a change of strategy in the way infrastructure and utilities services are provided: for example, a "shift" from a regime of full public ownership and control of infrastructure or utility firms to one where the sector is opened to private ownership of service providers, barriers to entry are removed or reduced, and public authorities play a relatively minor role in steering the conduct of infrastructure and service providers.

Regulatory regime Regulatory regime is "a historically specific configuration of policies and institutions which structures the relationship between social interests, the state, and economic actors in multiple sector of the economy" (Eisner 2000).

Regulatory system Regulatory systems are defined in OECD works as "the processes and institutions through which regulations are developed, implemented, enforced, adjudicated, and revised" (OECD 1994, 1997) and in World Bank publications as "the combination of institutions, laws, and processes that give a government control over the operating and investment decisions of enterprises" of the regulated sectors of the economy (Brown et al. 2006).

RPI-X regulation (also price-cap regulation) This method of regulation consists of having the regulator place a limit (threshold) to the yearly increase of tariffs that infrastructure and utilities firms can charge. The limit to tariff increase is typically set as equal to an index of inflation (RPI, or retail price index) minus an amount (X) that is arbitrarily set by the regulator.

Social regulation Social regulation is fundamentally concerned with the protection of the public interest, in such terms as environmental preservation, workplace safety, and consumers' health.

Sunshine regulation Sunshine regulation is a regulatory approach that consists of the disclosure of indicators of performance of infrastructure and utilities firms to the public, that can then compare how well firms perform with each other.

Utilities Utilities are understood as the sectors of the economy that are managed in the public interest, such as electricity, gas, postal services, telecommunications, waste disposal, water supply and sanitation services (i.e., the term utilities typically does not include transport services).

Yardstick competition Yardstick competition consists of providing regulated firms incentives to perform better than the average firms (or of any industry indicator): utilities that perform better than the regulated industry mean are rewarded while those that perform worse than average are penalized.

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