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RESHAPING  
ECONOMIC  
GEOGRAPHY



THE WORLD BANK

world development report **2009**

*Reshaping Economic  
Geography*



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Geography*



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## Foreword

Production concentrates in big cities, leading provinces, and wealthy nations. Half the world's production fits onto 1.5 percent of its land. Cairo produces more than half of Egypt's GDP, using just 0.5 percent of its area. Brazil's three south-central states comprise 15 percent of its land, but more than half its production. And North America, the European Union, and Japan—with fewer than a billion people—account for three-quarters of the world's wealth.

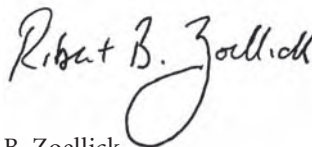
But economic concentration leaves out some populations. In Brazil, China, and India, for example, lagging states have poverty rates more than twice those in dynamic states. More than two-thirds of the developing world's poor live in villages. A billion people, living in the poorest and most isolated nations, mostly in Sub-Saharan Africa and South and Central Asia, survive on less than 2 percent of the world's wealth.

These geographically disadvantaged people cope every day with the reality that development does not bring economic prosperity everywhere at once; markets favor some places over others. But dispersing production more broadly does not necessarily foster prosperity. Economically successful nations both facilitate the concentration of production and institute policies that make people's living standards—in terms of nutrition, education, health, and sanitation—more uniform across space. Getting the benefits of both economic concentration and social convergence requires policy actions aimed at economic integration.

Integration should begin with institutions that ensure access to basic services such as primary education, primary health care, adequate sanitation, and clean drinking water for everyone. As integration becomes more difficult, adaptive policies should include roads, railways, airports, harbors, and communication systems that facilitate the movement of goods, services, people, and ideas locally, nationally, and internationally. For places where integration is hardest, for social or political reasons, the response should be commensurately comprehensive, with institutions that unite, infrastructure that connects, and interventions that target, such as slum upgrading programs or incentives for producers to locate in certain areas.

Using these principles, *World Development Report 2009*, the 31st in the series, reframes the policy debates on urbanization, territorial development, and regional integration. The report analyzes the early experience of developed countries and draws practical implications for urbanization policies in today's developing countries. For the poorest countries in Africa and Asia that are landlocked or otherwise isolated from world markets, the Report discusses promising approaches to regional integration that combine institutional cooperation, shared infrastructure, and special incentives. In growing middle-income economies, general prosperity can camouflage areas of persistent poverty. For such countries, the Report outlines strategies to foster domestic integration and help the poor in the least fortunate places.

I expect that *Reshaping Economic Geography* will stimulate a much-needed discussion on the desirability of “balanced growth,” which has proved elusive. And by informing some important policy debates, it will point the way toward more inclusive and sustainable development.



Robert B. Zoellick  
President





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## *Abbreviations and Data Notes*

ACP	Africa, Caribbean, and Pacific
AMU	Arab Maghreb Union
ASEAN	Association Southeast Asian Nations
BELDES	Municipal Infrastructure Support Project (Turkey)
CACM	Central American Common Market
CARICOM	Caribbean Community
CEFTA	Central European Free Trade Agreement
CESIN	Center for International Earth Science Information Network
CKLN	Caribbean Knowledge and Learning Network
DR-CAFTA	Dominican Republic–Central America Free Trade Agreement
EAC	East African Community
EAP	East Asia and the Pacific
ECA	Europe and Central Asia
ECOWAS	Economic Community of West African States
ECSC	European Coal and Steel Community
ECTEL	Eastern Caribbean Telecommunications Authority
EEC	European Economic Community
EMU	European Monetary Union
ENEA	École Nationale d'Économie Appliquée (Dakar)
ENSEA	École Nationale de Statistique et d'Économie Appliquée (Abidjan)
EPA	economic partnership agreements
EU	European Union
FDI	foreign direct investment
FEU	forty-foot equivalent units
GATS	General Agreement on Trade in Services
GDP	gross domestic product
GIS	geographic information system
GNI	gross national income
GRP	gross regional product
GRUMP	Global Rural-Urban Mapping Project
IBRD	International Bank for Reconstruction and Development
ICT	information and communication technology
IDA	International Development Association
IIED	International Institute for Environment and Development (UK)
INEGI	Instituto Nacional de Estadística y Geografía
IOM	International Organization of Immigration
ISSEA	Institut Sous-Régional de Statistique et d'Économie Appliquée (Yaoundé)
IT	information technology
KÖYDES	Village Infrastructure Support Project (Turkey)

MERCOSUR	Southern Common Market (Latin America)
NAFTA	North American Free Trade Agreement
NEPAD	New Partnership for Africa's Development
NSDP	National Slum Development Program (India)
NUTS	Nomenclature of Territorial Units for Statistics
OECD	Organisation for Economic Co-operation and Development
OEEC	Organization for European Cooperation
PAFTA	Pan-Arab Free Trade Area
PPS	purchasing power standard
R&D	research and development
RASCOM	Regional African Satellite Communication Organization
SADC	Southern African Development Community
SAR	South Asia region
SASEC	South Asia Sub-regional Economic Cooperation
SEZ	special economic zone
SIC	Standard Industrial Classification.
SPARTECA	South Pacific Regional Trade and Economic Cooperation Agreement
TEU	twenty-foot equivalent units
TFP	total factor productivity
UPE	universal primary education
VAMBAY	Valmiki Ambedkar Awas Yojana
WAEMU	West African Economic and Monetary Union
WTO	World Trade Organization

### Data notes

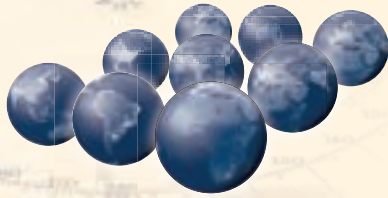
The countries included in regional and income groupings in this Report are listed in the Classification of Economies table at the beginning of the Selected World Development Indicators. Income classifications are based on gross national income (GNP) per capita; thresholds for income classifications in this edition may be found in the Introduction to Selected World Development Indicators. Group averages reported in the figures and tables are unweighted averages of the countries in the group, unless noted to the contrary.

The use of the word *countries* to refer to economies implies no judgment by the World Bank about the legal or other status of a territory. The term *developing countries* includes low- and middle-income economies and thus may include economies in transition from central planning, as a matter of convenience. The terms *industrialized countries* or *developed countries* may be used as a matter of convenience to denote high-income economies.

Dollar figures are current U.S. dollars, unless otherwise specified. *Billion* means 1,000 million; *trillion* means 1,000 billion.







### The Report at a Glance—Density, Distance, and Division

Growing cities, ever more mobile people, and increasingly specialized products are integral to development. These changes have been most noticeable in North America, Western Europe, and Northeast Asia. But countries in East and South Asia and Eastern Europe are now experiencing changes that are similar in their scope and speed. **World Development Report 2009: Reshaping Economic Geography** concludes that such transformations will remain essential for economic success in other parts of the developing world and should be encouraged.

#### Seeing development in 3-D

These transformations bring prosperity, but they do not happen without risk and sacrifice. Look at three of the world's most prosperous places:

- The first is Tokyo, the largest city in the world with 35 million people, a quarter of Japan's population, packed into less than 4 percent of its land.
- The second is the United States, the largest economy in the world and perhaps also the most mobile, where about 35 million people change residences each year.
- The third is Western Europe, the most connected continent in the world today, where countries trade about 35 percent of their gross domestic product (GDP), more than half among neighbors.

Visitors to Tokyo can see people being crushed into trains by professional train-packers. Millions of people willingly subject themselves to the unpleasantness of such a crush. A map of Japan's economic density shows why. Tokyo generates a big part of Japan's wealth—to get a share of it, people have to live close by (see map G0.1). The most striking feature of this map is density—the concentration of wealth in Tokyo and Osaka.

In the United States, each year in the days before the Thanksgiving holiday, about 35 million people try to get back to their families and friends. It is

the start of winter in some parts of the country, so flights often are canceled. But Americans put up with the pain of leaving friends and family, because economic activity is concentrated in a few parts of the country (see map G0.2). To get a part of this wealth, you have to get closer to it. That is why 8 million Ameri-

cans change states every year, migrating to reduce their distance to economic opportunity. The most striking feature of this map is distance.

Across the Atlantic, in Western Europe, another massive movement takes place every day—not of people but of products. One example is Airbus,

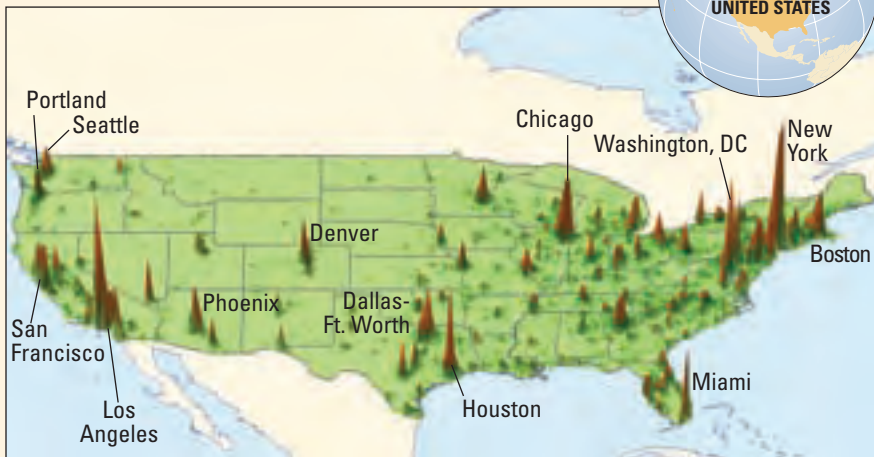
**Map G0.1 Density—why it pays to be close to Tokyo**  
Economic production per square kilometer in Japan



Source: WDR 2009 team and World Bank Development Research Group based on subnational GDP estimates for 2005. See also Nordhaus (2006).

**Map G0.2 Distance—why Americans must be mobile**

Economic production per square kilometer in the United States



Source: WDR 2009 team and World Bank Development Research Group based on subnational GDP estimates for 2005. See also Nordhaus (2006).

which makes parts of planes and assembles them in France, Germany, Spain, and the United Kingdom as well as in other countries. Huge sections of aircraft are loaded onto ships and planes, as places specialize in making different parts and producing them in scale. Countries in

**Map G0.3 Division—what prevents progress in Africa does not in Western Europe**

Border restrictions to flows of goods, capital, people, and ideas



Source: WDR 2009 team (see chapter 3 for details).  
Note: The width of borders is proportional to a summary measure of each country's restrictions to the flow of goods, capital, people, and ideas with all other countries.

a region that was divided not so long ago now trade with former enemies to become an ever-more-integrated European Union (EU). As this integration has increased, economic divisions have decreased, making specialization and scale possible (see map G0.3).

What is the payoff for this pain? A map of economic geography, which resizes the area of a country to reflect its GDP, shows the benefits of big cities, mobile people, and connected countries. The United States, Western Europe, and Japan dominate the world's economy (see map G0.4).

Cities, migration, and trade have been the main catalysts of progress in the developed world over the past two centuries. These stories are now being repeated in the developing world's most dynamic economies.

- Mumbai is not the largest city in the world, but it is the most densely populated. And it keeps growing.
- China is not the largest economy in the world, but it is the fastest growing and may be among the most mobile.
- Southeast Asia may not have formed a political union like Europe, but it trades parts of goods back and forth as the EU does.

People risk loss of life or limb on Mumbai's packed trains to take advan-

tage of economic density. Despite the crush among commuters and in such slums as Dharavi, Mumbai's population has doubled since the 1970s. Since the 1990s, millions of Chinese workers have migrated to get closer to economic opportunity concentrated along the coast. Just as Americans travel during Thanksgiving, more than 200 million people in China travel during the Chinese New Year. Regional production networks in East Asia are spread far wider than Airbus sites in Western Europe. East Asian countries may not trade airplane parts, but nations that once were enemies now trade parts of cars and computers with the same frequency and speed.

And what is the payoff? We can again recognize the shapes of China, India, and Southeast Asian countries on the map of the world's economic geography (see map G0.4). Contrast these shapes with that of the mighty continent of Africa, which shows up as a slender peninsula.

The *World Development Report* argues that some places are doing well because they have promoted transformations along the three dimensions of economic geography:

- Higher densities, as seen in the growth of cities.
- Shorter distances, as workers and businesses migrate closer to density.
- Fewer divisions, as countries thin their economic borders and enter world markets to take advantage of scale and specialization.

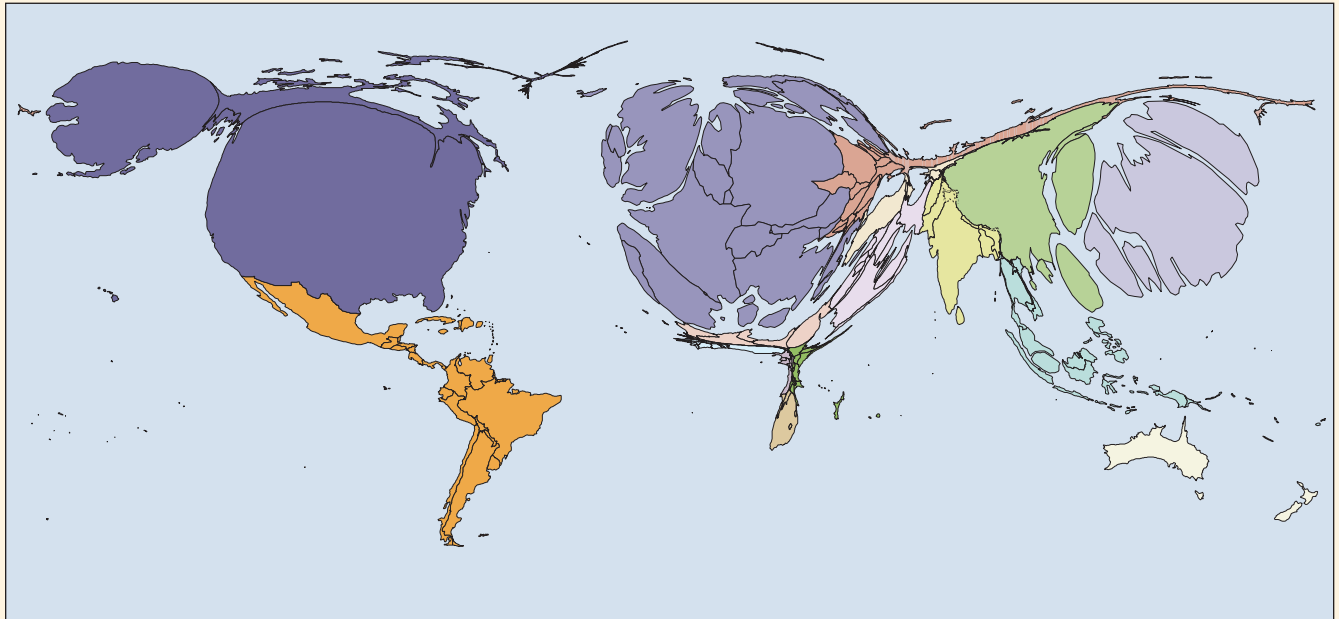
The United States and Japan reshaped their economic geography along these lines in the past. China is reshaping its economic geography now. This Report proposes that these will be the changes that will help developing nations in other parts of the world, most notably Africa.

**Unbalanced growth, inclusive development**

That is what this *World Development Report* proposes, and the Report is

**Map G0.4 How markets view the world**

A country's size shows the proportion of global gross domestic product found there



Source: WDR 2009 team using 2005 GDP (constant U.S. dollars).

Note: The cartogram was created using the method developed by Gastner and Newman (2004). This map shows the countries that have the most wealth when GDP is compared using currency exchange rates. This indicates international purchasing power—what someone's money is worth if spent in another country.

structured to bring out the message (see figure G0.1).

- Part one describes the changes along the dimensions of density, distance, and division—taking up each in turn. It summarizes the experience of the past century or so.
- Part two analyzes the drivers of these transformations—the market forces of agglomeration, migration, and specialization and trade. It distills the findings of policy research during the past generation or so.
- Part three discusses the policy implications of the experience and analysis in the first two parts. It provides a common framework for reframing three policy debates—on urbanization, on lagging areas within countries, and on regional integration and globalization.

The Report is structured and written in such a way that people interested in only one of these debates can read just some of it. That is, it can be read vertically. The chapters on density, agglomeration, and urbanization should

interest all countries—small and large, low income and middle income. The chapters on distance, factor mobility, and regional development may be of most interest to larger middle-income countries. And the chapters on division, transport costs, and regional integration may be of most interest to low-income and smaller economies.

Four spotlights on *Geography in Motion* examine the interplay between market forces and government policies in North America, Western Europe, East Asia, and Sub-Saharan Africa. By highlighting the interactions among the three dimensions, they also connect the Report's different parts.

Seen another way, the Report examines the most important policy issues of economic geography, from local, to national, to international. Locally, the policy issue in areas such as Lagos state in southern Nigeria is how to manage urbanization. Nationally, the policy issue in Nigeria is how to manage the disparities in resources and living standards in the north and the south. And internationally, the policy issue in West

Africa is how to make a better economic union that benefits both the landlocked and the coastal countries, the poorest and the more prosperous.

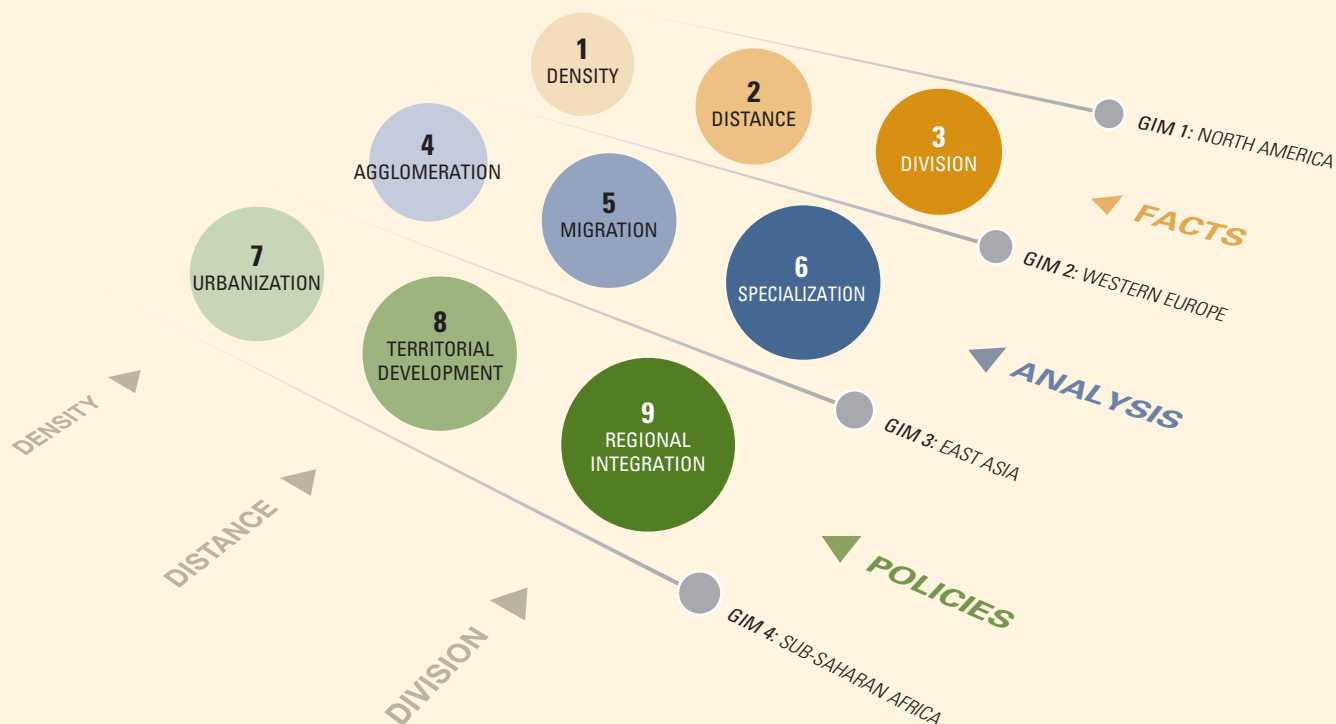
As the geographic scale increases from local to national to international, the specific policy issue changes. But the underlying problem is the same—some places do well, others do not. And it is difficult for anyone to accept this as inevitable.

The Report's main message is that economic growth *will* be unbalanced. To try to spread out economic activity is to discourage it. But development can still be inclusive, in that even people who start their lives far away from economic opportunity can benefit from the growing concentration of wealth in a few places. The way to get both the benefits of uneven growth and inclusive development is through economic integration.

### **Economic integration—local, national, and international**

The Report makes it clear what economic integration means. It means one

Figure G0.1 The Report can be read by part or by policy



Source: WDR 2009 team.

thing to integrate rural and urban areas, and slums with other parts of cities. It means another to integrate lagging and leading provinces within a nation. And it means yet another to integrate isolated and well-connected countries. These notions of economic integration are central to three debates in development—urbanization, territorial development, and international integration.

**Urbanization**

The arguments and evidence in *World Development Report 2009* can set priorities for policies at different stages of urbanization, essentially providing the elements of an urbanization strategy. Each territory or area within a nation has a specific geography. But the principles are quite universal.

- In places mostly rural, governments should be as neutral as possible and should establish the institutional foundation for possible urbanization in some places. Good land policies are central, and so are policies to provide basic services to everyone. A good example is Costa Rica.

- In places urbanizing rapidly, governments must put in place, in addition to institutions, connective infrastructure so that the benefits of rising economic density are more widely shared. A good example is Chongqing, China.
- In places where urbanization has advanced, in addition to institutions and infrastructure, targeted interventions may be necessary to deal with slums. But these interventions will not work unless institutions for land and basic services are reasonably effective and transport infrastructure is in place. A good example is Bogotá, Colombia.

**Territorial development**

The principles also can reshape the debate on territorial or regional development. The tools of geography can identify which places are poor—the lagging areas—and where most of the poor live. Often, the two are not the same, because the poor have the most reason to move from poor places. The Report discusses how governments can tailor policies to

integrate areas within nations, while reducing poverty everywhere.

Lagging areas have one thing in common—they are economically distant from places doing well. But besides this, the economic geography of different areas is not the same:

- In some countries, such as China, lagging areas are sparsely populated. It does not make a lot of sense to spread expensive infrastructure into these places—or to give firms incentives to move to them. What makes much more sense is to provide basic services everywhere, even if it costs more to reach these distant areas. Encouraging mobility of people is the priority, and institutions that make land markets work better and provide security, schools, streets, and sanitation should be the mainstay of integration policy.
- In other countries, such as Brazil, lagging areas are densely populated. As in China, poor people have moved in the millions from the northeast to the southeast. Everyone speaks



the same language, and domestic mobility is not difficult. But many poor people still live in the north-east. Encouraging mobility of people from the northeast is important, but so is enabling access to markets in the dynamic southeast. In such cases, both institutions and infrastructure to connect the two coastal areas are necessary for economic integration.

- In a third group of countries, such as India, lagging areas are densely populated—almost 60 percent of India’s poor live in these poor places—and people can find it difficult to migrate to places doing well, such as the capital area and the south. Language and cultural differences within some areas can be considerable. In such cases, institutions and infrastructure could be complemented by incentives to producers to locate in these lagging states. But these incentives should be carefully designed to avoid offsetting the unifying effects of common institutions and connective infrastructure. A promising

possibility is providing incentives to agriculture and allied activities that are appropriate for states that are still mostly rural.

### **Regional integration**

Finally, the principles developed in this Report inform the debates on how to make globalization work for all countries. The same logic applied at the local and national levels can be used at the international level to classify world regions by the difficulty of economic integration in these regions. The common problem is division—thick economic borders. Aside from this, the task of integration varies in different parts of the developing world:

- Countries in regions close to world markets, such as Central America, North Africa, and Eastern Europe, face a relatively straightforward task of integration. Common institutions can help them become extensions of these large markets.
- Countries in regions distant from world markets, but with large home

markets attractive to investors, face a more difficult challenge. Good institutions and regional infrastructure can help them access these markets. Examples include East Asia and, increasingly, South Asia. Southern Africa and South America can also integrate globally by making their home markets bigger and more specialized through regional institutions and infrastructure.

- Integration is hardest for countries in regions that are divided, are distant from world markets, and lack the economic density provided by a large local economy. These countries include those nicknamed the “bottom billion”—East, Central, and West Africa; Central Asia; and the Pacific Islands. For these countries, all three instruments are needed—regional institutions that thin borders, regional infrastructure that connects countries, and such incentives as preferential access to world markets, perhaps conditioned on ensuring that all countries strengthen regional cooperation.

*One thing is common to the policy debates on urbanization, area development, and globalization. In their current form, they over-emphasize geographic targeting—what to do in rural areas or in slums, what to do in lagging states or remote areas, and what to do in the most poor or landlocked countries. The Report reframes these debates in a way that better conforms to the reality of growth and development. The reality is that the interaction between leading and lagging places is the key to economic development. The reality is that spatially targeted interventions are just a small part of what governments can do to help places that are not doing well. The reality is that, besides place-based incentives, governments have far more potent instruments for integration. They can build institutions that unify all places and put in place infrastructure that connects some places to others.*

*The Report calls for rebalancing these policy discussions to include all the instruments of integration—institutions that unify, infrastructure that connects, and interventions that target. And it shows how to use the three dimensions of density, distance, and division to tailor the use of these policy instruments to address integration challenges that range from the relatively straightforward to the most complicated.*



# Overview

*Economic growth will be unbalanced, but development still can be inclusive—that is the message of this year’s **World Development Report**. As economies grow from low to high income, production becomes more concentrated spatially. Some places—cities, coastal areas, and connected countries—are favored by producers. As countries develop, the most successful ones also institute policies that make living standards of people more uniform across space. The way to get both the immediate benefits of the concentration of production and the long-term benefits of a convergence in living standards is economic integration.*

*Although the problems of economic integration defy simple solutions, the guiding principle does not have to be complex. The policy mix should be calibrated to match the difficulty of the development challenge, determined by the economic geography of places. Today, policy discussions about geographic disparities in development often start and end with a consideration of spatially targeted interventions. The Report reframes these debates to include all instruments for economic integration—institutions, infrastructure, and incentives. The bedrock of integration efforts should be spatially blind institutions. As the challenges posed by geography become more difficult, the response should include connective infrastructure. In places where integration is hardest, the policy response should be commensurately comprehensive: institutions that unite, infrastructure that connects, and interventions that target.*

## Place and prosperity

Place is the most important correlate of a person’s welfare. In the next few decades, a person born in the United States will earn a hundred times more than a Zambian, and live three decades longer. Behind these national averages are numbers even more unsettling. Unless things change radically, a child born in a village far from Zambia’s capital, Lusaka, will live less than half as long as a child born in New York City—and during that short life, will earn just \$0.01 for every \$2 the New Yorker earns. The New Yorker will enjoy a lifetime income of about \$4.5 million, the rural Zambian less than \$10,000.

A Bolivian man with nine years of schooling earns an average of about \$460 per month, in dollars that reflect purchasing power at U.S. prices. But the same person

would earn about three times as much in the United States. A Nigerian with nine years of education would earn eight times as much in the United States than in Nigeria. This “place premium” is large throughout the developing world.<sup>1</sup> The best predictor of income in the world today is not *what* or *whom* you know, but *where* you work.

## *Bumps, curves, and spills*

These disparities in incomes and living standards are the outcome of a striking attribute of economic development—its unevenness across space. Somewhat unfairly, prosperity does not come to every place at the same time. This is true at all geographic scales, from local to national to global. Cities quickly pull ahead of the countryside. Living standards improve in some provinces





while others lag. And some countries grow to riches while others remain poor. If economic density were charted on a map of the world, the topography at any resolution would be bumpy, not smooth.

Location remains important at all stages of development, but it matters less for living standards in a rich country than in a poor one. Estimates from more than 100 living standard surveys indicate that households in the most prosperous areas of developing countries—such as Brazil, Bulgaria, Ghana, Indonesia, Morocco, and Sri Lanka—have an average consumption almost 75 percent higher than that of similar households in the lagging areas of these countries. Compare this with less than 25 percent for such developed countries as Canada, Japan, and the United States. In contrast, as a country grows richer, location becomes more important for economic production. Ghana, Poland, and New Zealand—three medium-size countries with land areas of about 250,000 square kilometers—have vastly different per capita gross national incomes of about \$600, \$9,000, and \$27,000, respectively. The most economically dense 5 percent of the country's area produces about 27 percent of gross domestic product (GDP) in Ghana, 31 percent in Poland, and 39 percent in New Zealand.

Put another way, as countries develop, location matters less for families and more for firms. Development seems to give a place the ability to reap the economic advantages of rising concentrations of production, and to obtain the social benefits that come from a convergence in consumption. Economic development thus brings with it the conditions of even greater prosperity, in a virtuous circle.

Another stylized fact: neighborhoods matter. A prosperous city seldom leaves its periphery mired in poverty. A province's prosperity is sooner or later shared with those nearby. And neighboring countries share not just political borders but economic destinies. North America, Western Europe, and East Asia are now prosperous neighborhoods. Within these regions, all countries did not grow in lockstep. Within countries, some provinces did better, and within each province, prosperity came at different times to cities, towns, and villages.

Less widely appreciated is the fact that places near prosperous provinces, countries, and regions have invariably benefited. Prosperity produces congestion and causes economic activity to spill over, but only to places that are well connected to these prosperous parts. The detrimental effects of poverty, instability, and conflict spill over as well. To prosperous places, proximity is a blessing, to poor places, a curse.

These three attributes of development—geographic unevenness, circular causation, and neighborhood effects—have not always received much attention. They should, because they have radical implications for public policy.

- **Geographic unevenness**—the first attribute of development—implies that governments generally cannot simultaneously foster economic production and spread it out smoothly.
- **Circular causation**—the second attribute—provides hope for policy makers wishing to pursue progressive objectives. Rising concentrations of economic production are compatible with geographic convergence in living standards. And the market forces of agglomeration, migration, and specialization can, if combined with progressive policies, yield both a concentration of economic production and a convergence of living standards.
- **Neighborhood effects**—the third attribute—come with a principle for policy making: promote economic integration. Unevenness and circularity imply that it is more difficult for places left behind to catch up. But spillovers point to the promise for surmounting this handicap. Economic integration is an effective and the most realistic way to harness the immediate benefits from concentration to achieve the long-term benefits of convergence.

Putting this principle of economic integration into practice requires identifying the market forces and government policies that best support the concentration of economic mass and the convergence of living standards across different locations. It also requires recognizing that these market forces can be strong or weak depending on economic geography. Earlier *World*

*Development Reports* have studied these phenomena. This Report advances the influence of geography on economic opportunity by elevating space and place from mere undercurrents in policy to a major focus.

**The problem—at three geographic scales**

Depending on the “geographic scale,” the market forces to be harnessed or supported differ. At a smaller scale—say, an area within a country (a province or state)—geography poses different challenges than at a larger geographic scale—say, a country. At an even larger geographic scale—say, a group of countries that form a geographic region—the market forces that work toward integration can be blocked by even greater geographic and political obstacles (see box 1).

Locally, the concentration of economic production as countries develop is

manifest in urbanization. In East Asia, for example, if current trends continue, the urban population is expected to increase by about 450 million people over the next two decades, as countries in the regions grow, adding the equivalent of a Paris every month. In South and Central Asia, the increase is expected to be almost 350 million. And in Sub-Saharan Africa—if economies continue to grow—the urban population could increase by 250 million between 2005 and 2025. In other parts of the developing world, within-urban transformations will be as important.

The question is whether growing concentrations of humanity will increase prosperity, or produce congestion and squalor. Another concern is the divergence in living standards between those who benefit most from this geographic

**BOX 1 Three geographic scales: local, national, and international**

Consider the “neighborhoods” of Lagos State, Nigeria, and West Africa (see the maps below).

- *The first geographic scale is the area.* The state of Lagos in southwestern Nigeria has the five districts of Badagry, Epe, Ikeja, Ikorodu, and Lagos, covering about 3,500 square kilometers. Its estimated population density—with the smallest land area but among the two most populous in the nation—is about 2,600 persons per square kilometer. Metropolitan Lagos has a density more than three times that, fueled by

agglomeration economies and rural-urban migration.

- *The second geographic scale is the country.* With its 36 states and capital area and covering 924,000 square kilometers, Nigeria is the world’s 32nd largest country. The distance from Lagos to the northeastern tip of Nigeria is almost 1,500 kilometers. The southern states have seaports and oilfields. The northern part, once a seat of ancient empires, now has higher poverty. Migration between the north and the south is not an easy matter because

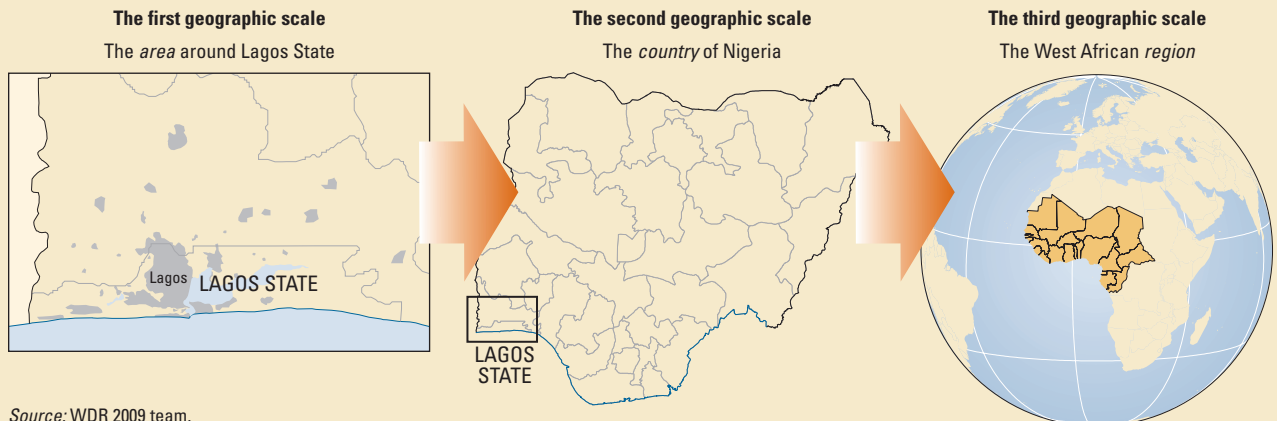
of religious and linguistic differences. The sharing of oil wealth is a source of tension.

- *The third geographic scale is the region.* Nigeria’s West African neighbors include Cameroon, the Central African Republic, Côte d’Ivoire, Equatorial Guinea, Ghana, Niger, and Togo. The region covers more than 6 million square kilometers, divided by some of the world’s thickest borders.

Source: WDR 2009 team.

**Three geographic units: area, country, and region**

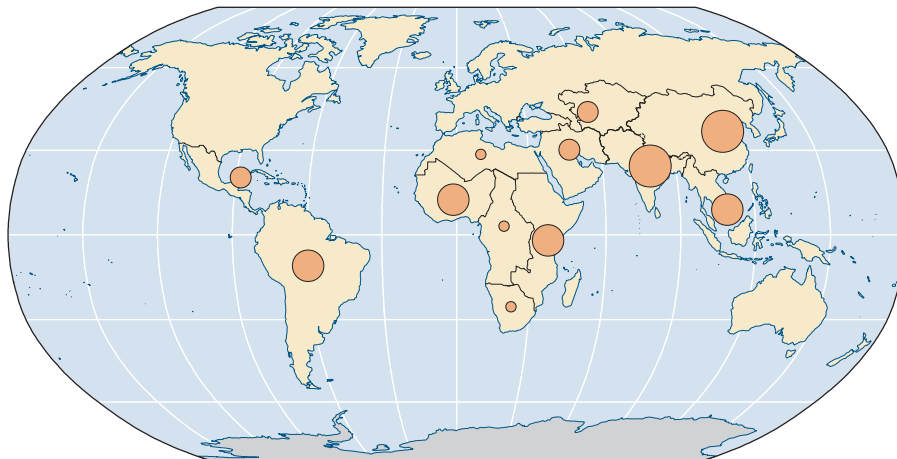
Lagos State, Nigeria, and West Africa represent the local, national, and international scales



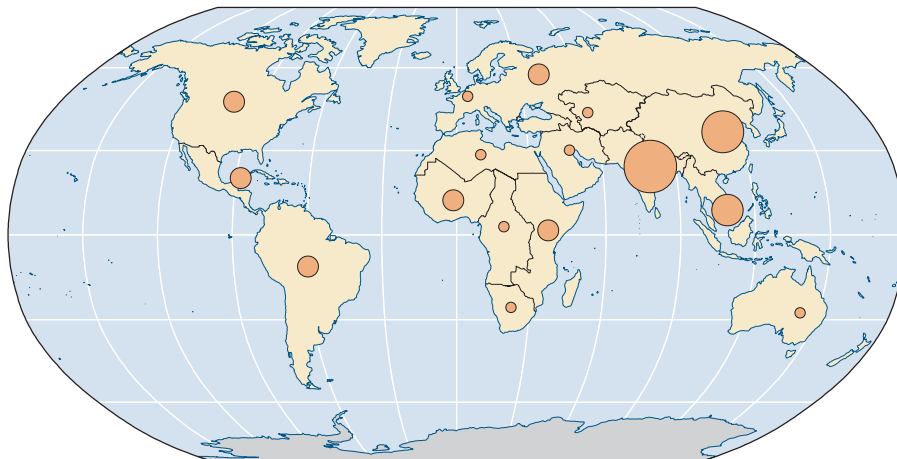
Source: WDR 2009 team.

**Map 1 The biggest development challenges—at the local, national, and international geographic scales**

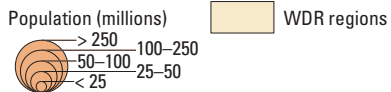
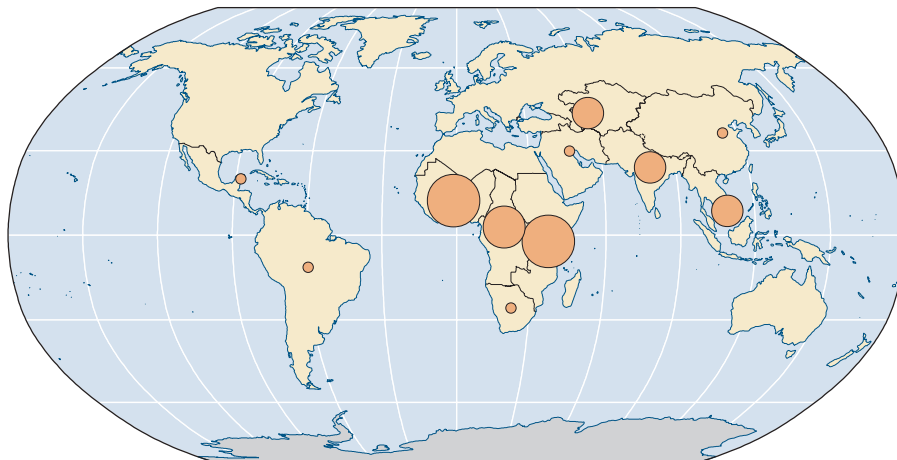
**a. A billion in slums**



**b. A billion in remote areas**



**c. The bottom billion**



Sources: Panel a: United Nations 2006a; panel b: WDR 2009 team, based on household survey data; panel c: Collier 2007.

concentration—essentially urbanites in prosperous neighborhoods—and those left behind in villages and those living in slums, estimated to number about 1 billion in the developing world (see map 1, panel a). The (ineffective) policy responses so far have been to try to slow down urbanization.

At the national scale, economic growth displays a similar unevenness, as places close to large markets prosper sooner than places more distant. In China the coastal provinces—mainly in the three areas known as the Bohai Basin, the Pearl River Delta, and the Yangtze River Delta—accounted for more than half of the country's GDP in 2005, with less than a fifth of its area. In Brazil the south-central states of Minas Gerais, Rio de Janeiro, and São Paulo account for more than 52 percent of the country's GDP, with less than 15 percent of its land area. Greater Cairo produces 50 percent of the Arab Republic of Egypt's GDP, using just 0.5 percent of its land area.

Politicians generally view this economic imbalance disapprovingly. In communist Russia the government labored to reduce the economic share of the old industrial area of St. Petersburg, the Center, and the mid-Urals from 65 percent to 32 percent, forcibly shifting production to the eastern areas. It boosted the share of the east in economic production from 4 percent in 1925 to 28 percent at the end of communism, whose demise probably was hastened by the spatial inefficiency that these efforts engendered. Because governments care so much about domestic disparities, they jeopardize competitiveness and risk collapse. Policies to reduce interstate or provincial disparities in production and living standards are commonplace—but largely ineffective. About 1 billion people continue to live in these inhospitable lagging areas (see map 1, panel b).

At the international scale, economic growth has concentrated global production in a few regions, with commensurate differences in incomes. In 2000 about three-quarters of world GDP was concentrated in North America, Western Europe, and Northeast Asia. This concentration is not new. Three centuries ago, China and India accounted for about two-thirds of the world's wealth. What was different then

is that they also had more than half of the world's population; the European Union (EU), Japan, and the United States have less than one-sixth.

Today, the worry at the international level is the high poverty, illiteracy, and mortality in some parts of the world, set against the prosperity, literacy, and longevity in others. The policy responses include foreign aid and multilateral efforts to ease international trade and investment flows. But barriers to the agricultural exports of developing countries remain considerable, and apathy for people distant or distinct renders aid flows miniscule. Aid will be a small part of the solution. Even in the European Union, with a combined GDP of about €8 trillion, annual aid through the structural and cohesion funds will average less than €50 billion between 2007 and 2013. Foreign aid is less than 0.5 percent of the gross national income of giving countries, and not even a large fraction of the GDP of countries home to the “bottom billion” who have 12 percent of the world's population, but less than 1 percent of its GDP (see map 1, panel c).<sup>2</sup>

A billion slum dwellers in the developing world's cities, a billion people in fragile lagging areas within countries, a billion at the bottom of the global hierarchy of nations—these overlapping populations pose today's biggest development challenges. Seemingly disparate, they share a fundamental feature: at different spatial scales, they are the most visible manifestation of economic geography's importance for development.

Concern for these intersecting 3 billion sometimes comes with the prescription that economic growth must be made more spatially balanced. The growth of cities must be controlled. Rural-urban gaps in wealth must be reduced quickly. Lagging areas and provinces distant from domestic and world markets must be sustained through territorial development programs that bring jobs to the people living there. And growing gaps between the developed and developing world must be addressed through interventions to protect enterprises in developing countries until they are ready to compete.

*World Development Report 2009* has a different message: economic growth is seldom balanced. Efforts to spread it

## BOX 2 *The three dimensions of development: density, distance, and division*

This Report uses three geographic dimensions to describe the transformation of economies as they develop (part one) and the conditions to keep in mind when formulating policies (part three). The words are easy metaphors, since density, distance, and division summon images of human, physical, and political geography. But they can be measured. Consider this illustration.

In 2003 Nigeria had 45 million goats and kids, 28 million sheep and lambs, and 15 million cattle. In a typical year 8 million sheep, 7 million goats, and 0.5 million cattle are slaughtered, mostly in five northern states including Kano. More than half the hides are consumed as *pomo*. The rest are sold to tanneries. The demand from tanneries exceeds local supply, so animals are imported from nearby Chad, Niger, and Cameroon. Goat and sheep skins are good business—in 2001 Nigeria produced 30 million to 35 million of them, exporting almost all to Europe.

**Density.** Consider the market conditions for a tannery that produces leather in the city of Kano in Northern Nigeria. Officially, the population of Kano State is about 9 million, large enough to provide the skilled labor and infrastructure for its tanneries. Due to the concentration of people in and around Kano city, the

area's economic density (GDP per square kilometer) was 35 times that of Nigeria in 1990. The capacity of the tanneries in and around the city even makes it worthwhile to illegally import live animals—the most important intermediate input—from neighboring countries. But Kano is neither large enough, nor rich enough, to consume more than a little of what is produced. The goods must be exported to people willing to pay enough to make production worthwhile.

**Distance.** Wealthy Europeans want goods made with "Morocco leather," a lot of which comes from Kano. To get to Europe, Kano's bulky exports must travel through Lagos, which along highways and railways is about 1,000 kilometers away. It might as well be 4,000 kilometers. A railway goes to Lagos through the cities of Kaduna and Ibadan, but it is narrow gauge and poorly maintained. Most commerce is by road, obstructed by roadblocks and piracy. Shipping companies charge more than \$1,200 for a 30-ton trailer from Kano to Lagos. Once the goods get to Lagos, there are port fees, pilferage, and delays. It takes 26 days to get the goods onto a ship. The economic distance from Kano to Lagos, measured as money, is several times the Euclidean (straight-line) 829 kilometers.

**Division.** But the journey is not yet complete. The goods must surmount the division caused by differences in currencies and conventions between Nigeria and Europe. Between December 2007 and March 2008, Nigeria's currency depreciated from 170 naira to €1 to 180 naira, but appreciated from 246 naira to the British pound in November 2007 to 235 naira in March 2008. Buyers and sellers of leather goods have to contend with these fluctuations. They must also deal with two sets of laws and customs. The United Kingdom has 30 procedures for enforcing a contract, Nigeria 39. These divisions multiply the costs of doing business. Few cargo ships make landfall in Lagos, so it costs much more to transport goods from Lagos than from busier places such as Shanghai. It costs less than \$400 to ship a container to the United Kingdom from China, more than \$1,000 from Nigeria.

Low local density, costly internal distances, and international divisions conspire against Kano. Making matters more difficult are religious and other divisions within Nigeria.

*Sources:* World Bank 2007; Phillips, Taylor, Sanni, and Akoroda, (FAO 2004); Government of Nigeria 2003.

prematurely will jeopardize progress. Two centuries of economic development show that spatial disparities in income and production are inevitable. A generation of economic research confirms this: there is no good reason to expect economic growth to spread smoothly across space. The experience of successful developers shows that production becomes more concentrated spatially. The most successful nations also institute policies that make basic living standards more uniform across space. Economic production concentrates, while living standards converge.

Part one of the Report describes the geographic transformations that are necessary for development. Part two analyzes the drivers of these changes and identifies the markets that deliver both concentration and

convergence. Part three proposes the principle of economic integration—between places that producers prefer and places where people live—to guide policy making. Using this principle, it reframes the debates on urbanization, territorial development, and international integration, calling for a change in orientation of policies away from geographic targeting toward integration.

By using a well-calibrated blend of institutions, infrastructure, and interventions, today's developers can reshape their economic geography. When they do this well, they will experience unbalanced growth and inclusive development.

### *The three dimensions of development*

The geographic transformations for economic development can be characterized in

three dimensions—density, distance, and division. These three words are not just metaphors for the policy challenges just outlined. They conform closely to the more technical notion of “market access” (see box 2). And they represent the dimensions of economic geography that have to be reshaped if the development challenges are to be met.

Understanding the transformations along the dimensions of density, distance, and division helps to identify the main market forces and the appropriate policy responses at each of the three geographic scales—local, national, and international (see table 1).

- **Density** is the most important dimension locally. Distances are short, and cultural and political divisions are few and shallow. The policy challenge is getting density right—harnessing market forces to encourage concentration and promote convergence in living standards between villages and towns and cities. But distance can be important as rapid urbanization leads to congestion, and divisions within cities can be manifest in slums and ghettos.
- **Distance** to density is the most important dimension at the national geographic scale. Distance between areas where economic activity is concentrated and areas that lag is the main dimension. The policy challenge is helping firms

and workers reduce their distance from density. The main mechanisms are the mobility of labor and the reduction of transport costs through infrastructure investments. Divisions within countries—differences in language, currency, and culture—tend to be small, though large countries such as India and Nigeria may be geographically divided because of religion, ethnicity, or language.

- **Division** is the most important dimension internationally. But distance and density are also relevant. Economic production is concentrated in a few world regions—North America, Northeast Asia, and Western Europe—that are also the most integrated. Other regions, by contrast, are divided. While distance matters at the international level, for access to world markets, divisions associated with the impermeability of borders and differences in currencies and regulations are a more serious barrier than distance. Having a large and dynamic economy within the neighborhood can help smaller countries, especially in regions distant from world markets. For economies in other regions such as Central Africa and Central Asia, international integration is hardest.

But the potential problem at each of these geographic scales is the same—people in one place, production in another. Places

**Table 1 Density is most important locally, distance nationally, and division internationally**

Unit	Geographic scales		
	Local	National	International
	Area	Country	Region
<b>Examples</b>	Guangdong (178,000 km <sup>2</sup> ) Rio de Janeiro State (44,000 km <sup>2</sup> ) Lagos State (3,600 km <sup>2</sup> ) Greater Cairo (86,000 km <sup>2</sup> )	China (9.6 million km <sup>2</sup> ) Brazil (8.5 million km <sup>2</sup> ) Nigeria (933,000 km <sup>2</sup> ) Egypt, Arab Rep. of (995,000 km <sup>2</sup> )	East Asia (15.9 million km <sup>2</sup> ) South America (17.8 million km <sup>2</sup> ) West Africa (6.1 million km <sup>2</sup> ) North Africa (6.0 million km <sup>2</sup> )
<b>Most important dimension</b>	<b>Density</b> Of rural and urban settlements	<b>Distance</b> Between lagging and leading areas	<b>Division</b> Between countries
<b>Second-most important dimension</b>	<b>Distance</b> Because of congestion	<b>Density</b> Of population and poverty in lagging areas	<b>Distance</b> To major world markets
<b>Third-most important dimension</b>	<b>Division</b> Between formal settlements and slums	<b>Division</b> Between areas within countries	<b>Density</b> Absence of large country in the neighborhood

Source: WDR 2009 team.

Note: Throughout the Report, “areas” are within-country economic neighborhoods or administrative units such as states or provinces, and “regions” are groupings of countries based on geographic proximity.



attract production and people at different speeds, and these differences determine geographic disparities in income. Across provinces, nations, and the world, development comes in waves and leaves behind a bumpy economic landscape—prosperity in some places, poverty in others.

### The world is not flat

Development is neither smooth nor linear—at any geographic scale. Growth comes earlier to some places than to others. Geographic differences in living standards diverge before converging, faster at the local scale and slower as geography exercises its influence. These are the stylized facts, based on the experiences of successful developers over the last two centuries.

#### *Economic production becomes more concentrated*

As countries develop, people and economic activities become more concentrated. But the speed varies, depending on the spatial scale—economic forces do not operate in a geographic vacuum. The concentration of people and production is fastest locally, slowest internationally.

- *Concentration is fastest locally.* Economic concentration at the local scale is most conveniently measured by the rate of urbanization—the growth of economic and population density in towns and cities. A large part of this geographic transformation has been completed when countries reach per capita incomes of about \$3,500, roughly the threshold for crossing into upper-middle incomes. The speed of this transformation is no different from what was seen in today's developed countries when they transformed. The implication is that all nations must manage a rapid growth of cities when they still have low incomes and nascent institutions.
- *Concentration is steadier nationally.* Here, it can best be measured by area development indicators—the accumulation of production and people in leading areas. A large part of this transformation generally is completed when countries reach per capita incomes of about

\$10,000–\$11,000, about the threshold for crossing into high incomes. This is the experience of successful developers. The implication is that developing countries should expect rising subnational disparities in income and production when they still have underdeveloped infrastructure and institutions.

- *Concentration is slowest internationally, and it continues longer.* Production and wealth continue to concentrate in countries beyond per capita incomes of \$25,000, the upper reaches of the international income distribution. Neighborhoods of nations seem to grow or stagnate together—nearness to prosperity helps, while nearness to poor nations hurts. The implication is that growth strategies for later developers are not the same as the strategies that worked for those who have already grown to high-income levels; for today's developing countries, economic integration with the rest of the world—neighbors and distant countries—is even more essential.

#### *Local concentration (in towns and cities) happens quickly.*

Consider first the rising concentration of people in towns and cities. As countries develop, the economic density in some places increases as more people move to live in or near towns and cities (see figure 1, panel a). The urban share of the population rises sharply—from about 10 percent to 50 percent—as countries grow from low income to lower-middle incomes of about \$3,500. (It is difficult to make international comparisons because countries define “urban” differently.<sup>3</sup>) Between 2000 and 2005, the average urban population growth for low-income countries was 3 percent a year, more than twice the rate for middle-income countries and more than three times the rate for high-income countries. Sometimes, this can mean rapid growth of a single city, such as Bangkok, Thailand, producing even greater concentration.

The share of urban residents in total household consumption rises too. Urbanites in Malawi, Jordan, and Panama—countries with per capita GDPs of about \$160, \$1,600, and \$5,600 respectively—account for 36, 63, and 80 percent of aggregate consumption.



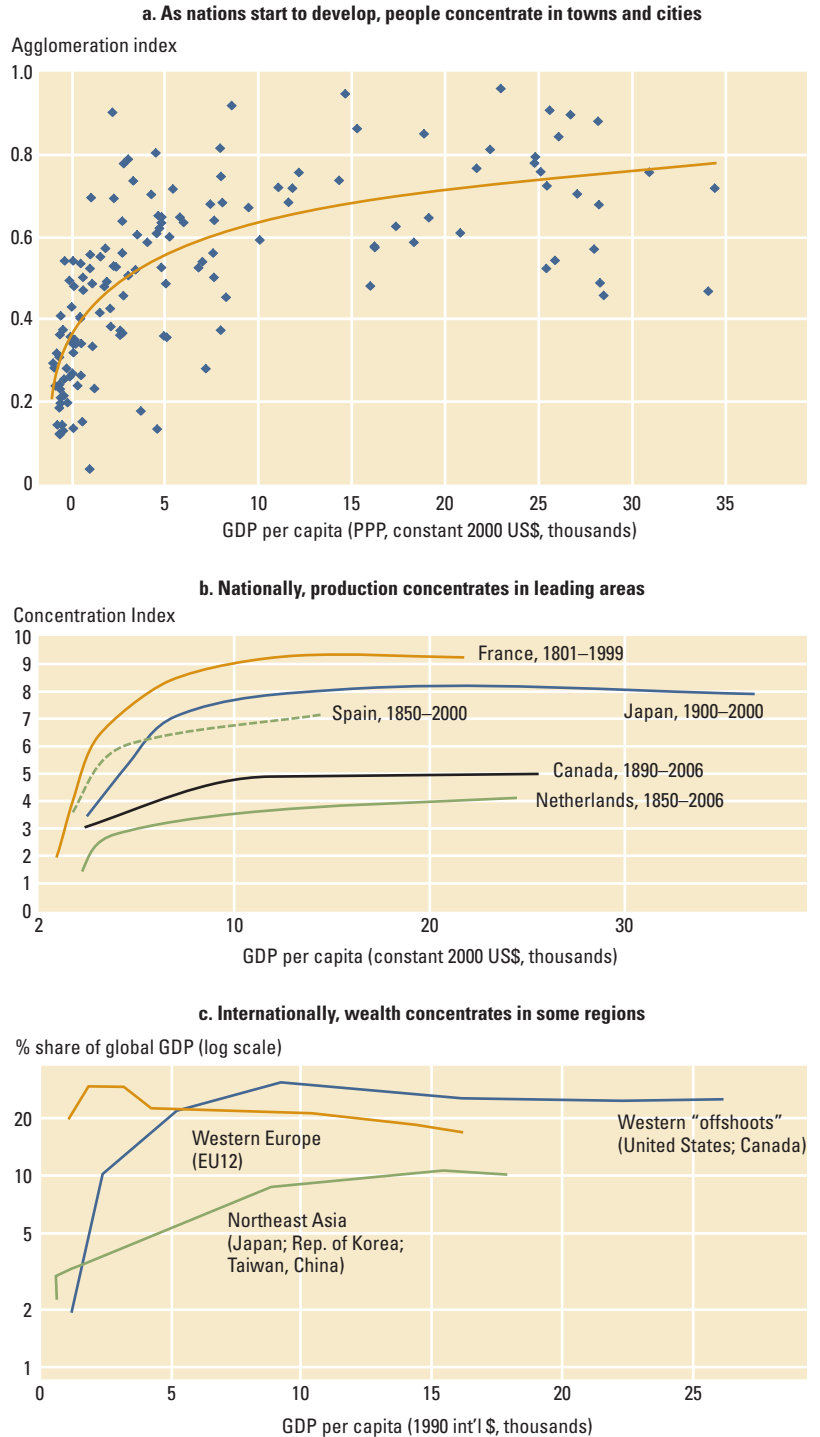
These spatial transformations are closely related to the sectoral transformation of countries from agrarian to industrial and then, in a postindustrial economy, to services. Today’s high-income countries experienced a similar rush to urbanize as they industrialized (see chapter 1). All the evidence indicates that the shift from farming to industry is helped, not hurt, by healthy agriculture, which helps towns and cities prosper.<sup>4</sup> People move to make their own lives better. But when agriculture is doing well, migration makes not just them better off, but also the villages they leave and the cities in which they settle.

**National concentration (in leading areas) continues for longer.** What is true of cities is also true of areas within countries, but at a slower speed. With development, people and production become concentrated in some parts of countries, called “leading” areas. Economic density grows in these parts—Marmara in Turkey, for example—while incomes in places economically distant—such as southeastern Anatolia in the east—can lag far behind. This concentration is hard to quantify, but it appears to slow or stop at per capita incomes between \$10,000 and \$15,000 (see figure 1, panel b).

Initially, the concentration increases rapidly. The share of total consumption of the leading areas in countries with incomes ranging between \$500 and \$7,500—Tajikistan, Mongolia, El Salvador, and Argentina—increases from 30 percent to 65 percent. Comparing GDP concentrations in countries with the same land area—Lao PDR, Ghana, Poland, and Norway—but with incomes from \$600 to \$27,000 shows concentration rising as incomes increase.

This is nothing new. Production in today’s developed economies grew more concentrated until they reached high incomes. Concentration in France’s leading area quadrupled between 1800 and 1960, and French incomes grew from \$1,000 to \$6,000. But at some point, nations continue to grow wealthier but not more concentrated—about when they enter the ranks of high-income countries. There are no reasons to expect greatly different patterns today (see chapter 2).

**Figure 1 At all three geographic scales, the patterns of concentration of economic activity are similar**



Sources: Panel a: WDR 2009 team (see chapter 1 for details); panel b: WDR 2009 team (see chapter 2 for details); panel c: WDR 2009 team (see chapter 3 for details).

***International concentration (in some world regions and leading countries) continues for a while.*** A similar concentration of economic mass has occurred internationally. Today, a quarter of the world's GDP can fit into an area the size of Cameroon, and a half into one the size of Algeria. In 1980 the shares of the EU15, North America, and East Asia added up to 70 percent; in 2000 the sum was 83 percent.<sup>5</sup> Within these regions, economic activity became more concentrated in a few countries over time before it became more dispersed. The shares of France, Germany, and the United Kingdom in the EU15 regional GDP rose to about two-thirds by 1940, before falling to about half today. In East Asia, the share of Japan in the region's GDP rose to 83 percent in 1975 and then fell to 62 percent by 2000.

There is no reason to expect that, when they prosper, other parts of the world will not experience the same patterns—a rising concentration in some countries, before overflowing to their neighbors (see chapter 3).

### ***Living standards diverge before converging***

As incomes increase, living standards converge between places where economic mass has concentrated and where it has not, but not before diverging.

- ***Essential household consumption converges soonest.*** Rural-urban gaps in essential household consumption diminish quite rapidly. Even for countries that have urban shares of about 50 to 60 percent, these differences can be small. Area differences in poverty rates are more persistent, international differences even more so. But as the world has developed, these gaps have diminished at all geographic scales.
- ***Access to basic public services converges next.*** Rural-urban gaps in basic education, health, drinking water, and sanitation persist until countries reach upper-middle incomes. But within-city disparities in these services—most visible as slums—persist well past high levels of urbanization and upper-middle incomes.
- ***Wages and incomes converge last.*** Indeed, wages and incomes diverge between lag-

ging and leading areas of a country as it grows through low and lower-middle incomes, the same range of per capita incomes needed for territorial concentration to increase. And global divergence in wages and wealth appears to go on for much longer. East Asia saw per capita incomes diverge between 1950 and 1970 as Japan pulled ahead. Then, Japan's prosperity spilled over into the neighborhood, and incomes converged as countries in the region that integrated internationally prospered. Among the countries of West Asia, by contrast, there was no divergence in incomes—nor was there rapid growth.

Convergence in living standards, like concentration of economic activity, takes place faster at the local geographic scale and slowest at the international. But this happens only in prosperous neighborhoods. Even in such places, some measures of living standards (such as per capita consumption, income, or earnings) take a long time to converge, sometimes even with an initial divergence (see figure 2). For others, such as education and health indicators, it can be quicker.

***Locally, convergence in basic living standards sets in early.*** Urban-to-rural gaps in consumption levels rise until countries reach upper-middle-income levels (see figure 2). But they fall soon after, and become small even before they get to high-income levels of around \$10,000 per capita. Access to water and sanitation in urban areas is more than 25 percent higher in urban areas for the less urbanized countries. For countries with urbanization rates of about 50 percent, such as Algeria, Colombia, and South Africa, the disparity in access is about 15 percent. For such countries as Brazil, Chile, Gabon, and Jordan, the disparity is less than 10 percent.

This pattern is also seen within countries. Provinces that are more prosperous and urbanized have smaller rural-urban gaps in living standards. This is true even in countries at low levels of income, such as China, India, and the Philippines. But within highly urbanized areas, gaps in basic living standards such as sanitation and schools tend to persist. Despite the best efforts of governments, for example, slums mark the urban landscape in countries well after they reach

high-income levels. It is common for one-third of a developing city's population to live in slums.

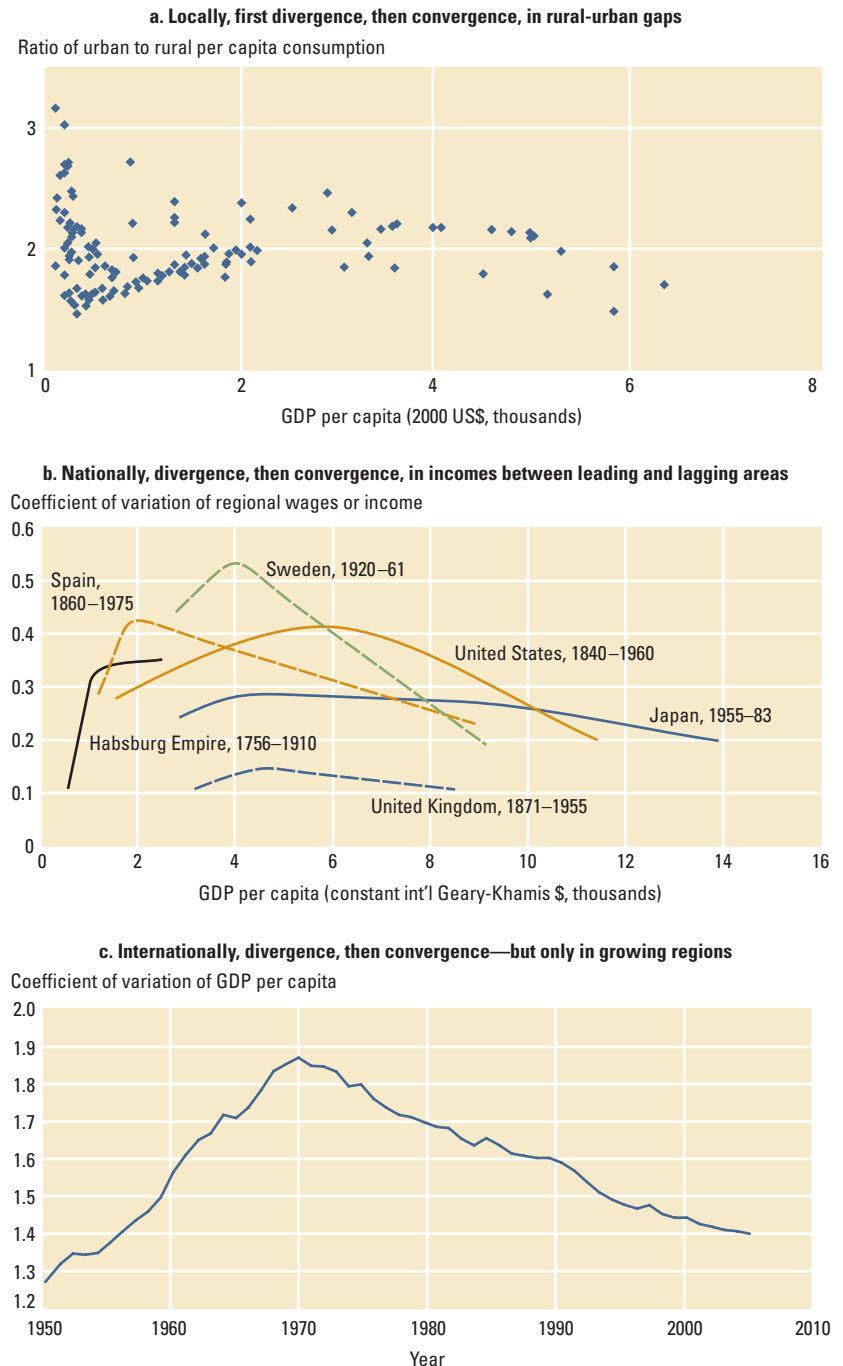
**Nationally, divergence in living standards happens quickly, but convergence is slower.** At early levels of income, provincial or interarea disparities in basic living standards can be small. But they increase quickly as countries grow. In low-income Cambodia, for example, the gap between leading and lagging areas in consumption of otherwise-similar households is almost 90 percent. In middle-income Argentina, the gap is 50 percent; but in contemporary Canada, it is just 20 percent. In the rapidly growing East Asian and Eastern European countries, for example, these gaps have increased rapidly.

A few countries such as Chile have been exceptions. Between 1960 and 2000, it experienced geographic convergence while its GDP per capita more than doubled to about \$10,500. In Colombia, the ratio of GDP of leading Bogotá to lagging Choco fell from 10 to 3 between 1950 and 1990. Less exceptional is convergence in poverty, basic health, nutrition, and education levels between areas within countries. Fast-growing countries everywhere have been able to quickly translate economic progress into spatial equity in these more basic living standards.

**Internationally, divergence in incomes continues a while, and convergence is slowest.** Global GDP per capita has increased almost tenfold since 1820. Life expectancy has doubled. Literacy rates have increased from less than 20 to more than 80 percent. But these gains have not been shared equally. Europe and its offshoots—Australia, Canada, New Zealand, and the United States—and more lately Japan and its neighbors have seen enormous increases in income and living standards.

For incomes, the convergence has happened only in the fastest-growing regions of the world. The pattern has been uneven within these countries—a few countries lead, resulting in divergence within the neighborhood, and then growth appears to spill over into their neighbors. In other regions such as Western Asia, there is no divergence—cold comfort because

**Figure 2 At all three geographic scales, the patterns of convergence in living standards are similar**



Source: Panel a: WDR 2009 team estimates from more than 120 household surveys for more than 75 countries; Panel b: WDR 2009 team (see chapter 2); Panel c: WDR 2009 team (see chapter 3).

these regions have been falling behind Europe, the European offshoots, and Japan. The importance of neighborhoods is shown most graphically by a comparison of the southern cone nations of Latin

America—Argentina, Brazil, Chile, and Uruguay—with Italy, Portugal, and Spain in southern Europe. Between 1950 and 2006, convergence within southern Europe took place at 1 percent per year, but in South America at just 0.3 percent.

In contrast to incomes, global inequality in access to basic living standards—life expectancy and education—has been falling since 1930. These improvements have picked up pace since 1960 and have been shared across all regions.

*The world is different today, but the past provides useful lessons*

The general patterns of concentration and convergence are likely to remain the same for today's developing countries as they were for early developers. But there are some differences because of reasons that are technological and political.

**Bigger cities.** Thanks to better medicine and transport, the world is now more populated and cities are much larger. Between 1985 and 2005, the urban population in developing countries grew by more than 8.3 million a year, almost three times the annual increase of 3 million for today's high-income countries between 1880 and 1900, when their incomes were comparable. If China and India are excluded, though, the annual increase is less than 4.5 million, about 50 percent more than a century ago. The big difference is that the world's largest cities are today much larger. London had fewer than 7 million people in 1900; the largest city among low-income countries today (Mumbai) is three times that size. So is Mexico City, the largest city in middle-income countries. The average size of the world's largest 100 cities has grown to almost 10 times their size in 1900 (see figure 3, panel a), and almost two-thirds of these cities are in developing countries.

**Wider markets.** Because of advances in communications and transport technology, the notion of markets is more global. Global trade as a share of production is now more than 25 percent, almost five times more than in 1900 (see figure 3, panel b). The openness to trade and capital flows that makes markets more global also makes subnational disparities in income larger

and persist for longer in today's developing countries. Not all parts of a country are suited for accessing world markets, and coastal and economically dense places do better. China's GDP per capita in 2007 was the same as that of Britain in 1911. Shanghai, China's leading area, today has a GDP per capita the same as Britain in 1988, while lagging Guizhou is closer to Britain in 1930. China's size, the openness of coastal China to world trade, and Shanghai's location are the reasons.

**More borders.** While markets are becoming more international because of better transport and communications, the world has become more politically fragmented. In 1900 there were about 100 international borders (see figure 3, panel c). Today, there are more than 600, as nations in Asia and Africa gained independence from European colonizers, and the Soviet Union and other communist countries broke up into smaller nations. The fragmentation of the world into more nations means smaller domestic markets. But at the same time, the potential for accessing foreign markets has been growing. In any case, thinner borders between countries now bring greater pay-offs for producers and workers.

Do such differences in technology mean that the past provides no lessons? Are cities in developing countries too large, and would these countries be better off if urbanization were slowed? Should today's developing countries be more concerned about regional disparities in production and income than developed countries were at a comparable stage of development? Is it easier today for all developing countries to access global markets and offset the disadvantages associated with greater fragmentation? This Report shows why the answer to all these questions is no.

### Markets shape the economic landscape

Rising densities of human settlements, migrations of workers and entrepreneurs to shorten the distance to markets, and lower divisions caused by differences in currencies and conventions between countries are central to successful economic development. The spatial transformations along

**Figure 3 Later developers face a different world**

Source: WDR 2009 team.

these three dimensions—density, distance, and division—have been most noticeable in Japan, North America, and Western Europe. Fast and frequent movements of people and products have helped North America, Western Europe, and Northeast Asia account for about three-fourths of global production with less than a sixth of the world's people.

The same market forces of *agglomeration*, *migration*, and *specialization* are

changing the economic landscape of today's most successful developing countries, in ways similar in scope and speed. Growing cities, mobile people, and vigorous trade have been the catalysts for progress in the developed world over the last two centuries. Now these forces are powering the developing world's most dynamic places.

### *The realm of "agglomeration economies"*

A trip on National Highway 321 east from Chengdu in Sichuan province to Shenzhen in Guangdong is a journey through economic development. Migrating workers who travel these highways often leave their families behind. But they also help their families escape poverty and propel China through the ranks of middle-income countries. As they travel eastward, they leave an agrarian realm in which they receive few benefits from working in proximity to others. Instead, they enter the realm of "agglomeration economies," in which being near other people produces huge benefits.

Shenzhen attracts young workers—90 percent of its 8 million residents are of working age. It specializes in electronic goods. But it makes them in enormous quantities. In 2006 its exports exceeded India's, making its seaport the fourth busiest in the world. Propelled by the forces of agglomeration, migration, and specialization, and helped by its nearness to Hong Kong, China, Shenzhen has grown the fastest of all cities in China since 1979, when it was designated a special economic zone.

This story is being replayed in India. In 1990 Sriperumbudur was known mostly as the place where Prime Minister Rajiv Gandhi was assassinated. In 2006 his widow, Sonia Gandhi, watched as Nokia's telephone plant churned out its 20-millionth handset.<sup>6</sup> The plant had begun production just earlier that year. With neither Shenzhen's favored administrative status nor its infrastructure, Sriperumbudur may be on its way to becoming a national, perhaps even regional, hub for electronic goods. The key is the town's proximity to Chennai, just as Shenzhen's proximity to Hong Kong, China, was instrumental in its growth.



In 1965, when independence was thrust on Singapore, it was not near any prosperous or peaceful place. Instead, it lay between Malaysia and Indonesia, two poor countries that had been ravaged by war between colonizers. Three-quarters of Singapore’s population lived in tenements. By 1980 it had industrialized, specializing in electronics, much as Shenzhen is doing now. By 1986 it was the world’s busiest container port and Southeast Asia’s financial hub. Along the way, by instituting land markets, building efficient transport infrastructure, and intervening to improve housing, it cleaned up its slums. Prosperity spilled over into neighboring Malaysia. Malaysia’s manufacturing-led prosperity in turn helped more than 2 million Indonesians who streamed in to fill jobs in construction and services. Singapore’s businessmen jet around Asia, fueling growth in places farther than Shenzhen and Sriperumbudur. The “little red dot” on a map—as reportedly derided by a neighboring president<sup>7</sup>—has transformed itself, integrated its neighborhood, and overtaken Britain, its former colonizer (see map 2).

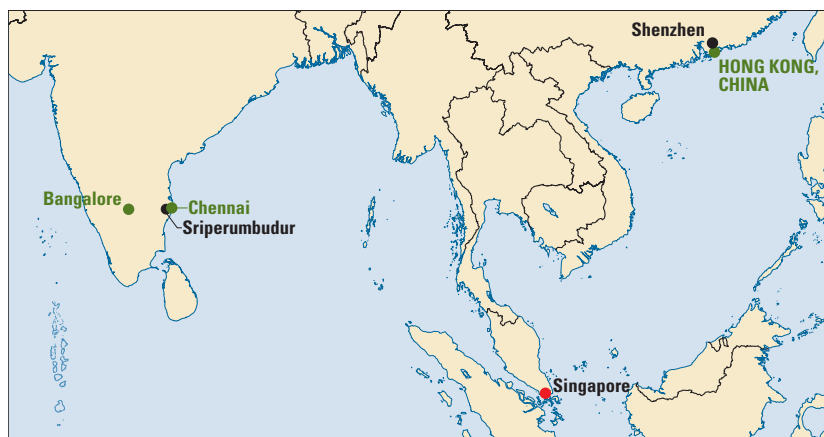
Singapore, Shenzhen, and Sriperumbudur show how scale economies in production, movements of labor and capital, and falling transport costs interact to produce rapid economic growth in cities and countries both large and small. These are the engine of any economy, with a role so fundamental in prosperity and poverty reduction that they are the subject of the

first three chapters of the most influential economics text ever written, Adam Smith’s *The Wealth of Nations*.

The economies of scale emphasized by Smith can be categorized into three types—those exclusive to firms, those shared by firms in the same industry and location, and those more generally available to producers in a larger urban area.

- With fewer than 17,000 people, Sriperumbudur was large enough for Hyundai to set up a big plant there in 1999. By 2006 the town had helped Hyundai produce its millionth automobile. Basic education and health services, proximity to a port, and basic infrastructure were all it needed to facilitate plant-level scale economies. The evidence is that internal scale economies are high in such heavy industries as shipbuilding, and low in such light industries as garments. The town has enough workers to enable matching workers and jobs in big plants. So towns like Sriperumbudur are large enough to facilitate *internal economies*.
- Shenzhen Special Economic Region—with an area of just 300 square kilometers but a population of almost 3 million—is home to a bustling electronics industry. With a ready supply of skilled and semi-skilled young workers, the area is investing in better education and research facilities to ensure that the city supplies what the industry needs. Its port ships in intermediate inputs and ships out final products. It shares expensive facilities, such as top-notch container ports and convention centers, and matches workers to the growing number of jobs as firms rapidly expand their operations. Proximity to Hong Kong, China, provides access to finance, though Shenzhen is home to a rapidly expanding financial sector. And competition for customers among the multiple suppliers of inputs produces cost savings. The area excels in providing, in economic jargon, *localization economies*.
- Singapore has passed through these stages and is now one of the world’s top centers of commerce. By providing a stable economic environment, excel-

Map 2 Settlements of varying size facilitate different scale economies



Source: WDR 2009 team.

lent transport links, livability, and efficient finance, it provides services to the entire Asia-Pacific region. These services are used by a wide range of industries, from shipping to manufacturing, to education, and to finance, insurance, and real estate. They thrive on economic density. With fewer than 5 million people packed into less than 700 square kilometers of space, Singapore is the world's most densely populated country. In 2006 its exports of \$300 billion approached those of the Russian Federation, which has more than 16 million square kilometers. Singapore's diversity facilitates sharing, matching, and learning, providing what economists call *urbanization economies*.

In most countries, such towns and cities coexist. Brazil's Rio de Janeiro state has about 14.5 million people. Volta Redonda, not too far from Rio city, originally supplied goods and services just to meet the needs of CSN, the largest steel plant in Latin America. Duque de Caixas, about 15 kilometers from Rio, meets the needs of an industry producing petrochemicals. And the diversified Rio de Janeiro metropolis, with about 6 million people, supplies financial services to settlements that surround it. And with other metropolises like São Paulo, Rio connects Brazil to the rest of Latin America and the world. The pattern is so familiar that it is almost a law of urban economics.

The functions and fortunes of settlements are linked. Industrialized places are different from their agrarian predecessors not just because they are more concentrated but also because they are more specialized. The largest cities may be well suited for startup enterprises; the smaller ones may be better suited for those more established. In agriculture, sowing and reaping must happen in the same place. Not so for industry and business services. Falling transport and communications costs allow firms to spatially separate sowing and reaping. Products may be designed and financed in large cities—and produced in small towns.

As firms adjust to changing market conditions, places have to perform different functions or risk decay. The most immobile

of all inputs to production—land—must become mobile between uses. Access to oceans and rivers might be the reason a place is settled, but the nimbleness of its land markets will largely determine how much it will grow. Governments may not be good at picking places that will prosper. But how well they institute regulations, build infrastructure, and intervene to make *land use* efficient will decide the pace of prosperity for the entire neighborhood.

Depending on what type of agglomeration economies they deliver, places can be large or small. Function is far more important than size. But locating farther away from economic density generally reduces productivity. Doubling this distance in Brazil apparently reduces productivity by 15 percent and profits by 6 percent. Better infrastructure reduces economic distance. But in a developing country, the most natural way for workers and entrepreneurs to close this distance is to move closer.

### *Migrating to profit from proximity*

Agglomeration economies attract people and finance. Today, capital tends to move quickly over long distances to exploit opportunities for profit. People also move, but they move more quickly to nearby agglomerations than to those far away. Once plants and people come to a place, others follow.

- Locally, the move toward density is quick in fast-growing economies, manifest in a rapid rural-urban migration that accompanies the shift from agriculture to industry. As the Republic of Korea grew between 1970 and 1995, the urban share of population quadrupled to 82 percent, with migration accounting for more than half the increase in the 1960s and 1970s.
- Nationally, workers move to reduce distance to markets in parts that are prospering. About 3 million people moved in the second half of the 1990s from the lagging Indian states of Bihar and Uttar Pradesh to leading Maharashtra and prosperous Punjab (see map 5). In Vietnam, a much smaller country, more than 4 million people migrated internally during the same period.



- Internationally, regional migration is a big part of labor mobility. Migration among neighbors is considerable. Côte d'Ivoire, India, and the Islamic Republic of Iran have been among the top destinations for their neighbors. Germany, Italy, and the United Kingdom still rank among the top 10 sending countries. But interregional migration is sluggish. Fewer than 200 million of the world's 6.7 billion people live outside their region of birth. And just 2 million people move from poorer countries to the developed every year, half of them to the United States.

**Map 3 Migrating to reduce distance to density: Despite the obstacles, Chinese workers have migrated in the millions**

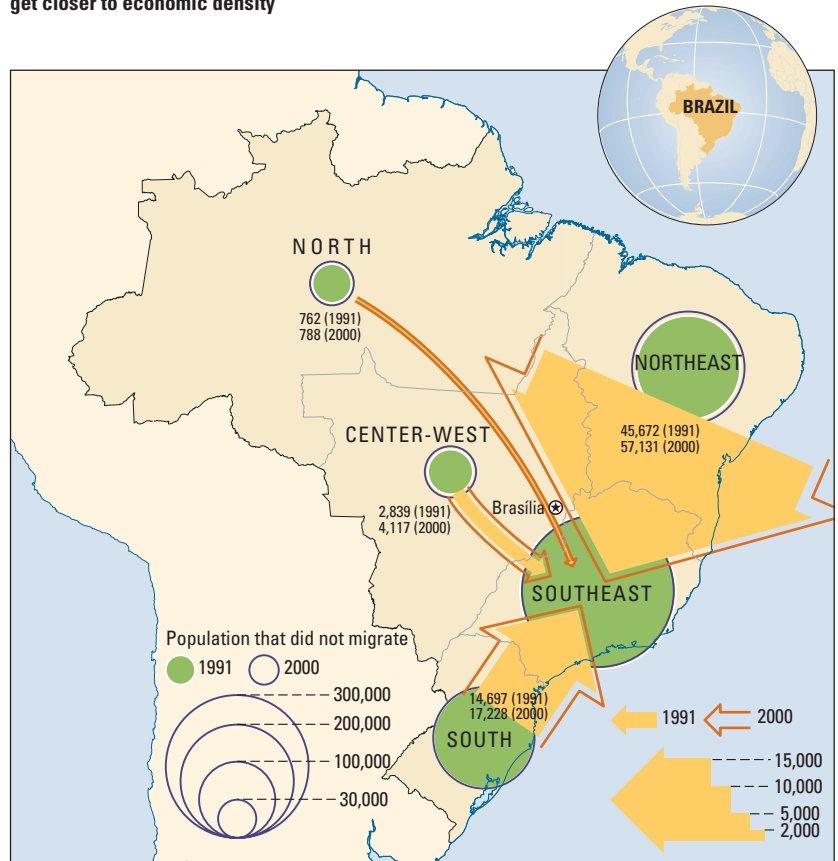


Source: Huang and Luo 2008, using data from the population census of China.

This sum is not likely to increase, even though the gains from greater migration from developing to developed countries are considerable.<sup>8</sup> International migration has been high in the past: fully 20 percent of Europeans emigrated to new lands in the Americas, Australia, and South Africa. Today, these movements have slowed. Just 500,000 Chinese emigrated abroad in 2005. But internal migration has picked up in the developing world. More than 150 million people moved internally in China despite restrictions (see map 3). In Brazil's high-growth years during the 1960s and 1970s, almost 40 million people left the countryside for cities; even today, young workers migrate in large numbers (see map 4). Vigorous internal migration is not new. Between 1820 and 2000 per capita incomes in the United States multiplied 25-fold, and Americans earned the reputation of being among the most footloose of people. In Japan internal migration peaked in the 1960s, as it grew to become the world's second-largest economy.

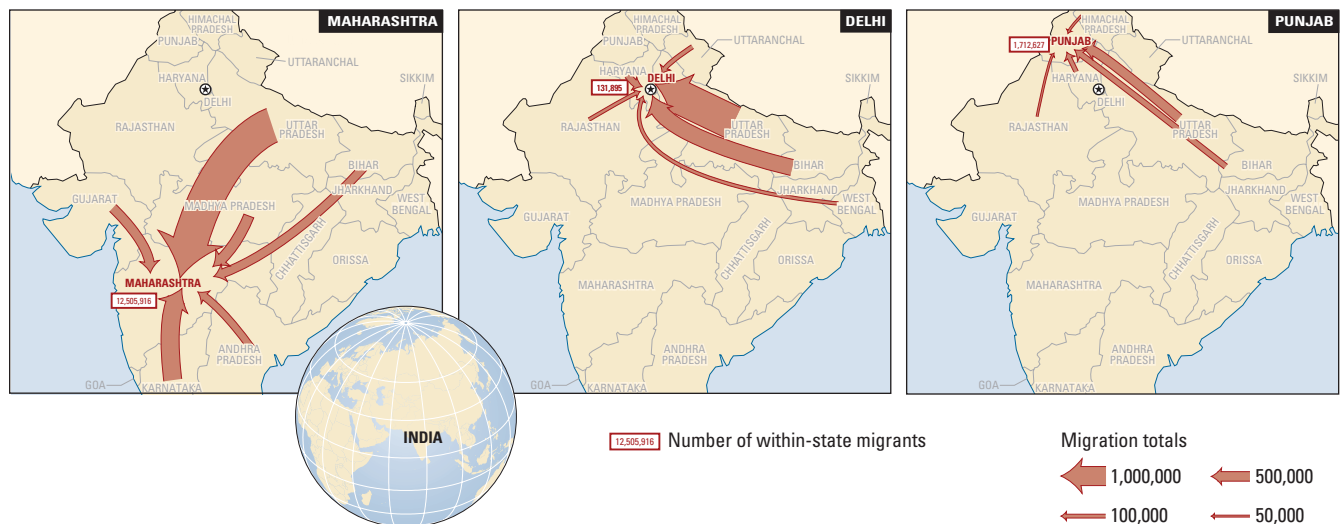
Despite aggressive area development policies, 1.7 million people—more women than men—have left East Germany for the West, helping to make incomes more equal. Since the transition to market economies, firms and people have picked places better suited for production. More than a million people—about 12 percent of

**Map 4 Migrating to reduce distance to density: Brazil's young workers move in thousands to get closer to economic density**



Source: WDR 2009 team, based on census data from the Instituto Brasileiro de Geografia e Estatística.

**Map 5 Migrating to reduce distance to density: Migration in India has been less frenetic**



Source: WDR 2009 team, based on census data from the Census of India.

residents—have left Siberia and the Russian North and Far East for the western parts of Russia.

West Africa has sustained regional labor mobility through institutional cooperation. But independent Africa is generally less integrated. Africans—especially the most skilled—have been leaving the continent, seeking and getting higher rewards in the North. Other parts of the world show how to deal with this brain drain. Educated workers will be pulled toward places where other skilled people agglomerate. This is beneficial for both places. But when people are pushed out by the lack of security or basic services, migration is beneficial for the migrant but not always for the nation. Pull migration is better than push, but both are hard to stop or slow. Policy makers are realizing that the challenge is not how to keep people from moving, but how to keep them from moving for the wrong reasons.

China illustrates the benefits. Except for a brief period during the Cultural Revolution, China has treated its diaspora well, according them both rights and respect.<sup>9</sup> Internally, its policies have gone back and forth, but now they are shifting from trying to discourage people from moving to delivering basic services to people wherever they live. The policies are paying dividends. As Chinese migrants are moving to the coast by the million, many of the 57 million overseas Chinese are bringing finance and expertise back to some of the same places. Internal and international migrants are coming together in a way that is not accidental. The willingness of the Chinese to move—leaving the country for other parts of the world to escape war and squalor in the first part of the twentieth century and then bringing finance and know-how to coastal China during the last quarter—promises to bring to southeast China a “reversal of fortune” rivaling the U.S. Northeast (see “Geography in Motion: Overcoming Distance in North America”).

Countries do not prosper without mobile people. Indeed, the ability of people to move seems to be a good gauge of their economic potential, and the willingness to migrate appears to be a measure of their desire for advancement. Governments

should facilitate *labor mobility*. For decades since independence, India treated its 40 million emigrants as “not required Indians.” Encouraged by a change in attitude since the 1990s, expatriate Indians are pulling distant places like Bangalore and Hyderabad closer to world markets, just as the overseas Chinese did for Shanghai and Guangzhou more than a decade earlier. Falling costs of transport and communications have helped greatly.

### *Specializing and trading as transport costs fall*

Transport and communication costs have indeed fallen rapidly over the last century, especially in the last 50 years. Since the 1970s, railroad freight costs are down by half. Road transport costs, despite higher energy and wage costs, are down by about 40 percent. For worldwide air freight, the price has fallen to about 6 percent of its 1955 level. The price for tramp shipping services is half that in 1960. A three-minute phone call from New York to London was almost \$300 in 1931. Today, the same call can be made for just a few cents.

With falling domestic transport costs, economic production should have become more evenly spread within countries. With lower costs of transporting and communicating internationally, countries should have traded more with distant partners. What happened was the opposite. Falling transport costs have coincided with greater economic concentration within countries. And while countries now trade more with everyone—exports as a share of world production quadrupled to 25 percent over the last three decades—trade with *neighbors* became even more important.

Why did this happen? The answer lies in the growing importance of scale economies in production and transport (see chapter 6). As transport costs have fallen, they have allowed greater specialization and radically altered the location of firms and the nature of trade. With high transport costs, firms had to be near consumers. But as transport costs fall, they can avail of internal, local, and urban economies of scale, and transport the product to consumers. Internationally, the same thing. With high transport

costs, England imported only what it could not grow or produce at reasonable cost—spices from India and beef from Argentina in exchange for British textiles and china. As transport costs fell, it imported more spices and beef. But it also traded more with France and Germany—Scotch whisky for French wine, English ale for German beer. Trade to fulfill basic needs was joined and soon overtaken by trade to satisfy a variety of wants.

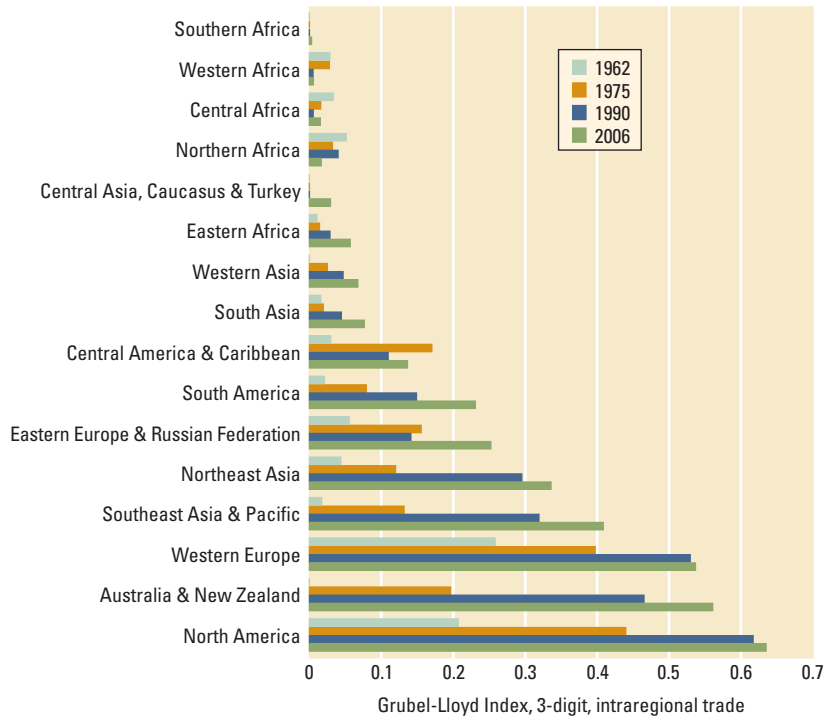
Falling costs of transportation and communication have made the world smaller. But they have also made economic activity more geographically concentrated.

- Locally, with falling costs of commuting and a greater potential for exploiting scale economies, towns and cities can grow bigger and denser.
- Nationally, as leading and lagging areas within countries are connected through better modes of transport, production is more concentrated in the more economically dense areas to take advantage of agglomeration economies.
- Internationally, countries that have lowered the costs of transport more have benefited most from greater trade. Greater specialization has made these countries more competitive still, concentrating trade and wealth in a few parts of the world.

Scale economies are evident in the transport sector, too. More trade means lower costs of transportation, which in turn means more trade. This is especially true for intraindustry trade, which has been the most rapidly growing part of international trade during the last half-century. Since 1960 the share of intraindustry trade in the world’s total has doubled from 27 percent to 54 percent. Within-region intraindustry trade is low in most regions, and high in a few. It is close to zero for Central Africa, Central Asia, East Africa, Northern Africa, South Asia, and Southern Africa. It is highest for Australia, East Asia, New Zealand, North America, and Western Europe (see figure 4).

Regional cooperation has advanced much faster and further in these parts of the

**Figure 4 Intraindustry trade is high in North America, Western Europe, Oceania, and East Asia**



Source: Brülhart 2008 for this Report.

Note: The Grubel-Lloyd Index is the fraction of total trade that is accounted for by intraindustry trade.

world, explaining why the friction of borders on trade has fallen. Aided by a deepening integration, the intraregional share of trade in the EU has risen above 60 percent (see “Geography in Motion: Overcoming Division in Western Europe”). In East Asia, the fastest-growing region, the share of regional trade is now more than 55 percent (see “Geography in Motion: Distance and Division in East Asia”).

Development in a world of greater specialization and concentration is even more challenging. Developing countries have higher transport costs and small markets, which do not support specialization. But several countries—mainly in East Asia—have shown that these markets are accessible for low-income countries. The answer lies in the fastest-growing component of intraindustry trade: trade in “intermediate inputs” of production (see box 3).

In agriculture, industry, and services, the potential for fragmenting production is almost without limit. Thailand may not be able to make a television set better than Japan, but it could make parts of televisions

### BOX 3 *Intraindustry trade and intermediate inputs*

More than half of world trade today is intraindustry trade, with industries classified in 177 (3-digit) categories, up from about a quarter in 1962. So countries are becoming more similar in their economic structures. This trade consists of

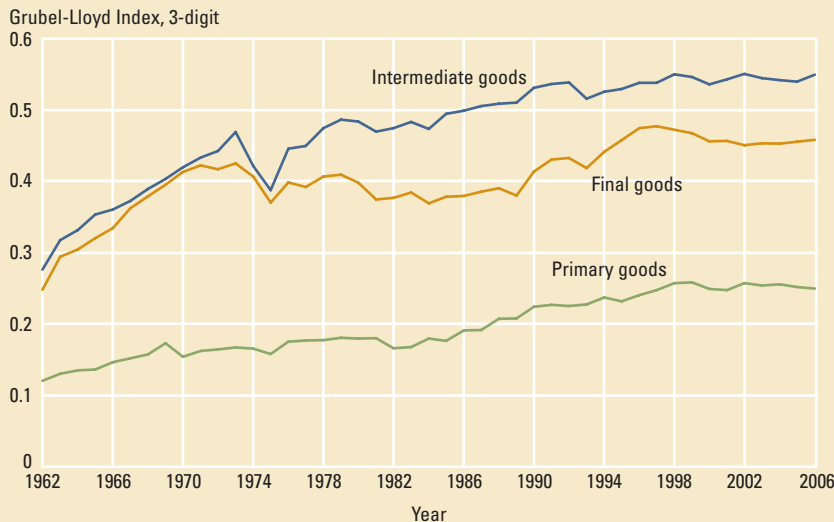
final and intermediate goods, with both having increased considerably over the last 50 years. This rise in intraindustry trade is not just for manufacturing. Intraindustry trade in machines and transport equipment is the highest, but the larg-

est increase is in food and live animals. Consumers like variety for farm produce, and that means profit in trade between two countries that raise similar food and animals (see figure at left).

But the largest rise is for intermediate inputs—the produced means of production. Marginal intraindustry trade—a reliable measure of change—is highest in intermediate inputs. This is not just for manufacturing. Agriculture needs inputs, too. And falling communications costs have resulted in greater fragmentation of services into “components,” supplied to final consumers from different parts of the world.

Trade in intermediate goods is more sensitive to transport costs than is trade in final goods. Consider the following illustration: if intermediate inputs are two-thirds of the value added for a good, a 5-percent increase in transport costs can mean the equivalent of a 50-percent tax. Little wonder that intermediate goods trade has increased fastest in parts of the world that have reduced trade and transport costs the most.

#### Intraindustry trade has risen for primary, intermediate, and final goods



Source: Brülhart 2008, for this Report.

Source: WDR 2009 team.

equally well and much cheaper. Anchored by China and Japan, countries in East Asia have developed production networks that trade intermediate goods back and forth. By specializing in a small part of the production chain, they have broken into this most lucrative and fastest-growing component of trade in manufactures.

Countries in other regions can also benefit from the growing *trade in intermediate goods*. The key for most is making a concerted effort to lower the costs of transport. This means more concentration within developing countries, but—by allowing them to specialize at earlier stages of development and exploit economies of scale—it will help them converge to the incomes and living standards in the developed world. Over the last two decades, such interactions between scale economies, mobility of capital and labor, and

transport costs have occupied the interest of researchers (see box 4).

Their insights should change what to expect from the markets. They should also inform what governments can do to promote the geographic transformations necessary for development.

#### Putting development in place

Prosperity will not come to every place at once, but no place should remain mired in poverty. With good policies, the concentration of economic activity and the convergence of living standards can happen together. The challenge for governments is to allow—even encourage—“unbalanced” economic growth, and yet ensure inclusive development. They can do this through economic integration—by bringing lagging and leading places closer in economic terms.



#### BOX 4 *New insights from a generation of analysis*

Researchers have been taking a fresh look at industrial organization, economic growth, international trade, and economic geography, having incorporated the effects of scale economies in production. The results can be surprising for those schooled in conventional economic analysis. Here are some of the new insights:

**Plants have to be big to exploit economies of scale, but places do not have to be big to generate them.** Increasing returns to scale arise because of fixed costs of production (internal to a firm) and proximity to workers, customers, and people with new ideas (external to a firm, even an industry). The size of settlements matters less than their function.

The reason: with reasonable transport costs, towns can be large enough to facilitate internal scale economies. Medium-size cities are often large enough for “localization” economies that come from

thick input markets, but not for “urbanization” economies—especially those involving knowledge spillovers—generated mainly by large cities (see chapter 4).

The implication: policy makers should focus on the functions of cities.

**Human capital moves to where it is abundant, not scant.** Conventional economic analysis implies that people should move to where their skills are scant. But the opposite seems to happen: educated migrants seek places where many others have similar skills. Among the 100 largest metropolitan areas in the United States, the 25 cities with the highest share of college graduates in 1990 had, by 2000, attracted graduates at twice the rate of the other 75.

The reason: educated workers gain from proximity to others (see chapter 5).

The implication: policies should not fight the market force that pulls skilled people together.

**Falling transport costs increase trade more with neighboring, not distant, countries.** With a decline in transport costs, countries should trade more with countries that are farther away. But trade has become more localized than globalized. Countries trade more with countries that are similar, because increasingly the basis of trade is the exploitation of economies of scale, not the differences in natural endowments.

The reason: falling transport costs make specialization possible (see chapter 6).

The implication: falling transport costs change the composition of international trade and make it even more sensitive to such costs. Policies to reduce trade and transport costs should be a big part of growth strategies for late developers.

Recognizing scale economies and their interaction with the mobility of people and products implies changing long-held views about what is needed for economic growth. *Source:* WDR 2009 team.

This integration can best be done by unleashing the market forces of agglomeration, migration, and specialization, not by fighting or opposing them. How well markets and governments work together determines the speed and sustainability of geographic transformations. Look at what is happening in Bogotá, Turkey, and West Africa:

- Bogotá has almost 7 million citizens, but migration from rural Colombia continues. A third of its population growth is due to rural migrants, who mostly settle in poor, crowded neighborhoods as the city grows denser. Since 2000 a new public transportation system, the *TransMilenio*, has eased congestion, now carrying a million passengers a month. For the poor neighborhoods especially, it has reduced the distance to economic opportunities. But many people still live in slums, and crime and violence are getting worse. A municipal initiative has addressed these social divisions since 2003, helping almost a million people integrate into the city and change their neighborhoods.
- Turkey is trying to change neighborhoods too, in a different way. The country of 70 million has been looking toward integration with the EU. Because of higher agglomeration economies and lower transport costs, areas near Istanbul and Izmir may be better suited for integrating with Europe. The more distant areas of eastern and southeastern Anatolia and the Black Sea have 40 percent of the land but less than 20 percent of the national product, with a GDP per capita about half that of the western areas. The disparities persist despite government efforts to spread economic mass toward the east. Meanwhile, public investments in social services help lagging areas, while fiscal incentives for firms to locate in those areas seem ineffective.<sup>10</sup>
- The Economic Community of West African States (ECOWAS) has a protocol that allows free movement of its 250 million people between member states. This has helped the neighborhood maintain regional labor mobility at preindependence levels, even as it fell in East and Southern Africa. But trade is another

story. In the most dynamic parts of the world, the exchange of similar goods and services—intraindustry trade—has been rising rapidly. But in West Africa, international borders are thickened by red tape and illicit checkpoints, which divide the region and thwart the efforts of ECOWAS members to specialize and trade.

As the lens of economic geography is widened, different movements, stresses, and strains come into view.

- Locally, in places like Bogotá, land must accommodate more and more people. If *land markets* work well, land will be mobile between uses and allocated productively. The cities that do this best will grow, and even more people will be attracted to their economic density.
- People and products move much faster in and around Bogotá than they do in Turkey. But even in Turkey, the western areas will become more prosperous and dense, if at a slower pace. Spatial disparities in incomes and poverty rates between the west and the east will likely rise and then diminish as people move to take advantage of economic density. If *labor markets* in Turkey are fluid, people will reduce their economic distance to these agglomerations.
- Internationally, these movements are likely to be fewer and even slower. If regional and global markets were integrated, countries in West Africa would specialize in a few tasks and become competitive in world markets. As divisions diminish, neighboring countries

trade similar goods and services, motivated more by the benefits of specialization and scale than by differences in natural endowments. Trade can only partially offset the immobility of land and labor, but it will help convergence when developing countries can tap into the most rapidly growing component: *trade in intermediate goods*.

Private motives are the main shapers of the economic landscape, but it can be reshaped by collective action, most potently by governments. Seen through the lens of economic geography, land use, labor mobility, and intermediate goods trade come into focus (see table 2). Governments should pay special attention to land, labor, and product markets. When they do not work well, the forces of agglomeration, migration, and specialization weaken, and the economy stagnates. When they do, land, labor, and input markets bring the economic efficiency that comes with geographic concentration, and the equity associated with converging living standards.

*A rule of thumb for economic integration*

The concern of policy makers is that production will concentrate in some places, people in others. Cities will have economic density, and the countryside most of the poor. Leading areas will have the economic mass, while the poor are massed in lagging areas. Some countries will have much of the world’s wealth, others most of the world’s poor. Even if this were temporary, it seems unfair. But the disparities may be long lasting, destabilizing parts of a country, entire nations, and even some world regions.

Governments have many reasons to worry about disparities in welfare in and among countries. They also have many policy instruments for promoting economic integration to reduce those disparities.

- *Institutions*—shorthand in the Report for policies that are *spatially blind* in their design and should be universal in their coverage. Some of the main examples are regulations affecting land, labor, and international trade and such social

**Table 2 Agglomeration, migration, and specialization are the most important forces—and land, labor, and intermediate inputs the most sensitive factor markets**

	Geographic scales		
	Local	National	International
<b>Economic force</b>	<b>Agglomeration</b> Speeded by migration, capital mobility, and trade	<b>Migration</b> Influenced by agglomeration and specialization	<b>Specialization</b> Aided by agglomeration and factor mobility
<b>Key factor of production</b>	<b>Land</b> Immobile	<b>Labor</b> Mobile within countries	<b>Intermediate inputs</b> Mobile within and between countries

Source: WDR 2009 team.

Note: Throughout the Report, “areas” are within-country economic neighborhoods or administrative units such as states or provinces, and regions are groups of countries based on geographic proximity.



services as education, health, and water and sanitation financed through tax and transfer mechanisms.

- **Infrastructure**—shorthand for policies and investments that are *spatially connective*. Examples include roads, railways, airports, harbors, and communication systems that facilitate the movement of goods, services, people, and ideas locally, nationally, and internationally.
- **Interventions**—shorthand for the *spatially targeted* programs that often dominate the policy discussion. Examples include slum clearance programs, fiscal incentives for manufacturing firms offered by state governments, and preferential trade access for poor countries in developed country markets.

Today, policy debates often begin and end with discussions of spatially targeted incentives. The debate on how to promote healthy urbanization is polarized between those who emphasize villages, where a majority of the world’s poor still live, and those who believe the way out of poverty lies in cities, where much of the world’s wealth is generated. As urban poverty increases, the focus is shifting from villages to slums. Motivated by within-country geographic disparities in living standards, the debate on territorial development is similarly fixated on economic growth in lagging areas. At the international level, preferential market access for

the least developed countries can end up dominating policy discussions.

This Report calls for a rebalancing of these debates to include all the elements of a successful approach to spatial integration—institutions, infrastructure, and incentives. Using the findings in part one and the analysis of market forces in part two, part three reframes these debates, calling for a shift from spatial targeting to spatial integration.

The world is complicated, and the problems of economic integration defy simple solutions. But the principles need not be complex. The bedrock of integration policies should be spatially blind institutions. Where the integration challenge spans more than one geographic dimension, institutions must be augmented by public investments in spatially connective infrastructure. Spatially targeted interventions are not always necessary. But where the problem is low economic density, long distances, and high divisions, the response must be comprehensive, involving spatially blind, connective, and targeted policies.

For each spatial dimension, an instrument of integration (see table 3). The rule of thumb: “an I for a D.”

- For a one-dimensional problem, the mainstay of the policy response should be (spatially blind) institutions.
- For a two-dimensional challenge, both institutions and (spatially connective) infrastructure are needed.

**Table 3 “An I for a D?” A rule of thumb for calibrating the policy response**

Complexity of challenge	Place type—local (L), national (N), and international (I) geographic scales	Policy priorities for economic integration		
		Institutions Spatially blind	Infrastructure Spatially connective	Interventions Spatially targeted
<b>One-dimensional problem</b>	L. Areas of incipient urbanization N. Nations with sparse lagging areas I. Regions close to world markets	●		
<b>Two-dimensional challenge</b>	L. Areas of intermediate urbanization N. Nations with dense lagging areas I. Regions distant from world markets	●	●	
<b>Three-dimensional predicament</b>	L. Areas of advanced urbanization that have within-city divisions N. Nations with dense lagging areas and domestic divisions I. Regions distant from markets with small economies	●	●	●

Source: WDR 2009 team.

Note: Throughout the Report, areas are within-country economic neighborhoods or administrative units such as states or provinces, and regions are groupings of countries based on geographic proximity.

- For a three-dimensional predicament, all three instruments are needed—institutions, infrastructure, and (spatially targeted) interventions.

The primary dimension at the local geographic scale is density; nationally, it is distance; internationally, division. At each of these geographic scales, policies designed without explicit consideration to space should be seen as the primary instrument. In some places, these can be a large part of integration policies. The task of integration is relatively straightforward in areas of incipient urbanization (as in lagging states in many low-income countries), in countries with mobile labor and capital (such as Chile), or in regions that are close to world markets (such as North Africa). In such places, the integration challenge can be seen as one dimensional. Explicitly spatial policies are not generally necessary. Universal or spatially blind institutions—made available to everyone regardless of location—form both the bedrock and the mainstay of an effective integration policy.

As the task becomes more complicated, these institutions must be assisted by infrastructure. Locally, rapid urbanization can congest the area, increasing economic distance and choking off agglomeration economies. In places such as Mumbai, whose population has doubled since the 1970s, rising congestion has to be met by investments in transport infrastructure, so that the benefits of density are shared more widely. Nationally, changing economic and political fortunes can leave

behind a misplaced density of populations in lagging areas, so that in some countries (such as Brazil) lagging areas have higher poverty rates *and* high population densities. Internationally, developing regions are all deeply divided, but some also may be distant from world markets. Even if regional institutions take hold and make South Asia a more integrated region, some countries (such as Nepal) may need concerted policy action to improve the infrastructure to reach growing regional and international markets. For places that face two-dimensional integration challenges, investments in infrastructure that connects lagging to leading places and aid market access should supplement the institutions that bring people together.

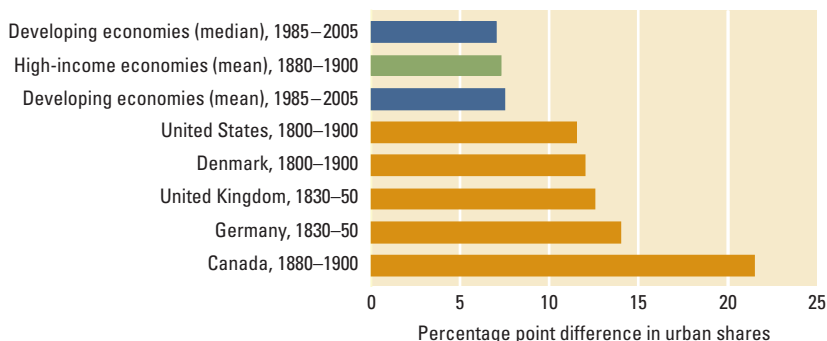
The integration challenge is greatest where adverse density, distance, and division combine to pose a “three-dimensional challenge.” In highly urbanized areas (such as Bogotá), the fear is that economic density and population density may not coincide. Within-city divisions may prevent the integration of slums and spawn problems of crime and grime. In some countries (such as India), ethnic, religious, or linguistic divisions discourage the poor in densely populated lagging areas from seeking their fortunes elsewhere. And in the most fragmented and remote regions (such as Central Africa or Central Asia), a clustering of small and poor nations can lead to spillovers of the wrong kind—disease, conflict, or corruption.

Slums in large cities, densely populated poor areas in divided nations, and the “bottom billion” countries—approximating the three billions discussed at the beginning—are the most difficult challenges for integration. The policy responses should not be timid. But they should also be deliberate.

*Efficient and inclusive urbanization*

No country has grown to middle income without industrializing and urbanizing. None has grown to high income without vibrant cities. The rush to cities in developing countries seems chaotic, but it is necessary. It seems unprecedented, but it has happened before (see figure 5). It had to have, because the move to density that is manifest in urbanization is closely related

**Figure 5 In charted waters: the pace of urbanization today has precedents**  
Change in urban shares since 1800



Source: WDR 2009 team calculations based on data from various sources (see figure 1.13).

to the transformation of an economy from agrarian to industrial to postindustrial.

Governments can facilitate the spatial transformations that lie behind these sectoral changes. Depending on the stage of urbanization, sequencing and priority-setting require paying attention to different aspects of the geographic transformation. What does not change is that a foundation of institutions must be universal and come first, investments in connective infrastructure should be both timed and located well and come second, and spatially targeted interventions should be used least and last.

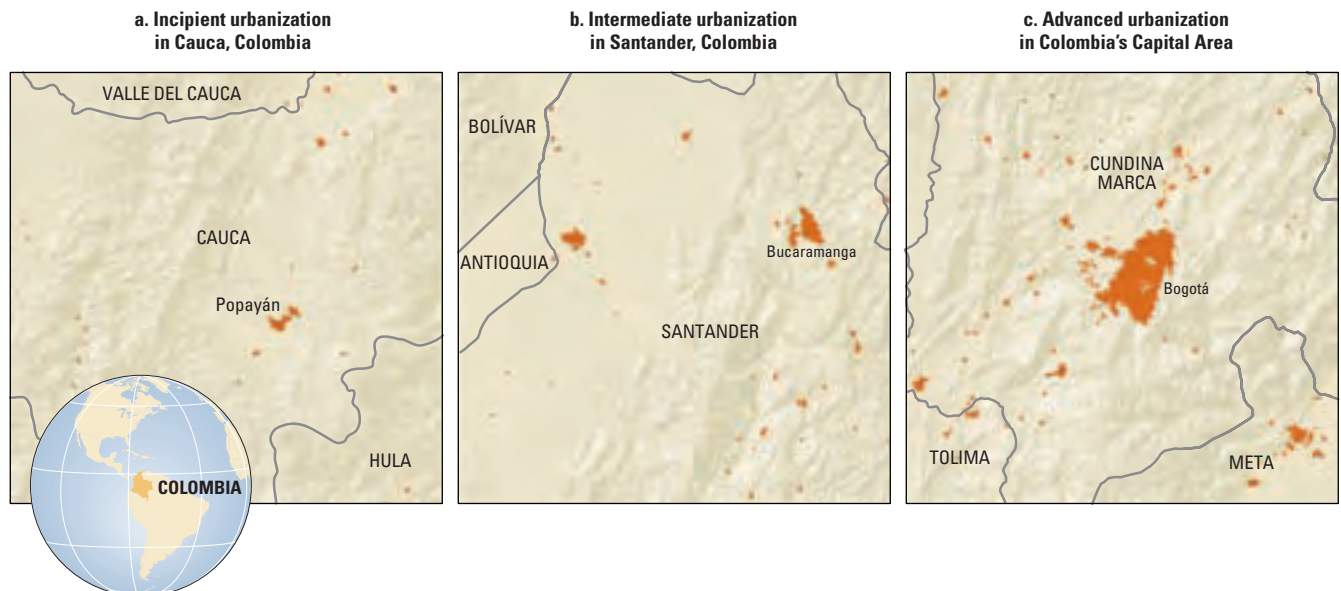
The approach requires the discipline of following the integration principle set out earlier. The payoff is a spatial transformation that is both efficient and inclusive (see chapter 7).

The principles outlined in the Report help to prioritize policies for different stages of urbanization, providing the elements of an urbanization strategy. Map 6 shows three areas in Colombia, each with a specific geography. But the principles are quite universal.

- **Incipient urbanization.** In places that are mostly rural, governments should be as neutral as possible and should

establish the institutional foundation of possible urbanization in some places. Good land policies are central, and so are policies to provide basic services to everyone. For example, the universalization of land rights in Denmark at the turn of the eighteenth century contributed greatly to the nation's take-off into industrialization a few decades later. Indeed, policies to strengthen rural property rights are seen as instrumental for higher agricultural productivity in sixteenth-century England, which freed workers to migrate to towns to work in manufacturing and services. A close complement to the institutions for better land markets is the universal provision of basic social services—security, education, health services, and sanitation. In 1960, the Republic of Korea had a per capita income level that Benin has today. Seventy-five percent of its people lived in rural areas, more than a third of Korean adults had no schooling, and fewer than 5 percent of children had been immunized against preventable diseases such as measles. By 2000, more than 80 percent had urbanized, almost everyone was literate and immunized, and the Republic of Korea's income had

**Map 6 As urbanization advances, policies must evolve**



Source: WDR 2009 team, using data from Schneider, Friedl, and Potere 2008.

### BOX 5 *Concentration without congestion in western China: Chongqing and Chengdu*

An experiment in China might change the future of urbanization policy in the developing world. Policy makers should take notice.

China is taking inland the urbanization strategy that was successful in the leading coastal areas in the 1980s and 1990s. The “area approach” is being implemented in two places—Chongqing and Chengdu, both located in the near west. At about 40 percent, they have the same urbanization ratio as the average for China. The aim is to increase that to 70 percent by 2020, promoting both concentration and rural-urban convergence.

Chongqing has a population of about 40 million, with a portfolio of a capital city, six large cities, 25 small and mid-size cities, 95 central townships, and 400 townships. Chongqing has been accorded the status of a special municipality, as Beijing, Shanghai, and Tianjin have had for some years. Like them, it will enjoy greater financial autonomy. Chengdu is smaller, a sprawling metropolitan area with 11 million people. Along with the 2,000-year-old capital city of Sichuan province, it has eight medium-size cities, 30 central townships, 60 townships, and 600 villages.

The urbanization strategy involves “three concentrations” of land, industry, and farmers. The idea is to reap the benefits of scale economies, promote the mobility of goods and workers, and improve the well-being of new migrants to cities. Consistent with the policy priorities outlined for areas with intermediate urban shares of about 40–50 percent, the emphasis in both places is on universal institutions and connective infrastructure, not spatially targeted interventions.

**Better institutions.** The emphasis is on coordination across government levels to manage land use and conversion. In the countryside, the plan concentrates rural land by transferring use rights to firms and farmers. In towns and cities, the creation of industrial zones is a key part of the wider framework. Large and medium cities are developing high value-added manufacturing, while smaller cities and towns are specializing in labor-intensive industries, pulling in labor from nearby villages, and facilitating localization economies.

**More infrastructure.** Massive trunk infrastructure is planned. Chongqing will spend billions on infrastructure, from the central government and through increased private investment from Hong Kong, China, and from Singapore. In Chengdu, about 117 billion yuan will be invested in 71 infrastructure projects, including rural-urban transport networks, and water and sanitation projects in both rural and urban areas. Another 16.5 billion yuan will be invested in 34 social projects to improve the living standards of lagging rural residents.

If markets favor the two places as much as the government has, they will improve the lives of millions in the Chinese hinterland. The integration already has had a local impact. In Chongqing, rural incomes in 2007 increased faster than those of urban residents. In Chengdu, farmer concentrations are believed to have led to a productivity increase of 80 percent, as industry has been absorbing about 100,000 farmers a year.

Source: WDR 2009 team.

of rising economic density are more widely shared. Industrialization involves changing land use patterns as activities concentrate, and requires moving goods and services around quickly. Land use regulations can affect location decisions, and they continue to be the institutional priority. Spatially blind social services should continue as part of rural-urban integration, so that people are pulled to cities by agglomeration economies, not pushed out by the lack of schools, health services, and public security in rural areas. But even if these services are provided, transport costs can rise quickly because of growing congestion, affecting the location choices of entrepreneurs. Connective infrastructure is needed to keep such areas integrated. State and central governments that work well together can provide the trunk infrastructure necessary to ensure that prosperity is widely shared. Making the administrative jurisdiction wider can help in coordinating infrastructure investments. A good example is Chongqing in western China (see box 5).

- **Advanced urbanization.** In highly urbanized areas, besides institutions and infrastructure, targeted interventions may be necessary to deal with the problem of slums. Services and learning require people to be in proximity to livable surroundings. This is the stage in which slums can compromise a city’s ability to deliver the economies that come from proximity. Slum-improvement programs may not be a priority at earlier stages of urbanization, but at this stage they become necessary. The lesson from assessments of slum-improvement initiatives is that targeted interventions will not be enough by themselves. These interventions will not work unless institutions related to land and basic services are reasonably effective, and transport infrastructure is in place. A three-dimensional challenge must be met by a three-pronged policy response, requiring coordinated policies at the central, state, and city levels of government. Singapore’s success shows the advantages of such coordination in a city-state. More recent examples are Shanghai

reached that of modern-day Portugal. Another good example is Costa Rica.

- **Intermediate urbanization.** In places where urbanization has picked up speed, in addition to these institutions, governments must put in place connective infrastructure so that the benefits

and Guangzhou in China. An even more recent (and perhaps more generally applicable) example is Bogotá in Colombia.

The experience of successful urbanizers indicates that the basis of successful rural-urban transformations is a set of spatially blind policies—“institutions” in the shorthand of this Report. Investments in infrastructure that connects places form the second tier. Geographically targeted interventions should be used only when the challenge is especially difficult, but should always be used together with an effort to improve institutions and infrastructure.

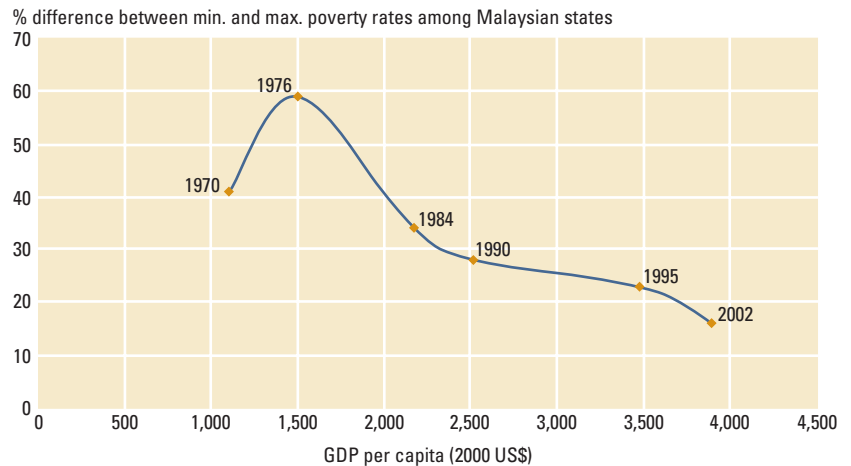
### *Area (territorial) development policies that integrate nations*

Some parts of a country are better suited for agriculture, others for industry, and still others for services. And as industry and services flourish, the spatial distribution of economic activities must change.<sup>11</sup> No country has grown to riches without changing the geographic distribution of its people and production.

A rising concentration of people and production in some parts of a country has marked economic growth over the last two centuries. To fight this concentration is to fight growth itself, and policy makers must show patience in dealing with these imbalances. But aided by government policies, successful development also has been marked by falling disparities in living standards between places favored by markets and those less fortunate. Policies can speed up the convergence in basic living standards, so that people in the least-fortunate places do not have to wait for basic public amenities until their nations reach high income levels. The experience of successful developers also justifies impatience in equalizing basic living standards.

Consider Malaysia. Economic growth and government policies have reduced poverty and improved living standards, speeding progress toward meeting the Millennium Development Goals. But in the early years of growth (between 1970 and 1976), poverty rates between different states diverged briefly, to later converge as they declined for all states (see figure 6). Health indicators (infant mortality) declined more

**Figure 6 Quicker geographic convergence in basic living standards in Malaysia**



Source: Malaysia Economic Planning Unit 2008.

in the slower-growing states, implying that tax and transfer mechanisms worked well. Such impatience with spatial inequality in living standards is paying off in other countries such as China, Egypt, Indonesia, Mexico, Thailand, and Vietnam.

But not all countries have experienced geographic convergence in the Millennium Development Indicators, such as child mortality, maternal health, basic education, safe water, and sanitation. What should they do?

The answer lies in integrating lagging and leading areas, using policies that are tailored to the level of difficulty of integration. While economic motives are important, social and political conditions influence the speed of these spatial changes. The location choices that people make reflect the strengths and inclinations of societies and political structures. Poverty maps provide a snapshot of where the poor are concentrated (high poverty mass—that is, the “poor people”), and which places are the poorest (high poverty rate—that is, the “poor places”). These maps can tell us a lot about the social and political conditions in a country: the movement of poor people may best reflect the constraints to mobility, because they have the most reason to move and the fewest resources to do so.

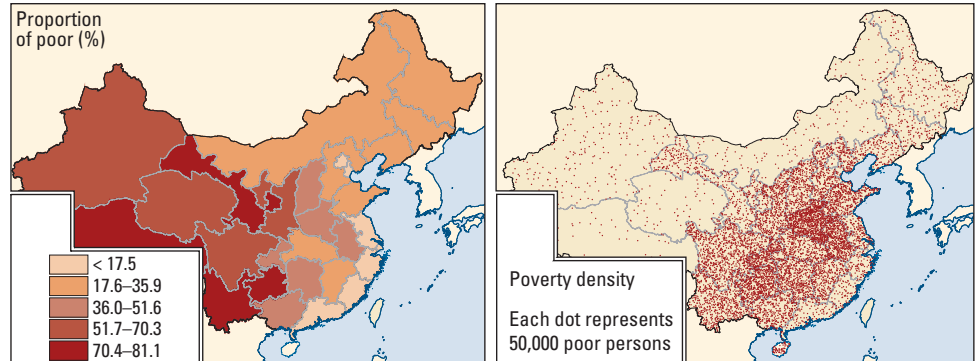
Using information on where poor people are located and which places are poor, the policy response can be calibrated to country conditions.

- **Countries with sparsely populated lagging areas.** In China the highest poverty rates

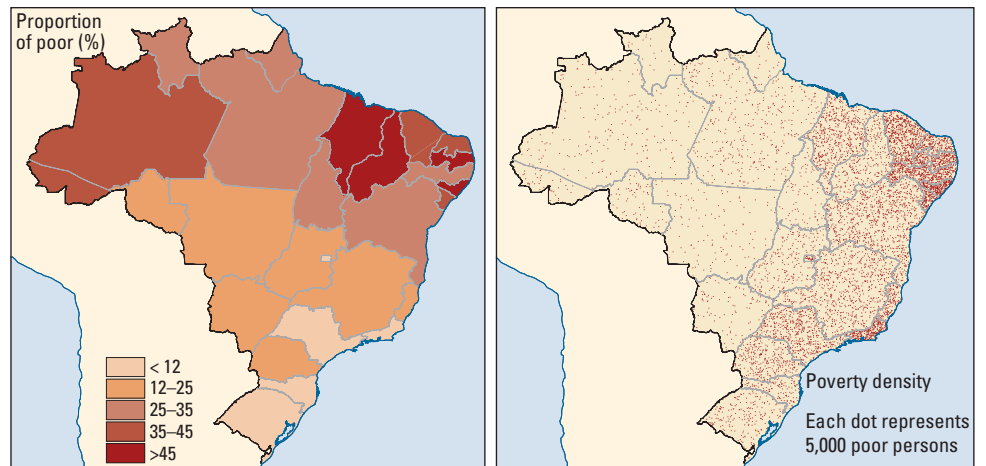


**Map 7 Three types of countries, differing challenges for area development**

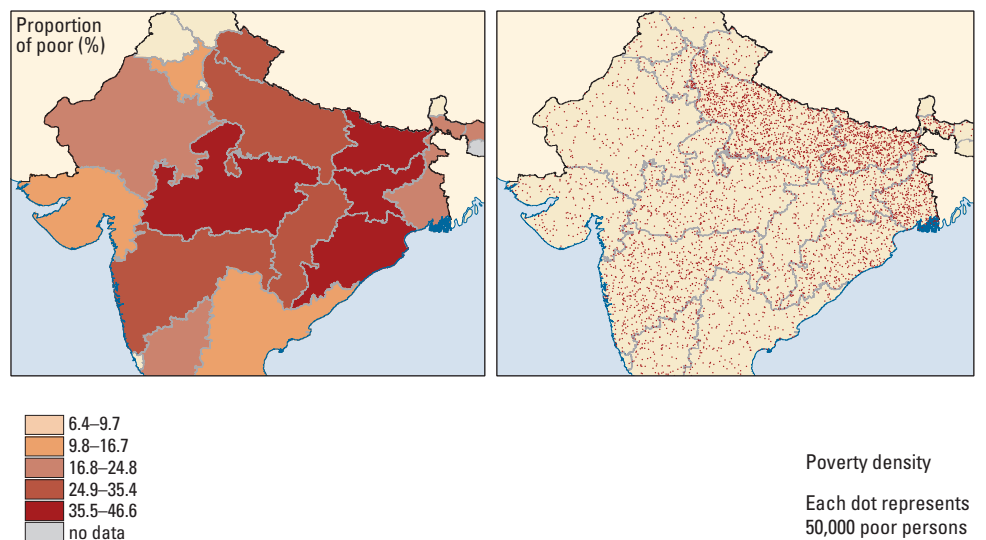
**a. China: Poverty rates are high in the west, but most poor people are in the east**



**b. Brazil: Poverty rates are high in the north and northeast, but most poor people live along the coast**



**c. India: Poverty rates are high in the central states, and many poor people live there**



Source: WDR 2009 team (see chapter 8 for details).



are in the western provinces, but the poor are concentrated in the southeast and central areas (see map 7, panel a). Economic density and population density overlap. The country has few divisions—linguistic and other barriers are not high—and people, including the poor, can move to reduce their distance to density. Spatially blind institutions that ensure well-functioning land markets, enforce property rights, and deliver basic social services such as schooling and health care can be the mainstay of an economic integration strategy to reduce the economic distance between lagging and leading areas. Chile, Egypt, Honduras, Indonesia, Russia, Uganda, and Vietnam are other examples of countries where the area development challenge is unidimensional—the main problem is distance.

- **Undivided countries with densely populated lagging areas.** In Brazil the poverty rates are highest in the north and northeast: eight of the ten poorest states are in the northeast, the other two are in the north (see map 7, panel b). But the economic mass and the concentration of poverty are highest in the urban agglomerations near the coast, from the poor northeast to the thriving southeast. Economic and population densities coincide only partially. The poverty-related symptoms are those of a country where within-country divisions such as ethnolinguistic differences and political fragmentation are low, but where population densities are—for historical and policy-related reasons—in the “wrong places.” Bangladesh, Colombia, Ghana, and Turkey have similar conditions. In such places the pull of agglomeration economies in leading areas and the mobility of labor may not be strong enough to induce concentration and convergence. The problems of “long distance and wrong density” must be met by a two-pronged policy of economic integration: spatially blind institutions should be augmented by spatially connective infrastructure, such as interregional highways and railroads and improved telecommunications.
- **Divided countries with densely populated lagging areas.** In India more than 400 million people live in the central lag-

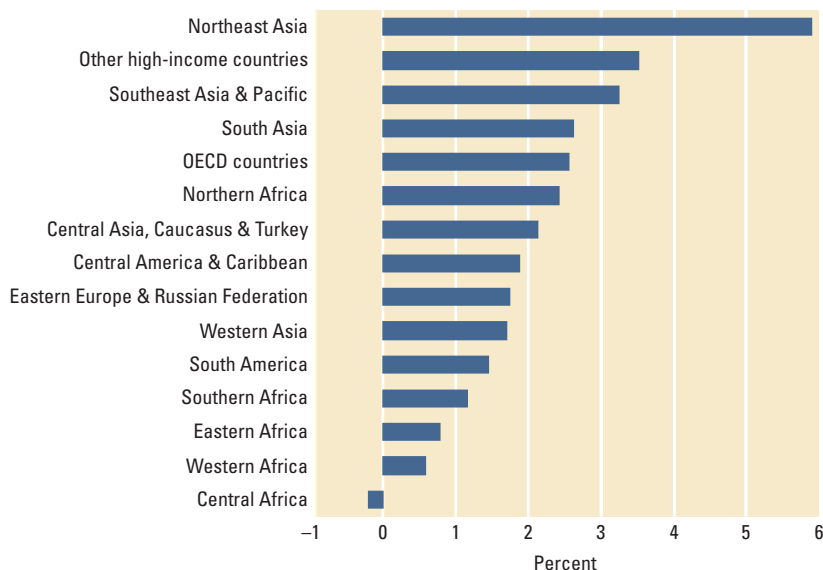
ging states, home to more than 60 percent of the nation’s poor (see map 7, panel c). People live there for a reason: it is a fertile plain and was the cradle of Indian civilization. But their location is less fortunate now, as the world has changed. Labor mobility is limited because of linguistic and class divisions. Mobility has not been helped by policies that sought to revive growth in these lagging provinces through subsidized finance and preferential industrial licensing. The debate is now shifting toward economic integration—policies more consistent with mobility of labor such as interregional infrastructure and better health and education services. These policies and the interstate migration they encourage will, if given time, reduce the divisions that have made the distances long between leading areas and densely populated lagging areas. In the meantime, these areas may need a helping hand—from geographically targeted incentives that encourage local production. Another country with a three-dimensional integration agenda of distance, densely populated poor areas, and domestic divisions may be Nigeria. In such places, the policy response has to be a blend of spatially blind, connective, and targeted policies.

Governments should not be faulted for being impatient with markets, and for trying to help lagging areas. But targeted interventions should be designed to work with the institutional reforms and the investments in infrastructure. Experience suggests that incentives should not be provided for activities that depend on agglomeration economies or international market access. Incentives for agriculture are prime candidates in these largely rural and agrarian areas. Relying mainly on targeted incentives for industry—as India did for decades—will not help the lagging states improve living standards to levels in the leading states.

#### ***Regional integration to increase access to global markets***

The merits of global versus regional trade agreements have been debated for years. The debate is now largely concluded. Where

**Figure 7 Northeast, Southeast, and South Asia have been catching up to developed nations**  
Average annual growth rates of GDP per capita, 1960–2006



Source: WDR 2009 team.

regional or bilateral pacts do not discourage trade with countries in other regions, and where they are accompanied by measures to facilitate the flows of goods, people, and finance—such as infrastructure and compensatory mechanisms—they can help. Otherwise, they are not worth the trouble.

This Report does not reopen that debate. Instead, it takes up the question of how developing countries can best gain access to markets within their neighborhoods and across the world. Geography matters greatly in deciding what is needed, what is unnecessary, and what will fail. But with the right mix of policy actions, even countries in parts of the world that have been left far behind can overcome their geographic disadvantage. The way to tell if the actions are paying dividends is whether market access improves noticeably.

Some regions of the world have done better than others (see figure 7). Countries in these regions now have thinner economic borders (see map 8, panel a). They can afford to have thin borders, because their neighbors are prospering too. For them, regional markets are world markets. Others, like the East Asians, have allowed production relationships to grow strong and cut paths even through thick borders. But specializing can increase efficiency only

if the scale of production is big, and that requires reaching the big markets of the Northern Hemisphere.

What do late developers have to do to accelerate development? The common condition is division—that is, thick borders. What differs is their distance from large world markets and whether or not there is a large country in their neighborhood (see map 8, panel b).

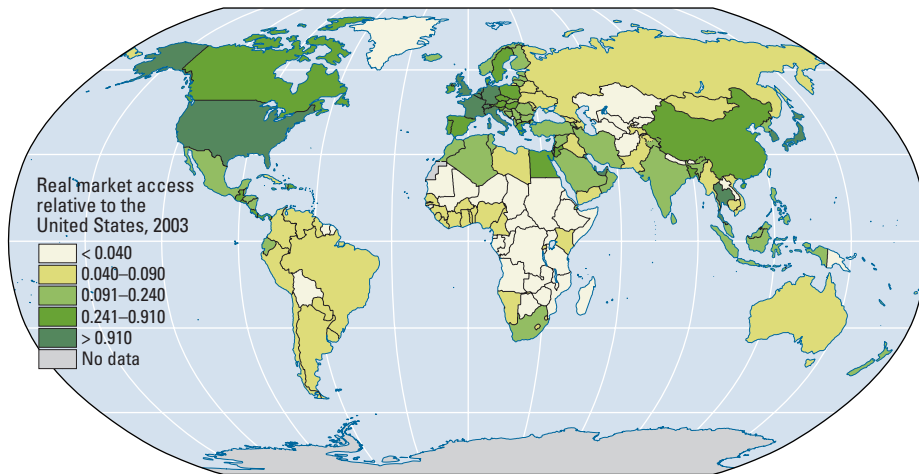
- Countries in regions near large world markets.** For countries near large markets, regional and global integration does not require geographic differentiation. Spatially blind measures such as improving economic policies and the investment climate will attract capital and technology from the more sophisticated markets nearby. Their underused talent and cheaper labor are powerful draws. Whether they lag or lead within the region is hardly relevant; the presence of a sun nearby makes them all small planets. Mexican exports to the United States are about 1.7 percent of the U.S. economy. Mexico should build even stronger links with the United States. But for other countries in Central America, the payoffs to infrastructure connections to Mexico are small—the market in North America dwarfs all of Central America’s. And market access likely depends most on economic stability. Spatially blind institutions should be able to integrate Central America with world markets. The same is true for Eastern Europe and North Africa. Countries in these regions have better-than-average market access, though depending on their economic policies and regulations, this access is not uniform even within these regions (see map 8, panel c).
- Countries in regions distant from large world markets that have a large economy.** To integrate regions more distant from large world markets but with a sizable economy—East Asia, Latin America, Southern Africa, and South Asia—such spatially blind measures are just as necessary, but they may not be sufficient. For lagging countries in these regions, such as Mongolia,

**Map 8 Market access distinguishes world regions**

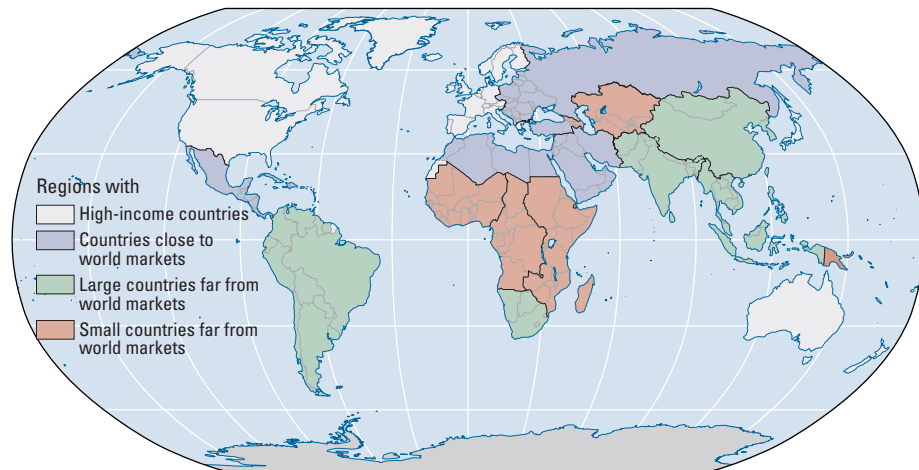
**a. Borders are thicker in developing regions**



**b. The size and access to markets differs greatly by region**



**c. The three D's suggest a simple taxonomy of the world's neighborhoods**



Sources: Panel a: WDR 2009 team (see chapter 3 for details); panel b: Mayer 2008 (see chapter 9 for details); panel c: WDR 2009 team (see chapter 9 for details).

Nepal, Paraguay, and Zimbabwe, some of the paths to world markets may go through their larger neighbors. Brazil, China, and India are attractive to investors because of their potential market size, and these “home market effects” can generate the impetus for specialization and help their enterprises compete in world markets. A qualification: for market access, the relevant measure of distance is economic, not Euclidean. With a combination of bilateral accords, inspired transport policies, and aggressive specialization in primary products, Chile reduced distance to North America and built global rather than regional links. But such cases are exceptions. For the smaller countries in these regions, both institutional reforms and regional connectivity will be necessary for economic integration.

- ***Countries in regions distant from world markets without large economies.*** The most difficult challenges are for the countries in parts of the world divided by thick borders, distant from world markets, and without a large country that can serve as a regional conduit to world markets, as Brazil and India might. For these regions, economic geography poses a three-dimensional challenge. Côte d’Ivoire or Tanzania

can hardly be blamed for worrying most about their own poor, and not their less fortunate neighbors such as Burkina Faso or Burundi. Indeed, seeing the benefits of regional cooperation, they have made repeated efforts to foster integration in their neighborhoods. The ECOWAS even includes a clause that allows workers to cross borders, a stage of integration rivaled only (and only recently) by the EU. It also has tried to share regional infrastructure. Other such regions are Central Africa, Central Asia, and the Pacific Islands. Countries in such regions face a three-dimensional challenge (see “Geography in Motion: Density, Distance, and Division in Sub-Saharan Africa”). A combination of efforts to improve institutional cooperation and regional infrastructure investments is needed—but it is not enough. Targeted incentives also will be necessary, through preferential access to developed country markets, perhaps made conditional on regional collaboration to improve institutions and infrastructure.

Everyone should support the efforts of these “bottom billion” countries to integrate their economies, within and across borders. A billion lives depend on it.

*We are familiar with the sectoral transformations needed for economic growth—the changes in work and organization as agrarian economies become industrialized and service oriented. This Report discusses the spatial transformations that also must happen for countries to develop. Higher densities, shorter distances, and lower divisions will remain essential for economic success in the foreseeable future. They should be encouraged. With them will come unbalanced growth. When accompanied by policies for integration calibrated to the economic geography of nations, these changes also will bring inclusive development—sooner, not much later.*

# Navigating This Report

In 1971 Simon Kuznets, a Russian émigré who had built his career in the United States, was awarded the Nobel Prize in Economics “for his empirically founded interpretation of economic growth, which has led to new and deepened insight into the economic and social structure and process of development.”<sup>1</sup> In his prize lecture, Kuznets summarized the structural changes that accompany economic growth, emphasizing “the shift away from agriculture to non-agricultural pursuits and, recently, away from industry to services.”<sup>2</sup> These are the sectoral changes in production needed for nations to prosper. Nations do not develop by merely doing more of the same thing. They must do different things, and do them better.

Over the years, this has been confirmed so often that it now seems almost obvious. Less obvious but no less important are the *spatial* transformations needed for these structural shifts. Some places are suited for farming, others for industry, yet others for services. As economies become industrialized and more people are employed in services, their shapes must change, too. These changes, involving social adjustment as much as the economic, can take time. The economic world is not frictionless. The “what” and “how” of economic production cannot be decided without deciding the “where.”

For policy makers, especially, it is important to understand these changes and to appreciate the market forces that shape them. This understanding can be the difference between prosperity and stagnation. It

may even be one of the main lessons of the twentieth century. After Kuznets left Russia in 1922, Soviet planners implemented one approach to economic geography, and the United States implemented another. The Soviet strategy forced people to move to the north and east and to spread out economic production. Meanwhile, Americans moved voluntarily toward the south and the west, but production became more concentrated. Within five years of Kuznets’ death in 1985, the Soviet Union would collapse. At the time, Russia’s per capita income was a quarter that of the United States. Spatial inefficiency was not the only reason why the Soviet Union fell. But it could not have helped.

As Russia has moved from plan to market, spatial efficiency increased. Between 1989 and 2004, almost all new firms chose locations with the best access to Moscow, St. Petersburg, and international markets.<sup>3</sup> Over the past three decades, researchers have been documenting the changes in economic geography needed to stay spatially efficient as technology advances and production structures change. They have studied the effects of larger populations, globalizing markets, and international borders on the location of people and production. They are starting to assess how governments can help or hurt these transformations. This Report draws on this work and its implications for public policy.

Government policies are important. With development, people and production become more concentrated—in towns and





cities, and in areas of countries closer to domestic and international markets. While economic activity concentrates in some parts of a nation or the globe, many people may be spread out over the countryside or in places distant from prosperity, perhaps opening sizable geographic disparities in living standards. This Report discusses why this happens, and assesses what has been most effective in altering the economic geography of developing countries. Economic activity will concentrate in any case. But managed one way, as the United States did, it can foster growth and integration. Managed another way, it can result in disintegration and despair, and even conflict.

The Report covers a broad and seemingly disparate set of phenomena that span the spectrum from local to national to international scales, from human to physical to political geography, and from national and global institutions to targeted interventions. To keep the inquiry disciplined requires emphasizing some aspects of spatial transformations and leaving others out. The rest

of this chapter summarizes the Report's scope, clarifies its terms, and outlines its structure.

### Scope

Governments intervene (usually incorrectly) to spread the benefits of economic growth more evenly across space. Even when the imperatives are political, they have economic consequences. And even if the objectives are economic, they have social and environmental effects. Policy makers thus face sharp tradeoffs and must compromise. The economic costs of mistakes can be large and lasting: recognizing the importance of economic geography means realizing that once producers and people make decisions on where to locate, they can be difficult to reverse.

Governments can do better by promoting the market forces that deliver both the concentration of economic production and the convergence of living standards, and augment them with policies to ensure affordable basic services everywhere. They can do this by helping people and entrepreneurs take advantage of economic opportunities, wherever they arise. The market forces that help most are agglomeration, migration, and specialization. Their economic benefits are the subject of this Report. Their social and environmental implications are not considered in detail (see box 0.1). The unintended social and environmental effects of market forces are important policy matters. But they deserve more space than can be covered in a report that shows how *economic* geography is reshaped during development.

The Report describes the geographic transformations needed for development. It analyzes these changes using the insights from economic history and recent research. It then revisits the policy debates on urbanization, regional development, and international integration. This is the 31st *World Development Report*, and the issues it covers have been visited by earlier Reports. But here the facts, analysis, and policies related to spatial transformations are the major focus, and the Report is structured accordingly.

### Terms

To formulate simple messages that are useful to policy makers requires an uncomplicated

#### BOX 0.1 *What this Report is not about*

To keep the Report focused, several important aspects of the spatial transformations do not get the attention they would in a fuller study. The main aspects not considered—except when emphasizing or qualifying the most important messages—are the **social and environmental effects** of a changing economic geography.

Agglomeration—the growth of cities—can have social and environmental effects that are beneficial and some that are detrimental. Cities help to break down societal stereotypes and increase cohesion. Most progressive movements throughout history have had urban origins. But so have the most violent. The propensity of people to commit crimes is believed to be greater in cities. And while cities allow individualism and creativity and break down social barriers, they also break societal ties:

The cities have always been the cradles of liberty, just as they are today the centres of radicalism. Every man of the world knows that isolation and solitude

are found in a much greater degree in a crowded city than in a country village, where one's individual concerns are the concern of everyone.<sup>a</sup>

Migration also can have vastly different effects across societies, both in the places people leave and to those places they go. It almost always brings economic rewards, but as the anti-immigrant sentiments in many countries show, it also means more risk.

Specialization of production made possible by falling transport costs can come at an environmental price. Cod is caught off Norway, transported by plane to China to be cleaned, and then flown back to Norway to be sold. Such specialization based on natural endowments (fish in Northern Europe, people in China) helps both Norwegian consumers and Chinese workers, but the cod now has a longer carbon trail. The environmental effects of urbanization and transport are considered in this Report, but only when they qualify the Report's messages.

a. Weber 1899, p. 432.



terminology. The Report uses some terms that may not be familiar to readers, introduces others, and uses yet others as shorthand. This section clarifies the terms that the rest of the Report uses consistently.

**Spatial scales—area, country, and region**

Throughout the Report, the analysis is provided at three geographic scales—local, national, and international. The policy concerns that correspond to these spatial scales are, respectively, the speed and sustainability of the rural-urban transformation, the territorial disparities in production and welfare within countries, and the same disparities across countries and world regions. The units that correspond to these spatial scales are area, country, and region. These terms are used consistently throughout the Report. An “area” is the same as a “territory,” the target of territorial development policies. In Anglophone countries, it is the same as a “region” within a country, as in the debates on “regional development.” Area is used here to avoid confusion with another spatial scale, the international, because “region” also describes a group of countries, such as South Asia, which includes India and its neighbors.

To fix the terms, consider the three geographic scales of the Shanghai metropolitan area, the country of China, and the East Asia region (see map 0.1):

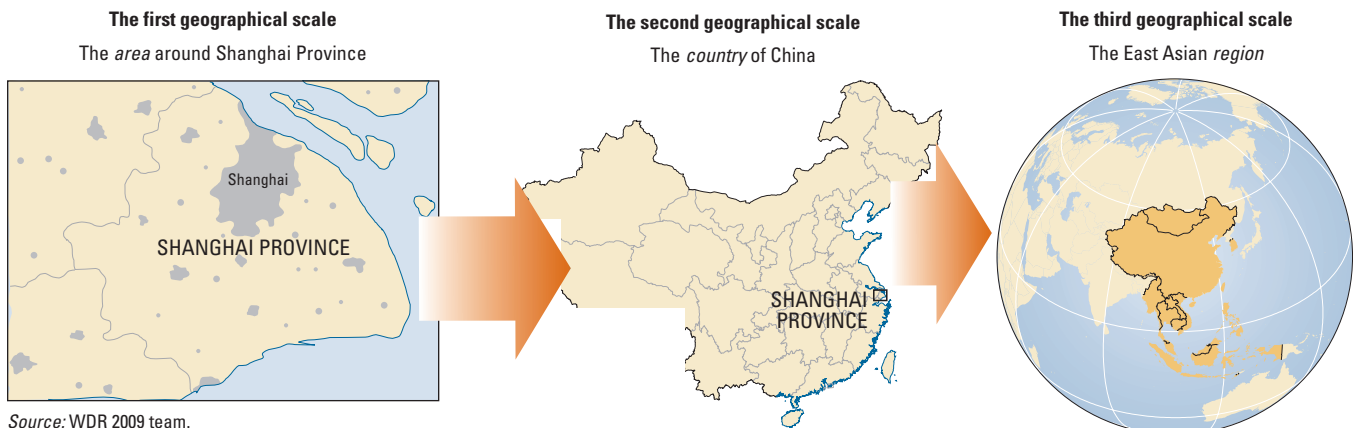
- **Area.** The local scale is the municipality of Shanghai—which includes the city of Shanghai and neighboring cities, towns, and villages in an area of about 7,000 square kilometers, with a population

density of about 3,000 persons per square kilometer. The population density in the city is about 13,000 persons per square kilometer.

- **Country.** The national scale encompasses the 23 provinces, five autonomous regions, and four municipalities (Shanghai is one of them) that make up China, covering about 9.6 million square kilometers. The distance between the western province of Xinjiang and the dynamic coastal areas in the east is more than 4,000 kilometers. Restrictions on internal migration can make the *economic* distance seem much longer.
- **Region.** The international scale consists of China and its East Asian neighbors including Japan, Mongolia, and the Republic of Korea. The region is divided by borders, some thick, some thin.

This Report uses the notion of “natural” neighborhoods, defined by elements of human, physical, and political geography. The World Bank commonly classifies all low- and middle-income countries into six regions, and groups all high-income countries together, regardless of their location. This Report classifies the world into 16 regions that include both developed and developing countries, using geographic proximity as the most important criterion (see box 0.2). It is also more detailed. Sub-Saharan Africa, for example, has four regions—West, Central, East, and Southern. East Asia and the Pacific has three—Northeast, Southeast, and the Pacific Islands. The

**Map 0.1 Three geographical scales—area, country, and region**  
Shanghai, China, and East Asia exemplify the local, national, and international scales



Source: WDR 2009 team.

### BOX 0.2 *This Report's regions are more detailed than the World Bank's*

This Report is about geography and economic development, focusing more on spatial variability of conditions and outcomes than economic analysis usually does. Where appropriate, it uses countries or areas within countries as the units of analysis. But where the emphasis is on regional integration and interactions between neighboring

sovereign states, the Report uses an aggregation of countries that is more detailed than the six standard World Bank regions, which can hide significant variation.

Adapting the United Nations geographic regions but remaining consistent with World Bank regions yields the 16 regions displayed here. Depending on

the context, the analysis in this Report ignores the income of countries within a region—say, where regional growth spillovers from industrial to developing countries are of interest—or treats the Organisation of Economic Co-operation and Development (OECD) and other high-income economies separately.

#### Regions used in this Report



Source: WDR 2009 team.

term “region” is used throughout the Report to refer to these 16 groups of countries.

While the choice of area or region can be arbitrary, these spatial scales conform well to the levels of policy making. This Report aims to inform policy making at these three levels—subnational, national, and international.

#### *Spatial dimensions—density, distance, and division*

To describe the geographic transformations that accompany development, the Report introduces the use of three spatial dimensions—density, distance, and division. These dimensions help the reader see development in real space—in three dimensions, in other words. The terms are easy metaphors, but they also have a technical

interpretation. *Density* generally signifies the intensity of economic activity on a unit of land, say, a square kilometer. Data limitations can force compromise: since production and population densities are closely related, and production data are less easily available, population density is sometimes used as a proxy for economic density. It can get a bit confusing. London is probably the city with the highest economic density in the world, but Mumbai, with 30,000 people per square kilometer, is the most densely populated. *Distance* signifies the costs of getting to places with economic density.

While density and distance relate closely to human and physical geography, *division* refers more to sociopolitical geography. Religion, ethnicity, and language are among the main attributes that lead to divisions

between places. While divisions are greatest across nations, they can be considerable within countries as well.

These dimensions are measurable. But unlike height, length, and breadth, for example, the geographic dimensions are not orthogonal. Better analogs for the three dimensions are a person's height, weight, and age, which are related. Likewise, as distances increase, it is likely that divisions also get stronger. Density, distance, and division are best illustrated by market access, an indicator of economic opportunity for a location that tells the size of the potential markets in its vicinity, and the ease of reaching them. Market access across geographic scales determines where economic activity can thrive and thus where firms will locate and populations will grow.

Using this concept of market access, the three dimensions are defined as follows:

- **Density** indicates the size of economic output or total purchasing power per unit of surface area—say, a square kilometer. It is highest in large cities where economic activity is concentrated and much lower in rural neighborhoods.
- **Distance** measures the ease of reaching markets. It determines access to opportunity. Areas far from economically dense centers in a country are more likely to lag.
- **Division** arises from barriers to economic interactions created by differences in currencies, customs, and languages, which restrict market access. It is most relevant in an international context.

The concept of distance is also relevant internationally. The difference between distance and division is that distance modulates access to economic opportunity in a more continuous way—a distance decay. Division, by contrast, presents discrete barriers to access and economic integration. It can be seen as increasing economic distance or travel time for a unit of physical (or Euclidian) distance.

These definitions are not scientifically exact. But the terms are used consistently in the Report. When “density” is used, it means economic density: production per area of land. When any other measure of

density—such as the population per square kilometer (as in chapters 1 and 7) or the places where more of a nation's poor people live (as in chapters 2 and 8), it is qualified accordingly.

Distance can be measured with some precision, but where infrastructure is sparse, straight-line distance is different from road or rail distance. Many other factors, such as the availability and affordability of transport services, determine actual accessibility. Where such information is available, it is used. Chapter 1, for example, reports a uniform measure of urbanization based on places that both have minimum levels of population density and are within an hour's travel time to sizable settlements. In computing this “agglomeration index,” the quality of transport infrastructure is taken into account. Division is associated with international borders, because they usually impede the ease of exchange or travel. But not all borders imply divisions. Those in the European Union (EU), for instance, have increasingly ceased to reflect divisions between countries. And not all divisions imply international borders. Where religious, ethnic, and linguistic differences are manifest spatially, there can be divisions within countries.

There is a correspondence between the geographic scales and dimensions. Locally, within an area, the most important dimension is density, because generally distances are short and divisions few. Nationally, the most important dimension is distance to density; divisions within countries tend to be fewer, though they can be serious in some countries. Internationally, across a regional or global spatial scale, distances and divisions are usually more serious.

Using these three dimensions, the Report summarizes the geographic transformations needed for development (part one). It shows how market forces drive these transformations (part two). And it assesses how governments can augment these forces to sustain growth and reduce poverty (part three).

### *Instruments for integration— institutions, infrastructure, and interventions*

Through good policies, governments can promote economic integration between

places where economic production is concentrated and places that are lagging. Some of these policy instruments are spatially explicit, like a slum-upgrading program in a city, a Brazilian state's fiscal incentives to a U.S. automobile company, or the EU's structural and cohesion funds. Others are intended to be universal in their coverage, including compulsory and free basic education for all children, such labor market regulations as minimum wage laws, and the enforcement of property rights. Between these spatially targeted programs and "spatially blind" policies are investments and regulations that connect places, such as roads, airports, and communications systems.

In their current form, the debates on how governments can foster rural-urban transformation, help lagging areas reduce poverty, and—in the poorest nations in the world—improve access to world markets all emphasize geographic targeting. The debate on how to promote healthy urbanization is polarized between an emphasis on villages, where a majority of the world's poor still live, and a belief that the way out of poverty lies in cities; if urban poverty increases, the focus shifts from villages to slums. Motivated by within-country spatial disparities in living standards, the debate on territorial development tends to be similarly fixated on promoting economic growth in lagging areas. At the international level, preferential market access for the least developed countries can end up dominating policy discussions. Part three of the Report reframes these debates, calling for a shift from spatial targeting to integration.

The policy instruments for economic integration can be classified in three categories, based on how explicitly place is considered in their scope and design:

- **Institutions** is shorthand for all the policy instruments that are *spatially blind*. These are the amenities that governments should provide to everyone, regardless of place. The word "institutions" connotes universality, and includes mechanisms for financing and delivering such basic amenities as the administration of justice, public security, the regulation of land, labor, and capital markets, primary education and health, and electricity, water, and sanitation. Systems for collecting taxes and financing the spending associated with these services are also best designed without specific places in mind.
  - **Infrastructure** is the summary term for all *spatially connective* investments and the associated rules and regulations. It includes roads and railways, airports and air transport systems, telecommunications, and the Internet.
  - **Interventions** is shorthand for all *spatially focused* incentives. These include regulations and investments that favor some places, such as export processing zones. They also include place-based programs—such as slum-upgrading schemes like Rio de Janeiro's *Favela Bairro*, or Superintendency for the Development of the Northeast (SUDENE), Brazil's development agency for the lagging Northeast, or the *Everything But Arms* initiative of the EU, which gives the least developed countries preferential trade access to European markets.
- Because these definitions do not conform strictly to common usage, additional clarification is necessary:
- First, spatial blindness does not mean spatial *neutrality*. A progressive tax system, for example, may not be neutral in its effects or outcomes. Cities may end up contributing more in taxes than the countryside, and richer states may contribute more than those that are poorer. But the guiding principle is that tax rates differ not by place alone, but by the attributes of firms and families that happen to be located there.
  - Second, in the common use of the term, infrastructure includes nonconnective investments such as water supply and energy. In this Report, infrastructure is reserved for the spatially *connective* components. Nonconnective public utilities are included in institutions, as for such basic services as sanitation.
  - Third, each of these categories includes all three tools of government policy—taxes, transfers and public expenditures, and regulations.

- Finally, government initiatives can include more than one instrument. Slum development can include steps to make urban land markets work better by formalizing property rights, improving streets, and offering monetary incentives for some of the slum-dwellers to relocate.

## Structure

The main finding of this Report—at all three spatial scales—is that economic development is not smooth, linear, or neat. The processes of economic growth leave behind a bumpy landscape, with economic mass concentrated in some places. Living standards in such places—especially rising prosperity, good access to education and health facilities, and safe shelter, water, and sanitation, some of the most urgent among the Millennium Development Goals—improve faster than where there is less economic activity, widening the spatial disparities in welfare. But where there is sustained economic growth, the convergence in living standards begins to supplant divergence. Nations become both spatially efficient and equitable (see box 0.3). The challenge of development is to institute policies that allow—even encourage—“unbalanced” economic growth and yet ensure geographically balanced development outcomes.

## The facts

Part one of the Report presents the facts about the spatial transformations—the changes in economic density, distance, and division. Chapter 1 shows that development is accompanied by the rising density of human settlements: no country has reached high income without this rise in density. Chapter 2 expands the scale and shows that development is also accompanied by the greater concentration of economic activity in areas of countries closer to economic density. Chapter 3 incorporates international divisions that slow, but do not prevent, the concentration of economic activities in some countries. At the local, national, and international scales the pattern is similar: rapidly rising concentrations at the early stage and then a slowing down.

### BOX 0.3 *This Report’s message is not anti-equity*

Policies for spatially balanced growth are often justified by equity. The EU describes its territorial policy as governed by the principle of solidarity because it “aims to benefit citizens and regions that are economically and socially deprived relative to EU averages.”<sup>a</sup> The policy seems to equate social and spatial equity—equality across individuals, and the equality of living standards across states and countries. This Report, by contrast, argues in favor of the benefits from geographic concentration of economic production. But it shows that in the earlier stages of development, increased concentration is associated with spatial divergence in living standards such as income. So is this Report’s message anti-equity?

No. It is important to distinguish between three types of disparities: spatial disparities in economic production, spatial disparities in living standards, and social inequality.

**Spatial disparities in economic activity.** In both the United States and the EU-15 countries, gross domestic product (GDP) and population have lumpy spatial distributions. In the United States, three states (California, New York, and Texas) generated 21 percent of national GDP in 2005. The same three states have 19.8 percent of the U.S. population, but only 12.8 percent of the country’s land. Meanwhile, 10 EU subnational areas were responsible for 20.5 percent of the EU’s GDP in 2005. These areas have 16.9 percent of the EU-15’s population, but only 8 percent of its land. So, in both cases, economic activity and population are concentrated. But spatial inequality of production and population is higher in the United States than in the EU.

The Gini coefficient for the spatial inequality of GDP is 0.53 for the United States and 0.41 for the EU. For population, the coefficients are 0.54 and 0.32, respectively. For subnational areas in the EU and states in the United States, the numbers change, but the conclusion is the same.<sup>b</sup>

**Spatial disparities in living standards.** EU-15 countries have greater spatial inequality in per capita income and unemployment rates, two common indicators of individual living standards in high-income countries. GDP per capita, for example, exhibited greater variation across EU areas than it did across U.S. states in 2005. Although production is more concentrated geographically in the United States, people are also more likely to live where production is, so GDP per capita varies less. The same is true of unemployment rates. In the United States, the state with the highest unemployment in 2007 (Michigan) had an unemployment rate of 7.2 percent, 2.8 times the lowest unemployment state (Hawaii). But in the EU in 2006, the ratio was 8.1. There is less spatial inequality in living standards in the United States.

**Social inequality.** While spatial inequality in living standards is greater in the EU than in the United States, the opposite is true for social inequality between individuals. During the past few decades, the Gini coefficient for the United States has been about 0.40, compared with 0.33, 0.28, and 0.23 for the United Kingdom, Germany, and Austria, respectively.<sup>c</sup>

Contributed by Mark Roberts.

a. [http://europa.eu/pol/reg/overview\\_en.htm](http://europa.eu/pol/reg/overview_en.htm).

b. Puga 2002.

c. Burkey 2006.

The long experience of countries shows that income differences between leading places and following places first diverge and then converge, but only in the more dynamic areas, countries, and regions. At each of the three spatial scales, it pays to be in dynamic neighborhoods. Economic growth leads to congestion in cities—and to



the growth of towns and cities that are well connected to fast-growing agglomerations. This pattern is repeated at the national and international levels. Expanding economic activity spills over to areas and countries that are—in economic terms—near places doing well.

### *The insights*

The second part of the Report is the “engine room.” It exploits the main insights from a quarter century of work spanning several subdisciplines in economics, such as industrial organization, urban economics, international trade, and economic geography. Distilled to its essence, the engine works through a three-way interaction between scale economies, the mobility of workers and entrepreneurs, and the costs of transporting and communicating between places (see figure 0.1).

Firms are generally more productive when they locate in large places and when they operate at a relatively large size. If it is relatively easy to transport produce, the scale can be even higher, since the potential market is bigger. Workers move to these places, bringing with them both a supply of labor and a demand for goods and services. As people become more mobile and as transport and communications costs fall, these economies of scale create a circular and cumulative causation, where economic activities become even more concentrated spatially. Rising concentration inevitably leads to congestion, which slows the process and eventually reverses it. Declines in transport costs first make concentration possible, and then, when they fall low enough, they make it unnecessary.

Part two discusses these interactions in some detail, summarizing more than a century of experience and the novel insights that come from a generation of research recognizing how factor mobility and falling transport costs feed economies of scale (see box 0.2). They should change what we can expect from the markets, and what governments can and should do to facilitate the concentration of production and promote the convergence in living standards.

Chapter 4 provides evidence of agglomeration economies—increasing returns to

scale associated with places, not plants—in producing goods, services, and ideas. Places of different sizes provide varying agglomeration benefits, and congestion associated with spatial concentration leads to a portfolio of places that facilitate economic growth, with different parts in the lead depending on the stage of development.

Chapter 5 explains the interaction between scale economies and factor mobility, focusing on the migration of workers. Chapter 6 explains the nonlinear relationship between transport costs and the geographic concentrations of production, focusing on intraindustry trade, which is especially sensitive to transport costs. These chapters summarize the new insights provided by the three-way interaction between scale economies, factor mobility, and transport costs—and their implications for development policy (see box 0.4).

### *The policy framework*

Circular causation, unevenness, and spillovers make for a world in which policies can promote economic growth and improve social welfare beyond what markets yield, because well-executed policies can set these transformations in motion or speed them up.

These features of economic development also make policy making a difficult enterprise. Part three of the Report reframes three important policy debates, using a principle derived from its first two parts: for developing countries to realize the benefits of both spatial concentration of production and convergence in consumption, development is best facilitated by economic integration. Using the three dimensions—density, distance, and division—described in part one, and the (mal) functioning of pivotal markets at each spatial scale—land, labor, and intermediate inputs—analyzed in part two, the chapters in part three provide a simple framework and illustrate its workings through real-world policy experience. At each of the geographic scales, the response rule is the same—an *instrument per dimension*. Here is a somewhat oversimplified summary, using examples from only the local scale (chapter 7):



### BOX 0.4 *Fresh insights from economic geography: concentration, convergence, and integration*

Over the past two decades, new analysis has changed the way we think about the location of production, trade, and development. The analysis builds on two elements. First, large markets are disproportionately attractive for firms producing with scale economies. Firms with a larger home market have more sales that, with scale economies, imply lower unit costs and more profits, which encourage existing firms to expand and attract new firms. Second, large markets are big partly because many firms and consumers locate there. Market access and mobility creates a circular and cumulative causation. A large market attracts firms and workers—and the demand for intermediate inputs by firms and the demand for final goods by workers make the market even larger, attracting more firms and workers, and so on.

This is both good and bad news for places with poor initial conditions. It is good because it means that firm location is not as constrained by nature as theories based on comparative advantage would have us believe. Places with poor endowments can sustain concentration of activity. It is bad news because the circle of market access and mobility produces persistence. Once a place gets far ahead, it is difficult for lagging areas to catch up. While agglomeration raises the cost of labor, firms do not move to low-wage areas, because this would mean forgoing the benefits of proximity to suppliers and customers.

**Concentration is the rule.** The strength of the agglomeration forces created by market access and mobility depends on

transport costs, but the relationship is not linear. When these costs are high, firms avoid shipping their output long distances by spreading out their production. Firm location is then mostly determined by local access to immobile demand, such as from farmers and miners. For intermediate values of trade costs, it becomes feasible to supply markets from a distance, and places that get an advantage in market size build on it and take off relative to other places. When trade costs fall to low levels, it matters little whether one sells and buys locally. Firm location is then determined mostly by the local cost of immobile features, including the cost of land and housing, but also by the ability to have face-to-face interactions or to find a good match in a specialized labor market. So once trade costs decline sufficiently, some activities will spread out in response to cost differences, and others will remain concentrated.

**Convergence is the objective.** The forces of market access and mobility have implications for the way we think about convergence. The view of development as smooth and linear gives way to a lumpier nonlinear process. As a country grows, new producers locate close to existing production, widening the production differences between lagging and leading places. When wage gaps become wide, industry starts to spread to places that have low wages. But this does not lead to steady development of all places. Instead, development takes place in waves, where some areas or countries are drawn in sequence out of poverty and are

pulled rapidly through the development process. In the neoclassical world, being behind can be an advantage—places lagging farther can catch up faster. But with agglomeration economies, the farther behind an area, country, or region, the tougher it is to catch up. What should lagging places do?

**Integration is the answer.** Because both high and low trade costs can encourage production to spread out, lagging areas, countries, or regions could in principle turn to either import substitution or export-oriented industrialization. But import substitution becomes less feasible as a development strategy over time. Why? Because it limits foreign access to local immobile demand, whereas export-oriented industrialization reduces the cost of purchasing foreign intermediates for processing and export. The falling share of agriculture and the tendency of manufacturing and services to agglomerate have reduced the share of demand in lagging places. And the fragmentation of production has made access to intermediate inputs more important. Both make development strategies based on fencing off local immobile demand hopeless. The observation that some developed countries or provinces industrialized while being closed to trade is of little help to lagging areas, countries, or regions today. The ones left behind are so small relative to the world economy that isolation is no longer a feasible option.

Contributed by Diego Puga.

- For one-dimensional problems, a calibrated response would be spatially blind policies. In areas experiencing incipient urbanization, for example, the policy objective should be to facilitate rising *density*, and policy makers should pay special attention to *institutions* to improve the functioning of (rural and urban) land markets.
- For two-dimensional problems, the response should include both spatially blind and connective policies. For example, in areas of a country undergoing rapid urbanization, the policy problems are not only to facilitate the increase in *density*, but also to alleviate the problem of *distance* caused by growing congestion. The response includes improvements in *institutions* to facilitate rising density as just outlined—and investments in *infrastructure* to address the growing problem of economic distance.
- For three-dimensional problems, the response should include spatially blind, connective, and targeted policies. In highly urbanized areas of a country, for example, the problems of *density* and *distance* are compounded by *divi-*

sions within urban areas, most noticeably between formally settled parts of a metropolis and slums, where land markets use informal conventions. An effective policy response includes *institutions*, *infrastructure*, and *interventions*.

At the national level, a similarly graduated policy response can help to integrate lagging and leading areas (chapter 8), and at the international level, it can help to integrate poor countries with world markets (chapter 9).

At all three geographic scales, policy debates have one thing in common: currently, they begin and end with discussions of spatially targeted interventions. This Report calls for a rebalancing of these debates to include all the elements of a successful approach to spatial integration—institutions, infrastructure, and incentives.

This Report takes a long-term perspective, chronicling spatial disparities in today's developed economies when they were at incomes comparable to those of today's low- and middle-income countries. It also systematically documents the relationship between spatial disparities and development for a large set of countries. In its conclusions, it makes a sharper distinction between spatial disparities in economic production and those in welfare. And it recommends using agglomeration rents in leading areas to push up social welfare in lagging areas—and not, except in special circumstances, to push economic production out to those places.

- At the local spatial scale, the policy objective should be to improve the quality of urbanization to maximize its growth effects. Chapter 7 discusses how the priorities of policy makers should change as urbanization advances. It pays special attention to *land use*, where the potential for market malfunctioning is greatest.
- At the national spatial scale, the policy objective should be to improve the market access of workers and entrepreneurs, especially in a world in which diminished distance has changed the notion of markets from local to global. Discussing how policy makers can reconcile the political objective of national unity with

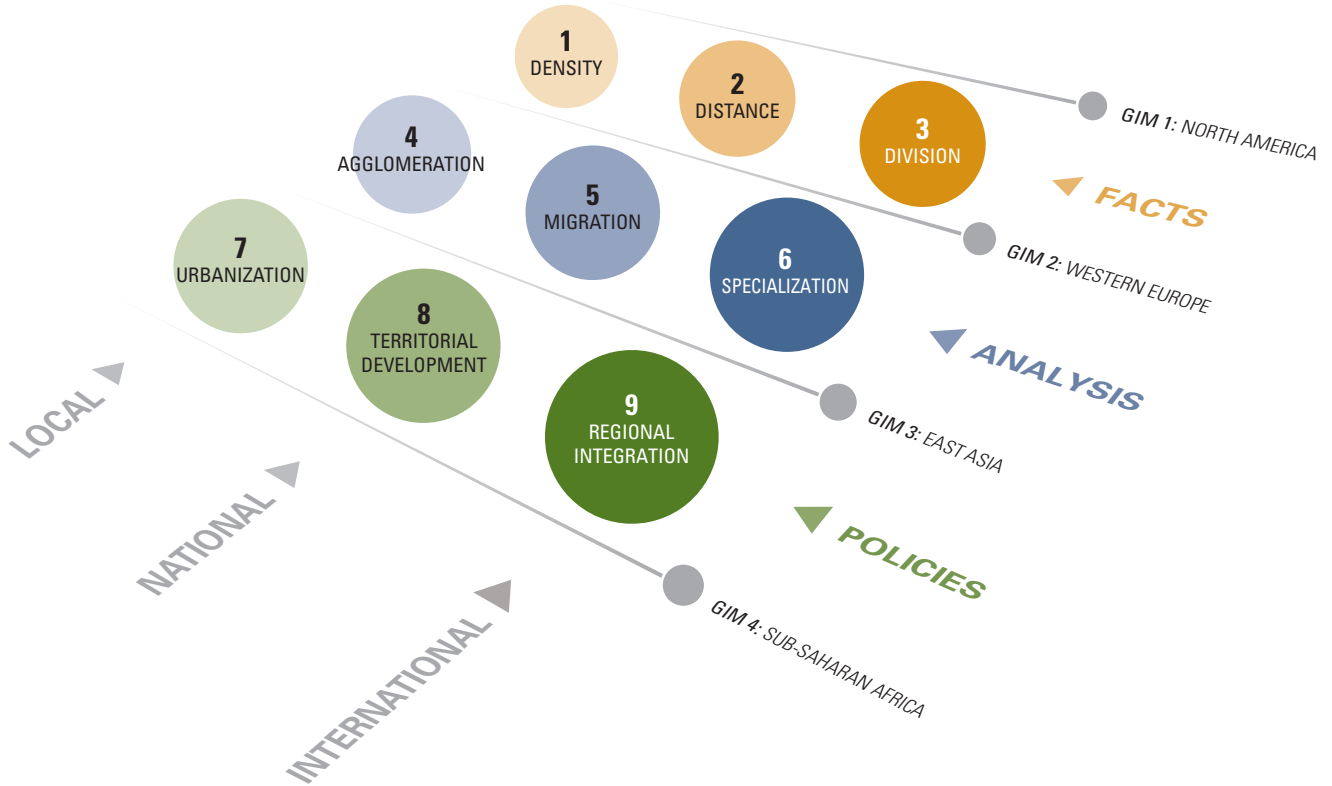
economic concentration, chapter 8 pays special attention to *labor mobility*, for which the potential for market malfunctioning is greatest.

- At the international spatial scale, the policy objective should be to promote convergence in living standards in a world in which divisions hamper the movements of labor and capital. Discussing how developing countries can gain access to world markets, chapter 9 emphasizes specialization and intra-industry trade, in addition to exploiting comparative advantage based on natural endowments. It pays attention to trade in *intermediate goods*, which is especially sensitive to transport costs.

The Report draws on both experience and analysis to discipline the inquiry in a policy area as broad and difficult as development itself, and it should be useful for a wide readership. But the Report is structured to be friendly to readers interested only in specific aspects of this inquiry:

- The Report has descriptive, analytical, and prescriptive parts and progresses gradually from the positive to normative. Each part is a section of an integrated inquiry, but each can be read separately. Policy makers pressed for time can read just the overview and the three policy chapters in part three. Students interested in the world's spatial transformation can read just the three chapters of part one, which provides a three-dimensional tour of economic development.
- The Report progressively widens the spatial scale for addressing the policy questions posed by economic geography, from local to national to international, with the specialized reader in mind. Readers interested in just the policy debate on urbanization in developing countries can read just the three density cluster chapters—1, 4, and 7. Those who are mostly interested in the policy discussion on territorial development and geographic disparities within countries can read chapters 2, 5, and 8—the distance cluster. Readers interested in regional integration can read just chapters 3, 6, and 9 in the division cluster.

Figure 0.1 A navigational aid for the reader

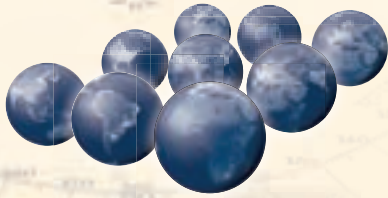


Source: WDR 2009 team.

- Chapters 1 through 9 slice the problem of economic development into digestible bites, each serving a pedagogical function. The arguments in the Report are punctuated with four notes on “Geography in Motion,” which connect the different components by spotlighting the experiences of North America, Western Europe, East Asia, and Sub-Saharan Africa. Readers interested in the chal-

lenges posed by geography for development—and some clues to how geography was reshaped—can read these notes on different parts of the world.

Figure 0.1 shows how the Report can be read horizontally (facts, forces, and policies, respectively) or vertically, according to the policy interest of the reader.



### Overcoming Distance in North America

When Europeans began to colonize beyond their shores, the prospects for economic growth in North America seemed remote. During the Seven Years' War (1756–63), as the French and British battled over Canada, Voltaire wondered why they should fight over “a few acres of snow.” They should have been more interested in the economic potential of the Caribbean, where climate and soil were good for growing sugarcane, and they were. Manhattan was famously traded away by the Dutch in exchange for land around Suriname. But over time, it has been the few acres of snow and the rocky landscape of Plymouth (Massachusetts) that gave birth to the “reversal of fortune” between frigid northeastern America and the warmer south.<sup>1</sup>

To understand how this reversal happened, one has to understand how North Americans managed the growing density, the vast distances in the continent, and the sharp divisions between slaves and their owners, between natives and colonialists, between French and English—in short, how North America's economic geography has been reshaped.

#### Size and American economic ascendancy

Size is the most obvious feature of the United States' economic geography.<sup>2</sup> In 1800 5.3 million individuals lived on the 865,000 squares miles of land given to the fledgling nation under the Treaty of Versailles (1783). By 1900 a little more than 2 million square miles had been added through outright purchase, spoils of war, or treaty. Today the United States has more than 300 million people and a territory of 3.5 million square miles. Since 1790 the population *density* of the country has multiplied nearly 18 times.

The challenges of distributing population and production over such a vast space are enormous. Both people and productive land have moved west and south. In 1800 the population was centered in Maryland, on the eastern seaboard (see map G1.1). By 1900 the center had moved to Indiana. Over the twentieth century, the center veered

southwest, ending up in Missouri in 2000. By this time, America's population had settled mostly on its two coasts. Americans are as physically distant as they have ever been.

How did America overcome these vast physical distances? Initially, institutional mechanisms to allocate land and secure property rights

were paramount. The Constitution and the Northwest Ordinance (1787) provided the procedural mechanisms for transforming unsettled areas into states. Public land was disposed of through sales to private individuals and outright grants. Eminent domain was used to put land to its best use, especially when required for railroads.

Map G1.1 The U.S. geographic center of population gravity moved 1,371 kilometers between 1790 and 2000



Source: Geography Division, U.S. Census Bureau.

The first transcontinental railroad was completed in 1864. Indigenous populations were removed forcibly, where necessary, by the U.S. Army. States and local governments encouraged Americans to move by offering land, building canals, and supplying schools, roads, and other public goods. These local governments competed with each other to attract people and firms, offering tax and other incentives.

People and firms were also encouraged to move by the commerce clause of the U.S. Constitution, which explicitly prohibits state governments from engaging in restraint of trade across state boundaries. The institutional structure thus permitted the free movement of people (except slaves), capital, and goods, with attendant property rights so that movement could occur without economic loss.

In this policy environment, the “transport revolution” of the nineteenth century and growing density permitted a fundamental change in American economic structures. The combination of rail, canals, and steamboats vastly reduced the costs of medium- and long-haul transport compared with wagon transport alone.<sup>3</sup> The country became more urban and dense, while regional economic structures diverged. New England, which had been 80 percent agricultural in 1800 despite its poor soils and climate, started to develop manufactures, while the Midwest specialized in food. By the beginning of the twentieth century, the United States had become the largest manufacturer in the world.

The growing density and the migration of people and firms were driven largely by market forces. Most settlement was cautious. Railroads were built when (and where) investors thought they could make a profit and moved incrementally across the country. Occasionally settlement did “leapfrog,” jumping over large expanses of land to get someplace else, as in California after the discovery of gold in 1849. But that simply accelerated the pace of reallocation of labor in America.

### Convergence in living standards

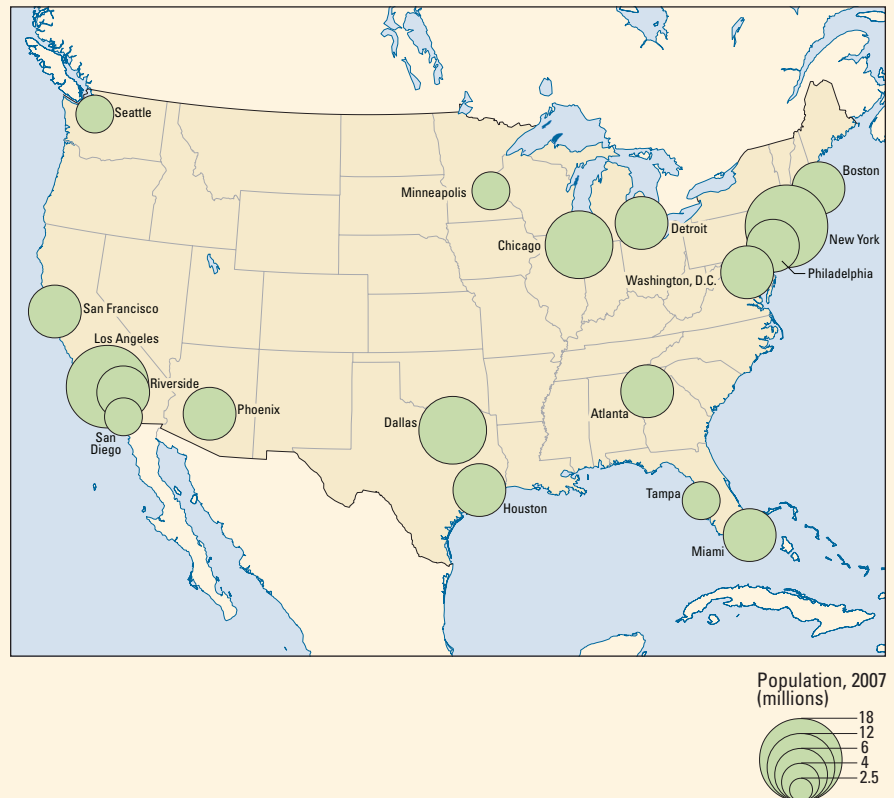
The American Civil War had long-lasting economic effects that *divided* the country. Per capita incomes fell sharply in the South after the Civil War, both absolutely and relative to the rest of the country. In 1900 per capita income in Alabama was still half of the national average. In 1938 Franklin Roosevelt famously remarked that the South was the nation’s “number one economic problem.” America had its lagging areas. But the twentieth century experience was one of steady convergence of living standards.

In the United States, a clear negative relationship exists between the level of per capita income in a state in 1900 and the income growth in that state over the next century. That is, poorer states grew faster than richer states between 1900 and 2000, a phenomenon known as “beta-convergence.” The main explanation for this phenomenon is migration of people. In the twentieth century,

the dominant pattern of movement was from poorer to richer states. Probably the most important example is the migration of African Americans from the rural South to the urban North (and West), beginning in earnest during World War I and becoming a tidal wave during and just after World War II. States such as Mississippi and Louisiana now rank lowest in disposable income, but it is easy to imagine that they would have been much worse off without this migration.

Convergence has been aided by reductions in transport costs. Many of the most important inventions in transport and communications happened in the United States. In the twentieth century, the network expanded with the diffusion of the airplane, the automobile, and electronic communications. Today, 16 of the 30 busiest airports in the world are in the United States, and there are more than 75 automobiles for every 100 Americans.

Map G1.2 America’s large cities are in the Northeast and on the two coasts



Source: Population of Metropolitan Statistical Areas; U.S. Census Bureau.



The invention and diffusion of the automobile led to the enlargement of cities through a pronounced “flattening” of urban density as one moves from the center city to the suburbs. This helped magnify agglomeration economies, but it also produced social *divisions*. The U.S. system of local public finance, relying on local property taxes to fund services, is poorly designed to effect income redistribution. Rich and middle-class households can avoid subsidizing others by moving to new suburbs. Race also plays a role—the central city is predominantly “black” whereas the suburbs are “white.”

For better or for worse, growth in automobiles benefited from the Federal Highway Act of 1956, which authorized building of the Eisenhower Interstate System of highways. In a famous speech, President Eisenhower recounted how as a young officer he participated in the first transcontinental motor convoy from Washington, D.C., to San Francisco in 1919. The trip took 62 days, encountering every type of delay imaginable along the way. Today, courtesy of the system, a driver can cover the 2,819-mile journey in two days. Recent research shows that the 47,000-mile network of highways has integrated formerly isolated rural areas into the national economy and fostered metropolitan growth.

What have these connections done to the distribution of population and economic activity? Paradoxically, as the center of gravity moved toward the interior of North America, the interior—except for its metropolises—has hollowed out. Missouri has just 5.5 million people, more than half of them in the greater St. Louis area. Spreading out the transport infrastructure has not spread people out, but it has allowed growth from agglomeration economies to occur in more cities across the country. The distribution of population in 2000 is clustered in cit-

ies, in the Northeast and on the coasts, producing what is known as “sigma-convergence,” a reduction in the income inequality across states (see map G1.2). By one measure, the dispersion across states in per capita income had fallen to one-third its 1880 level by 2000.

### Rising density, falling disparities, persisting divisions

The long-run economic performance of the United States is exemplary. Per capita income growth has averaged 1.8 percent per year for the last 180 years, leading to a cumulative 26-fold improvement in living standards. Alongside this growth, income inequality across states has fallen. America has realized economies of scale—first at the plant level, then at the local level as towns specialized in manufacturing, and later at the metropolis level in the major urban agglomerations in places like Los Angeles and New York.

The United States today is composed of a highly effective set of national markets in goods and factors of production. Place still matters in determining income, but it matters in the short run, not the long, and the short run is much shorter than it was a century ago. Major local shocks like Hurricane Katrina have far less impact on local growth prospects than before. After the Mariel boatlift brought 125,000 Cuban refugees to Miami in the early 1980s, regional wages did not experience a perceptible impact.

The result is a seeming paradox: wages in America (corrected for human capital) are similar in different locations, while economic activity is highly unequal across space. Europe is lauded for having lower *social* inequality, but North America is more *spatially* equal. And it has a more spatially efficient distribution of economic production. The reason: a mobile labor force. Every year about 8 million Americans move

across states; over a decade, more than a quarter of the population changes its state of residence. By overcoming distance and division, and by permitting population and production to be uneven across space through free mobility, per capita incomes in the United States today are both high and remarkably similar across the different states.

A remaining challenge for the United States is the removal of divisions. The North American Free Trade Agreement (NAFTA) is a step in this direction. But it is a modest step. Consider Canadian-U.S. market integration. One study found that trade among Canadian provinces was much larger than between Canada and the United States, controlling for distance and the economic size (gross domestic products) of the trading partners, in this case, states and provinces.<sup>4</sup> Given California’s size, for example, its trade with Ontario should have been 10 times Ontario’s trade with British Columbia, California’s closest Canadian neighbor. In fact, Ontario’s trade with British Columbia was three times its trade with California. Even one of the thinnest borders in the world has a large negative influence on trade.

Along its northern boundary, the United States and Canada share 3,987 miles, the longest unguarded international border in the world. The situation is markedly different along the southern border with Mexico. The border is guarded—not closely enough for many U.S. citizens—to keep potential illegal immigrants from entering. There are even proposals to build a fence stretching across the 1,933 mile border. Such barriers are an obstacle to convergence between countries in the North American continent.

Contributed by Robert A. Margo.



# PART ONE

## SEEING DEVELOPMENT IN 3-D



As the world's economy grows, people and production are concentrating, pulled as if by gravity to prosperous places—growing cities, leading areas, and connected countries. As it did decades ago in today's high-income countries, the drive to density in low- and middle-income countries can increase the sense of deprivation as the economic distance between prosperous areas and those left behind widens. And although rapid advances in transport and communication increasingly bind together geographically distant communities around the world and open new opportunities for exchange, political divisions that obstruct the flow of people, capital, and goods remain. Part one of this Report defines the spatial dimensions—density, distance, and division—and describes their evolution with economic development. Chapters 1, 2, and 3 show how the economic geography at the local, national, and international scales is changing, and how the scope and pace of these changes compare with transformations in the economic geography of North America, Europe, and Japan when they were at similar stages of development. This broad sweep of stylized facts informs the analysis in part two and the policy discussions in part three of the Report.

# Density



Mostly off the world's radar, on a dusty plain in West Africa, is a city of 1.6 million people. Bisected by the River Niger, its two halves—with about 800,000 people each—are linked by only two bridges. The pressure of movement is so strong that every morning one of these bridges is dedicated to incoming traffic: minibuses, bicycles, motorbikes, pedestrians, and occasionally private cars. In the evenings, to leave the center means joining an exodus of people toward the minibus depots. Green vans loaded with passengers file out to residential neighborhoods as far as 20 kilometers away. This is Bamako, Mali. It contracts into its center every morning and breathes out again in the evening.

With each breath Bamako grows bigger. It happens to be one of the fastest-growing cities in the world. Natural demographic growth is supplemented by migration from the countryside and other Malian cities. Its population in 2008 is 50 percent larger than 10 years ago, making it the same size as Budapest, Dubai, or Warsaw. It has 10 times more inhabitants than the next biggest Malian city and accommodates 70 percent of the country's industrial establishments.<sup>1</sup> New neighborhoods—*quartiers*—formerly villages, become consolidated with the rest of the city, toward the south, east, and west. Some of Bamako's people are now moving out into surrounding neighborhoods in search of cheaper land and some tranquility, but they remain within reach of the city because it provides their livelihoods.

Despite its industriousness, Bamako is one of the sleepier cities in West Africa. Many of the manufactured staples come 1,184 kilometers by road from one of the region's metropolises, Abidjan, which has more than twice Bamako's population. Abidjan seems small beside Lagos, where activity is so concentrated that its residents speak of living in a pressure-cooker. Some families rent rooms to sleep for six hours and then turn them over to another family that takes their place. Shopping does not necessarily require travel: goods are brought on foot and cart to drivers stuck in Lagos's interminable traffic jams. To some, like the authors of Lagos's 1980 master plan written when the city had just 2.5 million residents, the continuing growth of the city is "undisciplined."<sup>2</sup> What can possibly be so attractive about living in Lagos that, despite its congestion and crime, it continues to draw migrants?

The short answer: economic density. Lagos is not the most economically dense city in the world, nor even the most densely populated. Those distinctions belong to Central London and Mumbai, respectively. Even so, Nigeria's economic future and Lagos's growth are as inextricably tied as Britain's economy is with London's growth. No country has developed without the growth of its cities. As countries become richer, economic activity becomes more densely packed into towns, cities, and metropolises. This geographic transformation of economies seems so natural

that—at an impersonal aggregate level—it is taken for granted. But moving to economic density is a pathway out of poverty both for those who travel on it and, ultimately, for those left behind. Jane Jacobs, the noted urbanist, did not have Bamako and Lagos in mind when she wrote, “A metropolitan economy, if it’s working well, is constantly transforming many poor people into middle-class people, many illiterates into skilled people, many greenhorns into competent citizens. Cities don’t lure the middle class. They create it.”<sup>3</sup> She might as well have written: as Lagos and Bamako grow, they will fill in West Africa’s missing middle.

This chapter introduces density, the first of the geographic dimensions of development, defined as the economic mass or output generated on a unit of land. Surveying the evolution of density with development, the chapter presents stylized facts about how density in a country rises with urbanization, rapidly at first, and then more slowly. These changes are associated initially with a divergence of living standards between places with economic density and those without, later with a convergence. Living standards thus eventually converge between areas of different density, such as urban and rural. Even within cities, densely populated slums amid formal settlements, the differences slowly disappear with development. But this convergence does not happen by itself. It requires the institutions to manage land markets, investments in infrastructure, and well-timed and executed interventions.

The main findings:

- ***The concentration of economic activity rises with development.*** The world’s densest areas or settlements are in developed countries. But the path to these levels, “urbanization” in this Report, is not linear. The share of a country’s population settled in towns and cities rises rapidly during its transformation from an agrarian to an industrial economy, which generally coincides with its development from low to middle income. The pace of urbanization slows after that, but economic density continues to increase in a postindustrial economy because services are even more densely packed than industry.
- ***Rural-urban and within-urban disparities in welfare narrow with development.*** In the early stages of development, geographic disparities in welfare are large. With development, these gaps may increase initially. Rural-urban gaps in income, poverty, and living standards begin to converge as economies grow, faster for access to social services, and faster in areas of more vibrant growth. Within-city gaps in welfare and housing—most obvious in informal settlements or slums—persist for much longer, and narrow only at later stages of development.
- ***Neither the pace of urbanization nor its association with economic growth is unprecedented.*** Today’s developing countries are sailing in waters charted by developed nations, which experienced a similar rush to towns and cities. The speed is similar, and the routes are the same. What is different today is the size of the ship: the absolute numbers of people being added every year to the urban populations of today’s developing countries are much larger than for even the most recent industrializers such as the Republic of Korea and Taiwan, China. Later chapters of this report investigate the policy implications of these similarities and differences.

### Defining density

Density refers to the economic mass per unit of land area, or the geographic compactness of economic activity. It is shorthand for the level of output produced—and thus the income generated—per unit of land area. It can, for example, be measured as the value added or gross domestic product (GDP) generated per square kilometer of land. Given that high density requires the geographic concentration of labor and capital, it is highly correlated with both employment and population density. Density is the defining characteristic of urban settlements.

### *The economic world is not flat*

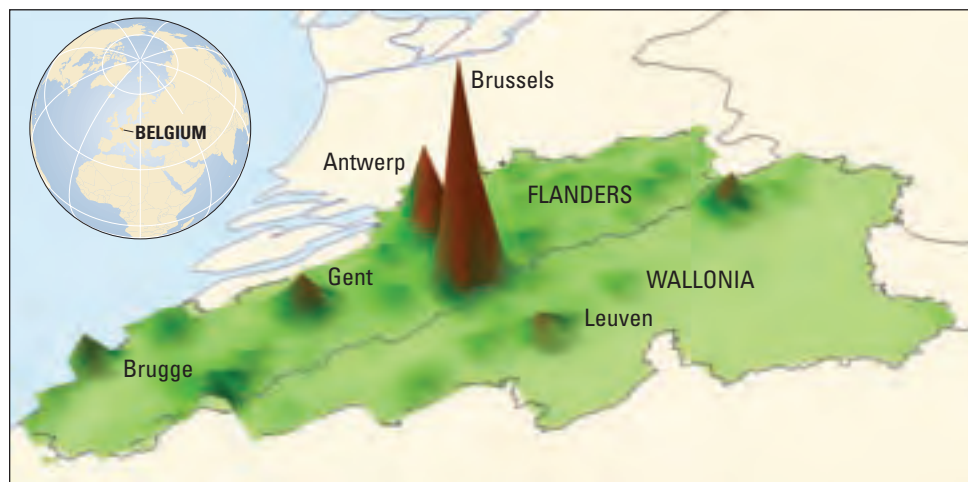
The geographic distribution of economic activity, at any resolution, is uneven. No matter the geographic scale examined, be it the country or a subnational area such as a province or district, there is a hierarchy of density. At the top is the primary city, and at the bottom are agricultural lands or rural areas. Between them is a continuum of settlements of varying density.

The geographic unevenness of economic mass, or bumpiness, tends to increase with a country's land area. But even the economic geography of small countries is bumpy. The Belgian city of Brussels has a land area of 161 square kilometers, of which 159 square kilometers are used for nonagricultural purposes. On this small area, a GDP of €55 billion is generated by about 350,000 workers—that is, the average square kilometer of land has more than 2,000 workers annually producing almost €350 million of services and goods. Brussels not only has high densities of GDP and employment; it also has the highest population density of any European (EU27) area classified as NUTS1 (Nomenclature of Territorial Units for Statistics)—more than 6,000 people per square kilometer, 18 times the average for Belgium.<sup>4</sup> For the sake of comparison, the population density of London and Madrid is about 5,000 people per square kilometer.

This density contrasts markedly with the agricultural areas of Belgium. In the Flemish Flanders (Vlaams Gewest) area, 6,323 square kilometers of land are used for agriculture. Its area is almost 40 times that of Brussels, but its employment is just 13 percent of Brussels and its GDP a mere 4.5 percent, translating into employment and GDP densities of only seven workers and €330,000 per square kilometer. The ratio of output density between Brussels and Flanders is 1,000 to 1. In between metropolitan Brussels and rural Flanders is a range of settlements, each with a different density (see map 1.1). The cities of Antwerp, Brugge, Gent, and Leuven have an average output of €22 million and employment density of 342 workers per square kilometer.<sup>5</sup>

In both developed and developing countries, then, the economic landscape is bumpy. But the topography does not correspond to a simple urban-rural dichotomy. A continuum of density gives rise to a portfolio of places. At the head is a country's leading, primary, or largest city. Below the primary city is a spectrum of settlements—secondary cities, small urban centers, towns, and villages (see figure 1.1). In some countries, such as France and Mexico, the size difference between the top two cities is phenomenal. With a population of 10 million, Paris dwarfs second-ranked Marseille with just 1.5 million. And with a population

**Map 1.1** The landscape of economic mass is bumpy, even in a small country like Belgium



Source: WDR 2009 team and World Bank Development Research Group, based on subnational GDP estimates for 2005. See also Nordhaus 2006.

of 22 million, Mexico City is more than four times as populous as Guadalajara, Mexico's second city. Conversely, in India and the United States, the size difference between the two biggest cities is relatively small. With populations of more than 22 million people, Mumbai and New Delhi stand shoulder to shoulder. New York has a population of 22 million, Los Angeles 18 million.<sup>6,7</sup>

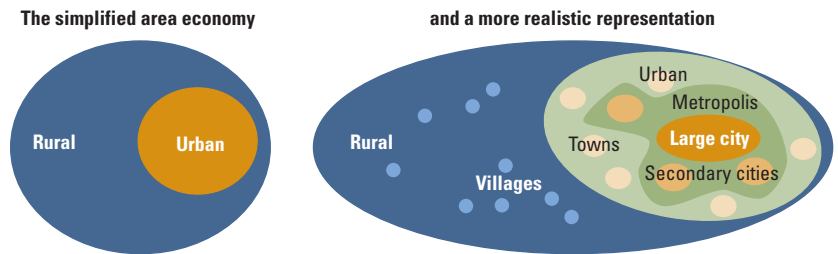
### An evolving portfolio of places

Although the growth of cities appears chaotic, the underlying patterns have a remarkable order (see figure 1.2). A country's urban hierarchy is characterized by two robust regularities:

- The “rank-size rule”—the rank of a city in the hierarchy and its population are linearly related.
- Gibrat's law—a city's rate of population growth tends to be independent of its size.

According to a special case of the rank-size rule, known as Zipf's law, the population of any city is equal to the population of the largest city, divided by the rank of the city in question within the country's urban hierarchy (see box 1.1).<sup>8</sup> As early as 1682, Alexandre Le Maitre observed a systematic pattern in the size of cities in France.<sup>9</sup> For all classes of country, the relative size distribution has remained stable over time, even as incomes and populations grew (see figure 1.2). Concerns about “urban

**Figure 1.1 From dichotomy to continuum: a portfolio of places**



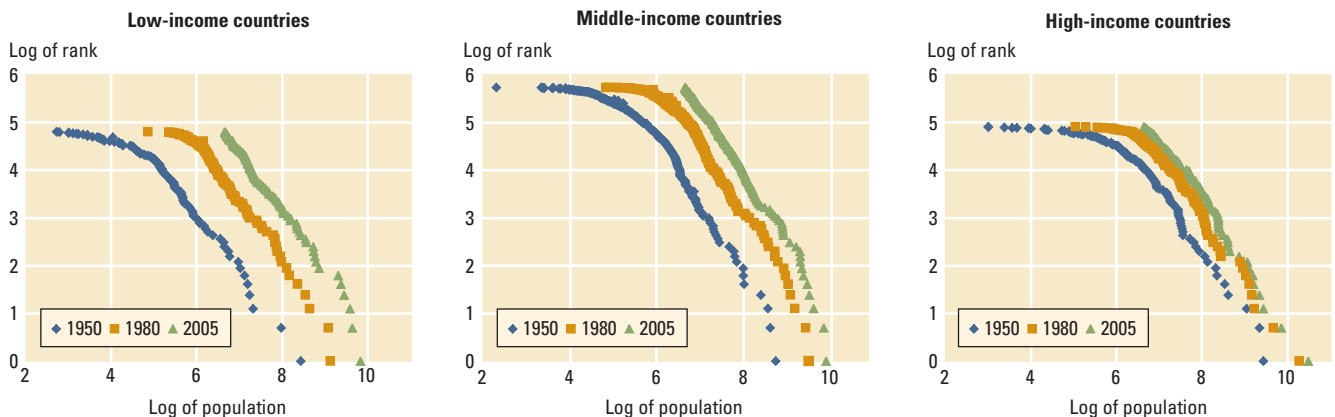
Source: WDR 2009 team.

primacy” notwithstanding, the “portfolio of places” is an enduring feature of economic development.

Settlements of different sizes complement one another. Metropolises, secondary cities, market towns, and villages are all linked through their complementary functions (see box 1.2). The primary city is often but not always the national administrative center and the seat of political power: Cambodia's Phnom Penh, Cameroon's Yaounde, and Colombia's Bogotá. A country's leading city also tends to be its most diversified, both in the provision of goods and services and in cultural and other amenities. For the cultural amenities, think of Broadway in New York City, the Opera House in Sydney, and the Louvre in Paris. But think also of Trinidad and Tobago's Port of Spain, famous for the annual carnival that attracts large numbers of visitors.

Just as a primary city forms the core of a country's metropolitan area with other adjacent cities, other large urban centers or

**Figure 1.2 Almost a law: relative size distributions of settlements remain stable over time**



Source: United Nations 2006c.

Note: Each data point represents an agglomeration area of population size of 750,000 or more.

### BOX 1.1 *Two laws and a rule: the empirical regularities of a country's city-size distribution*

The rank-size rule, discovered in 1913, can be expressed as the rank  $r$  associated with a city of size  $S$  is proportional to  $S$  to some negative power. The special case in which the estimated power equals  $-1$  is known as Zipf's law, named after a linguist, George Zipf. Evidence on the pervasiveness of the rank-size rule comes not only from large cities belonging to countries of different income classes, but also from the experience of individual countries. The remarkable westward and southward expansion of the U.S. urban hierarchy notwithstanding, the rule provides a good description of the size distribution of U.S. cities for every decade between 1790 and 1950.<sup>a</sup> Indeed, even today, the rank-size rule continues to describe well the size distribution of U.S. cities (see figure below). This is so despite evidence that the shape of the rule has changed over time, becoming slightly flatter so that the overall distribution of

U.S. city sizes is more even—and that the rule fails to hold at the extremes of the U.S. city-size distribution, a common finding for many countries.<sup>b</sup> Moreover, the rank-size rule also holds for countries as diverse as Kazakhstan and Morocco, providing further evidence of its universality (see the figure below).

Whether the rank-size rule is really a rule with underlying theoretical structure is still under debate. It can be shown to follow from Gibrat's law, which implies that cities grow in parallel.<sup>c</sup> This is consistent with the absence of any systematic growth differences between cities. But this does not imply that policy is incapable of influencing a city's size and economic performance. Cities can and do move up and down their national urban hierarchies as a result of good and bad policy choices. And even transitory departures from a parallel growth

path can have important long-term repercussions for the welfare of a city's inhabitants. On whether the power in the rank-size rule equals  $-1$ , so that Zipf's law holds, many researchers seem to agree that, in general, it does not.

The robust message from the rank-size rule is that, for a given country or area, a wide range of city sizes coexists. Even the most developed countries have a portfolio of settlements of different sizes, ranging from the small to the large, as opposed to a single megacity or a collection of cities, all of similar size. Agglomeration is a balancing act between centripetal and centrifugal forces. The balancing point differs depending on the sector, the economic activities, and the type of industries.

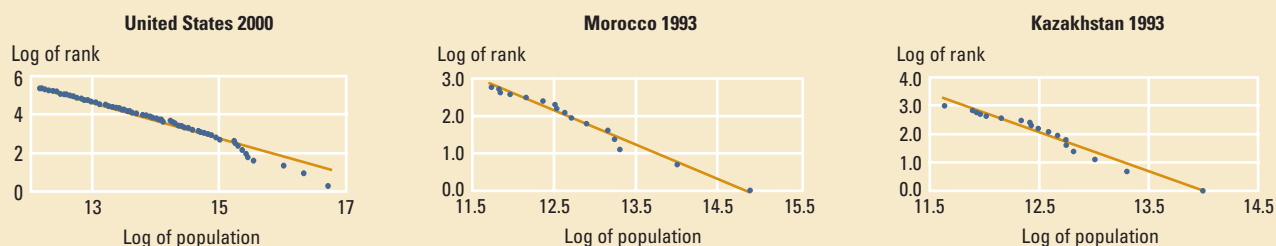
Contributed by Mark Roberts.

a. Madden 1956, cited in Kim and Margo 2004.

b. Gabaix and Ioannides 2004, p. 14.

c. Gabaix and Ioannides 2004, pp. 16–17.

#### The rank-size rule, for nations as diverse as the United States, Morocco, and Kazakhstan



Sources: The graph for the United States is from Rose (2005); the graphs for Kazakhstan and Morocco are based on data for cities and urban agglomerations from Brakman, Garretson, and Marrewijk (2001).

secondary cities act as regional foci for both the economy and society. For example, they are the local centers for the financial sector, which serve the areas around them. Düsseldorf, Hamburg, Hanover, and Munich are all home to regional stock exchanges, as well as local concentrations of venture capital firms.<sup>10</sup> Dallas and Atlanta emerged as regional centers of commerce and finance in the lower South of the United States, and both host regional offices of the Federal Reserve Bank.<sup>11</sup> Large urban centers and secondary cities also act as local political centers, and provide advanced public health, education, and cultural facilities. Hyderabad, the state capital of Andhra Pradesh, with numerous universities, leading institutes for technical education, and

private medical colleges, is a seat of learning in southern India.

These large regional cities are connected to smaller cities or major towns. The Ruhr area of Germany, the Randstadt area of the Netherlands, and the Padang-Medan hub in Indonesia's Sumatra represent alliances of cities. Smaller cities within these areas constitute more specialized urban centers, typically focusing on manufacturing and the production of traditional and standardized items. Symbiosis is the ruling order: just as the larger cities help to serve the smaller cities, so the reverse is true. For instance, the larger cities depend on the smaller ones for the daily provision of workers through commuting.<sup>12</sup>

Just as there are mutually beneficial links between larger and smaller cities, the same is



### BOX 1.2 *The Republic of Korea's portfolio of places*

Illustrating a well-developed portfolio of places are seven settlements in the Republic of Korea's urban hierarchy: Seoul, Pusan, Daegu, Ansan, Gumi, Jeongeup, and Sunchang.

Seoul is at the pinnacle of the hierarchy. Located 50 kilometers from the Republic of Korea's border with the Democratic Republic of Korea in the Han River basin, it is the country's capital and home to a quarter of its population (that is, 9.76 million people). It serves as the nation's political center and cultural heart. Also typical is its specialization in business services, finance, insurance, real estate, and wholesaling and retailing. Overall, services account for 60 percent of the local economy. Seoul is also highly specialized in publishing and printing and in fashion design and high-end apparel, with the two industries employing more than half the city's 465,000 manufacturing workforce.

Next in the urban hierarchy are Pusan and Daegu. With a population of 3.7 million, Pusan is the Republic of Korea's second largest city. In the southeastern corner of the Korean Peninsula, its seaport, one of the world's largest, handles more than 6.5 million container ships a year. Daegu is a metropolitan area of 2.5 million, dominated by textile and clothing manufacturing and automotive parts manufacturing and assembly. Since 1970, the Gyeongbu Expressway has connected Pusan to Seoul through Daegu. About 20 flights operate daily between Seoul and Daegu, and since 2001, the two cities have been linked by a high-speed train.

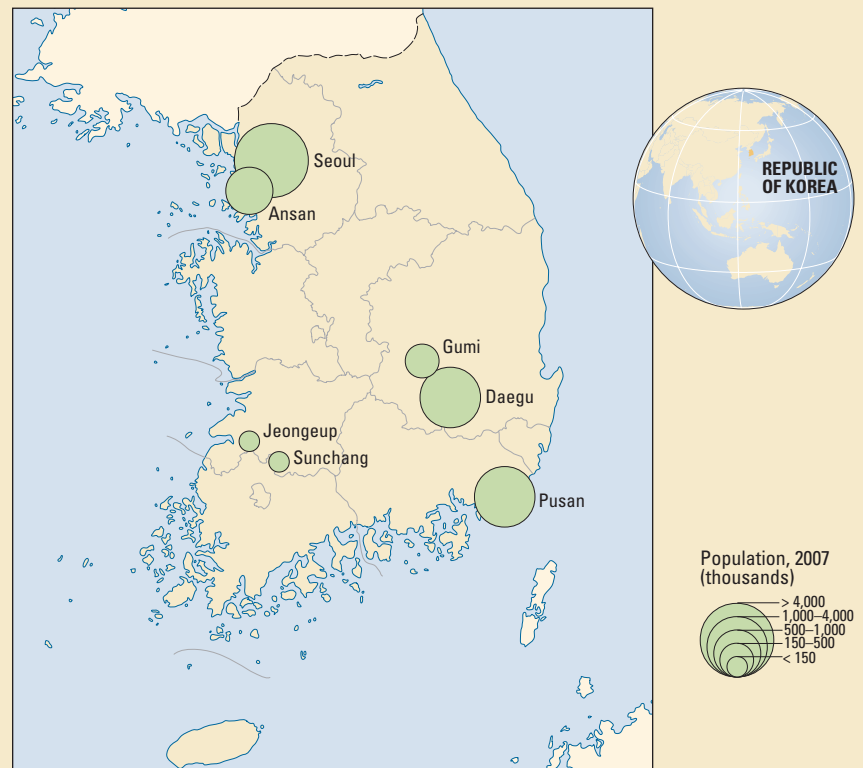
Much farther down the hierarchy, Ansan and Gumi are secondary cities, with populations of around 679,000 and 375,000, respectively. In Gyeonggi province, Ansan belongs to the Seoul National Capital Area, as part of Seoul's suburban area. Gumi is in Gyungbok province, in the southeast. As tends to be the case with secondary cities, Ansan and Gumi are more specialized in

manufacturing, especially standardized manufacturing, than cities farther up the hierarchy. Although both cities serve as manufacturing centers, they differ in their specializations. Gumi is heavily specialized in the radio, television, and communication equipment industry, which by itself accounts for more than 50 percent of local manufacturing employment. Ansan is specialized in such high-tech industries as electrical machinery and computers and office machinery. It also has agglomerations in several heavy industries: almost 14,000 workers, or 14.7 percent of the local manufacturing workforce, are employed in the fabricated metal products industry.

At the bottom of the hierarchy, Jeongeup and Sunchang, both in the Jeonbuk province, are close to the interface between rural and urban. So while Jeongeup has a relatively large population (129,050), one in four of its inhabitants is a farmer. Likewise, Sunchang is a rural town: half of the 32,012 residents are farmers. To the extent that they exhibit any specialization in manufacturing, it is either in traditional resource-related industries, as in Jeongeup, or in the manufacture of food and beverage products, as in Sunchang.

Contributed by Park Sam Ock.

#### Seoul heads the hierarchy of settlements in the Republic of Korea



Sources: WDR 2009 team, using data from the National Statistical Office of the Republic of Korea.

true for smaller cities and towns, and towns and rural areas. Towns are the connective tissue between rural and urban areas. They act as market centers for agricultural and rural output, as stimulators of rural nonfarm activity, as places for seasonal job opportunities for farmers, and as facilitators of economies of

scale in postsecondary education and health care services. Symbiosis is again the rule. Towns draw sustenance from the agricultural activity of rural areas, but their prosperity also spills over to villages by providing non-farm employment opportunities. Farmers in Vietnam migrate seasonally to work in urban

construction, returning to invest the money earned in their farms.<sup>13</sup> Farmers in Makueni, Kenya, use nonfarm income to invest in terracing, planting trees, clearing bush, building houses, and educating their children. Farmers in the semiarid Diourbel region of Senegal have responded to growing urban demand for meat by diversifying away from groundnut production into animal husbandry.<sup>14</sup>

### *Measuring density*

Measures of gross product at a refined spatial scale, such as a district or a city, are difficult to come by. Even for developed countries, output estimates tend to be available only for rather broadly defined subnational areas (first level and administrative units, such as provinces or states). At this level, important variations in economic density are likely to average out. Fortunately though, as illustrated earlier for Belgium, output and population density are closely correlated. Reliable population estimates are more easily available, even for villages or townships, because in most countries, a population census is taken every decade.

The strong correlation between population density and economic mass is consistent with urban areas being a conglomeration of consumers and producers, of buyers and sellers, and of firms and workers. For a typical metropolitan area, the gradient of population density for distance from the city center is similar to the corresponding gradient for employment density.<sup>15</sup> As implied above, the extent to which a country's population lives in urban areas bears a strong relationship to how "bumpy" its economic geography is. Density goes from smoothly spread out to quite uneven as a country develops. Urbanization is thus synonymous with a tendency toward greater agglomeration within a country. A country's urban share is a good proxy for the proportion of its population living in areas of high density and, therefore, for the "bumpiness" in its economic geography.

This Report proposes the use of an agglomeration index computed using geographic information systems as a measure of density. Measures of urbanization are nonuniform across countries, which makes comparability and aggregation a challenge. The index allows for a more consistent comparison of the level of urbanization—or,

interchangeably, agglomeration, density, or geographic concentration of economic activity—across countries.

The index identifies an area of 1 square kilometer as urban, agglomerated, or dense if it satisfies the following three conditions:

- Its population density exceeds a threshold (150 persons per square kilometer).
- It has access to a sizable settlement within some reasonable travel time (60 minutes by road).
- The settlement it has access to is large in that it meets a population threshold (more than 50,000 inhabitants).

Box 1.3 summarizes the rationale and methodology underpinning the index.

One advantage of the agglomeration index is that it incorporates both density and the local distance to density. Based on the criteria of population density and accessibility to a sizable market, the index also comes closer to providing an economic definition of an area that can both benefit from and contribute to agglomeration economies. Although economic density is both a cause and a consequence of agglomeration economies, accessibility to this economic mass from the outer parts of the city facilitates the exploitation of such benefits to proximity. This is especially true in the service sector in which face-to-face interactions are often necessary. By reducing the need to allocate valuable land area to residential uses in and near urban centers, transport infrastructure facilitates economic density.

Going to work by car or by high-speed public transportation is a luxury that developed country commuters do not always share with their counterparts in developing countries. For any given geographic distance, therefore, accessibility to a city tends to be lower in developing countries because of the need to rely on alternative, more time-intensive modes of transportation, such as walking, cycling, or inefficient public transportation operating on poor-quality roads. In Mumbai, India, 44 percent of people walk to work,<sup>16</sup> and in Hefei City, China, more than 70 percent either walk or cycle.<sup>17</sup>

Such variations in accessibility determine both the shape and form of a city. When most people walk to work, a city is more likely to be monocentric and densely

### BOX 1.3 Computing the agglomeration index

The United Nations maintains the *World Urbanization Prospects* database, a treasure trove of information. It provides urban shares and population data for 229 countries stretching back to 1950. But these data are based on country definitions, which can be quite different. This Report proposes a new measure of agglomeration, based on a uniform definition of what constitutes an “urban” or agglomerated area, using the technique outlined in Chomitz and others (2007) and elaborated in Uchida and Nelson (2008).

This should not be read as implying that *World Urbanization Prospects* data are flawed. A better interpretation is to see the challenge of measuring urbanization as analogous to the measurement of poverty. Each country has its own poverty line and criteria to track changes in national poverty rates. But these measures do not allow reliable comparisons of poverty between countries, and they cannot be used to aggregate poverty for groups of countries. The merit of a uniform poverty measure—such as those living below US\$1 or US\$2 a day,

adjusted for purchasing power differences between countries—is that it allows international comparisons and calculations that aggregate poverty for regions and the world. The agglomeration index allows the same comparisons and aggregation.

The methodology underlying the calculation of the agglomeration index can be summarized as follows:

- *Specify thresholds.* To be classified as “urban” using the agglomeration index, an area must satisfy three criteria based on (1) minimum population size used to define a sizable settlement, (2) minimum population density, and (3) maximum travel time, by road, to the sizable settlement.
- *Locate the centers of sizable settlements.* This mapping is done for cities that meet the minimum population size criterion using data from the Global Rural-Urban Mapping Project (GRUMP) human settlements database.<sup>a</sup>
- *Determine the sizable settlement’s border.* The border surrounding a sizable

settlement center is calculated based on the maximum travel time to the center.

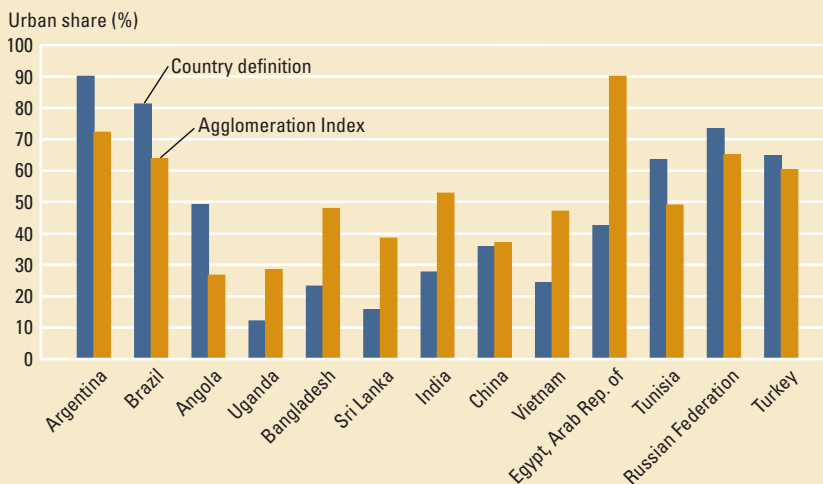
- *Create population density grids.* These are created at a 1-kilometer spatial resolution using two global grid-based population data sources, GRUMP and LandScan.<sup>b</sup>
- *Identify the areas.* Identify the grid cells that satisfy thresholds for all three criteria.
- *Aggregate grid cell populations.* The result is analogous to urban population. The proportion of this number to that country’s total population is the agglomeration index, a summary measure of the proportion of the population living in areas of high density.

In calculating the index, this Report uses a base case set of thresholds of 50,000 for minimum population size of a settlement, 150 people per square kilometer for population density, and 60 minutes for travel time to the nearest large city.

The density and travel time thresholds are those employed in Chomitz, Buys, and Thomas (2005). The density threshold is the same as the one used by the Organisation for Economic Co-operation and Development (OECD). The threshold of 50,000 for a sizable settlement is reasonable for developing and developed countries. Many developing nations have more than 10 percent of their total population in urban centers of between 50,000 and 200,000. Some examples include Chile in 2002, Brazil in 2000, and Malaysia in 2000, all with around 17 percent of their national population living in urban centers of 50,000–200,000 inhabitants. Of India’s urban population in 2001, 20 percent lived in settlements of this size.

According to the *World Urbanization Prospects* database, the worldwide urban share in 2000 was 47 percent. Using the base case criteria, this ratio is 52 percent, but using 100,000 as the minimal settlement size, it is 44 percent, according to the agglomeration index. But country level estimates can be further apart (see figure at left).

#### The internationally comparable agglomeration index can yield different urban shares than those from country-specific definitions



Sources: Chomitz, Buys, and Thomas 2005; Nelson 2008; Satterthwaite 2007; United Nations 2006c.

a. The GRUMP human settlements database was developed by the Center for International Earth Science Information Network (CIESIN) at Columbia University (<http://sedac.ciesin.columbia.edu/gpw/index.jsp>).

b. LandScan was developed by Oak Ridge National Laboratory (<http://www.ornl.gov/sci/landscan/>).

populated at its core. In Mumbai, half of all workers commute less than 2 kilometers, implying that they live close to their places of work. Similarly, to obtain the advantages of

agglomeration in industrial districts, workers in nineteenth-century Britain had to live nearby. The centers of industrial towns were densely populated, and overcrowded housing

was common. Not until the electric tram was introduced did this change.

In determining accessibility, and thus the shape and form of cities, features of physical geography can also be important. Manhattan Island in New York City is difficult to get to, simply because of geography, so it has skyscrapers and a classic monocentric structure, with half its employment within a three-mile radius of Wall Street. By contrast, in Los Angeles, one has to widen the area to a radius of 11 miles from the center to find as large a share of employment.<sup>18</sup> The implication: economic density in New York City is \$1.44 billion of gross product per square kilometer, in Los Angeles it is \$0.49 billion.<sup>19</sup>

In the United Kingdom, Stevenage, Basildon, and Crawley are commuter towns that serve London. About 11 percent of London's GDP is generated by commuters from suburban areas.<sup>20</sup> Similarly, in the United States, a daily tide of workers commute into Washington, D.C., from the neighboring states of Maryland and Virginia. In 2005 the net contribution of commuters from these two states to Washington, D.C.'s output was \$36.4 billion. Maryland's Montgomery County—within easy commutable distance of the district—alone contributed \$6.4 billion to Washington's gross product.<sup>21</sup>

The biggest advantage of the agglomeration index is its comparability across countries. Here the index has an advantage over the United Nations' *World Urbanization Prospects* database, which contains the "de facto population living in areas classified as urban according to the criteria used by each area or country."<sup>22</sup> The heterogeneity across countries can make cross-country comparisons misleading. A few examples:

- *India.* With the criterion for an urban area used by Zambia or Saudi Arabia, defined as settlements with populations of 5,000 or more, the share of India's population in urban areas in 1991 would be 39 percent instead of the official figure of 26 percent. This is because 113 million inhabitants of 13,376 villages would be reclassified as urban.
- *Mexico.* Based on Mexico's official criterion of settlements of 2,500 or more as urban, the country's urban share in 2000 was 74.4 percent. But if the settlement population threshold were to be

redefined as 15,000 (Nigeria and Syria, for example, have cutoffs of 20,000), that share would drop to 67 percent.

- *Mauritius.* In 2000 about a quarter of Mauritius's population lived in settlements with between 5,000 and 20,000 inhabitants. Some of these settlements are district capitals, but none of them are classified as urban. If they were, the urban share would have been more than two-thirds rather than less than half.

At a regional level, according to *World Urbanization Prospects* data, South Asia poses the paradox of being the least urbanized region (27 percent urban) in the world while also the most densely populated. Using the agglomeration index, South Asia's urban share in 2000 was 42 percent, making it more urbanized than both Sub-Saharan Africa and East Asia and the Pacific (figure 1.3). The *World Urbanization Prospects* also pose a puzzle for Latin America and the Caribbean. The urban share in this region in 2000 was greater than that in Eastern Europe and Central Asia and almost on par with the OECD's. The OECD has an average GDP per capita more than six times that of the average Latin American country. More reasonably, the agglomeration index indicates that Latin America and the Caribbean's urban share in 2000 was similar to that of Eastern Europe and Central Asia, and 15 percentage points lower than that of the OECD.

Despite these drawbacks, the *World Urbanization Prospects* data are the only available information for comparisons over time. The agglomeration index is available only for 2000, because time-series data on road networks, necessary to estimate travel time, are not readily available. So, the agglomeration index and *World Urbanization Prospects* database should be considered as complementary data sources for examining urbanization and density, and this Report uses both the agglomeration index and the *World Urbanization Prospects* data.<sup>23</sup> Calculating comparable urban share measures for at least some countries in the past is possible; going forward, it should be a priority for all countries.

### **Economic concentration— the richer, the denser**

In the early stages of development, when an economy is primarily agrarian, people live

spread out on farmland. Even the largest towns and cities are small. Urban settlements are likely to be small port cities and market towns, serving the rural needs and trading surpluses of agriculture. Industrialization brings with it a rapid process of urbanization—new cities are born, and existing cities expand. As people crowd into these cities at a faster rate than their boundaries expand, population and economic density increase. Quite early in a country's development, this leads to a hierarchy of places.

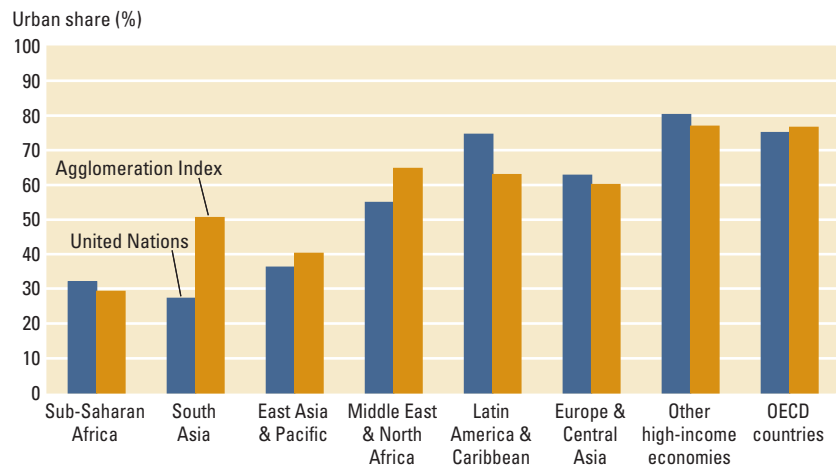
So, two transitions characterize economic development. The first involves the movement from a primarily agrarian economy to a much more manufacturing-oriented economy. The second transition, taking place at a much higher level of development, involves the transformation to a service-oriented economy. The first phase of urbanization, which occurs at a faster rate, coincides with the transition from a rural to an urban economy. The second phase of urbanization, at a slower rate and a much higher level of development, is linked to a within-urban evolution. In most countries, these transformations happen at the same time but in different areas.

To measure concentration, we have to define an area. The policy debate often involves a discussion of urban primacy, such as whether developing country cities are too big or too small. More academic discussions use a purer geographic notion of space. This chapter uses both spatial units—primary cities and the densest grid cell of 1° longitude by 1° latitude of a country—to measure concentration.

### *Historically, rapidly rising concentration, then a leveling off*

By one definition, a city is a geographic area characterized by a concentration of economic actors.<sup>24</sup> Globally, the top 30 cities, ranked by GDP, generated around 16 percent of the world's output in 2005, while the top 100 generated almost 25 percent. The urban agglomerations of Tokyo and New York have estimated GDPs (in purchasing power parity) broadly similar to those of Canada and Spain, respectively, whereas London has a higher estimated GDP than either Sweden or Switzerland. Similarly, primary cities in developing countries account

**Figure 1.3** The agglomeration index helps to compare urbanization across regions



Sources: Chomitz, Buys, and Thomas 2005; Nelson 2008; Satterthwaite 2007; United Nations 2006c.

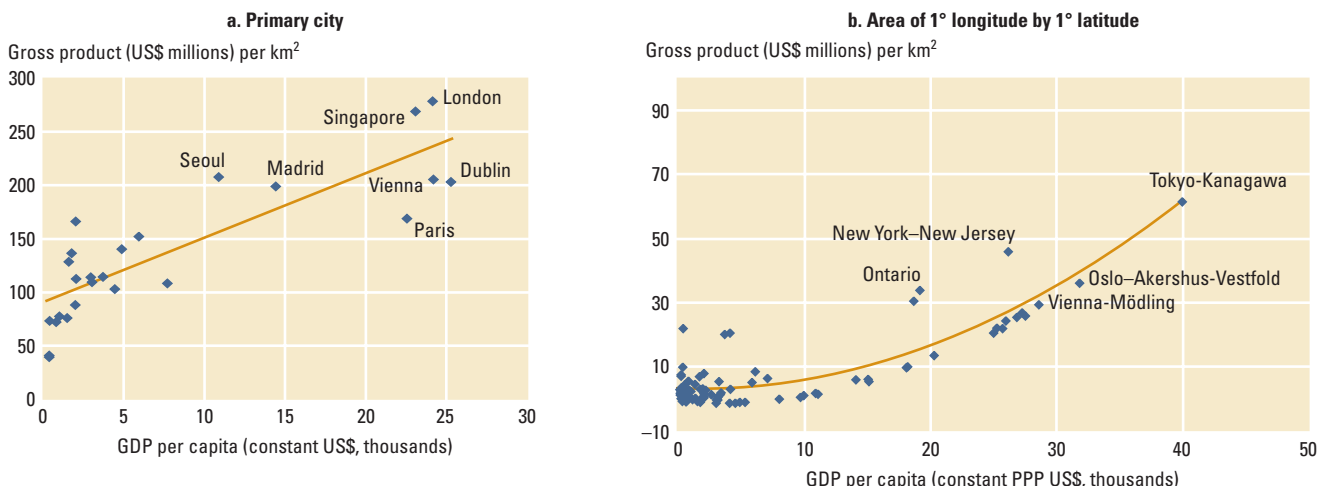
for disproportionate shares of their national GDP. In 2005, Mexico City contributed 30 percent of Mexico's GDP despite occupying only 0.1 percent of its land. Luanda contributed a similar share of Angola's GDP, while occupying 0.2 percent of its land. Likewise, the largest cities in Hungary, Kenya, Morocco, Nigeria, and Saudi Arabia—Budapest, Nairobi, Casablanca, Lagos, and Riyadh—contributed about 20 percent of their country's total GDP while taking up less than 1 percent of land.<sup>25</sup>

Density, defined as GDP in purchasing power parities per square kilometer, rises with the level of development, and the densest places in the world are in the richest countries. Dublin, London, Paris, Singapore, and Vienna ranked at the top, in 2005, with more than \$200 million in gross product per square kilometer. Likewise, Tokyo-Kanagawa, New York–New Jersey, Oslo–Akershus-Vestfold, and Vienna-Mödling were the densest grid cells of 1° longitude by 1° latitude, generating more than \$30 million of gross product per square kilometer (figure 1.4).

A century of data on aggregate urban shares, and two centuries of population estimates for primary cities, suggest that urbanization is initially rapid before slowing. Developing countries—especially those in Africa and Asia—are at phases during which urban shares increase sharply. People in Western Europe and North America, which went through the same phase a century ago, have understandably forgotten. Emerging economies such as the Republic of Korea that

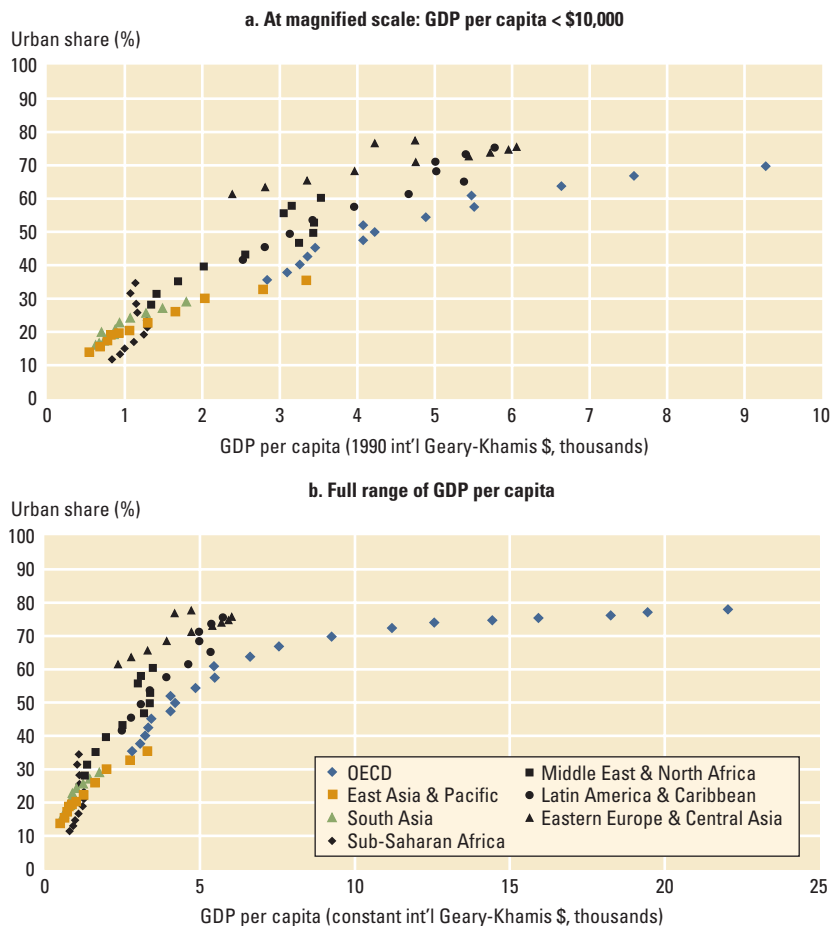


**Figure 1.4 The richer a country, the more concentrated its economic mass**



Sources: WDR team estimates based on World Bank (2007j), and databases from www.citymayor.com and www.gecon.yale.edu.

**Figure 1.5 Developing countries have a pace of urbanization similar to that of early developers**



Sources: Maddison 2006; United Nations 1969; United Nations 1949; United Nations 1952; Historical Database of the Global Environment; United Nations 2006c.

developed rapidly provide the best case studies for understanding the pace and pattern of geographic concentration. Their experience traces the initially rapid and the more gradual growth of today's wealthiest nations.

At the aggregate level, using the population shares in urban areas, the urbanization pattern of developing countries in Asia, Africa, Middle East, and Latin America over the last 50 years closely tracks the first part of the historic path earlier traversed by OECD countries between 1900 and 2000 (figure 1.5). The urbanization in Asia mirrors the rapid phase of urbanization that OECD countries experienced in the nineteenth century. Likewise, the geographic transformations in Latin America and the Caribbean, in Eastern Europe and Central Asia, and in the Middle East and North Africa are qualitatively similar to those experienced by the OECD in the first phase of urbanization. Quantitatively, the urban shares for Latin America and the Caribbean and for Eastern Europe and Central Asia regions are higher than those for the OECD at comparable incomes.

This may, however, be an artifact of the data. Data from the *World Urbanization Prospects* database systematically overstate—purely as a definitional matter—the urban shares of Latin America and the Caribbean, Eastern Europe and Central Asia, and Sub-Saharan Africa. The safest conclusion may be that the pattern of urbanization—the



### BOX 1.4 Africa's urbanization reflects industrialization

Between 1970 and 1995, the urban populations in Sub-Saharan Africa were growing at 5.2 percent a year while their GDP per capita was shrinking at 0.66 percent a year. Since the work by Fay and Opal (2000), many have argued that urbanization does not necessarily accompany development, with Sub-Saharan Africa in mind (Commission for Africa 2005). But Satterthwaite (2007) questions the validity of the urban population numbers in most studies. Since many were based on projections, some may have been grossly overestimated.

The problem is the lack of regular population censuses. For Chad and Eritrea the population projections spanning 1950 through 2030 were based on one population census. Those for the Democratic Republic of Congo were derived from two observations, the most recent for 1984. It is thus reasonable to consider only countries with at least two censuses during the period examined (1970–95), a census post-2000 for more accu-

rate population estimates, a population of at least 1 million in 1995, and data on sectoral value added for 1970 and 1995.

This whittles the sample down to just 10 countries: Benin, Botswana, Central African Republic, Ghana, Mauritania, Niger, Rwanda, Senegal, Zambia, and Zimbabwe. Of these 10 countries, five experienced conflict at least once, and the other five were peaceful throughout the period. The results do not appear to differ systematically between these two sets of countries. The main findings follow:

- Except for Botswana, the countries experienced on average a doubling of population, but only 60 percent cumulative growth in GDP. Population growth outpaced increases in gross value added, and GDP per capita fell.
- Urban population growth and total GDP growth are positively correlated. Countries with the fastest growth

in total GDP—a doubling of their economies—also witnessed the fastest growth in urban population—a four-fold increase. The leaders in the sample were Benin and Zimbabwe.

- The pace of urbanization was positively correlated with growth in industries and services, activities predominant in urban areas.

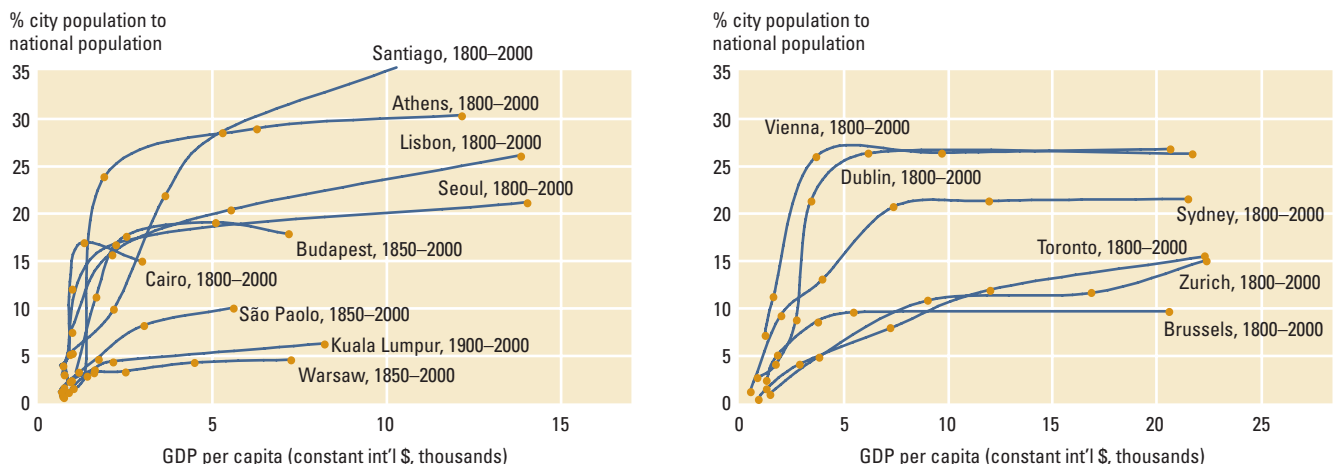
These patterns do not support the claim of African urbanization without growth. In contrast, countries with higher GDP growth experienced faster urbanization, and rapid urbanization came hand-in-hand with higher growth in industries and services. A counterfactual of an Africa without urbanization is one with even slower economic growth, greater GDP per capita losses, and increases in poverty.

Sources: Fay and Opal 2000; Satterthwaite 2007; United Nations 2006c.

relationship between economic growth and urbanization—is not unprecedented. Even in Sub-Saharan Africa, faster urbanization between 1970 and 1995, albeit with negative GDP per capita growth, was associated with higher total GDP growth. Urbanization also came hand-in-hand with rapid growth in industries and services (see box 1.4).

At a disaggregated level, the primary city's population share of a country displays a similar, nonlinear pattern of initially rapidly rising concentration, followed by a subsequent leveling (figure 1.6). This intensification of economic mass within a country's largest cities is seen for a wide range of incomes, from Budapest, Cairo, Kuala

Figure 1.6 Density intensifies rapidly in the early phase of urbanization before leveling off



Sources: WDR 2009 team estimates, based on the Staff City Population Database, Human Settlements Group, International Institute for Environment and Development (IIED). Data from 1950 to the present, primarily from United Nations (2006c); data before 1950, primarily from Chandler and Fox (1974), Chandler (1987), and Showers (1979). Latin America drew on a review of 194 published censuses.

Lumpur, and Warsaw to Athens, Lisbon, Santiago, and Seoul. These evolutions have also been observed in Brussels, Dublin, Sydney, Toronto, Vienna, and Zurich over the two centuries since 1800.

**Again today, rapidly rising concentration, then a leveling off**

A similarly shaped pattern reappears in contemporary comparisons between a country's level of development and the concentration of density. During 2000–05, the average urban population growth for low-income countries was 3 percent a year—faster than upper-middle-income countries at 1.3 percent and high-income countries at 0.9 percent. The relationship is robust. It holds for a variety of concentration measures, ranging from the agglomeration index, to population, gross product, and household consumption density. It is robust to geographic scale: an area of 1 square kilometer, a city, a grid cell of 1° longitude by 1° latitude, and an aggregated urban sector.

**Local 1-square kilometer areas.** Estimated agglomeration indexes produce a pattern similar to the historical time series: rapidly rising density for countries during the early phase of urbanization (figure 1.7). This strong positive relationship between

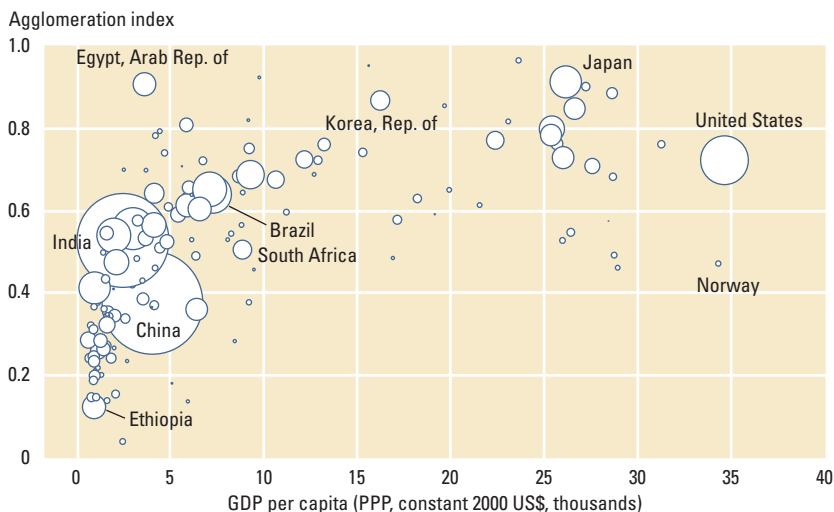
urban share and development holds until a GDP per capita of around \$10,000. This incipient urbanization is associated with a rapid shift in the number of people moving from rural to urban areas. Subsequently, the pace of urbanization slows and density levels off as the urban share surpasses 60 percent, and the level of GDP per capita surpasses \$10,000. With only a handful of exceptions, countries with GDPs per capita above \$25,000 have an agglomeration index above 70 percent.

**Administratively defined areas.** Taking individual cities as the geographic unit, a positive concave relationship exists between a country's level of development and its primacy—the share of urban population living in the country's primary city, a widely used concentration measure. Similar to the relationship between agglomerations and the level of development, primacy also rises rapidly before stabilizing during the latter stages of urbanization (see figure 1.8, panel a). Population and output density are highly correlated, but population density understates the geographic concentration of economic mass. Agglomeration economies, the benefits that firms and workers enjoy as a result of proximity, make it likely that output density will increase more than proportionately with employment or population density.

**1° longitude by 1° latitude.** Using the terrestrial grid cells to estimate concentration as the share of the densest cell's gross product in the country's GDP, concentration of economic mass rises rapidly among countries with a GDP per capita of less than \$15,000, and then stabilizes and tapers off among higher-income countries (see figure 1.8, panel b).

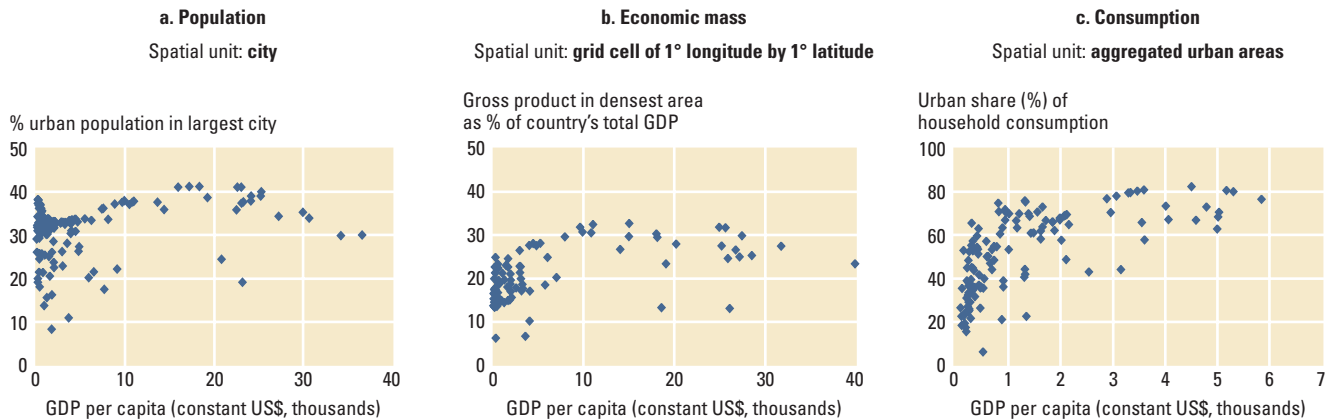
**Urban areas of countries.** Concentration measured by consumption, rather than by population or GDP, suggests the same concave relationship with the level of development. For instance, the urban shares of household consumption in Malawi and Cameroon at GDPs per capita of \$150 and \$700, respectively, are 36 percent and 48 percent. At about 63 percent, the shares are higher for Jordan and the Arab Republic of Egypt with GDP per capita of around \$1,600, and rise to 80 percent in Panama and Poland

**Figure 1.7 Shares of population living in urban agglomerations rise with the level of development**



Sources: Calculated by WDR 2009 team using Nelson (2008) and World Bank (2006g). Note: The size of each circle indicates the population size of that country. PPP = purchasing power parity. The agglomeration index uses the following criteria: density of 150 persons per kilometer or more, access time of 60 minutes or less to a sizable settlement, defined as one that has a population of more than 50,000.

**Figure 1.8 Geographic concentration of population, gross product, and household consumption rises sharply with development, then levels off**  
Cross-country evidence, late 1990s and 2000s



Sources: WDR 2009 team estimates, based on World Bank (2007j), Nordhaus (2006), and more than 120 household surveys for more than 75 countries.

with GDPs per capita of \$3,500 and \$5,000, respectively (see figure 1.8, panel c).<sup>26</sup>

### *A portfolio of bigger and denser places*

It follows from these stylized facts of geographic transformation that high-income countries have a portfolio of places with a higher proportion of large settlements and a lower proportion of small settlements than do middle-income countries. And the middle-income countries have a significantly higher proportion of medium-size settlements than do low-income countries. In low-income countries, about three-quarters of the population live in small settlements of less than 20,000 people, and only 10 percent live in urban agglomerations of more than 1 million people. In high-income countries, the opposite is true. Less than a quarter of the population live in small settlements of less than 20,000 people, and about half of the population live in settlements of more than 1 million people (see table 1.1).

At an incipient stage of urbanization, the portfolio of places in a small country or part of a larger country, such as a province or even a large district, can be approximated as 75 percent rural and 25 percent urban, all settlements of relatively low density. As urbanization accelerates—still predominantly a rural-urban transformation driven by industrialization—and the area or province grows toward a GDP per capita of \$10,000, its distribution of settlements

will approximate a 50/50 urban-rural split. During more advanced urbanization—now a within-urban transformation in a postindustrial area—the distribution of population can be approximated as 75 percent urban and 25 percent rural.

This generalization corresponds well to the experience of the United States. In 1690, when the average GDP per capita was a mere \$500 (1990 international dollars),<sup>27</sup> the primary city in colonial British America was Boston. With a population of 7,000, however, Boston was by modern-day standards little bigger than a small town. In the urban hierarchy, only three other cities had populations greater than 2,500, two of them New York and Philadelphia. The early phase of American industrialization brought with it an increase in the urban share from 7 percent in 1820 to 20 percent in 1860, as GDPs per capita rose from \$1,257 to \$2,170 (1990 international dollars). During this time, the population of the primary city, now New York, expanded from 123,706 to 805,651. Its rapid growth allowed the urban hierarchy to expand and stretch out.

**Table 1.1 The size of urban settlements grows with development**

Population size	Low-income countries (%)	Middle-income countries (%)	High-income countries (%)
Small settlements: less than 20,000	73	55	22
Medium settlements: 20,000 to 1 million	16	25	26
Large settlements: more than 1 million	11	20	52

Source: World Bank 2007j.

The number of cities with a population greater than 1 million increased from just one, New York, in 1820 to nine in 1860. All these cities were in the Northeast, where industrialization began. As the geographic transformation wore on, and the United States completed its transition to a mature industrial economy, population density in a consistent sample of U.S. cities with populations greater than 25,000 increased from 7,230 persons per square mile to 8,876 per square mile. The average land area of a city increased from about 19 square miles to 40 square miles.<sup>28</sup> Cities became more packed and more sprawling at the same time.

### **Convergence—rural-urban and within cities**

A “bumpy” economic geography distributing production and people unevenly across the space in a country is a natural feature of the working of a market economy. This bumpiness tends to become more pronounced as a country develops. The question often asked is: what does this do to the geographic distribution of poverty, consumption, and other living standards? The answer can determine the political and social sustainability of the process of concentration.

#### ***Rural-urban disparities in well-being—first wide, then narrow***

Rural-urban disparities in productivity, wages, and well-being can be expected to be large and increasing in the earlier stages of development. With the rapidly increasing concentration of economic mass in a country’s towns and cities in the earlier stages of development, significant disparities in productivity, wages, and basic welfare occur between urban and rural areas. The agglomeration of capital, consumers, and workers quickly brings production advantages, and transport costs restrict the benefits to the locality. These larger local markets enable firms to spread the fixed costs of production across a wider number of consumers, producing cost and productivity advantages.<sup>29</sup> This means higher wages in towns and cities, and greater availability of a more diversified range of goods and services.

The concentration of mass also helps to ensure a better supply of basic infrastructure

and public health facilities in urban areas. Along with diverging wages, this promotes divergence in more basic measures of welfare between urban and rural areas.<sup>30</sup> But rural-urban disparities begin to narrow as the urbanization process slows, and governments become more capable. The exodus of people and workers from rural areas to towns and cities reduces surplus labor from the land in agriculture—and reduces competition between workers in rural labor markets. And labor-saving technological progress releases labor for migration to urban areas and improves productivity. In time, investments and fiscal redistributions give rural residents better local access to basic amenities, such as a clean daily source of running water, sanitation, and electricity, as well as schooling and health care. Indeed, with development and the passage of time, a country’s economic geography approximates a “natural” balance that equalizes welfare between urban and rural residents. In this situation, people choose to live where they expect to be best off in material and nonmaterial well-being. The Islamic Republic of Iran illustrates this rural-urban convergence (see box 1.5).

Evidence from today’s industrial countries suggests that development has largely eliminated rural-urban disparities. High urban shares and concentrated economic density go hand in hand with small differences in rural-urban well-being on a range of indicators. The 15 countries that joined the European Union (EU) before 2004, all with GDPs per capita in excess of \$13,000 (1990 international dollars), consider the unemployment rate an important policy target.<sup>31</sup> But rural-urban unemployment differences should not be a concern. The unemployment rates are 10.1 percent for urban areas, and 9.9 percent for rural areas. This is also evident for youth: 19.4 percent in urban areas compared with 18.7 percent in rural areas. The rates of labor force participation in urban and rural areas are 68.3 and 69.4 percent, respectively.<sup>32</sup> For England, the high degree of rural-urban equality in well-being is reflected in similar disposable incomes: indeed, at £522, weekly disposable income in villages is 10 percent higher than the £476 in cities.<sup>33</sup>

### BOX 1.5 *Urbanization and narrowing rural-urban disparities in the Islamic Republic of Iran*

Rural-urban disparities have narrowed in the Islamic Republic of Iran. In 1976, on the eve of the Iranian revolution, the mean per capita household income in rural areas was 44 percent of that in urban areas. By 2005, it had increased to 63 percent.

The Shah's government favored cities over the countryside. Price controls for essential foods depressed agricultural incomes. High tariffs, import bans, and licensing for industrial goods propped up prices of manufactured goods and depressed farmers' purchasing power. An inward-looking development strategy oriented toward final domestic demand amplified internal migration to Tehran and a few other large cities. For every indicator of development, the center performed far better than the periphery. In 1973, the poverty rate was 23 percent in the central region and 42 percent for the country. This spatial inequality matched the nation's ethnic map, fueling tensions.

What has happened since the commitment in 1979 to address spatial disparities?

- First, the share of the urban population has increased from 49 to 67 percent between 1979 and 2005. This is a continuation of a longer-term trend: the urban population had grown by 5.4 percent per year (and in Tehran by 6 percent) between 1966 and 1976.
- Second, the rural-urban gap in household incomes has narrowed. Between 1976 and 1984, agricultural value added grew by 31 percent, twice the rate of the nonoil economy. One reason for this growth was that farmgate prices rose 55 percent. Another reason was that more was spent on projects to increase the productivity of small and medium-size farms. Growth could also be attributed to the fact that agricultural production in the Islamic Republic of Iran is dominated by the private sector, whereas large industrial enterprises and service providers were nationalized after the revolution, which hindered their efficiency.
- Third, rural and urban human development indicators improved, even in

the lagging provinces. Between 1976 and 1996, the female literacy rate rose from 17 to 62 percent, while for urban women it rose from 56 to 82 percent. During 1994–2000, infant mortality and under-5 mortality fell fastest in the poorest provinces.

- Finally, overall poverty has fallen. The national poverty rate was at 8.1 percent in 2005, with relatively modest differences in rural and urban poverty of 10 and 7.1 percent, respectively. But poverty rates still vary a lot between provinces, ranging from 1.4 to 23.3 percent.

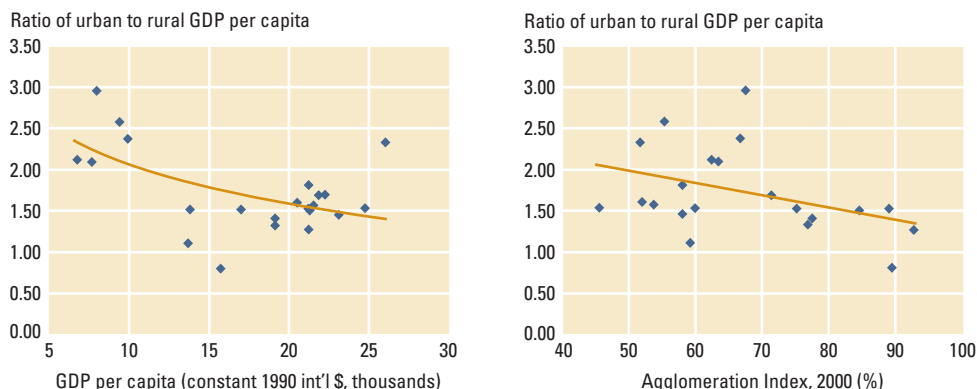
The political commitment to spatial equity has produced mixed outcomes during the last 30 years: overall poverty declines and a convergence in rural-urban standards of living, but persistent differences in interprovincial living standards.

Based on a contribution by Anton Dobrogov, Alexander Kremer, and others.

For 21 of the 30 OECD countries, the higher the GDP per capita in 2003,<sup>34</sup> the lower the ratio of GDP per capita in predominantly urban areas to that in rural areas (see figure 1.9).<sup>35</sup> For the Czech Republic, Hungary, Poland, the Slovak Republic, and Turkey, with an average GDP per capita below \$10,000 (1990 international dollars), GDP per capita in urban areas is two to

three times higher. But for OECD countries with average GDPs per capita above \$10,000, the ratio is between one and two (except for Norway). Given the well-developed fiscal redistribution mechanisms in OECD countries, and differences in age-demographic profiles between urban and rural areas, these disparities in GDP per capita will overstate rural-urban differences in, say,

**Figure 1.9 Rural-urban disparities in GDP per capita tend to be smaller in richer OECD countries**



Source: WDR 2009 team, based on data from OECD (2007), pp. 1–256.



**Table 1.2 Rural-urban disparities in earnings, wealth, and consumption characterize development over the last two centuries**

Country (year)	Rural-urban disparity (%)	Description and country sample
Sweden (1805)	221.0	Wealth per male adult in urban and rural areas.
Finland (1805)	146.0	Wealth per male adult in urban and rural areas.
England (1830s)	73.2	Urban wages are wages per laborer in the building trades, and rural wages are for agricultural laborers.
France (1882)	29.0	Urban wages are for unskilled wages in the regional capital city (department <i>chef lieu</i> ), and rural wages are based on average farm wages .
France (1911)	51.0	
United States (1925)	28.0	Urban earnings are manufacturing earnings, and rural earnings are agricultural earnings.
United States (1935)	75.0	
Developing countries (nineteenth century)	51.2	Urban wages are for unskilled general laborers, and rural wages are agricultural wages, including payments in kind. The countries included are Argentina 1872; Australia 1887; Denmark 1872; France 1892, 1801; Hungary 1865; Japan 1887; and the United States 1820–29, 1890.
Developing countries (twentieth century)	41.4	Urban wages are based on wages for unskilled construction workers, and rural wages are agricultural cash wages. There are 19 countries (1960–70) underlying this average: Argentina, Cameroon, Chile, Costa Rica, Côte d'Ivoire, Guatemala, Kenya, Pakistan, Malawi, Malaysia, Mexico, Morocco, Panama, Sri Lanka, Tanzania, Trinidad and Tobago, Tunisia, Uruguay, and R. B. de Venezuela.
Developing countries (twenty-first century)	42.0	Based on per capita household consumption, after controlling for household characteristics. There are 72 countries (2000–05) underlying this average disparity: Armenia, Angola, Bangladesh, Belize, Benin, Bhutan, Bolivia, Brazil, Burkina Faso, Burundi, Bulgaria, Cambodia, Cameroon, Chad, Chile, Colombia, Dem. Rep. of Congo, Costa Rica, Côte d'Ivoire, Croatia, Djibouti, Ecuador, Arab Rep. of Egypt, El Salvador, Ethiopia, The Gambia, Georgia, Ghana, Guatemala, Guinea, Guyana, Honduras, Hungary, India, Indonesia, Jamaica, Jordan, Kyrgyz Republic, Madagascar, Malawi, Maldives, Mali, Mauritania, Mexico, Moldova, Mongolia, Morocco, Mozambique, Nepal, Nicaragua, Nigeria, Pakistan, Panama, Paraguay, Peru, Philippines, Poland, Romania, Russian Federation, Rwanda, Senegal, South Africa, Sri Lanka, Swaziland, Tajikistan, Tanzania, Thailand, Timor-Leste, Uganda, Ukraine, Vietnam, and Zambia.

Sources: Sweden and Finland 1805: Soltow 1989, table 1, p. 48; England 1830s: Williamson 1987, table 3, p. 652; France 1882, 1911: Sicsic 1992, table 2, p. 685; United States 1925, 1935: Alston and Hatton 1991, table 3, p. 93; Developing countries (nineteenth century): Clark 1957, table II pp. 526–31;

Developing countries (twentieth century): Squire 1981, table 30, p. 102; Developing countries (twenty-first century): WDR 2009 team estimates based on individual country's household survey for 72 countries; the data set is described in detail in Montenegro and Hirn (2008).

Note: Rural-urban disparity (in nominal terms) is computed as the difference in wages, earnings, wealth, or consumption between urban and rural areas relative to the rural averages.

average levels of personal disposable income and consumption. The agglomeration index produces the same qualitative pattern.

Rural-urban disparities in these countries were wide throughout the nineteenth and early twentieth centuries. Wealth per male adult in nineteenth century Sweden was more than 200 percent higher in urban areas than in rural areas, and 150 percent higher in Finland (see table 1.2). Meanwhile, for rapidly urbanizing England, urban wages were more than 70 percent higher than rural wages in the 1830s. France and the United States saw big increases in the urban wage premium from 1882 to 1911 and from 1925 to 1935. Indeed, in the United States, the premium increased almost threefold in a decade.<sup>36</sup> For developing countries in the nineteenth century, including Australia, Denmark, France, Japan, and the United States, urban nominal wages were 50 percent higher.

Today's developing countries are still in the first phase of urbanization and, not surprisingly, have large rural-urban

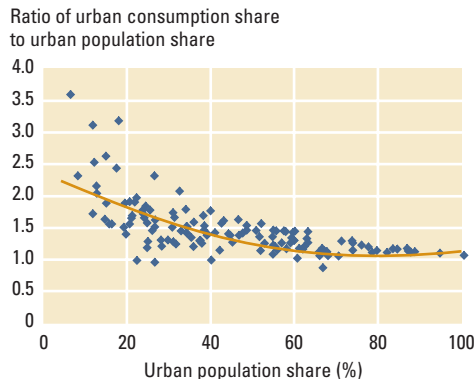
disparities in productivity and income. For a sample of developing countries in the 1960s—among them Malaysia, Mexico, and Trinidad and Tobago, which have since reached upper-middle-income or high-income status—urban wages exceeded rural wages by more than 40 percent. Similar gaps can be observed in per capita consumption between urban and rural areas for a recent sample of 72 developing countries.

The rural-urban discrepancy between economic mass and population distributions diminishes with urbanization. Another way to examine consumption disparities between urban and rural areas is to look at the population share of a country's urban areas and compare it with the share of consumption in these areas. If this ratio is greater than one, consumption per capita is, on average, higher in urban areas than in rural areas, while the converse is true if the ratio is less than one.

Rural-urban disparities in consumption fall with density in today's developing



**Figure 1.10 Rural-urban gaps in per capita consumption become smaller with urbanization**



Source: WDR 2009 team estimates from more than 120 household surveys for more than 75 countries.

countries (see figure 1.10).<sup>37</sup> In Malawi and Sri Lanka the ratio is around two: urban areas account for about 10 percent of the population but 20 percent of consumption. For countries with higher levels of urbanization, the spatial distribution of population more closely resembles that of production. Madagascar and Tanzania have urban population shares of around 20 to 25 percent and urban consumption shares of about 30 to 35 percent. By the time a country enters an advanced stage of urbanization, population is more or less proportionately distributed with economic mass, so that the ratio is close to one. In Chile 85 percent of the population reside in urban areas, and these urban residents account for 92 percent of national consumption. In Brazil 80 percent of people live in urban settlements, and these 80 percent are responsible for 85 percent of consumption. As development progresses and the concentration of economic activity in areas of high density increases, rural-urban disparities narrow. A downward sloping line at all levels of urbanization is a good omen: most developing countries may have passed the peak in their rural-urban disparities.<sup>38</sup>

What is true for private consumption is true for basic amenities. Among low-income countries with urban population shares of less than 25 percent, access to water and sanitation in towns and cities is around 25 percentage points higher than in rural areas.<sup>39</sup> But for more urbanized countries, such as Algeria, Colombia, and South Africa, the disparity in access is 15 to 20 percentage

points. For countries where urbanization is advanced and the urban share is approaching its natural maximum, almost no difference exists between urban and rural areas in access to basic services. Equalization of access to basic services can be expected to promote a corresponding convergence in nonmaterial indicators of welfare and living standards (see table 1.3).

Narrowing rural-urban disparities is important, but the progress in absolute measures of basic welfare in the rural areas of the world's poorest countries is even more important. Rising rural-urban disparities are consistent with an absolute improvement in basic welfare in both rural and urban areas. The overall evidence is encouraging. Over the past decade, most low- and middle-income countries have experienced absolute improvements on a range of basic welfare indicators, including infant and under-5 mortality rates, malnutrition, immunization, and school participation in rural and urban areas. Of 32 low-income countries, three-quarters reduced infant and under-5 mortality rates and the incidence of severe stunting and severe underweight, especially in rural areas.<sup>40</sup> And since 1990, school attendance rose in four-fifths of these countries, especially in rural areas.<sup>41</sup> Both

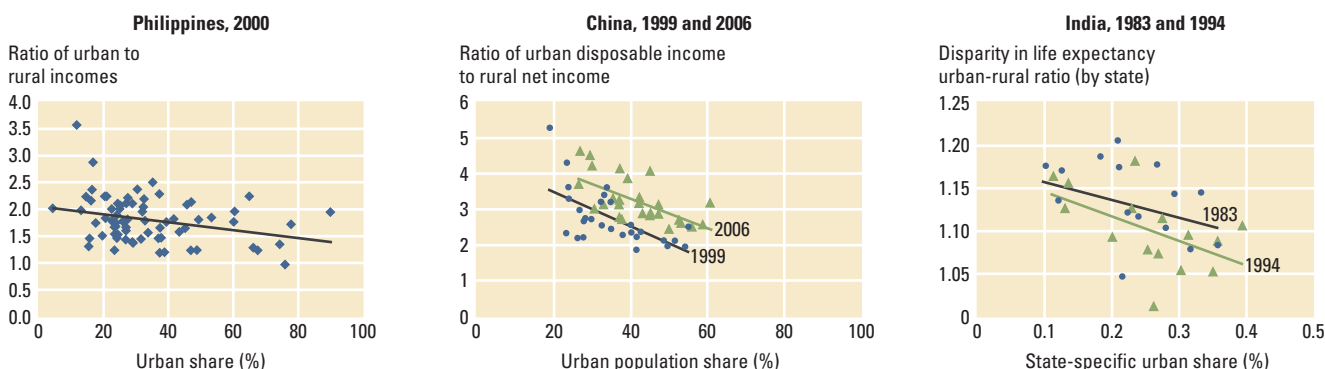
**Table 1.3 Rural-urban disparity in basic services narrows with development**

Urban population share (mean GDP per capita)	Disparity in access to clean water (percentage points)	Disparity in access to sanitation (percentage points)	Examples of countries in the sample
75% or higher (mean GDP per capita: \$21,602)	8	8	United States, Norway, Switzerland, Spain, Germany, Canada, Mexico, Chile, Brazil, Argentina, Gabon, R. B. de Venezuela, Djibouti, Lebanon, Jordan, United Kingdom
50%–70% (mean GDP per capita: \$9,672)	15	20	Estonia, Panama, Turkey, Hungary, Ecuador, Colombia, Malaysia, Syria, Azerbaijan, South Africa, Rep. of Congo, Algeria, Tunisia, Bolivia
25% or lower (mean GDP per capita: \$2,585)	24	26	India, Rep. of Yemen, Madagascar, Chad, Tajikistan, Bangladesh, Tanzania, Kenya, Nepal, Cambodia, Malawi, Uganda, Sri Lanka, Bhutan

Source: World Bank 2007j.

Note: Disparity refers to the percentage point difference between urban and rural areas.

**Figure 1.11 Even at the subnational level, rural-urban disparities fall as density increases**



Sources: Balisacan, Hill, and Piza forthcoming; Yao forthcoming; Cali 2008.

urban and rural areas in these nations have achieved progress toward the Millennium Development Goals.

Rural-urban convergence takes place sooner in more urbanized subnational areas. In both China and the Philippines, urbanized provinces exhibit lower internal urban-rural disparities in incomes (see figure 1.11). In China the entire relationship has shifted upward over the past decade so that, in general, rural-urban disparities have increased over time, consistent with China’s early stage of development, which is marked by rapid urbanization. In India rural-urban gaps in life expectancy were smaller in the more urbanized states in both 1983 and 1994. But the entire relationship has shifted downward over time.

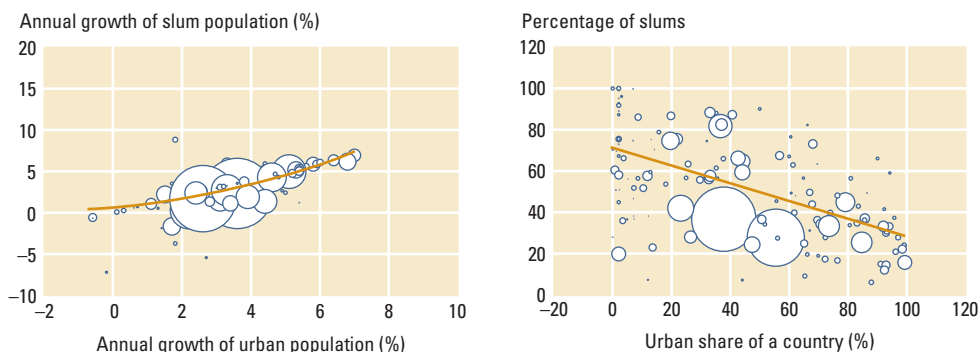
**Slums—divergence and convergence within cities**

In poor countries, higher average living standards in cities do not rule out poverty

and deprivation. Disparities within cities can be large. In Nairobi poverty is high in the inner city but much lower in the rest of the city and the suburbs (see figure 1.12). In Mombasa, Kenya’s second-most-populous city, marked geographic divisions in the poverty rate are evident (see map 1.2). South African cities also show internal disparities in the poverty rate. Cape Town has a low poverty rate in the coastal areas, but a higher poverty rate in the interior of the city. Similarly, both Johannesburg-Pretoria-Tshwane and Durban have visible divisions. But the geography of poverty in Durban is different from that in Cape Town and Johannesburg: the poverty rate is, in general, higher outside the city boundaries than inside.

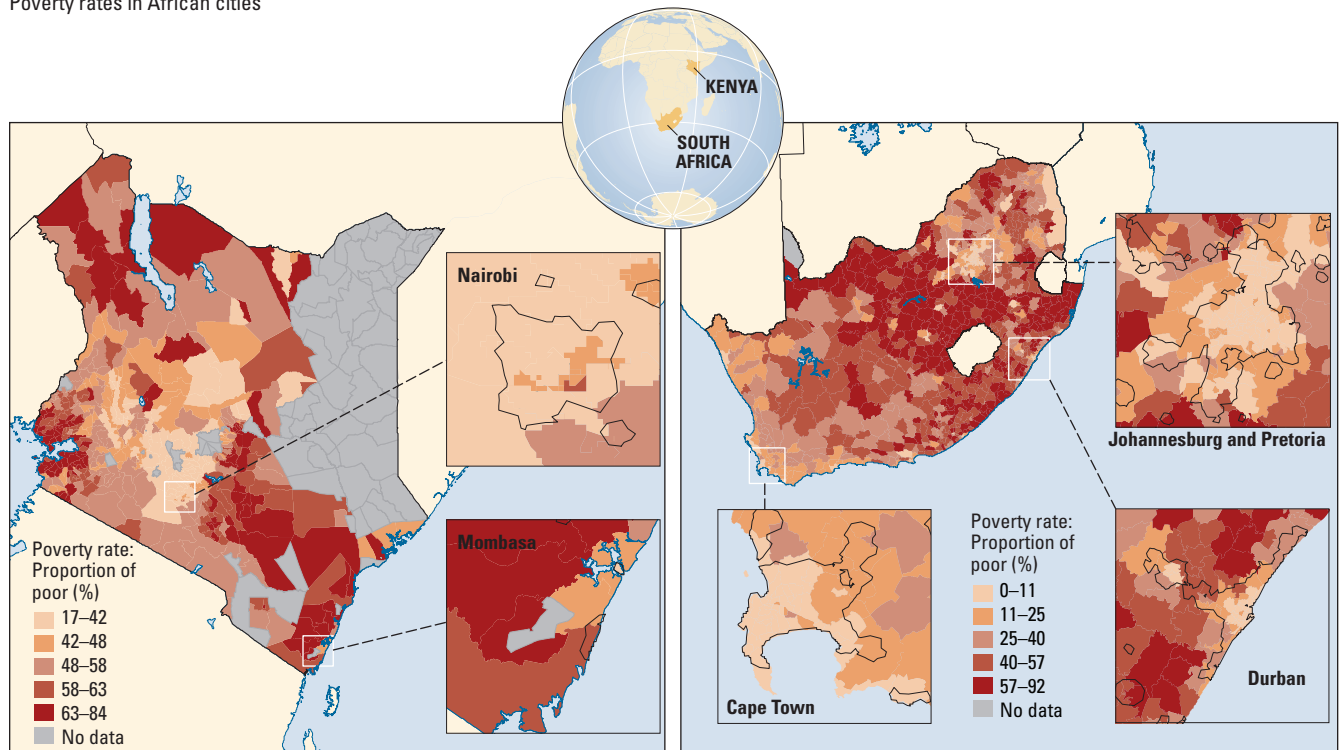
The most obvious sign of divisions within cities is slums. Slums have chronically overcrowded dwellings of poor quality in underserved areas. The reason for the lack of basic public services and infrastructure is the inability or unwillingness of many urban

**Figure 1.12 Slums grow with the pace of urbanization, and fall with its level**



Source: Kilroy 2008.

**Map 1.2 Local divisions—spatial disparities within urban settlements can be large**  
Poverty rates in African cities



Source: The Poverty Mapping Project, Columbia University, using data from Alderman and others (2002); Statistics South Africa; the Central Bureau of Statistics, Kenya; and the Ministry of Planning and National Development, Kenya.

governments, utilities, and service providers to operate in slums, generally because of the informality and illegality of such settlements.<sup>42</sup> So living standards, especially health, security, and sanitation, are lower in slums than in formal settlements close by. Mumbai's Dharavi, believed to be Asia's biggest slum, has "maybe a million residents . . . crammed into a square mile of low rise wood, concrete and rusted iron . . . a family of 12 living in a 90-square-foot room." In Shiva Shakti Nagar, again in Mumbai, each community tap is shared by roughly 100 people.<sup>43</sup>

The growth of slums in major cities is characteristic of rapid urbanization. Because rapid population growth cannot be satisfactorily accommodated, slums and shantytowns grow bigger and more visible. This contributes to wide and increasing geographic divisions in well-being within urban areas. Development—both economic and institutional—and better infrastructure, combined with focused interventions, eventually bring about a convergence in living standards in urban areas.

Slums are part of rapid urbanization, and it is not uncommon for a fifth to a third of a city's population in a contemporary developing country to reside in slums (see figure 1.12).<sup>44</sup> Goiânia, the capital of the Brazilian state of Goiás, a medium-size city of 40,000 in 1950, is today a city of more than 1 million, with much of the population increase accommodated in slums.<sup>45</sup> Since 1950, Delhi's population has risen more than tenfold, from 1.4 million to 15.6 million,<sup>46</sup> accompanied by an increase in the number of slum clusters from 200 to 1,160.

"A dirtier or more wretched place he had never seen. The street was narrow and muddy, and the air was impregnated with filthy odors. . . . Covered ways and yards, which here and there diverged from the main street, disclosed little knots of houses, where drunken men and women were positively wallowing in filth." A contemporary description of a developing country slum such as Nairobi's Kibera or Huruma, Abidjan's Washington, Delhi's Majboor Nagar or Kanchan Puri, Buenos Aires's San Fernando,

### BOX 1.6 *Slums, then and now*

The term “slum,” probably originating from an old English or German word meaning a poorly drained or muddy place, was applied to housing in the early Industrial Revolution in the United Kingdom before the railways were in place, when canals transported heavy goods along the length and breadth of the country. During Britain’s rapid industrialization, most factories were built beside canals, the main channel for transporting coal for their steam engines and other inputs of production.

Poor workers, migrating to cities for factory jobs, could ill afford to walk long distances to and from their places of work. Before electric trams, other forms of transport were expensive. So workers settled close to factories. Cheap housing grew around these factories in low-lying, poorly drained areas. Housing was overcrowded. Sanitation was inadequate and in most cases nonexistent. And air quality was poor, with soot and other pollutants. Sickness was commonplace. Diarrhea, typhus, respiratory diseases, measles, and scarlet fever cut the life expectancy of those born in cities by 12 years compared with those born in rural areas.

The growing public health hazards in Britain’s urban slums exacted a terrible health toll that eventually

reached out beyond the working class, finally motivating strong political action. But rather than attempting to stop more workers from coming, or clearing out these areas of disease and poverty, the government in the 1870s passed legislation for strict building regulations, prescribing the dimensions of streets and houses, and making it mandatory that all dwellings be connected to newly built sewerage systems. Major municipal investments in water works, sewage facilities, and public health dramatically reduced mortality in Britain’s cities between 1874 and 1907.

Despite atrocious and filthy conditions, millions of migrants keep leaving rural areas for the teeming economic opportunity offered in the cities of poor and middle-income countries. Even though health hazards and mortality rates are far worse in the shanties around many cities in Africa, people there are trading, working, and sending large sums of money home. The challenge facing policy makers today is similar to that faced by the Victorians in London: how to nurture these agglomerations with functional land markets, better transport, and public health infrastructure to capture the benefits of economic growth.

Sources: Satterthwaite and others 2007; Crafts 2008; *The Economist* 2007a.

or Rio de Janeiro’s Rocinha? No, this is an excerpt from Charles Dickens’s *Parish Boy’s Progress*, published in 1838, describing the rapidly expanding city of London in the nineteenth century (see box 1.6).

London was by no means the only city or urban area in nineteenth century Britain with large slum settlements. Chronically overcrowded and inadequately serviced housing was a common feature of British cities and industrial towns of the time. In Edinburgh rapid population growth and a first wave of suburbanization by the then-rising middle classes meant that by the 1860s, the core of the city had a large slum area with population densities as high as 600 persons per acre. Residents in this area lived

in multistory tenements arranged along narrow, unlit foot passages. This “housing was hopelessly inadequate in all respects—in quantity, in quality and environmental amenities, if needs as basic as clean water and safe sewage disposal can be described as amenities.”<sup>47</sup> Apart from the obvious misery, slums were prone to deadly outbreaks of measles and scarlet fever and high rates of mortality attributable to diarrheal diseases, typhus, and respiratory diseases.<sup>48</sup>

Yesterday’s slums are today’s world-class cities. Britain is not the only industrial country to suffer from slums and wide intracity divisions in welfare during the earlier phases of development and rapid urbanization (see box 1.7). The stylized pattern of divergence followed by convergence is a hallmark of other modern-day developed countries as well. Slums for these cities are now much a thing of the past. Aided by improving land markets, investments in infrastructure, and targeted incentives, within-city welfare disparities tend to narrow, but only in the more advanced stages of urbanization. Indeed, for “world” cities such as London, New York, Paris, Singapore, and Tokyo, slums can, with the benefit of hindsight, be viewed as part of their “growing pains.” Britain cleaned up its Dark Satanic Mills over a century, and if it had started the cleanup sooner, the working class would have suffered from slower wage growth and lower consumption.<sup>49</sup>

The emergence and growth of slums in the early and intermediate stages of a country’s development can be explained by the interaction of functioning labor markets with dysfunctional land markets. In the rapid phase of urbanization, the labor market signals higher labor demand in urban areas, the higher demand that arises from growth in industries and services. Labor responds by moving to towns and cities.

As a reflection of this, slum dwellers in developing countries are often productively engaged, taking advantage of the economic opportunities the city offers. Mumbai’s Dharavi has 15,000 “hutment” factories, and “the clothes, pots, toys and recycled materials its residents produce earn the factories millions of dollars a year.” Many slum residents started businesses after the state government provided them with limited

### BOX 1.7 *Many of today's world-class cities were littered with slums*

"In **Antwerp** and in most Belgian towns the basic problem in matters of working class housing was . . . no individual sanitation or individual water supply. . . . The three heavy cholera epidemics of the 19th century had terrific effects in these slums . . ."

"The first encampments of **Baltimore's** poor were at the water's edge. Time and again, outbreaks of yellow fever, malaria, cholera, typhoid fever swept the town. These epidemics seemed peculiarly associated with the low-lying encampments of the poor. The yellow fever epidemic of 1797, for example, was said to have begun in the stagnant waters of the Fells Point cove and to have spread . . . to the huts and hovels on the banks of the Jones Falls and thence on to the shacks and shanties at the foot of Federal Hill."

"By the 1890s, Polish immigrants had supplanted the Irish and Germans, creating a ghetto of a new dimension. Single dwellings housed from six to eight families, one [family] to a room. . . . Fells Point was described by a health official as an Augean stable . . . a mass of nuisance . . . Open drains, great lots filled with high weeds, ashes and garbage accumulated in the alleyways, cellars filled with black water, houses that are total strangers to the touch of whitewash or scrubbing brush, human bodies that have been strangers for months to soap and water . . . that's Pigtown."

"The slums of **Dublin** were among the worst in Europe, rivaled only by **Glasgow**. Tall town houses, originally built as elegant homes for the rich in the eighteenth century, fell into the Tomae hands of avaricious and pitiless landlords who filled them to bursting point with the desperate and impoverished urban poor. Conditions were often unspeakably vile, with massive over-crowding and utterly inadequate sanitation."

"Katajanokka's transformation in its entirety from a low-income housing area to an enclave for the city's civil service elite and bourgeoisie represented an urban growth pattern that emerged for the first time in the history of **Helsinki**. A former slum had become a prestigious residential area for the privileged classes."

"Here the background embraces the pauper burial-ground, the station of the **Liverpool** and **Leeds** railway, and, in the rear of this, the Workhouse, the "Poor-Law Bastille" of **Manchester**, which, . . . looks threateningly upon the working-people's quarter below. . . . Passing along a rough bank, among stakes and washing-lines, one penetrates into this chaos of small one-storied, one-roomed huts, in most of which there is no artificial floor; kitchen, living and sleeping-room all in one. In such a hole, scarcely five feet long by six broad, I found two beds—and such bedsteads and beds!—which, with a staircase and chimney-place, exactly filled the room."

"**Melbourne's** most infamous slum, Little Bourke Street, . . . by the 1880s . . . was crowded, bustling and growing. . . . The lane is completely filled up with all kinds of filth comprising garbage tips, putrid liquid, straw rags, and other rubbish. A most disagreeable odor arose from this offensive mass . . . the loathsome mass . . . exposed and allowed to rot and spread its contaminating influences."

"About 200 years ago, Lower **Manhattan** was adorned by a pretty five-acre lake known as the Collect. . . . By the mid-1700s, however, the Collect was already rimmed with slaughterhouses and tanneries. The effusions from these bloody businesses were poured directly into the lake and more industries, more trash, quickly followed. By 1800 the Collect was a reeking cesspool. By 1813 it had been entirely filled in and by 1825 something entirely new stood on the site—America's first real slum, the Five Points."

"Although this is a hugely expensive area in **Paris** to live today, in Victor Hugo's day it was a slum area, close to the Bastille Prison."

"[T]he lawyer Derville ventures into the slums of Saint Marceau, the poorest section at the outskirts of **Paris**. Taking his coach through the filthy rutted lanes, he arrives at a broken-down building, made entirely of second-hand materials and poorly built, where Colonel Chabert is lodged with the cows, goats, rabbits and impoverished family of a former regimen-

tal soldier turned milkman, Vergniaud. There the Colonel lives in a single room with a dirt floor and a straw bed."

"Between 1815 and 1851 France's population grew from 29 to 36 million . . . it was the cities that absorbed the thousands of migrants unable to find work in the countryside. . . . But there were simply not enough jobs. Unemployment and overcrowding created appalling living conditions. Only one in five houses had running water. In 1832 cholera wiped out some 20,000 Parisians."

"Like so many other European cities, **Paris** suffered from chronic post-war housing shortages. Of the 17 slum areas designed for clearance, most were still intact in the 1950s."

"One of the worst outrages of industrialism in China against humanity is the herding of these workers in noisome slums in the factory districts, . . . so foul and revolting . . . in **Shanghai**. . . . There are no sanitary provisions of any kind, and the passages between the rows of houses are practically open latrines. Overcrowding exists to a distressing extent. The many children who are reared in these filthy quarters are covered with running sores from dirt and bodily neglect."

"In the 15 years between 1930 and the end of the war, the population of **Singapore** doubled to a million people. The population explosion had generated a housing shortage of epidemic proportions. Small shophouses gave shelter to as many as 100 people. The average living space was 9 feet by 9 feet, about the size of a prison cell."

"All of the ghettos of the 1920s within the city of **Tokyo** were products of Tokyo's urban development and Japan's modern economic growth. . . . The sheer size of these ghettos was astonishing. . . . Poverty pockets re-emerged in all parts of the metropolis of Tokyo after the Second World War, even in the midst of the old city of Tokyo."

Sources: Belgium: Lis; Baltimore: Garrett 2002; Dublin: Kearns 2006; Helsinki: Mäkinen; Manchester: Engels 1987; Melbourne: Mountford; Manhattan: Baker 2001; Paris: Sanderson, Villon 2000, *The Economist*; Shanghai: Schwenning 1927; Singapore: Baker 1999; Tokyo: Koji 1969.



rights over their dwellings in 1976 and began to supply water and power to parts of the settlement. Because Dharavi is sandwiched between the city’s two main railway lines and is surrounded by six stations, it also acts as Mumbai’s transportation hub.<sup>50</sup> In short, slums arise in many developing countries as low-income households take advantage of spatially concentrated employment opportunities and as businesses take advantage of their location in a land-constrained environment. Consistent with today’s industrial countries, the correct response is not to slow, stop, or reverse urbanization. It is to tackle dysfunctional land markets.

The interplay of such market forces and responses from rational market actors can also be seen in many Sub-Saharan African countries. But inefficient land markets, often thanks to misguided urban planning and zoning, produce only a limited and unresponsive supply of affordable, legal land sites for building housing to keep pace with the demand.<sup>51</sup>

### What’s different for today’s developers?

At the beginning of the nineteenth century, one person in every 10 in today’s developed

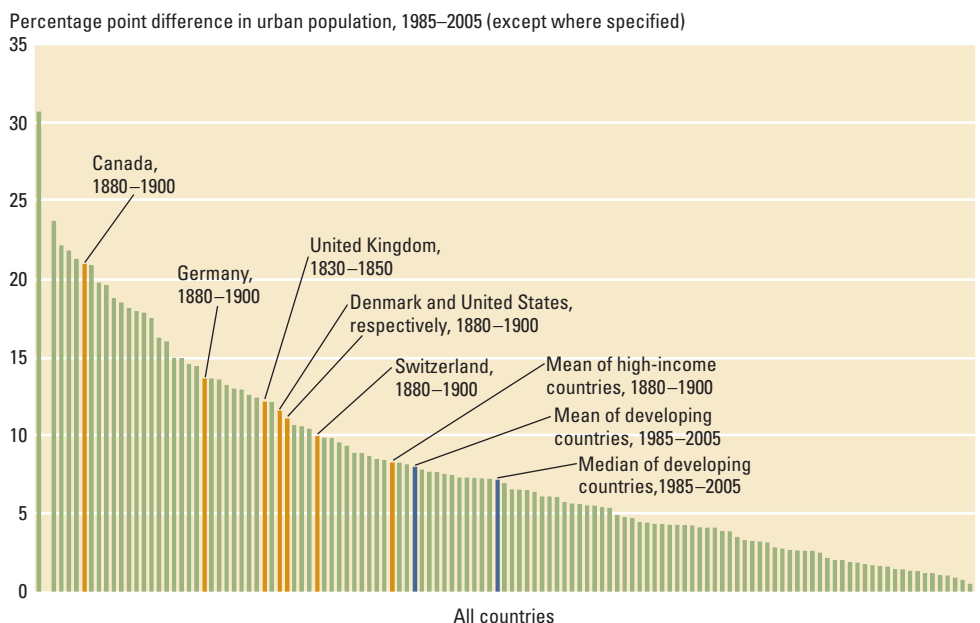
European countries lived in urban settlements of 5,000 inhabitants or more.<sup>52</sup> In this respect, at least, little had changed from the previous five centuries. So the takeoff into urbanization over the next century broke dramatically from the past.

### The pace and pattern of urbanization is similar

It started in Great Britain. In 1800 Britain’s urban share stood at 19.2 percent, about twice the European average. But in the first two decades of the century, the number of people living in urban areas doubled. By 1820 the urban share was 40 percent. By the close of the century, seven of every 10 Britons were living in urban settlements. Britain was joined in its headlong rush into urbanization by other early European industrializers. By the second half of the nineteenth century, urbanization spread beyond the Old World to the United States and Canada. By World War I, four of every 10 Americans were living in urban settlements with populations of 5,000 or greater; just 60 years earlier, the ratio was one in 20.

So if anything is different for today’s developers, it is certainly not the pace of urbanization. Indeed, the average pace of

**Figure 1.13 Urbanization’s speed has precedents**



Sources: WDR 2009 team calculations based on data from the United Nations (2006c); historical data for Canada, the United Kingdom, and industrial countries’ averages are from Bairoch and Goertz (1986) and Dumke (1994).



urbanization for developing countries over 1985–2005 is remarkably similar to the average for European and North American countries<sup>53</sup> between 1880 and 1900 (see figure 1.13).<sup>54</sup> For the early developers the average absolute increase in the urban share over the 20 years was 7.7 percentage points, and for current developers the respective median and mean absolute increases were 7.1 and 8.0 percentage points. The pace of urbanization among most of the early developers in the last two decades of the nineteenth century ranked in the top quartile of the contemporary distribution of urbanization speeds.

### *The volume of urbanization is greater for today's developers*

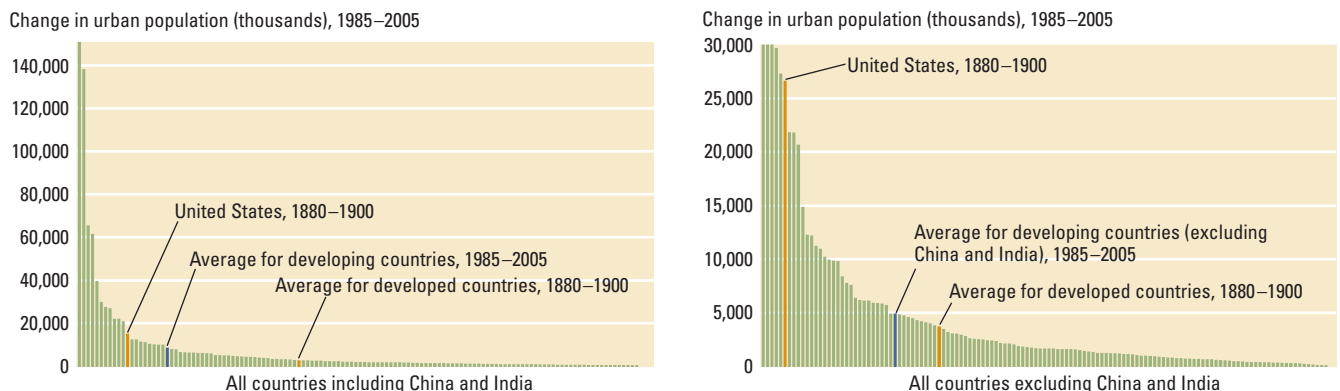
What then is different? One difference is the unprecedented absolute increases in urban populations in many developing countries in recent decades. Today's developing countries simply have larger populations than the industrializing countries of the nineteenth and early twentieth centuries. The urban population today, estimated at 3.3 billion, is far greater than the world's total population as recently as 1960. It took more than 10,000 years for the urban population to reach 1 billion in 1960, 25 years to add the second billion, and only 18 to add the third.<sup>55</sup> According to the UN projection, it will take just 15 years to add the fourth.<sup>56</sup> In East Asia alone, 500 million people will join today's 750 million urbanites over the next 25 years, essentially adding another Paris or Kuala Lumpur every month.

Between 1985 and 2005, China added 225 million people to its towns and cities, almost the entire population of the United States. Yet China for the same time period, ranked only fifteenth in its absolute increase in urban share. In India the number of people in towns and cities rose by 137.8 million, adding a Germany and an Italy to its urban areas in just two decades.

Today's developing countries had an average increase in their urban population of 8.3 million over 1985–2005, almost three times the increase for many of today's high-income European and North American countries between 1880 and 1900. But when China and India are excluded from the group, the average urban population increase in recent decades has only been 4.4 million, about 50 percent more than the average for the early developers during 1880–1900 (see figure 1.14).<sup>57</sup>

Correspondingly, megacities in developing countries are unprecedented in their size. Through the nineteenth century the world's largest city was London. But its 1900 population of 6.6 million was only a third that of modern-day Mumbai or New Delhi, the largest cities in low-income countries. The London of 1900 and, indeed, even the London of today are also smaller than modern-day Shanghai (10 million), the largest city in lower-middle-income countries, and several others (Cairo, Jakarta, and Manila) among the more successful developers. With more than 22 million people, Mexico City, the largest city in upper-middle-income countries, is three

**Figure 1.14** The population increment in urban areas of today's developing countries is much larger



Sources: WDR team calculations based on data for 1985–2005 from the United Nations (2006c) plus historical data from Bairoch and Goertz (1986).

times the size of London at the start of the twentieth century.

***Urbanites today enjoy both higher private earnings and better public services***

Cities now do better than rural areas in both income and nonincome indicators of well-being. In 2000 the infant mortality rate in rural Malawi was 117 per 1,000 live births, in urban Malawi it was 83. Urban Benin did much better than rural Benin in lowering under-5 mortality rates and reducing diarrhea and acute respiratory infections.<sup>58</sup> Urban Ugandan women were less likely to suffer from anemia or malnutrition. Superior health indicators are repeated in urban areas throughout the developing world—from Chad and Cameroon in Sub-Saharan Africa, to Nepal in South Asia, Kazakhstan in Central Asia, and Nicaragua in Latin America, and to Morocco and Egypt in North Africa and Middle East.<sup>59</sup>

But the opposite was true for the developers of the nineteenth and early twentieth centuries. Migrants to cities could expect better material standards of living, offset by poorer health and shorter lives for them and their children. In 1881–91 life expectancy at birth was 51 years in English and Welsh villages, but only 44 years in London and 39 years in large towns.<sup>60</sup> In 1850s Britain the infant mortality rate in cities with populations greater than 100,000 was, at 196 per 1,000 live births, far higher than the 138 per 1,000 live births in rural communities.<sup>61</sup>

Even as late as 1937, George Orwell saw it fit to characterize industrial towns and cities as places where “one always feels that the smoke and filth must go on for ever and that no part of the earth’s surface can ever escape them.”<sup>62</sup> It is perhaps no surprise, then, that the absence of respiratory diseases attributable to poor air quality in the cities would have resulted in life expectancies 4.7 years longer in the England and Wales of 1861–70. In the absence of cholera, diarrhea, dysentery, and typhus, life expectancy might have been 1.7 years longer, and the absence of measles and scarlet fever, common in the cities, would have added 2.3 years to life expectancy.<sup>63</sup> Thus in the 1830s, while

workers in London earned an urban real wage premium of 67 percent, a large part of this premium was compensation for the evident health hazards of city living.<sup>64</sup>

In Germany during the second half of the nineteenth century, infant mortality rates in rural areas were about 150 per 1,000 live births. But expanding Berlin had the highest infant mortality in the Kaiserreich era, hovering around 300 per 1,000 live births in the 1860s, and peaking at 410 per 1,000 live births in the 1870s. The rural-urban gap in physical well-being remained for decades during the nineteenth century.<sup>65</sup>

As the U.S. economy industrialized and urbanized, people living in high-density areas at the turn of the twentieth century were exposed to infectious and parasitic diseases. In 1880 urban mortality for adults was 50 percent higher than rural mortality, and two decades later, the urban mortality rate was still 18 percent higher. The rural-urban mortality difference was even greater for infants and young children. For infants, excess urban mortality was 63 percent in 1890 and 49 percent in 1900, and for young children ages one to four, the respective figures were 107 percent and 97 percent. In 1900 male life expectancy was 10 years shorter in urban areas than in rural areas.<sup>66</sup>

That the cities and towns of modern-day developing countries do better than villages on indicators of health, while the opposite was true for the developed countries at similar incomes in the nineteenth century, reflects advances in public health and medicine, and improvements in sewers and water systems. It also reflects the public benefits that today’s cities in developing countries confer. So the advantages of high density are not limited to income generation and wealth creation—they also include social services.

With these differences in private and public sources of well-being, it should hardly be a surprise that cities and towns in the developing world are growing rapidly. The surprise is that this move to density is not faster. And the policy implication? Any strategy for a less desperate and more deliberate urbanization must include efforts to improve public services in rural areas.

# Distance

**D**eng Xiaoping, generally seen as the architect of China's resurgence as an economic superpower, insisted on openness to world markets. He also insisted on concerted development of the country's coastal areas, like Shanghai and Guangzhou, as launching grounds for connecting to these markets. When asked about the growing wealth disparities between the coast and the interior, he reportedly countered, "If all of China is to become prosperous, some [areas] must get rich before others."

This chapter shows that all successful developers support Deng's insight. But his wisdom may have eluded leaders in the developing world, even the few lauded as visionaries, as later chapters in the Report will show. For decades, "spatially balanced growth" has been a mantra of policy makers in many developing countries. It was an obsession of planners in the former Soviet Union (see box 2.5). And it has been the objective of governments of various political hues in the Arab Republic of Egypt, Brazil, India, Indonesia, Mexico, Nigeria, the Russian Federation, South Africa, and other great developing nations. There has even been a strong commitment to spatially balanced development in the economic history of many developed countries. The United Kingdom pursued it between the late 1920s and 1980s,<sup>1</sup> and Canada did so between the late 1950s and late 1980s.<sup>2</sup> But in these cases, even with the popularity of these policies, Deng's insight remained valid.

Indeed, the concentration of economic activity and the convergence of living

standards can happen in parallel. Development in the United States was accompanied by a rapidly rising concentration of manufacturing activity in a relatively small area of the northeast and eastern part of the Midwest at the turn of the twentieth century.<sup>3</sup> Throughout this process, U.S. states witnessed a slow, if sometimes halting, convergence of per capita incomes.<sup>4</sup> Today, roughly half of the U.S. population is in only five states,<sup>5</sup> but long-term unemployment disparities among states have been fairly small since World War II.

The convergence of living standards in the United States has been assisted by the willingness of workers to "pull up their roots" and relocate.<sup>6</sup> But basic welfare indicators have converged even in countries where such a willingness has been less evident, because development has been accompanied by the spread of public services. Take France and Germany. Even though Paris generates 28 percent of France's gross domestic product (GDP)<sup>7</sup> using only 2 percent of its land, infant mortality rates in the country show little spatial variation. The lagging area of Lorraine had the highest rate, 4.5 deaths per 1,000 live births in 2005, but this is not much higher than the national average of 3.8.<sup>8</sup> In Germany the leading area of Hamburg—with an economic density of €114 million of GDP per square kilometer—enjoyed a GDP per capita more than twice that of the northeastern lagging area of Mecklenburg-Vorpommern and an economic density more than one hundred times higher. Despite the phenomenal differences in economic density between these



areas, there is no difference in basic welfare. The numbers of physicians and hospital beds per 1,000 habitants in both Hamburg and Mecklenburg-Vorpommern closely track the national averages.<sup>9</sup>

This chapter presents stylized facts about economic concentration in parts of a country, usually called “leading areas,” and the convergence in living standards between households in these areas and those in distant or disconnected parts, called “lagging areas,” in the same country. It introduces the concept of economic distance, which is related to but not the same as physical distance. When supplemented with the economic density discussed in chapter 1, distance helps characterize the spatial transformations that accompany development and that may be necessary for rapid economic growth.

The main findings:

- ***As countries develop and integrate internally, location matters more for economic activity but less for social welfare.*** Greater economic mass (which accumulates where firms carry out production) and higher living standards (reflected in household consumption, poverty, and access to basic services) are not spatially synonymous. During the early phases of development, infrastructure and social services tend to be confined to areas of economic mass. But as countries develop and integrate internally, the distinction between leading and lagging areas becomes sharper for economic mass and more blurred for living standards.
- ***The spatial concentration of economic activity first rises and then levels off.*** As an economy changes from agrarian to industrial, the spatial distribution of people and economic production becomes more compact. Within a country, agglomeration and city-periphery integration give rise to metropolitan areas and leading areas of dense economic mass. This process eventually levels off, and the spatial distribution of economic activity stabilizes.
- ***Spatial disparities in living standards follow an inverted-U path, widening in the early stages of economic development, and remaining high for a long period before slowly converging.*** As a

country industrializes, it concentrates its limited initial human and physical capital in leading areas, those with high growth potential. Areas distant from the new density lag. Spatial disparities in productivity and income can persist for generations, even with mobile labor and capital. History points to persistent spatial divergence in living standards in today’s developed countries in their earlier stages of development, followed by slow convergence many years after they attained high income.<sup>10</sup>

- ***Technological progress and globalization have increased market potential in the leading areas of developing countries, intensifying concentration and amplifying spatial disparities.*** Although the basic forces shaping the internal economic geography of developing countries are the same as those that earlier shaped the economic landscapes of today’s developed countries, the magnitudes have changed. Larger international markets, better transportation, and improved communication technologies mean that leading areas in open developing countries have greater market potential than industrial countries did in their early development. So the forces for spatial divergence between leading and lagging areas are now stronger.

### Defining distance

Density, discussed in chapter 1, is also relevant at the country level. Denser concentrations of economic activity increase choice and opportunity. They ensure greater market potential for the exchange of goods, services, information, and factors of production. This chapter examines the disparities in economic mass and welfare between areas within countries, linking these disparities to the distance from economic density. So while chapter 1 discussed changes at the local scale—where the most relevant spatial dimension is density—this chapter addresses the spatial transformations at the country scale, where both density and distance are relevant. Chapter 3 will propose that although density and distance also matter for world regions, the most important dimension at the international scale is

division—political barriers to the flows of goods, entrepreneurship, people, and information between nations.

*As the crow flies? Distance as an economic, not Euclidean, concept*

Distance refers to the ease or difficulty for goods, services, labor, capital, information, and ideas to traverse space. It measures how easily capital flows, labor moves, goods are transported, and services are delivered between two locations. Distance, in this sense, is an economic concept, not just a physical one. Although economic distance is generally related to Euclidean (straight-line) distances between two locations and the physical features of the geography separating them, the relationship is not always straightforward. One reason is that distance for the exchange of goods is different from that for the migration of people.

For trade in goods and services, distance captures time and monetary costs. The placement and quality of transport infrastructure and the availability of transport can dramatically affect the economic distance between any two areas, even though the Euclidean distance between them could be identical. Two villages may have the same straight-line distance to a city, but one could be near a national highway, the other on an unpaved rural road. Based on straight-line distance, most of India is

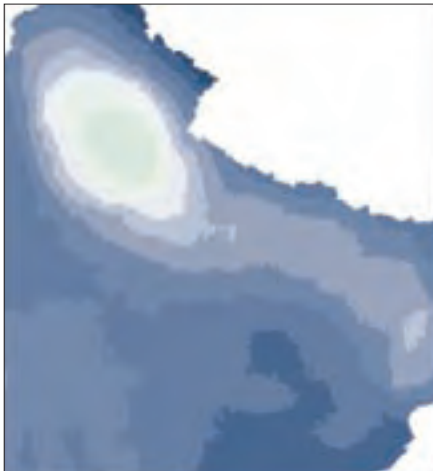
well connected to markets in dense settlements. But people in many parts of India have difficulty getting to markets because of the travel time, determined by the type and quality of roads and other transport infrastructure (see map 2.1).

For labor mobility, distance also captures the “psychic costs” of separation from familiar territory. Between 1985 and 1995, the share of migrants in a Chinese province originating from another province fell as distance between the provinces increased. And additional costs exist for migration between non-neighboring provinces.<sup>11</sup> So, as with trade, economic distance for migration is related to, but not synonymous with, physical distance. In this Report, the destination of interest is a location with the greatest economic density or highest market potential. Distance is thus a metaphor for access to markets.

Manmade barriers, including policies, can also increase distance. Roadblocks and local barricades—improvised “toll stations” for local police and others to extract payments—are common for journeys by road in many Sub-Saharan countries.<sup>12</sup> And where local political autonomy is high, there may be territorial fragmentation as policies of protection are pursued at the local level. Map 2.2 shows the time to human settlements, assuming few or no manmade barriers. Distances can be long, even in high-income countries.

**Map 2.1 Access to markets is not a straight line**

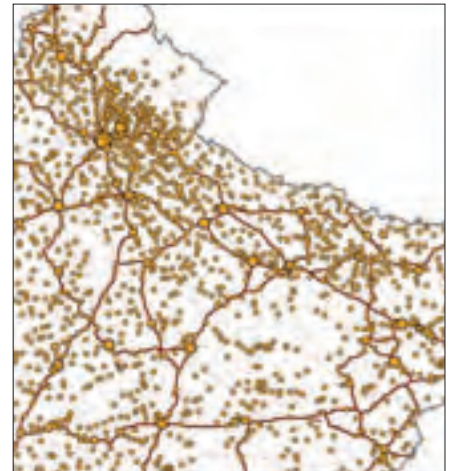
**a. Based on Euclidean distance**



**b. Based on economic distance**



**c. Roads and settlements**



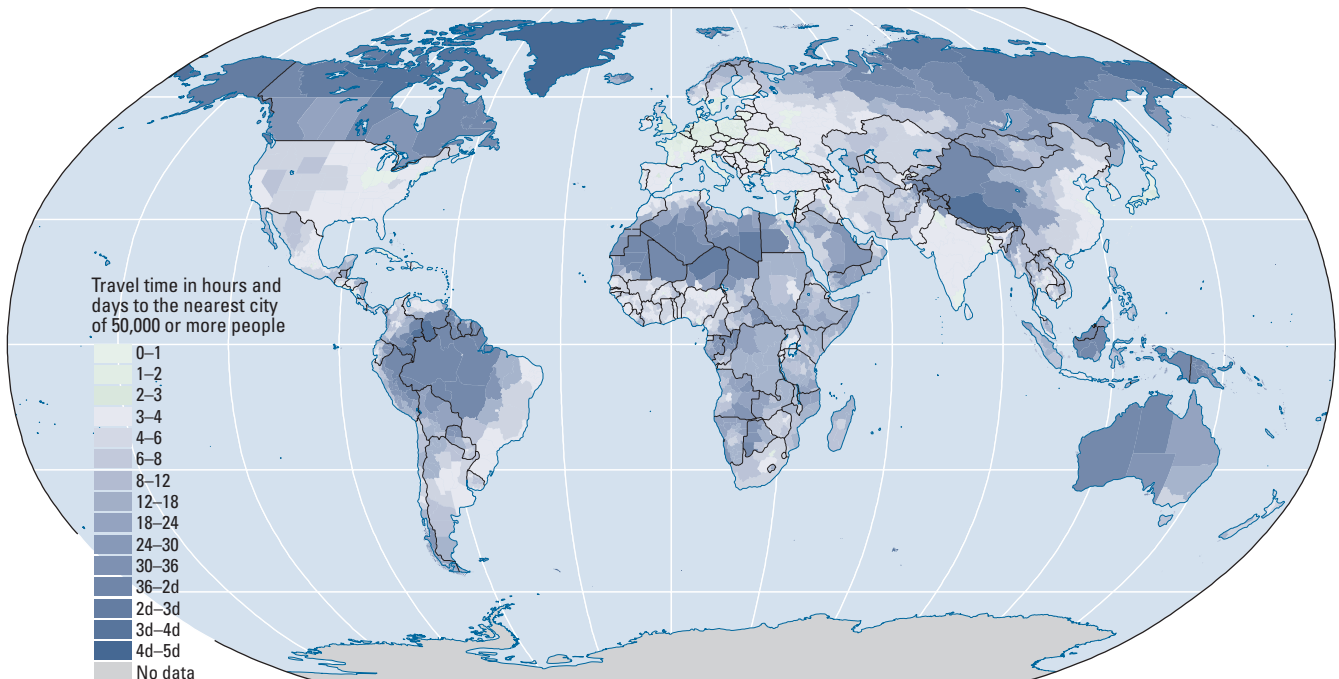
Source: WDR 2009 team.

Note: The lighter color represents greater access to places with economic mass.



Map 2.2 Distances can be long even in the developed world

Travel time to sizable settlements, by subnational administrative area



Contributed by Andrew Nelson; see Uchida and Nelson (2008) for this Report.

### *Locations close to markets have a natural advantage*

Provincial governments in 1980 in China heightened their administrative powers under decentralization reforms. They used these powers to protect local firms—raising tariffs and imposing bans on shipments from other provinces. Imports between provinces fell from 50 percent of GDP to 38 percent between 1992 and 1997, while local absorption of goods within provinces rose from 68 percent to 72 percent. The magnitudes are similar to those for goods crossing the U.S.-Canada border and international borders in the European Union (EU).<sup>13</sup> China's *hukou* system of permanent household registration—linking place of residence with access to consumer goods, employment opportunities, and social protection—similarly reduced internal migration.<sup>14</sup>

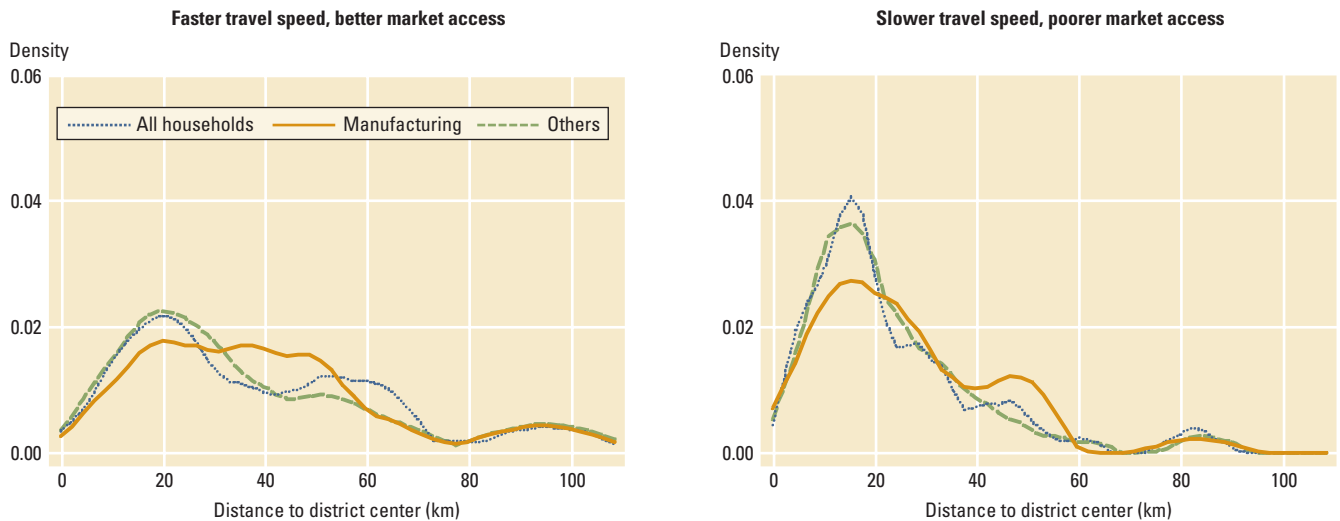
Distance to density affects spatial movements in goods, services, information, knowledge, and people. Commuting, migration, telecommunication, information flows, and shipments of goods connect originating and receiving areas. Most spatial interactions, such as learning and trade, are beneficial. But some are harmful, such

as the spread of disease. The main determinant of the strength of these interactions is distance. Waldo Tobler's *First Law of Geography* states that "everything is related to everything else, but near things are more related than distant things."<sup>15</sup> Areas closer to economic density have easier access to beneficial interactions and exchanges.

In Indonesia better road connections shorten travel time and the distance to economic centers, creating larger agglomerated areas. Because of good roads and easier access to markets, villages 60 kilometers from the district center generate as much manufacturing activity as the district center itself, and the well-connected periphery becomes part of the agglomerated area. But in poorly connected peripheries, the density of economic activity falls off rapidly beyond 25 kilometers from the center (figure 2.1).

Spillovers from proximity to density show up in both developed and developing countries. In European manufacturing, an area's total factor productivity growth is positively and significantly related to the density of manufacturing production in neighboring areas. And faster demand growth in neighboring areas stimulates, through spillovers,

**Figure 2.1 Manufacturing activity in Indonesia flourishes in areas with shorter economic distance to density**



Source: Yamauchi and others, forthcoming.

faster total factor productivity growth.<sup>16</sup> In Canada, North York and Waterloo are, thanks to proximity and local research universities, becoming an extended part of the Toronto information and communication technology (ICT) hub. Firms closer to Toronto do better than those farther away.<sup>17</sup>

The phenomenon is repeated in emerging economies. When a network of highways surrounding Jakarta was built in the 1980s, many firms moved out of the center to save on land and congestion costs. But they stayed near the metropolitan region to have access to the large market.<sup>18</sup> Similar but less pronounced is the pattern in other Indonesian agglomerations, where growth has been strongest in peripheral areas surrounding megacities.<sup>19</sup> In Brazil industries moved out of greater São Paulo to the lower-wage populated periphery. Following the transport corridors, these industries moved through São Paulo state and into the neighboring state of Minas Gerais. In the Republic of Korea the early decentralization of manufacturing from Seoul was to peripheral locations within an hour's drive. Only in the 1990s did industries decentralize to towns and rural areas.<sup>20</sup>

***The natural way to reduce distance is for people to migrate***

A leading area of dense economic activity, through its market opportunities, creates incentives for firms and workers to move

there. Responding to these incentives, firms and workers enlarge the market opportunities available in the dense area. The result is a circular and cumulative process of dense areas continually gaining workers and firms from less dense areas. In this process, migration balances the distribution of population against the spatial disparity in economic density. Reducing distance-related costs or spatial frictions increases movements of people, firms, and ideas—as well as those of goods and services—and thus brings less developed areas into the national system of production. With trade, the mobility of people is probably the most potent mechanism for integrating areas of low economic density with markets of high density. But for internal migration to bring about a convergence in living standards, large population movements may be necessary over generations.

Every year, approximately 40 million people in the United States change residences, and 8 million people change states.<sup>21</sup> The reason for this mobility is that economic production is concentrated in a few parts of the country, and accessing this economic density generally means moving closer to it.

People moving to economically dense areas contribute to production and boost their incomes. But they also increase competition among workers in dense areas, reducing it in less dense areas, and contributing to the convergence of living standards between low- and high-productivity areas.

Among today's industrial countries, the quickest convergence occurred between 1870 and 1913, largely driven by the largest flows of people from Europe to emerging markets in Asia and the Americas. For Ireland between 1851 and 1908, mass outmigration contributed at least a third to the catch-up in Irish real wages with those in the United States and Britain—by reducing competition in the domestic labor market. The virtual cessation of catch-up or convergence among the industrial countries between the two world wars was attributed largely to more restrictive immigration policies.<sup>22,23</sup>

### *Density in leading areas, distance for lagging areas*

Subnational areas, when compared, should ideally be defined according to economic

criteria that correspond to fairly self-contained labor markets and zones of economic activity. But data on such functionally defined economic areas are hard to come by.<sup>24</sup> So subnational areas are more commonly defined by administrative or political boundaries. Such definitions can bias econometric analysis (see box 2.1), but they have the advantage of corresponding to the areas for defining and implementing subnational policy. This chapter examines administratively or politically defined areas based on different data sources, ranging from national accounts and household surveys to terrestrial grid cells of 1° longitude by 1° latitude.

In this Report, leading areas have a high economic density, and lagging areas have a long distance-to-density. An area is more likely to be lagging the farther it is from

#### **BOX 2.1** *Defining an area: impossible or NUTS?*

Subnational policy analysis relies on data for areas that range from small primary sampling units to districts, and to states or provinces. Typically, these areas are defined administratively or politically, reflecting historical characteristics more than current patterns. For instance, the existing administrative structure of the EU's member states generally consists of two levels, such as *länder* and *kreise* in Germany, *regions* and *départements* in France, *comunidades autónomas* and *provincias* in Spain, and *regioni* and *provincie* in Italy. The *Nomenclature of Territorial Units for Statistics* (NUTS) provides a single uniform classification of territorial units for producing regional statistics for the EU. The first two administrative levels in most member states correspond to NUTS 2 and NUTS 3. NUTS 1, a larger unit representing the major socioeconomic regions, often does not correspond to existing administrative units within member states.

Which spatial scale to use, or how best to define a subnational area, depends on the issue and the information available. But the choice can dramatically affect the conclusions drawn from studying social and economic conditions across different parts of a country—for two reasons.

- First, areas are not defined keeping in mind the policy issues. For instance,

within-area differences in employment or poverty can be as large as between-area differences. Any change in the boundaries between areas could change the results. The potential implications are succinctly summarized by the title of a classic paper on this topic, "A Million or So Correlation Coefficients."<sup>a</sup>

- Second, analytical findings depend on the aggregation or spatial scale, the ecological fallacy of inferring characteristics of individuals from aggregate data. The classic study by Robinson (1950) illustrates this problem.<sup>b</sup> A broader aggregation will yield smaller differences between units of analysis—and lower variances. So, results can differ significantly depending on the size of the units.

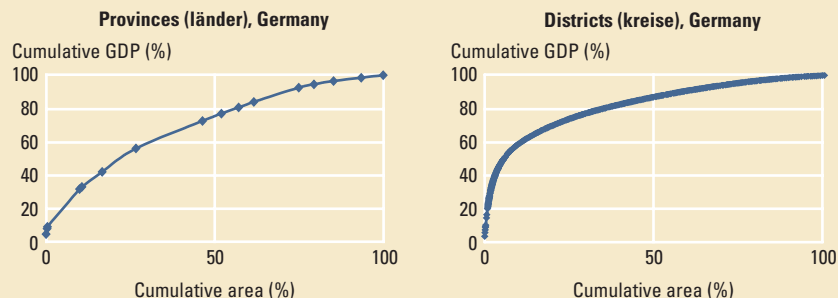
The figure below shows the density of economic activity for Germany's 16 provinces (*länder*) and 439 districts (*kreise*). The highly aggregated data indicate that 30 percent of GDP is produced on 10 percent of the country's area, and the more disaggregated data show that almost 60 percent of GDP is produced on the same 10 percent. Aggregate information can be useful, but be mindful of these biases.

Source: WDR 2009 team.

a. Openshaw and Taylor 1979.

b. Using state level data for the United States, the study showed that the proportion of foreign-born people is positively correlated with the proportion literate in English, suggesting that native-born Americans were more likely to be illiterate. Analyzing the same relationship using individual data showed a negative correlation.

#### **Different spatial scales yield different results because of an aggregation bias**



Source: Estimates based on Nordhaus 2006.

leading areas because greater distance-to-density implies a lack of integration into the economy of leading areas. It also implies poorer access to the “thick” markets of capital, labor, goods, services, and ideas, and the spillovers of knowledge and information they provide. A lagging area is usually a remote part of the country with one or more of the following features: high poverty, low productivity and income, high unemployment, and stagnant growth, which are typically the criteria governments use to define lagging areas.

In developing countries, lagging areas tend to be remote places where basic needs,

such as access to sanitation and electricity, are not met. In developed countries, lagging areas are locations with poorer job prospects than leading areas, but no differences in basic welfare. So distance and market access, in this Report, capture a wide range of criteria that different countries use to define a lagging area (see box 2.2).

It follows that distance-to-density is the cause of low income per capita, labor productivity, and real wages—and of the high rates of poverty and unemployment. In the United Kingdom, economic density in the leading London and southeast areas produces a wage premium of 18 percent, which

### BOX 2.2 *How developed and developing countries define lagging areas: a quick survey*

In this Report, a lagging area is defined as a place distant from density. How does this definition compare with how policy makers in developing and developed countries have, today and historically, defined lagging areas?

Usually, the criteria national governments use to classify an area as “lagging,” “disadvantaged,” or “backward” are linked to explicit strategies or policies for spatial or regional development. The criteria might be vague or precise. They might relate to a single indicator of economic performance or to a weighted average of several. And they might reflect the definition of lagging areas at different spatial scales.

- *Vague.* UK regional policy in the 1980s classified a lagging area as being either a “development area” or an “intermediate area.” But the law was vague in the criteria it set to designate such areas. “In exercising his powers under the preceding provisions of this section [in the designation of development and intermediate areas] the Secretary of State shall have regard to all the circumstances actual and expected, including the state of employment and unemployment, population changes, migration and objectives of regional policies.”<sup>a</sup>
- *Precise and simple.* EU regional or “cohesion” policy for the period 2007–13 defines lagging areas as those qualifying for assistance under the “convergence objective,” equated with NUTS2 areas with a GDP per capita of less than 75 percent of the EU average.<sup>b</sup> These areas are budgeted to receive

around 71 percent of funds under the convergence objective. But, even in EU regional policy, funding is available on more favorable (and complicated) terms for those areas whose GDP per capita is not only less than 75 percent of the EU average, but which are in a country whose GDP per capita is less than 90 percent of the EU average. These areas are considered to be “more lagging.”<sup>c</sup>

- *Precise and complicated.* Between 1982 and 1987 Canada’s Department of Regional Industrial Expansion used a development index to classify areas for allocations under its Industrial and Regional Development Program. The index assigned a 50 percent weight to an area’s unemployment, a 40 percent weight to its personal income, and a 10 percent weight to the fiscal capacity of the province to identify 15 percent of the “least developed.”<sup>d</sup>
- *Sophisticatedly defined and measured.* To identify areas considered as lagging, Mexico’s microregional strategy uses a “marginalization index” based on indicators of access to such basic services as electricity and drinking water, and indicators of the quality of dwelling conditions and the proportion of the local working population that is poorly paid.<sup>e</sup> It is mainly targeted at remote rural communities in the south, because the “remoteness of rural communities often translates into conditions of poverty and a substantial lack of access to a wide range of basic public services.”<sup>f</sup>

Mexico is noteworthy not only because of the sophistication of the measure used to identify lagging areas, but also because of the sophisticated manner of defining areas. Rather than using crude administrative boundaries to define areas, geographical information system (GIS) techniques are used to consider an area’s geographical proximity, ethnic and cultural identity, and geoeconomic characteristics.

So the criteria that different countries use to identify lagging areas depend on the level of development and on domestic political considerations. High levels of poverty and marginalization define lagging areas in developing countries, and a high rate of unemployment often defines them in developed countries.

India’s 10th Five-Year Plan (2002–07) identifies the northeastern region as “backward” and “disadvantaged” and thus deserving special policy attention. EU regional policy, under its convergence objective, makes special provisions for “the outermost regions,” deemed to require additional assistance.

This Report’s definition of lagging areas—as distant from density—captures this wide range of criteria.

Contributed by Mark Roberts.

a. Industrial Development Act 1982, chapter 52, part I, para. (3); bold emphasis added.

b, c. [http://europa.eu/pol/reg/index\\_en.htm](http://europa.eu/pol/reg/index_en.htm), “Activities of the European Union—Regional Policy,” 2008.

d. Atkinson and Powers 1987.

e. Villarreal 2005; OECD 2003, p. 6.

f. OECD 2003.

distant areas in the north and southwest of England and in Scotland and Wales do not enjoy.<sup>25</sup> In Indonesia the potential profitability of firms in textiles and other sectors is negatively related to distance-to-density: more distance, less profit. This is true for distance-to-density within the country and for distance to an international port and thus to the density in international markets.<sup>26</sup> Again, lagging areas unable to attract investment and employment are those with a high distance-to-density.

As in today's rich countries, distance-to-density affects incomes in emerging market countries. In China good market access produces higher individual wages, even after controlling for individual, sector-, and province-specific attributes, living cost differences, and human capital externalities.<sup>27</sup> In Brazil lagging areas economically distant from São Paulo and other large markets

have lower wages, and improving an area's growth prospects largely depends on reducing distance.<sup>28</sup> In Brazil's leading area, economic density implies a wage premium of 13 percent, comparable to that in European countries.<sup>29,30</sup> In Mexico the southern rural areas—distant from the economic density in Mexico City and the United States—have the lowest wages and highest poverty.

Lagging areas in many countries are home to ethnic minorities. Tribal, racial, and religious differences in access to resources show up as spatial disparities. In a vicious cycle, disparities between areas that coincide with different ethnic groups can deepen political divisions and fuel tensions, contributing to greater divergence in living standards. They can even fuel civil conflict that is difficult to extinguish, causing “development in reverse” (see box 2.3).<sup>31</sup>

### BOX 2.3 *Dangerous disparities: when divisions aggravate distance*

The academic literature argues that internal labor migration is the strongest force for convergence in economic and other measures of household welfare across areas of a country. But differences in language, religion, ethnicity, and race are probably one of the strongest barriers to internal migration, a troubling dilemma for policy makers. The ethnic, linguistic, and religious barriers that may keep households from taking advantage of many opportunities to arbitrage geographic differences for employment and earnings can be the same barriers that cage poor people in lagging areas, perpetuate their poverty, and sharpen spatial disparities.

**Disparities in East Asia.** In Thailand 17 percent of people in the northeast are poor, compared with 0.5 percent in Bangkok. About half of Thailand's ethnic minority groups live in the Northeast. In Indonesia poverty and welfare indicators are persistently worse in West Kalimantan—home to such ethnic minorities as the Dayak, Bugis, and Sambas—than in Java, home to Indonesia's ethnic majority.

**Disparities in South Asia.** In India the states of Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland,

Sikkim, and Tripura make up the lagging northeast. Except for the Assamese, the population is predominantly tribal, speaks Tibeto-Burman and Austro-Asiatic languages, and has a strong genetic similarity with the people of East Asia. Hinduism is the dominant religion, but the proliferation of Christianity has set the area apart from the rest of India. By conventional measures of economic welfare and development, northeastern states rank among the lowest in India.

**Disparities in Africa.** A study of 11 Sub-Saharan countries found that ethnicity was on its own a strong predictor of differences in child mortality, but when combined with geography, it continued to predict the probability of survival among children. For instance, in Côte d'Ivoire, mortality among two year olds fell much faster from 1970 to 1994 for the Baoule than for other ethnic groups. Children of Ashanti women in Ghana were about 20 percent less likely to die than other children. In Uganda, Baganda children under five were a third less likely to die than children of other ethnic groups.

A 2005 study on spatial inequalities by the World Institute for Development

Economics Research at the United Nations University in Helsinki (UNU-WIDER) conjectured that “Spatial inequality is a dimension of inequality overall, but it has added significance when spatial and regional divisions align with political and ethnic tensions to undermine social and political stability.”<sup>32</sup> These somewhat abstract words chillingly foreshadowed the violence in Kenya in early 2008, which left 1,500 people dead and another 250,000 displaced. Violence began over the disputed outcome of a presidential election in late December 2007, quickly exposing deep ethnic cleavages that demarcate Kenya's economic and political geography. Communal fighting was most pronounced around the town of El Doret in the Rift Valley, and on the outskirts of Kisumu in the Western district of the country. The Rift Valley and Western districts are among Kenya's economically lagging areas and are the traditional home places of the minority Kalenjin, Luo, Kisi, and Luhya tribes, who along with other ethnic minorities in these areas harbor resentments related to economic deprivation and neglect.

Source: Brockerhoff and Hewett 2000. a. Kanbur and Venables 2005.



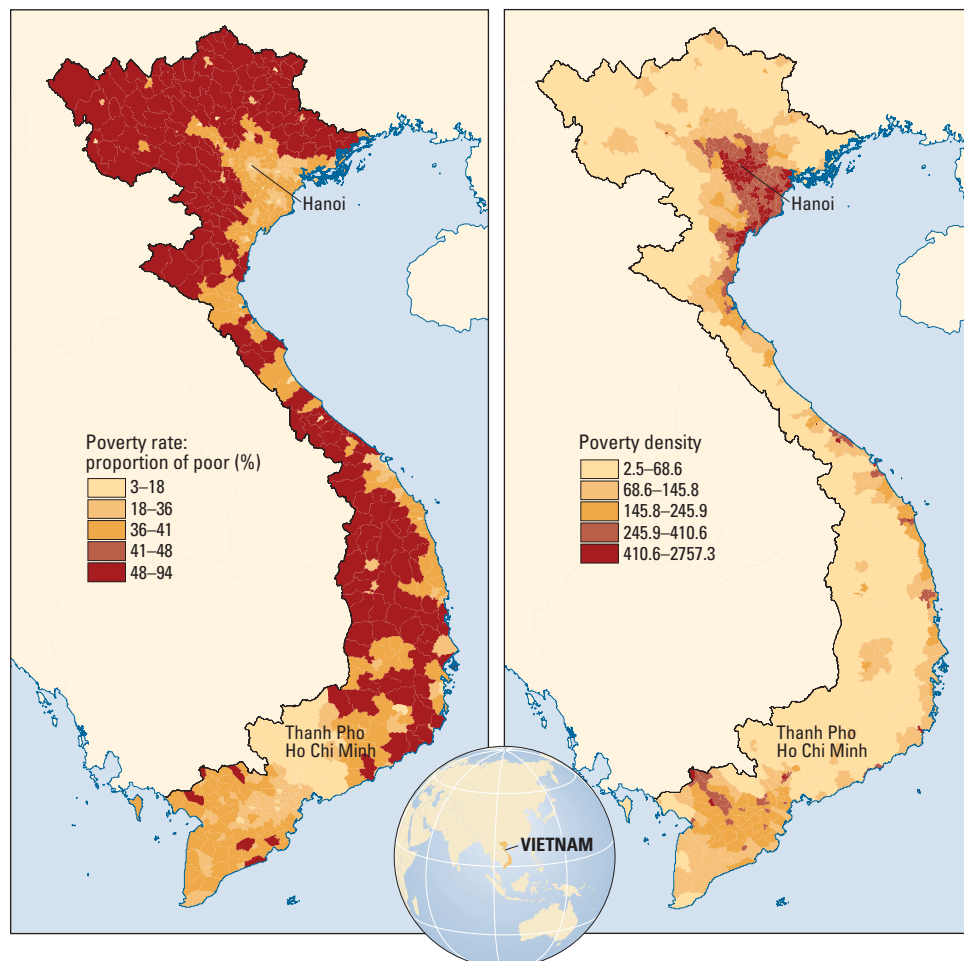
**Lagging areas have higher poverty rates, leading areas have more poor people**

The rate of poverty (the poverty head-count) is related to distance, and the mass of poverty is related to density. Lagging areas tend to have a higher proportion of poor residents, and the leading areas tend to contain a higher share of the country's poor people, because of the dense population in leading areas. Vietnam's lagging inland areas have the highest poverty rate, but its prosperous leading areas contain the mass of poor people (see map 2.3). And in Honduras the country's poverty mass is concentrated in its two leading areas of Tegucigalpa and San Pedro Sula, while distant eastern areas generally have a high poverty rate (map 2.4).

**Economic concentration in leading areas**

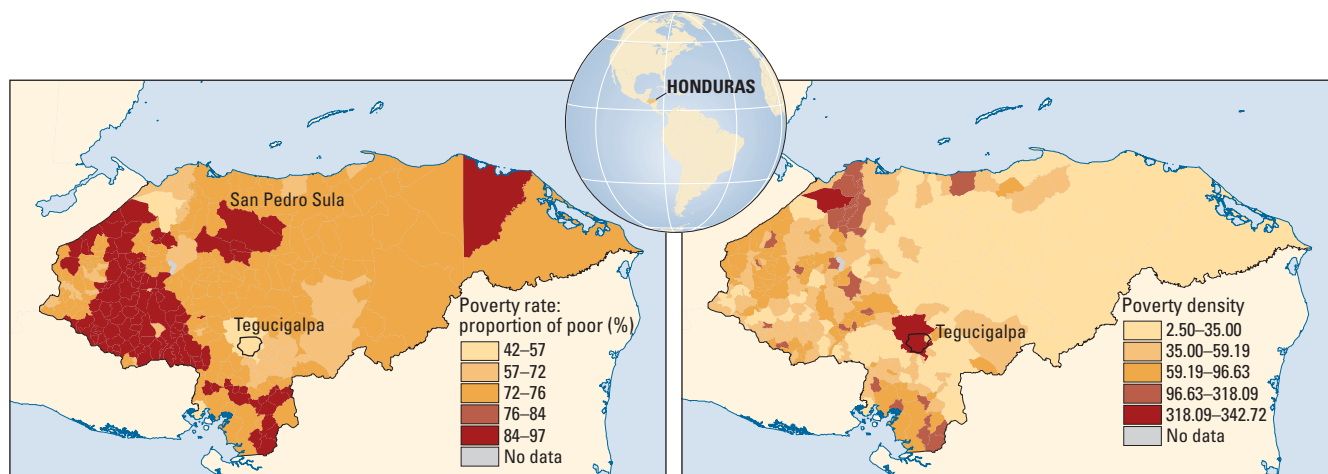
As economies develop, economic activity generally becomes more concentrated, not less. In about a quarter of the world's nations—such as Botswana, Brazil, Norway, Russia, and Thailand—more than half of national income is generated on less than 5 percent of the land area. In half of all nations—such as Argentina, Saudi Arabia, Slovenia, and Zambia—a third or more of national income is generated on less than 5 percent of land. Only one country in 10 has a dispersed economic mass, with less than a tenth of national income generated on 5 percent of its land. Among the few countries with this high spatial dispersion: Bangladesh, the Democratic Republic of Korea, the Netherlands, and Poland.<sup>32</sup>

**Map 2.3 Vietnam's poverty rate is higher in lagging inland areas, but its poverty mass is greater in leading coastal areas**



Source: The Poverty Mapping Project. Columbia University, using data from Minot, Baulch, and Epprecht 2003.

Map 2.4 The poverty rate is high in distant eastern Honduras, but the poor are concentrated in the two largest metropolitan areas



Source: The Poverty Mapping Project, Columbia University, using data from Robles 2003.

This section presents the historical experience of selected industrialized countries. Spanning more than a century, this section shows how these countries experienced rapidly rising spatial concentrations, followed by a leveling off. It then turns to a large sample of developed and developing countries to document how the concentration of economic mass rises with a country's development.

### *Rapidly rising concentration in the early stages of development, then a leveling*

It is difficult to come by data that track the evolution of spatial concentrations of economic activity.<sup>33</sup> The information available reveals that economic development, in its early stages, is accompanied by a rapidly rising spatial concentration in a country. Not only does the volume of economic activity grow, but its generation becomes more compressed into a smaller land area. Leading areas benefit most from this compression and growth.

Economic concentration in the Ile de France—the leading area of France, with about 2 percent of the country's land—increased rapidly from a value of around two times the hypothetical share in 1801 to three times in 1851 and to six times by 1910.<sup>34</sup> It continued to rise, but less rapidly, to nine times that share in 1960. French GDP per capita grew from less than \$1,000 in 1801 to \$7,000 in 1960. From 1960 on, however, its economic concentration stabilized, even though its GDP per capita tripled. In Canada and the Netherlands the increases were

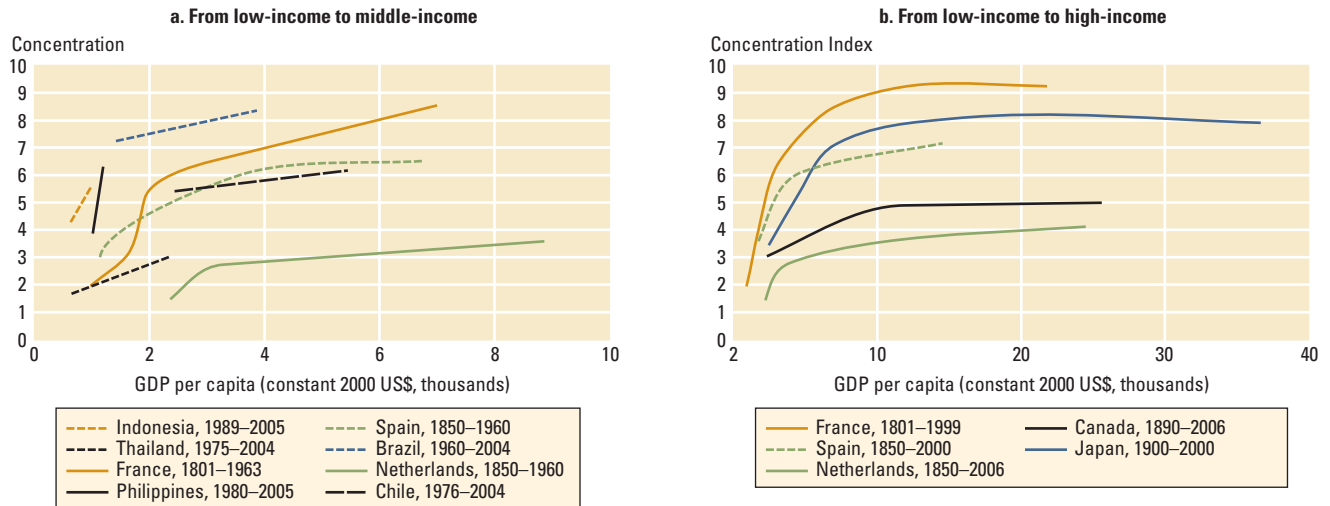
not as dramatic, but both countries experienced the same pattern of rapidly rising concentrations at low levels of development, followed by a leveling off as GDP per capita rose past \$10,000 (see figure 2.2).<sup>35</sup>

Patterns are similar in today's developing countries. As Thailand industrialized and grew rapidly, the concentration in the leading Bangkok metropolitan area increased from 1.8 in 1975 to 3.1 in 2004, while GDP per capita increased fourfold. In Brazil too, the concentration in the leading São Paulo area edged upward from 7.3 in 1960 to 8.4 in 2004, as the country's GDP per capita almost tripled.

For Japan during its post-World War II industrialization, the concentration in its leading area of greater Tokyo increased from a high of 7.1 in 1955 to about 8 in 1970 as its GDP per capita more than doubled. This increasing spatial concentration eventually levels off, as the spatial distribution of economic activity in a country stabilizes. After 1970, the concentration in greater Tokyo stabilized.

In the United States as GDP per capita rapidly increased from \$1,806 in 1850 to \$4,091 in 1900,<sup>36</sup> concentration came in the manufacturing belt of Green Bay–St. Louis–Baltimore–Portland ME, which accounted for three-quarters of U.S. manufacturing employment. Over the next 60 years, the belt's share of manufacturing employment remained stable at two-thirds to three-quarters.<sup>37</sup> Despite structural changes in the U.S. economy and shifting patterns of economic concentration, that concentration remained stable after 1960.

**Figure 2.2** Rising density of economic mass accompanies development over decades, even centuries



Sources: WDR team estimates based on national accounts—statistical yearbooks of various years in respective countries. 1890 data for Canada come from Green (1969). Data on France are based on population numbers from Catin and Van Huffel (2003); Barro and Sala-i-Martin (2004). Data on Japan, the Netherlands, and Spain came from the Staff City Population Database, Human Settlements Group, International Institute for Environment and Development (IIED).

Another corroborative piece of evidence of rising concentration comes from the falling share of land area occupied by 80 percent of the U.S. population in the densest counties from 25 percent of the U.S. land areas in 1900 to 17 percent in 2000.<sup>38</sup>

As countries grow beyond \$10,000 GDP per capita, concentration tends to stabilize, with the details differing. The concentration in the leading area is greater in Canada, France, and Japan than it is in the Netherlands and the United States. For developing countries too, Brazil, Indonesia, and the Philippines seem to be on paths toward greater spatial concentration than either Chile or Thailand.

### *International comparisons of concentration today support historical trends*

The relationship between a country's development and its spatial concentration holds for countries at different levels of development. It holds for countries based on administrative areas (Canadian provinces, Japanese prefectures, Russian oblasts, and U.S. states), statistical areas (the nine census regions of the United States, the three regions in Ecuador), and land areas (terrestrial grid cells of 1° longitude by 1° latitude). And it holds for different measures of concentration.

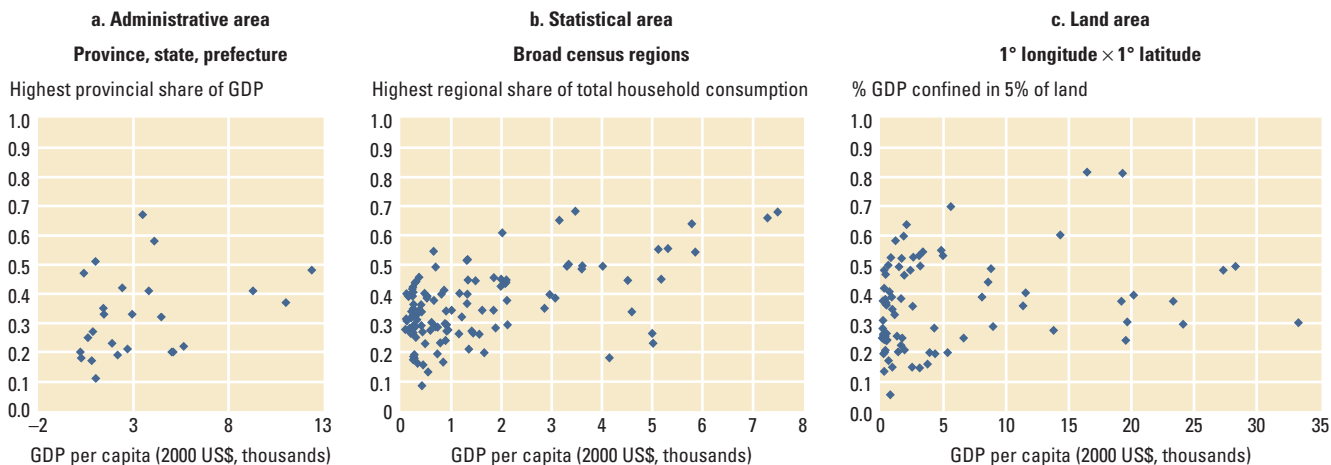
**Administrative areas.** Different countries have different numbers of

administrative areas, which may be of different geographic sizes. But controlling for these factors, a comparison of 24 developing countries—ranging from Mozambique with a GDP per capita of \$211 to Greece with more than \$12,000—reveals the same pattern as the historical experiences of Canada and France. The share of national GDP produced in the leading administrative area tends to increase with the level of development (see figure 2.3, panel a).

**Statistical areas.** Statistical areas, broad census regions, can differ from administrative areas. The United States has nine statistical areas but 50 states; Canada has five statistical areas but 10 provinces and three territories. A country's statistical office generally uses these areas to stratify its sampling frame for household surveys, with the areas corresponding to the geographic partitions of a country such as east and west.<sup>39</sup> Despite the difference in aggregation, the data for statistical areas suggest the same relationship between concentration, measured by consumption rather than GDP, and development (see figure 2.3, panel b).

**Land areas.** Terrestrial grid cells of 1° longitude by 1° latitude, each corresponding to a land area of 100 square kilometers can provide purer geographic resolution.<sup>40</sup> Spatial concentration within a country can then be measured as the share of national GDP generated on the densest 5 percent of

**Figure 2.3 Measures based on national accounts, household surveys, and geoscaled economic data confirm the historical pattern of a rising concentration of economic mass with the level of development**



Source: Panel a: National accounts at national statistical office Web sites or Yearbooks; panel b: World Bank staff estimates of more than 120 household surveys in 75 countries (data set is described in detail in Montenegro and Hirn 2008); panel c: World Bank staff estimates from <http://gecon.yale.edu>.

its land.<sup>41</sup> The stylized pattern of rising concentration of GDP with development using historical data is the same as that using contemporary data. The relationship between development and economic concentration is positive and roughly linear when comparing developing countries with a GDP per capita of less than \$10,000. But this relationship starts to level off when higher-income countries are included in the sample (figure 2.3, panel c).

The rising concentration of production with economic development is not an artifact of the number of subnational areas across countries or of the different sizes of land area in the countries (see table 2.1). Consider Tanzania, Italy, France, and Sweden, with similar numbers of administrative areas (21 or 22). Tanzania's leading area of Dar-es-Salaam generates 15 percent of national GDP, Italy's leading area of Lombardia, 21 percent. France and Sweden, each with a higher GDP per capita than Italy, also have higher concentrations in their leading areas.

For a set of countries partitioned into five statistical areas—ranging from Argentina to Tajikistan—the concentration of consumption in the leading area increases with development. Among medium-size countries with about 300,000 square kilometers of land area, Ghana and Lao People's Democratic Republic (both low-income countries) have markedly lower spatial GDP concentrations measured by spatial Gini coefficients<sup>42</sup> than Poland (a lower-

middle-income country) and New Zealand (a high-income country). Poland and New Zealand have lower spatial Gini coefficients than richer Norway and the United States. The pattern also holds for small and large countries.

### Divergence, then convergence—between leading and lagging areas

When production is primarily agrarian, economic activity tends to be evenly distributed across space. Productivity differences are also moderate, varying naturally with soil quality and climate. But as an economy develops and production expands in manufacturing and services, some areas become more attractive to firms and workers. Some are endowed with natural or “first nature” geographic advantages.<sup>43</sup> For example, a strategic coastal location makes an area a natural choice for a port (as with New York and Philadelphia in the United States). For others areas not so blessed by nature, their economic pull might be linked to a “second nature” historical accident. An example is Boston, saved from economic decline by an influx of immigrant labor fleeing the Irish potato famine. For Irish immigrants it was cheaper to travel from Liverpool to Boston than to New York.

Economic development brings with it greater market integration, which facilitates the mobility of people and capital and allows for greater trade, forces benefiting the leading

**Table 2.1 Administrative, statistical, and geographic area measures all point to rising spatial concentrations of economic activity with development**

Administrative areas	Country	GDP per capita	Number of administrative areas	Share of GDP in the leading area (%)
	Tanzania	324	21	15
	Italy	19,480	21	21
	France	22,548	22	29
	Sweden	31,197	22	29
Statistical areas	Country	GDP per capita	Number of statistical areas	Share of household consumption in the leading area (%)
	Tajikistan	204	5	30.2
	Mongolia	406	5	34.6
	El Salvador	1,993	5	43.9
	Brazil	3,597	5	51.6
	Argentina	7,488	5	64.7
Land areas	Country	GDP per capita	Land area (km <sup>2</sup> )	Spatial Gini coefficient
	Ghana	211	227,540	0.48
	Lao PDR	231	230,800	0.48
	Poland	3,099	311,888	0.52
	New Zealand	11,552	267,990	0.55
	Norway	27,301	304,280	0.64

Sources: Administrative area information for Tanzania is from <http://www.nbs.go.tz/nationalaccount/index.htm>; information for France, Italy, and Sweden are from the Annex in *Growing Regions, Growing Europe*. Statistical area information is from more than 120 household surveys fielded during the 2000s for more than 80 countries (data set described in detail in Montenegro and Hirn 2008). Land area information is from <http://gecon.edu.yale>, which is based on 1990 information.

Note: GDP per capita estimates are in 2000 U.S. dollars for the particular year of the household survey.

areas. And by attracting people and firms, leading areas fuel agglomeration economies, becoming centers for innovation and growth and driving the national economy. But the process does not go on forever. Agglomeration economies start to be offset by congestion and pollution, the diseconomies of agglomeration. So the spatial concentration in leading areas starts to level off.

What, then, of the income and welfare disparities that accompany this pattern of first rising and then stable economic concentration? Is there a tendency for lagging areas to catch up with leading ones as economic development progresses? What is the role of government policies in facilitating this convergence?

*For today's developed countries, spatial inequalities in income and welfare rose early, followed by slow convergence*

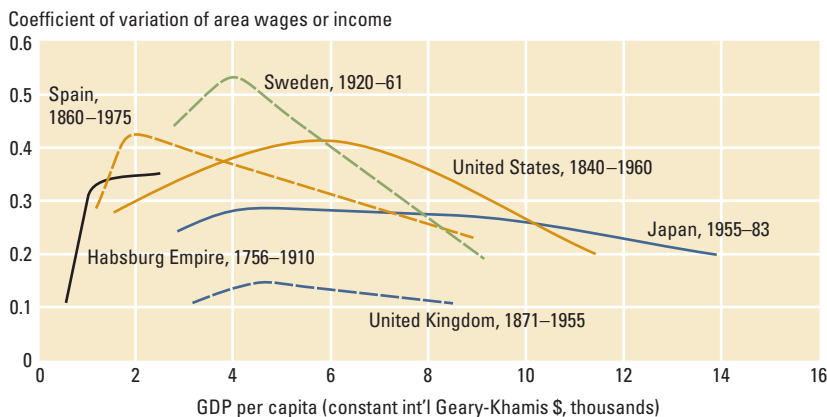
In today's developed countries, per capita incomes initially diverged between sub-national areas, and convergence began to set in as GDPs per capita approached \$10,000, following an inverted-U relationship (see figures 2.4 and 2.5 and table 2.2).<sup>44</sup>

Across areas of the United Kingdom, the coefficient of variation of GDP per capita increased by almost 40 percent between 1871 and 1911.<sup>45</sup> During this period, Britain went from a modern-day Namibia to a Jordan or the former Yugoslavia.<sup>46</sup> After World War II, GDP per capita across areas of the United Kingdom displayed a slow convergence, continuing until the late 1970s, when spatial inequalities stabilized.<sup>47</sup>

In the United States, the dispersion of per capita income across states increased between 1840 and 1880, coinciding with the rise of the manufacturing belt in the North, and the Civil War and its aftermath. The end of the Civil War marked the beginning of integration between states in the North and the South, and spatial dispersion in per capita income began to narrow. Because the southern states remained more dependent on agriculture, lagging areas of the United States suffered a setback in the 1920s because of a sharp drop in the relative prices of agricultural goods. Once this shock dissipated, the slow convergence between lagging and leading areas resumed with few interruptions until the 1990s, when disparities among states stabilized.<sup>48</sup>

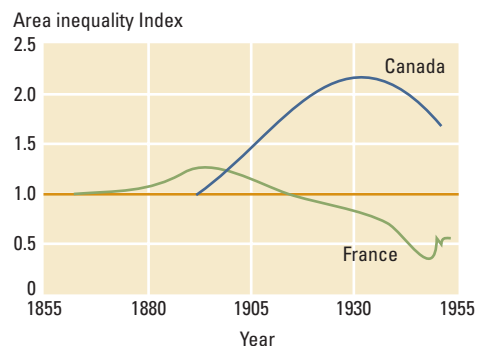


**Figure 2.4 Spatial inequality rose and remained high before slowly declining as economies approached \$10,000 in GDP per capita**



Sources: United States: Williamson 1965; Habsburg Empire: Good 1986; Sweden: Williamson 1965; Spain: Martinez-Galarraga 2007; Japan: Mutlu 1991.

**Figure 2.5 Subnational disparities in income and wages persisted for more than 70 years in Canada and France**



Sources: Canada: Green 1969; France: Williamson 1965.  
Note: Canada data are based on provincial per capita gross value added; France data are based on department agricultural wages.

**Table 2.2 Spatial inequality varied through different phases of development**

Country	Spatial disparity measure	Phase of economic development			
		Early	Middle	Advanced	
United States		1774	1790	1840	1860
	Relative deviation regional GDP per capita from U.S. average	30	31	56	66
Italy		1861	1911	1936	1951
	Index of regional percent agriculture labor force	6.55	9.41	12.7	14.2
Canada		1901	1911	1941	1951
	Index of regional percent agriculture labor force	7.14	9.88	12.6	10.2
England		1767	1795	1867-70	1898-1914
	Maximum-minimum in county agriculture wages	3s 11d	8s 2d	11s 0d	7s 4d
Austria		1869	1890		1910
	Maximum-minimum regional percent agriculture labor force	0.32	0.35		0.40
Spain		1860	1914	1955	1975
	Maximum-minimum ratio regional GDP per capita	1.76	2.33	2.22	1.74
Australasia		1860	1880		1900
	Coefficient of variation regional GDP per capita	0.30	0.35		0.10

Sources: United States: Good 1986; Italy: Williamson 1965; Canada: Williamson 1965; England: Hunt 1986; Austria: Good 1986; Spain: Martinez-Galarraga 2007; Australasia (Australia, New Zealand, and Tasmania): Cashin (1995).

Note: For Spain, the maximum is the top five and the minimum is the bottom five. For England, the currency is in shillings (s) and pence (d).

Canada and France also exhibit the same inverted-U-shaped pattern of rising spatial disparities in the early stages of development—spanning two generations—followed by slow convergence (see figure 2.5). In France the spatial dispersion of wages across *départements* increased between 1855 and 1900, when convergence set in. In Canada the spatial dispersion of average gross value added between areas increased between 1890 and 1910, carrying

over to 1929 and starting to fall by 1956.<sup>49</sup> In Italy, Germany, and Spain, the convergence in per capita income gradually set in many years after these economies reached high income—after World War II—followed by stable income disparities (see figure 2.6).

Government policies can facilitate this convergence. In Japan, for example, investments in social services in lagging areas were increased as concentration of economic production accelerated. By making

### BOX 2.4 *Correcting geographic disparities in postwar Japan*

In 1970, Prime Minister Eisaku Sato and the Cabinet initiated the New Economic and Social Development Plan and the New Integrated Spatial Development Plan (Shin-Zenso). The objective was to address disparities in living standards, as a result of accelerated growth in industrial areas around Tokyo, Nagoya, and Osaka along the Pacific Coast during the early postwar years. An excerpt in the Shin-Zenso summarized the government's vision:

Among many problems concerning spatial disparities, disparities in living standards are more serious than those in per capita income. From this standpoint, the construction of the basic services and social institutions must be accelerated in rural towns, and new policies must be adopted to improve the living conditions of their surrounding areas above a certain minimum level.

These plans continued to provide public investment in basic services and social institutions (for example, public utilities, medical facilities, and school buildings) to industrialized areas. But additional investments were made in the less developed areas, to achieve at least a minimal level of living standards for all places. The result was a rapid catch-up in investment in basic services and social institutions in less developed areas relative to the more industrialized areas (see the figure immediately to the right).

Both the general account budget of the central government and the Fiscal Investment and Loan Program were

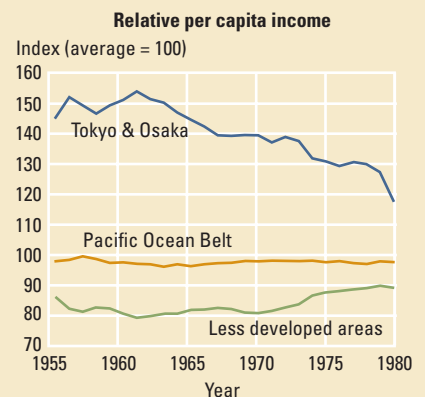
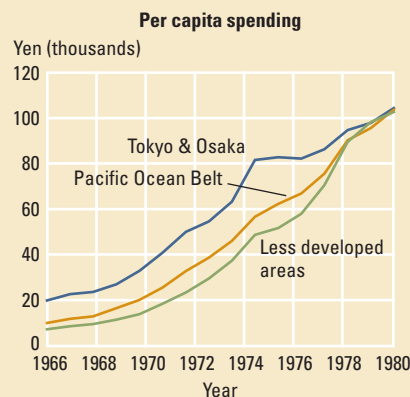
instrumental in mobilizing financial resources. The general account budget of the central government provided earmarked budget transfers to local governments in addition to nonearmarked transfers. Among the earmarked budget transfers, a substantial amount was allocated for investments in basic services (for example, rural roads) and social institutions under cost-sharing arrangements with the local government.

The Fiscal Investment and Loan Program pooled public funds from such sources as postal savings and public pension insurance premiums and then channeled them for investments in housing and social institutions to improve

welfare in less developed areas. These policies were effective in corraling large investments toward achieving universal attainment of basic living standards. Per capita income converged between leading and other areas during the 1970s (see the figure on the right, below). Labor migration from rural to large urban areas was pronounced throughout the 1950s and 1960s, but it tapered off after the mid-1970s.

Sources: Cabinet Council 1972; Hayashi 2003; Kamada, Okuno, and Futagami 1998; Ministry of Finance 2008; Nakajima 1982; Okuma 1980; Overseas Economic Cooperation Fund 1995; Policy Research Institute for Land 2001; Sakamaki 2006.

#### Rising investments in social services facilitate convergence in incomes



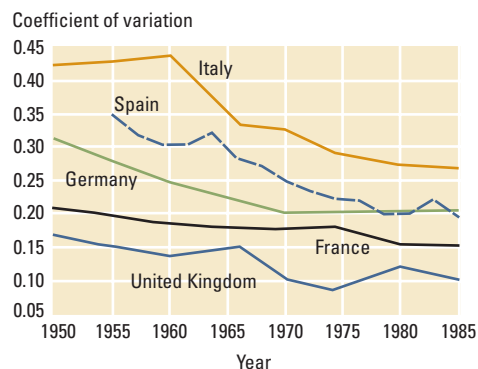
Contributed by Keijiro Otsuka and Megumi Muto.

the labor force more mobile, this led to falling geographic disparities in incomes (box 2.4).

### *For developing countries, spatial disparities in living standards between subnational areas first rise and then fall with development*

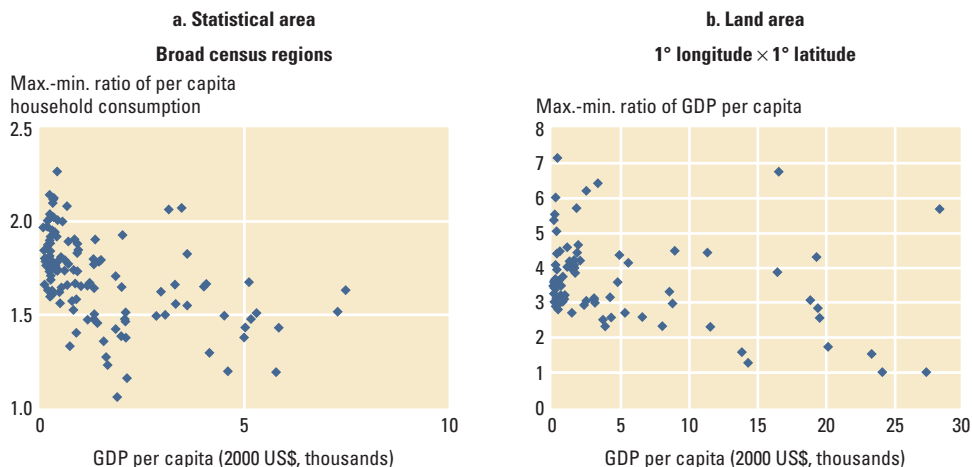
Comparing a large number of countries at different levels of development reveals that spatial disparities in per capita product and welfare diminish with level of development (see figure 2.7). This is consistent with most developing countries being clustered on the upward-sloping section of the inverted-U-shaped relationship between development and spatial inequality—and with the developed countries on the

**Figure 2.6** Spatial disparities have narrowed slowly in Europe since World War II



Sources: de la Fuente 2000; Barro, Sala-i-Martin, Blanchard, and Hall 1991.

**Figure 2.7 Contemporary comparisons of countries indicate that disparity in welfare among subnational areas fall with economic development**



Source: Panel a: World Bank staff estimates of more than 120 household surveys fielded during 2000s in more than 80 countries; panel b: World Bank staff estimates from <http://gecon.edu.yale>, which is information in 1990.

downward-sloping part of the relationship. The conclusion is based on two sources of information. The first source comes from more than 120 household surveys covering more than 80 developing countries, from the Democratic Republic of Congo with a GDP per capita of less than \$100,

to Argentina with more than \$7,500. The second source is based on the geophysically scaled economic data of terrestrial grid-cells of 1° longitude by 1° latitude for 90 countries that span the full spectrum of development, from Ethiopia with a GDP per capita of less than \$200, to Japan with a GDP of more than \$30,000.<sup>50</sup>

The household survey data offer an added advantage because individual household consumption is a better measure of welfare than income. Similar households in different areas of a developing country can have an average gap in household consumption of 70 percent simply as a result of location.<sup>51</sup> In Nicaragua, a six-person household headed by a primary-educated 40-year-old male in the lagging area of Matagalpa-Jinotega consumes half of what an equivalent household consumes in the leading area of Managua. In Canada and the United States a household in the lowest GDP per capita area consumes 20 percent less than an equivalent household in the highest. In Japan the area of residence means even less for the gap in consumption.

As countries become more developed, the disparities in welfare purely attributable to location diminish.<sup>52</sup> This pattern holds after controlling for the land area of a country and its number of administrative areas. Among countries partitioned into five areas,

**Table 2.3 Household survey and subnational gross product data corroborate the pattern of declining spatial disparities in welfare with development**

Statistical area	Country	GDP per capita	Number of statistical areas	Leading-lagging area disparity in household consumption (minimum-maximum ratio)
	Cambodia	234	5	1.89
	Bangladesh	286	5	1.73
	Colombia	1,989	5	1.54
	Thailand	2,109	5	1.52
	Argentina	7,489	5	1.48
	Canada	23,392	5	1.22

Land area	Country	GDP per capita	Land area (km <sup>2</sup> )	Leading-lagging area disparity in per capita gross product (minimum-maximum ratio)
	Philippines	920	300,000	5.43
	Poland	3,099	311,888	4.63
	New Zealand	11,552	267,990	3.35
	Norway	27,301	304,280	1.78
	Japan	33,280	364,600	0.35

Sources: Estimates of consumption disparity are from more than 120 household surveys fielded during the 2000s for more than 80 countries. Estimates of disparity in gross product are from, which comes from information gathered in 1990.

Note: GDP per capita estimates are based on constant 2000 U.S. dollars for the particular years of the surveys.

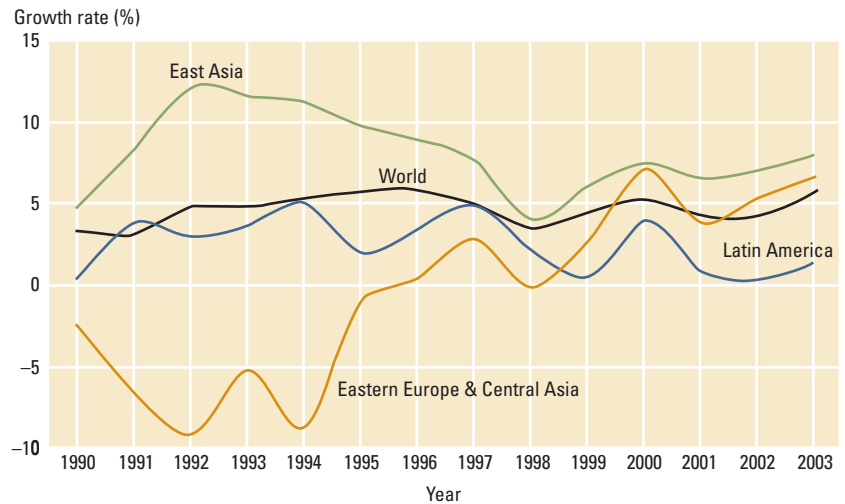
Bangladesh and Cambodia, both with GDP per capita less than \$300,<sup>53</sup> had spatial gaps in consumption between their leading and lagging areas of 89 percent and 73 percent, respectively. For Colombia and Thailand (with GDPs per capita of approximately \$2,000) the equivalent gaps are about 50 percent. For Canada (with a GDP per capita of \$20,000) the gap is less than 25 percent. Among the medium-size countries, spatial disparities in welfare follow the same pattern, falling across the spectrum from developing to industrialized countries. The same is true for larger and smaller countries (see table 2.3).

### *Fast-growing countries see spatial disparities in income widen*

East Asian growth has outstripped both the world economy and the growth of other developing regions. As they moved from plan to market, Eastern European and Central Asian countries have also grown faster than the world (see figure 2.8). As in the early stages of development in today's industrialized countries, development in East Asia, Central Asia, and Eastern Europe has brought widening gaps. In Southeast Asia the disparities in incomes per capita between leading and lagging areas has grown wider (see figure 2.9). In China too, the spatial dispersion in GDP per capita increased over the last decade (see figure 2.10). All this is consistent with the findings of the UNU-WIDER research program.

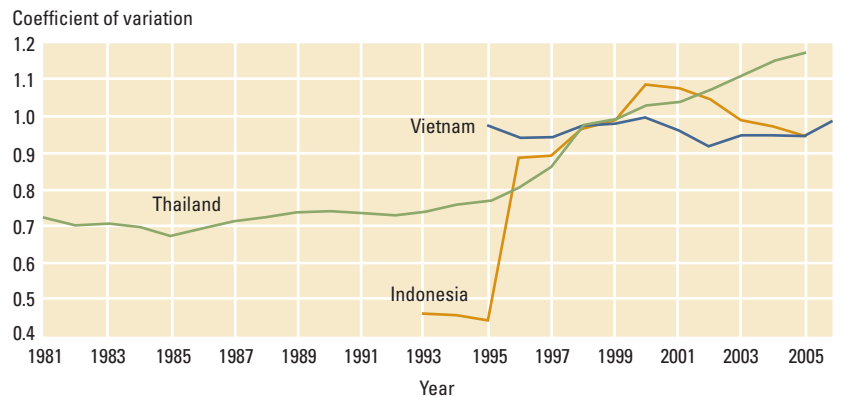
In Eastern Europe and Central Asia, too, disparities among subnational areas in labor productivity and income widened. In Russia income per capita in the lagging subnational area in 1985 was half the national average, and that in the leading area, twice the national average. Since then, income per capita in the lagging area has fallen to a quarter of the national average, while that in the leading area increased to five times the national average.<sup>54</sup> This divergence occurred during a reshaping of Russia's economic geography as state industries in remote areas collapsed, and economic activity started to respond to spatial variations in market potential (see box 2.5). Similarly, the Czech Republic, Hungary, Poland, and the Slovak Republic have

**Figure 2.8 Economic growth in East Asia and Eastern Europe is faster than the world's growth**



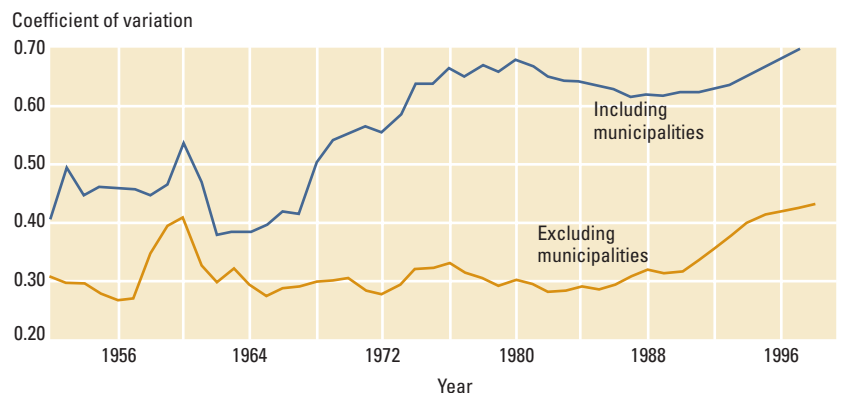
Source: World Bank 2005e.

**Figure 2.9 Disparities in per capita gross product have been rising between leading and lagging areas in Southeast Asia**



Source: Hamaguchi forthcoming.

**Figure 2.10 Steady rise in inequality of per capita provincial gross product in China since 1990**



Source: Demurger and others 2002.

### BOX 2.5 *Spatial inefficiency and the downfall of the Soviet Union*

The Earth hosts many vast and harsh spaces, but few governments have put as much energy into the development of such places as Russia did under the Soviet government.

The effort to develop Russia's eastern areas was substantially increased under Stalin's rule. A forced industrialization attempted to shift production to the east and create new economic bases in the country's geographic heart. Equalization of economic (especially industrial) mass across Russia was seen as the way to make development uniform across space. "Balanced industrial growth" remained a slogan for a long time. In the 1930s the new areas received more than 50 percent of the central investment, financed mainly by expropriating wealth from agriculture. The new areas absorbed only capital at first. Visible effects appeared during World War II, although the most productive zones were close to the front, like the Ural-Volga, where 58 percent of factories evacuated from the west of the USSR were placed.

An accounting of this centralized, directive effort to spread out economic mass is depressing. Alexei Mints, the Soviet geographer, dismissed as propaganda the claims that directed investment boosted backward areas and created cities "from zero" under the five-year plans. The reality was more prosaic: the "opening up" of eastern raw material fields coincided with the growth of manufacturing in the west. The shift eastward, Mints wrote, occurred mostly in the European part.<sup>a</sup> In reality, Russia's demographic and economic geocenter had moved only as far east as the river Belaya in Bashkiria by 1990; eight of Russia's 11 time zones lay to the

east of the Belaya. Industrial Siberia grew in absolute terms, but its share did not exceed one-fifth under the Soviet price system that favored final goods at the expense of raw materials, transportation, and energy (see the table below).

The Soviet social infrastructure overlapped with industrial development. Health centers, schools, recreational, cultural, sports, and communal-housing facilities—called *sotskul'tbyt*—generally belonged to enterprises. This overlap was especially evident in large companies in remote areas, such as the transpolar city of Noril'sk. This tradition was combined, somewhat paradoxically, with a vigorous redistribution of funds between sectoral and regional departments. Profits were seized and then given back—not necessarily to the same place—in capital goods and assets. The share of enterprises under the all-Union jurisdiction reached 70 percent in the reigns of Stalin and Brezhnev. The central government (Sovmin) controlled less than 20 percent of industrial profits obtained on Russian soil.

Industrial deconcentration, together with price system distortions and an expensive arms race, would bring the Soviet system down. In the late 1980s both the elite and the masses in almost every area or republic claimed that it bore the burdensome duty of a land that "fed the others." The slogan of regional *khoz-raschet* (self-repayment and economic accounting) soon grew into political separatism and contributed to the demise of the Soviet Union.

After the Soviet Union collapsed, the Russian Federation became more integrated with the world market. Russia

found itself more resource abundant, but also less populated. The market revaluation of resources and assets shrank the economic mass of distant zones and poles, but deteriorating infrastructure did not reduce, and in some cases, increased economic distance. Industry-tied public services also collapsed in the 1990s, as firms were privatized or transferred to their *sotskul'tbyt* to municipal authorities. For some time under Yeltsin, the revenues of federal and regional/local budgets were officially equal (50:50). In the 2000s, though, the rules were changed in favor of the Federation (60:40 when the external debt payments were made, reduced later to 55:45). But expenditures stayed at 50:50 because of growing transfers.

Today, center-region financial relations are again based on the principle of redistribution, though less so than in the Soviet Union. But industry is now more fuel and material based. After decades of equalization plans, the economy sees widening disparities in regional per capita product.

The figures on the next page show this for 1990 and 2005, using old Soviet net material and new gross regional product (GRP) methods and prices. The two leaders, Tyumen oblast in Western Siberia and Moscow in the center, remained the same. But the gap between leading and lagging areas skyrocketed from 5 to 43. With redistribution, the leading-lagging gap in each area's average personal income in 2005 was 11. Only 20 of 88 regions exceed the Russian average in per capita GRP, and only 22 in income. Most poor areas reduced the gap in living standards with the help of transfers.

**Spatial shifts in the Russian Federation, 1900–2000**

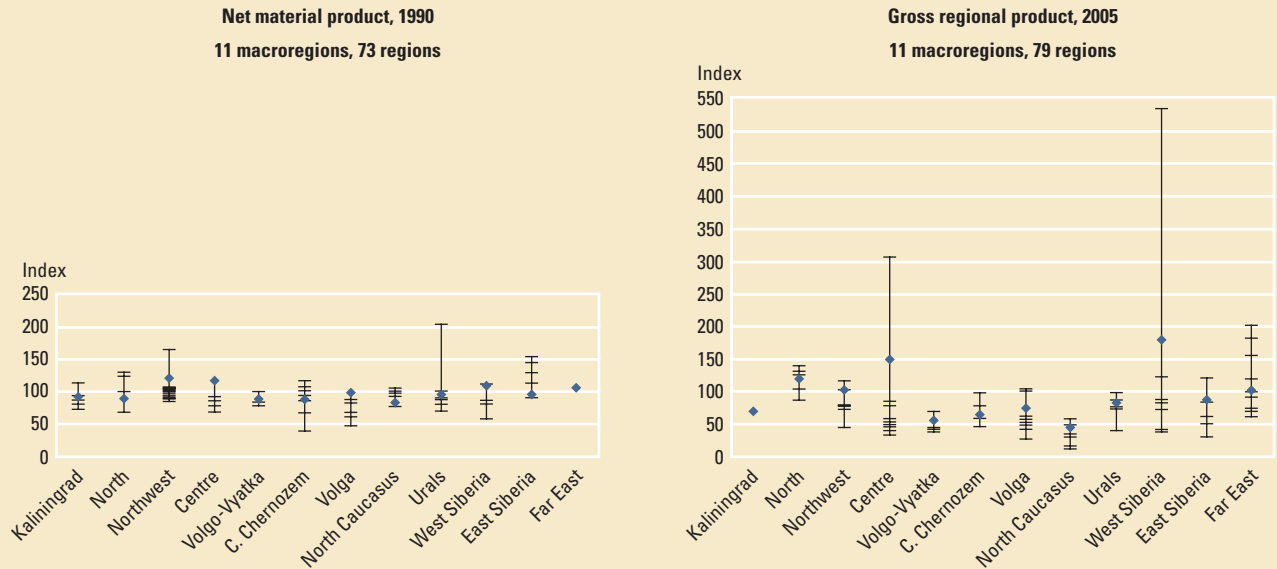
Indicator/region	1900	1925	1950	1975	2000	1900	1925	1950	1975	2000
	<b>Number of workers, millions</b>					<b>Production, billion rubles, in 2000 prices</b>				
<b>Absolute figures</b>	1.9	2.2	10.8	21.4	13.3	22	37	579	4,705	4,759
<b>By type of region<sup>a</sup></b>	<b>Percent</b>					<b>Percent (in current prices)</b>				
Old industrial <sup>b</sup>	64	61	42	40	33	50	65	68	42	32
New European	30	33	39	41	47	33	31	27	38	40
Eastern (Asiatic)	6	6	19	19	20	17	4	5	20	28

a. Author's calculations based on various statistical and literary sources. b. Includes St. Petersburg and suburbs, the center (including Nizhny Novgorod) and the mid-Urals.



**BOX 2.5** *Spatial inefficiency and the downfall of the Soviet Union—continued*

**Differences in regional product widened**  
Current prices, percent of Russian average



Welfare in remote areas has become less dependent on economic mass in contemporary Russia. The trend is not seen as satisfactory by some Russian observers and policy makers, but what should be done about it is not clear. The policy debate ranges between two polar visions: reinforcing the redistributive system

across space based on a wider sharing of oil and gas profits, or a forced diversification of regional economies based on military-industrial activities and research and development initiatives. While the debate continues, Russia's experience under the Soviet government offers policy lessons. Particularly for a country with the world's

largest land area, spatial policy choices and their efficiency could mean the difference between economic progress and stagnation.

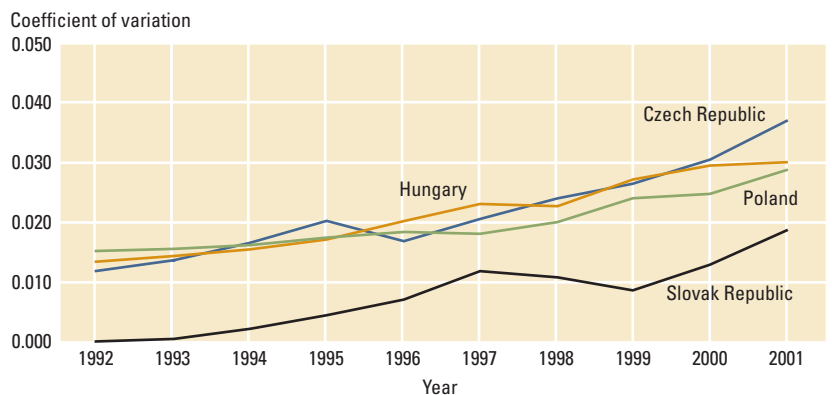
Contributed by Andrei Treyvish. a. Mints 1974, pp. 20–54.

all witnessed increased spatial disparities across subnational areas since the beginning of transition (see figure 2.11).

The East Asian and Eastern European countries appear to be on the rising part of the inverted-U curve. Economic activity is still concentrating in a small number of favored leading areas, with agglomeration economies increasing their productivity, wages, and income per capita. The lagging areas, insufficiently integrated into the national economy, have not yet captured spillovers from the leading areas.

The dynamics of geographic divergence in East Asia, Eastern Europe, and Central Asia have generally been a “race to the top.” All subnational areas experienced gains in average wages and household incomes, though the biggest gains have gone to the

**Figure 2.11** Income disparities between areas widened as Eastern European nations moved from plan to market



Source: Ezcurra and Pascual 2007.

leading areas.<sup>55</sup> Among the poorest provinces in China, the southwest region had GDP per capita growth of 7.7 percent over 1979–98, the central region 7.8 percent, and the northwest region 8.4 percent.<sup>56</sup> East Asian countries saw phenomenal declines in poverty from more than 450 million poor living on less than \$1 a day in 1990 to about 120 million in 2007.<sup>57</sup> For Eastern Europe and Central Asia, the divergence between 1998 and 2003 was associated with a fall of 40 million in the region’s poor living on less than \$2 a day, mainly because the mass of poverty is in leading areas.<sup>58</sup>

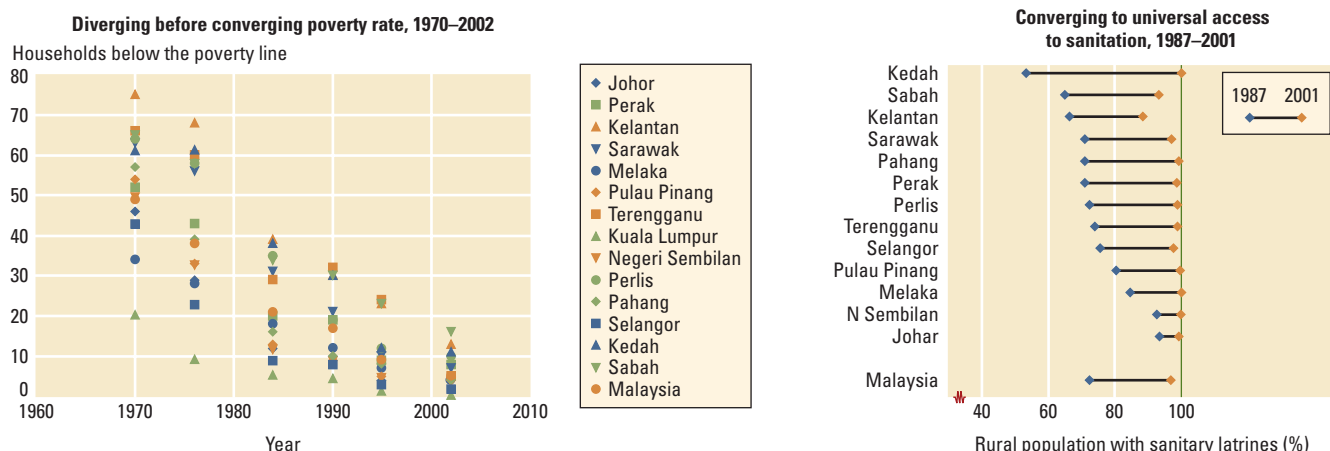
*Some relatively closed or middle-income countries had incomes converge*

In upper-middle-income Brazil, the dispersion of state per capita income around the national mean fell from a coefficient of variation of 0.65 in 1970 to 0.49 in 1995.<sup>59</sup> Chile witnessed spatial convergence in GDP per capita across subnational areas between 1960 and 2001, when its GDP per capita more than doubled from \$4,270 to \$10,538.<sup>60</sup> Upper-middle-income South Africa also had per capita incomes converge between its towns and cities from 1990 to 2000.<sup>61</sup> For Colombia, a relatively closed economy, the ratio of GDP per capita in the leading *departamento* of Santafé de Bogotá to the lagging *departamento* of Choco fell from 10 to 6 during 1950–60 and to 3.1 in 1990.<sup>62</sup>

*As incomes diverge, health and education converge*

Many developing countries have had subnational Millennium Development Indicators across areas converge, so even though disparities in income and material well-being widened, basic welfare has become more equal. In Indonesia the coefficient of variation across provinces for average years of schooling fell from 0.43 in 1971 to 0.15 in 2000, and that for the poverty rate fell from 0.42 to 0.35.<sup>63</sup> In Thailand infant mortality rates narrowed from a minimum-maximum gap of 6 percentage points between the leading and lagging areas in 1980 to 0.7 percentage points in 2000,<sup>64</sup> around a national mean of six deaths per 1,000 live births. In Vietnam the gap in malnutrition rates between leading and lagging areas fell from 20 percentage points in 1998 to 15 percentage points in 2004, accompanying an overall improvement for all areas.<sup>65</sup> In China territorial disparities in the human development index declined between 1995 and 2003. The disparity between the best-performing province (Beijing) and the worst-performing province (Tibet) declined from 0.26 in 1995 to 0.19 in 2003 for life expectancy, and from 0.50 to 0.32 for the human development index. The gap for literacy rates also declined between 1990 and 2003, from 58 to 51 percentage points.<sup>66</sup> The convergence of basic welfare in rapidly growing East Asian countries is epitomized by Malaysia (see figure 2.12).

**Figure 2.12 In Malaysia, geographic convergence in basic welfare accompanied economic growth**



Source: Malaysia Economic Planning Unit 2008.

For Mexican states, rates of adult literacy and infant mortality converged from 1940 to 2002, as did life expectancy and enrollment rates from 1990 to 2002.<sup>67</sup> In Egypt the gap in female primary school enrollment rates between the best- and worst-performing governorates narrowed from 41 percentage points in 1995 to 25 in 2004, as did the literacy rate and the gender gap in literacy between 1986 and 2001.<sup>68</sup>

Not all countries have experienced spatial convergence in the Millennium Development Indicators. Countries in South Asia and Africa still have wide internal disparities. In India and Sri Lanka the disparities across states remained large between 1981 and 1991,<sup>69,70</sup> though there have been absolute improvements both nationwide and in the country's lagging areas. In Sri Lanka poverty was reduced in all provinces between 1991 and 2007, with the fastest reduction in its leading western province.<sup>71</sup> In Kenya provincial gaps in primary and secondary school enrollment rates remained large between 1999 and 2004, but more important, all areas made progress, including the lagging Northeast.<sup>72</sup>

### What's different for today's developers?

In *The Wealth of Nations*, published in 1776, Adam Smith wrote, "It is upon the sea coast, and along the banks of navigable rivers, that industry of every kind naturally begins to sub-divide and improve itself, and it is frequently not till a long time after that those improvements extend themselves to the inland parts of the country."<sup>73</sup> What Smith wrote in 1776 could apply equally to the spatial processes in China's modern economic development. What, if anything, is different for today's developing countries?

In some fundamental respects, very little. Smith's key point was that a country's economic development, in its early stages, tends to be led by subnational areas that provide the greatest potential access to markets and thus to density. But subnational areas distant from density, inland areas in Smith's example, tend to be left behind. Only later in the development process do these lagging areas share more of

the benefits of development as a slow subnational convergence in living standards sets in. This basic thesis holds true today.

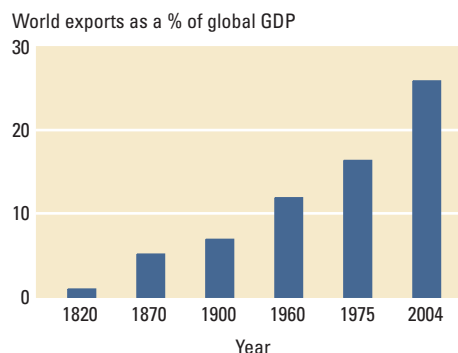
But there are some important differences for modern-day developing countries:

- Given the phenomenal size of today's global market, development relies more on pursuing an outward-oriented strategy in which leading areas compete and trade globally.
- The rapid transformation of internal economic geography—and the spatial disparities in today's developing countries—will likely be greater than in industrial countries during their early stages of development.
- Because redistributive mechanisms take time to build and mature, labor mobility and market connectivity are more potent mechanisms to integrate lagging areas into national economies. Globalization and technological progress in transportation and communication potentially provide a wider range of means to bridge the economic distance between leading and lagging areas.

#### *Global markets are more important.*

Because of greater integration today, global markets are more important than domestic markets than at any time in history. The market potential of leading areas is higher in today's developing countries than it was in today's developed countries during the nineteenth and early twentieth centuries, thanks to the rapid growth of trade since the end of

**Figure 2.13** Today's developing countries face a more integrated world



Source: Chase-Dunn, Kawano, and Brewer 2000.

World War II. Indeed, the growth of trade has been about twice that of world income in recent decades.<sup>74</sup> Trade as a proportion of world GDP is now more than 25 times its level in 1820 (see figure 2.13). So development under protectionist policies might have been a viable (if not optimal) strategy in the nineteenth and early twentieth centuries.<sup>75</sup> But a protectionist strategy is much less likely to be viable today, especially in the light of recent failures of such policies in Latin America and Sub-Saharan Africa.

When a country is relatively closed, an area's market potential is determined mainly by its distance to density within the country. But once it is open, distance or access to international markets also becomes important, and border and coastal areas tend to gain in their shares of economic activity. Structural shifts in patterns of trade can alter the topography of market potential in a country: previously leading areas, perhaps favored by policy, lose out and decline as their distance to new leading areas increases. This is illustrated by Britain, China, and Mexico.

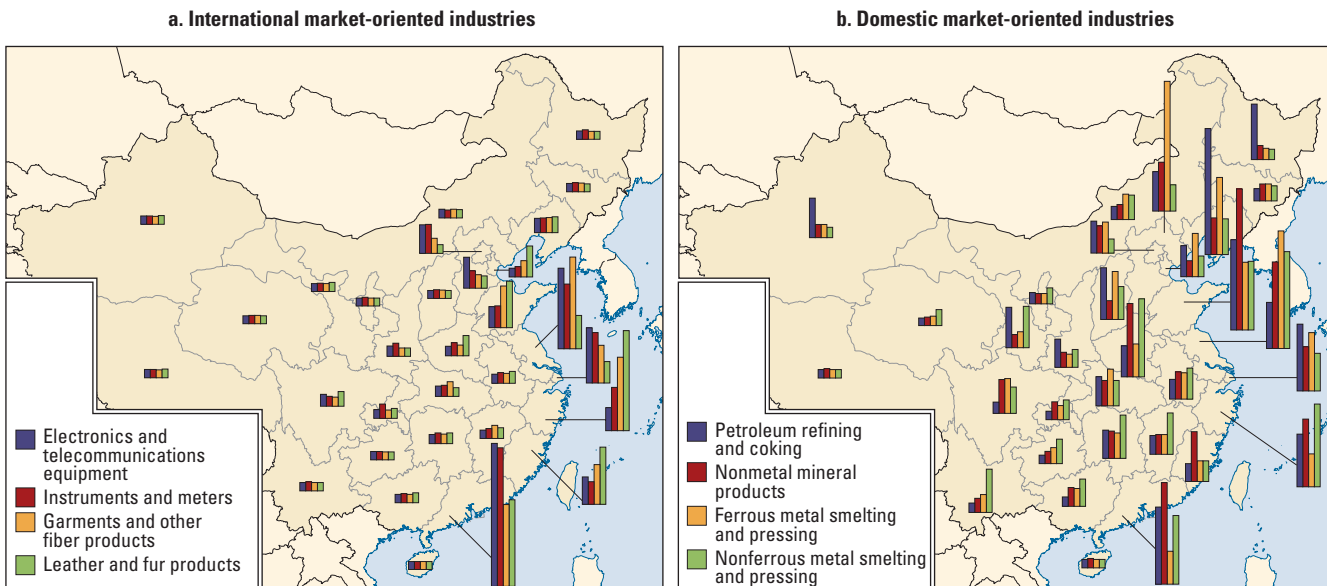
**Openness matters for distance.** Before Mexico liberalized trade in 1985, the distance to Mexico City was the primary determinant of an area's market potential. But with liberalization, distance to density in

the United States also became important, and border areas such as Ciudad Juarez, Mexicali-Calexico, Nogales, and Tijuana had large increases in market potential and growth, whereas Mexico City had some depopulation and dispersion of its manufacturing activity.<sup>76</sup>

In China, during Mao's era of self-sufficiency, heavy industries were promoted in interior provinces, which received 71 percent of state investment between 1966 and 1970. Many companies in Shanghai and other coastal cities were relocated to the interior and mountainous provinces of Guizhou, Hubei, and Sichuan.<sup>77</sup> But since China has become more open to foreign trade and investment, coastal areas flourished as gateways to overseas markets, but many interior areas floundered. Export-oriented industries (garments, electronics, leather) are concentrated in coastal provinces, while domestic market-oriented industries (metals, nonferrous smelting) are dispersed (see map 2.5).<sup>78</sup>

**The costs of transport and telecommunications matter more.** Sea coasts and navigable rivers are natural locations for leading areas because, in Smith's day, shipping was the most cost-effective way of transporting goods to domestic and international

Map 2.5 Exporting industries concentrate in coastal areas to minimize distance to the global market



Source: He forthcoming.

markets. But technological progress has led to large reductions in the cost of transporting goods and in telecommunications (see chapter 6). New (non-water-based) modes of transport and the information technology revolution have reshaped the landscape of economic density.

**Access to knowledge is easier.** So today's developing countries can take advantage of world markets of unprecedented size and can access these markets with greater ease. At the same time, greater flows of foreign direct investment, expanding twice as fast as world trade, increase access to knowledge at the world's technological frontier.<sup>79</sup> For the most successful developing countries (mainly in East Asia) of recent decades, the result has been national growth—driven by leading areas—far faster than that of today's developed countries in the early stages of their development.

With such rapid growth in leading areas, the geographic disparities in today's developing countries are far larger. Take China, for example, whose GDP per capita is roughly equivalent to that of Britain in 1911. London then had a GDP per capita around 1.7 times the national average, whereas East Anglia had a GDP per capita two-thirds that average.<sup>80</sup> In China today, the comparable figures are 3.3 for the leading area of Shanghai and one-third for the lagging area of Guizhou.<sup>81</sup> Shanghai has a GDP per capita (\$16,044), roughly equivalent to the British average in 1988, while

Guizhou has a level (\$1,653) close to the British average in 1830.<sup>82</sup>

Although comparisons between China and Britain need to be made with caution because of the different geographic scales of the two countries, the basic point remains. When today's rich countries were developing during the nineteenth and early twentieth centuries, the growth of their leading areas was constrained to the rate of growth of their domestic markets and the world technological frontier. These constraints limited the extent to which spatial disparities could increase in their early stages of development. In sharp contrast, for today's developing countries, these constraints no longer exist. Although the absence of these constraints helps developing countries, the potential disparities that can arise between leading and lagging areas in the early stages of development are much larger.

Although the spatial inequality between leading and lagging areas in today's developing countries will follow the same inverted-U shaped path, the features of this path will differ. The ascent is likely to be steeper in the initial stages of development. Set against this faster rise in disparities, however, is the opportunity for faster convergence between lagging and leading areas as development progresses—because modern information and communications technologies offer a wider range of methods to bridge the economic distance between leading and lagging areas.



# Division



**D**ensity and distance, the dimensions of economic geography examined in the two previous chapters, matter for the development of countries and regions. Over the past two centuries, global gross domestic product (GDP) has grown about 2.3 percent a year, an almost 50-fold increase in constant dollars.<sup>1</sup> But growth has not been uniform. Half of global GDP today is produced on just 1.5 percent of the world's land, which would fit comfortably into Algeria. This dense economic mass is home to about a sixth of the world's people.<sup>2</sup>

High density reflects the self-reinforcing benefits of proximity between economic agents across spatial scales—local, regional, and international. Distance also matters for countries and world regions. For the past 50 years, by far the largest share of global economic activity has been concentrated in North America, Western Europe, and Northeast Asia (see map 3.1). Being near these largest markets for products and supplies opens great opportunities. Indeed, the correlation between access to markets and economic growth is strong.

But it is the persistence of divisions between nation-states that sets the processes of economic geography apart for countries and regions. The latest wave of globalization, which began after World War II, has been associated with a borderless world. In 1990 Kenichi Ohmae famously pronounced that “borders have effectively disappeared.”<sup>3</sup> For some world regions and some transactions across borders, this reflects reality. But borders, rather than disappear, have tripled in the past 50 years. There are now about

600 land borders between nations (see figure 3.1).<sup>4</sup> And their number may continue to increase if federated states split apart, if minorities within nations achieve self-determination, and if some of the remaining 70 dependencies seek independence.<sup>5</sup>

This chapter shows how divisions affect economic development, how geography and cultural history contribute to persistent divisions, and how countries impose barriers to productive interaction with their neighbors and the rest of the world. Economies benefit from gradually lowering barriers, and rich countries tend to have the lowest barriers to trade and factor mobility. Countries that have integrated *regionally* benefit from growth spillovers, larger home markets, and scale economies in production and some types of public services. Some countries within a region may initially prosper more than others, but living standards eventually converge in regions that have integrated. And in a world with economic activity and purchasing power concentrated in a few regions, countries that have integrated *globally* benefit from access to those markets and sources of investment. This chapter makes the case for countries to promote such integration.

The main findings:

- ***Divisions between countries make for thicker borders in the developing world.*** Borders restrict the flow of goods, capital, people, and ideas everywhere. But larger countries with big markets may get by with more restrictive borders. Small countries have to worry more.

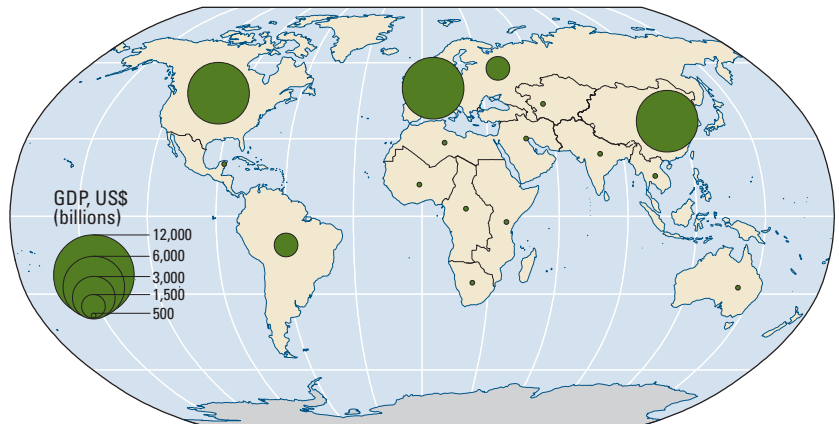
Some types of divisions, like being landlocked, are beyond the control of individual countries. Others are self-imposed. And as countries develop, they gradually lower almost all types of barriers.

- **Economic mass is concentrated in North America, Western Europe, and North-east Asia.** And only East Asia has significantly increased its share of global GDP in recent decades. This global concentration matters greatly for the development prospects of today's lagging world regions, and increasing their access to these large world markets must be a priority for global development policy.
- **Within world regions, economic development tends to be accompanied by an initial divergence in living standards between countries, followed by convergence.** Basic health and education indicators show improvements in almost all world regions, but there is some divergence in incomes between the richest and poorest countries. The increasing inequality between countries within a region reverses as lagging countries benefit from growth spillovers from leading countries.
- **Overcoming divisions between countries regionally and globally is essential for sustained progress.** This points to the importance of facilitating access to global markets and promoting regional integration in all its many forms (see chapters 6 and 9).

## Defining division

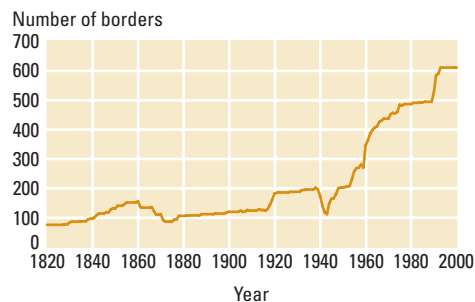
Borders and divisions are not synonyms. National borders enclose people with shared characteristics, providing a sense of place and belonging that contributes to social welfare. They also generate manageable units for governing society. And well defined and settled, they provide security and stability, yielding considerable economic benefits. Divisions, by contrast, arise when borders are poorly managed. They range from moderate restrictions on the flow of goods, capital, people, and ideas to more severe divisions triggered by territorial disputes, civil wars, and conflicts between countries. Borders are not a problem in themselves. But the consequences for economic development are quite different when the countries separated by

Map 3.1 Global GDP is concentrated in a few world regions, 2006



Source: World Bank 2007j.

Figure 3.1 The number of borders between nations tripled in the past 50 years



Source: Stinnett and others 2002.

those borders are integrated in a functional economic community (the Czech Republic and the Slovak Republic) or divided by conflict, reducing the scope for further integration (Eritrea and Ethiopia).

Viewed through an economic lens, some borders are much wider than others (see map 3.2). The width or thickness of each country's borders is proportional to restrictions that each country imposes on the flow of goods, capital, people, and ideas with all other countries.<sup>6</sup> The wider the border, the more the country limits trade, travel, and the flow of factors of production.

- Economic borders are narrow in North America, Western Europe, Japan, Australia, and New Zealand; are wide in Asia, Africa, and Eastern Europe; and are in between in Latin America. Countries with wide borders include emerging economies in East Asia and countries in Sub-Saharan Africa, which for decades have had low growth.

Map 3.2 Some borders are much wider than others



Source: WDR 2009 team.

Note: The width of borders is proportional to a summary measure of each country's restrictions to the flow of goods, capital, people, and ideas with all other countries. Gray areas = insufficient data.

- Borders of the same width appear narrower around larger countries. This reflects the reality that large countries can often get away with more restrictive policies. Small countries depend more on openness to overcome small markets and production scales.
- Some countries with narrow borders are surrounded by countries with restrictive policies, making it more difficult for them to benefit from openness than for countries in more open neighborhoods.
- This is true more for countries that are open but landlocked, such as Armenia, Uganda, and Zambia, than for those that are open and coastal, such as Chile or Georgia. Some coastal countries, by contrast, have such high restrictions that they might as well be landlocked.

Comparing border widths with economic status confirms that wealthier countries typically have lower border restrictions (see figure 3.2).<sup>7</sup> As a country develops, it strengthens the institutions that manage its borders and regulate the flow of goods and factors of production. It also becomes more integrated into the global economy and

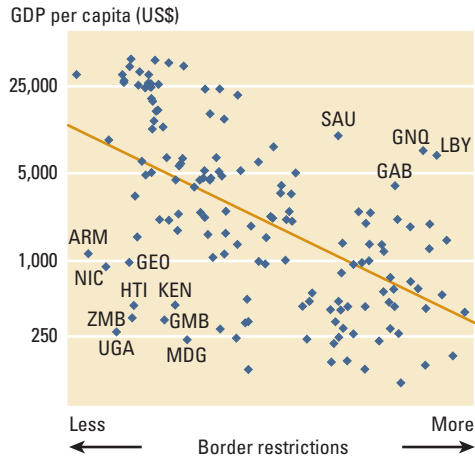
opens its borders to benefit from interactions with other countries, promoting further development. But there are exceptions. Some upper-middle-income countries maintain high restrictions—all of them oil exporters: Equatorial Guinea, Gabon, Libya, and Saudi Arabia (upper right of figure 3.2). And some poorer countries have greatly reduced border restrictions, among them the landlocked countries of Armenia, Uganda, and Zambia, as well as the coastal countries of The Gambia, Georgia, Haiti, Kenya, Madagascar, and Nicaragua (lower left).

#### *How countries maintain divisions*

Countries choose how permeable their borders are, affecting the flows of goods, capital, people, and ideas. And the effects of division change as countries become more open to some flows and restrict others.

**Goods and services.** Borders reduce trade. A study in the mid-1990s found that trade between Canadian provinces is, on average, more than 20 times greater than trade between those provinces and equally distant places in the United States. That implies a “border-width” equivalent to increasing the trade distance by 10,500 miles.<sup>8</sup> More recent

**Figure 3.2 Rich countries tend to have lower border restrictions**



Source: WDR 2009 team (see note 6).  
 Note: GDP per capita is for 2005 in 2000 U.S. dollars from a series used in later sections of this chapter and based on World Bank (2007) and Maddison (2006). ARM = Armenia; GNQ = Equatorial Guinea; GAB = Gabon; GMB = The Gambia; GEO = Georgia; HTI = Haiti; KEN = Kenya; LBY = Libya; MDG = Madagascar; NIC = Nicaragua; SAU = Saudia Arabia; UGA = Uganda; ZMB = Zambia.

estimates suggest that international borders reduce trade between industrial countries by a still significant 20–50 percent.<sup>9</sup> The reductions are even larger for developing countries, which tend to have higher trade barriers.

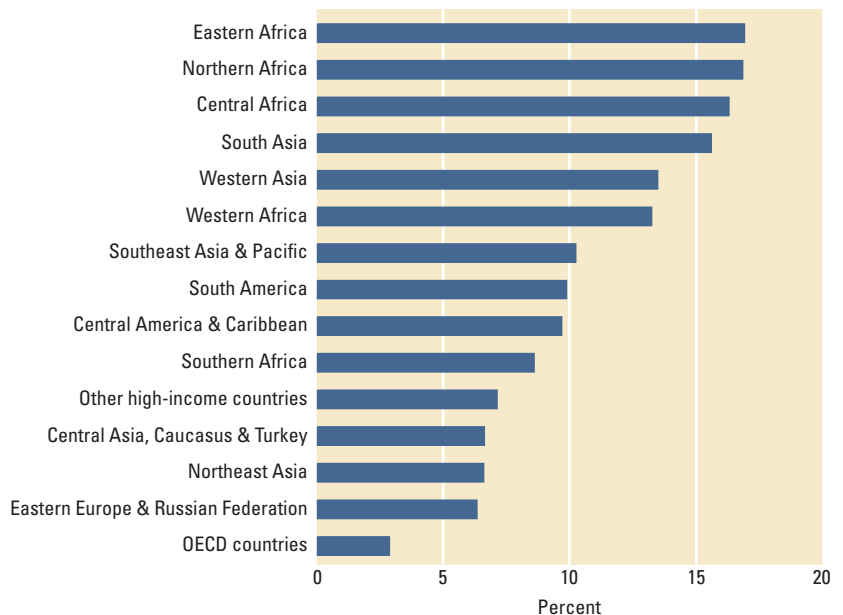
Countries that encourage exports and are open to imports of goods and services grow faster and reduce poverty more than countries that do not encourage exports. When exports are concentrated in labor-intensive manufacturing, trade increases the wages for unskilled workers, benefiting poor people. It also encourages macroeconomic stability, again benefiting the poor, who are more likely to be hurt by inflation. And through innovation and factor accumulation, it enhances productivity and thus growth.<sup>10</sup> There may be some empirical uncertainty about the strength of trade’s relationship with growth.<sup>11</sup> But essentially all rich and emerging economies have a strong trade orientation.

A country’s openness to trade is often measured by a country’s sum of exports and imports as a share of GDP. But a more direct measure is the average tariff rate, which fell globally from close to 30 percent in the early 1980s to about 10 percent in 2005.<sup>12</sup> Tariffs are highest in Africa, South Asia, and Western Asia and lowest in member countries of the Organisation for Economic Co-operation and Development

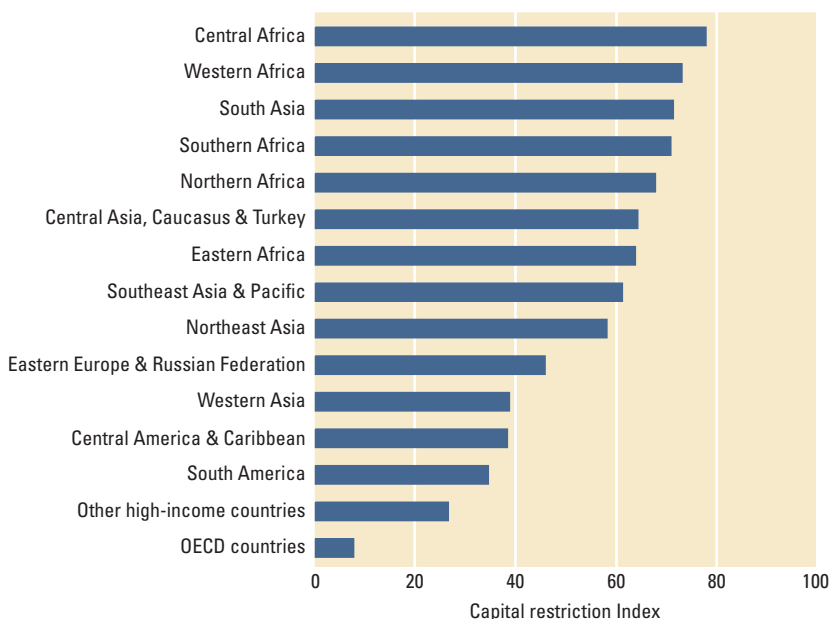
(OECD) (see figure 3.3). Quotas, subsidies, antidumping duties, licensing, and idiosyncratic or confusing regulations affect trade as well.<sup>13</sup> Using tariff and nontariff barriers, poor countries restrict trade more than rich countries. They also face higher barriers to their exports. Nontariff barriers, on average, represent more than two-thirds of total trade barriers, with higher proportions in rich countries than in poor.

**Capital.** Restrictions on capital flows in 2005<sup>14</sup> are lower in industrial than in developing countries (see figure 3.4) and are greatest in Africa, Central Asia, and South Asia. Recent empirical work—much prompted by the financial crises of the 1990s—provides qualified evidence that financial globalization benefits developing countries and that greater financial openness does not by itself contribute to more severe economic crises.<sup>15</sup> By reducing the cost of capital in receiving countries, freeing capital account transactions increases the availability of resources for productive investment. It can also promote portfolio diversification, thus mitigating risk, and encourage sound monetary management. From 1955 to 2004, freeing capital accounts had a positive association with growth in both developed and emerging economies.<sup>16</sup> Liberalizing equity markets

**Figure 3.3 Tariffs are highest in Africa, South Asia, and Western Asia**  
 Average tariff, 2005



Source: World Bank 2006f.  
 Note: The figure reflects the unweighted mean of country average tariffs.

**Figure 3.4 Capital restrictions are highest in Africa, South Asia, and Central Asia**

Source: Chinn and Ito 2006.

added 1 percentage point to annual GDP growth.<sup>17</sup> But short-term debt flows, which include portfolio bond flows and commercial bank loans, can be highly volatile. In countries where the financial sector is underdeveloped, governments and financial institutions may increase their exposure to short-term debt and thus their vulnerability to sudden outflows.

The indirect benefits of global integration and free capital flows may be greater than the direct effect of capital accumulation and portfolio diversification. Open markets can enforce monetary discipline, macroeconomic stability, and financial development. They can also strengthen institutions and governance structures. And they can increase integration with the global economy.<sup>18</sup> Where markets and governance are well developed, financial globalization contributes to GDP and productivity growth and reduces financial vulnerability. Where they are not, the impacts on growth are ambiguous, and the risk of a financial crisis is high.

**People.** Migration flows have increased with globalization, but much less than trade or capital flows. Global estimates suggest that 11 million people move annually for longer-term employment or to settle in another country. About 3.5 million of them are low-skilled workers, many migrating to the Gulf

States or other middle-income countries.<sup>19</sup> Migrants move for higher wages, greater education opportunities, or a better quality life (see chapter 5). Sending countries receive remittances, shed surplus agricultural labor, and benefit from return migration by those who have acquired skills or capital abroad. Receiving countries, many with aging populations or chronic labor shortages, increase their labor pool by admitting unskilled workers and their productivity by attracting highly qualified migrants.

The economic benefits from more migration could be great.<sup>20</sup> The pool of potential migrants is likely to remain large given prevailing wage differentials between poor and rich countries, three to four times those triggering the mass migration of Europeans to North America in the late-nineteenth century.<sup>21</sup> Yet, despite the potential benefits and the ready supply of migrants, most countries restrict in-migration, largely because of perceived negative effects on domestic labor markets.

Comparable information on migration restrictions is not available. But countries also regulate admission of short-term visitors. Each country faces a tradeoff in allowing people from some nations to visit for business or pleasure, while deterring residents of other nations for economic, political, or security reasons. This produces a complex system of “unequal access to foreign spaces”<sup>22</sup> that reflects similar restrictions for people seeking to migrate. Residents of richer countries face fewer visa requirements than those from poorer countries (see figure 3.5). But poorer countries also restrict entry by visitors from other nations. Exit can be regulated as well. Many countries make it difficult for their citizens to leave.<sup>23</sup> Passport costs across countries are as high as 125 percent of per capita gross national income (GNI), and higher costs are associated with lower migration rates.

**Ideas.** Basic labor-intensive manufacturing is a stepping stone for countries to improve their economic fortunes. But to maintain growth that outpaces population and reduces poverty, an economy needs to move from low-margin activities to the development and production of new or improved products, a process associated with moving from low-income to middle-income status.



Endogenous growth theory stresses that new ideas support this transition, generating economic rents that enable the accumulation of private and public capital. China—for the past two decades a producer of low-margin, standardized manufactured goods—now exports more than \$300 billion worth of information and communication technology (ICT) goods a year. So far, most of these exports have been assembled from imported components, with the largest rents captured by foreign firms that develop innovative technologies and control marketing and sales. Of the retail proceeds from an iPod® music player assembled in China, more than half goes to Apple's profits and the retail and distribution costs.<sup>24</sup> Assembly and testing account for only about 2 percent of the final sale value.

Freedom of access to all types of information is necessary for an atmosphere that induces innovation and productivity. Ideas and knowledge spread through the research and development (R&D) investments by firms and governments and through the global stock of existing knowledge accessible through publications, patents, and so on.<sup>25</sup> Governments do not restrict the flow of purely technical information, although poorer countries have limited access to such information because of cost or language barriers.

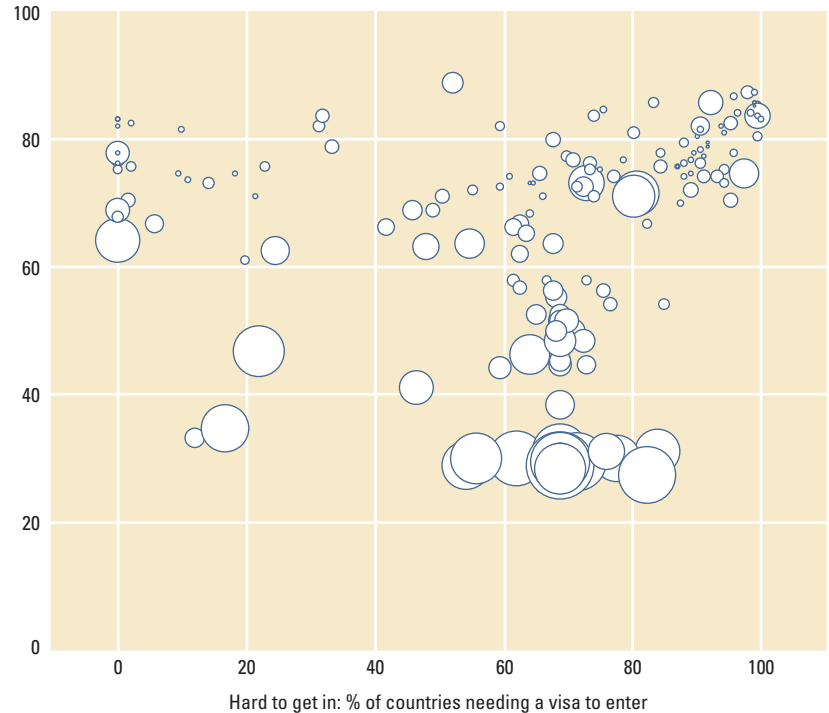
The link between the free flow of ideas and economic development is somewhat ambiguous and not well researched. A free press generally reduces corruption and increases public accountability.<sup>26</sup> An indicator of press freedom reported annually since 2002 by Reporters without Borders covers freedom and security in reporting, government control of media, restrictions on Internet providers, and censorship of content.<sup>27</sup> Western industrial countries generally have a high degree of freedom. Many low-income countries have high restrictions on the media and Internet traffic. Significant restrictions persist in parts of Africa, East Asia, the Middle East, and the former Soviet Union.

### *Some divisions are beyond the control of individual countries*

Countries for the most part are free to determine their openness to the outside world. But geography and history produce divisions over which countries have little or

**Figure 3.5 Residents of richer countries face fewer visa requirements**

Hard to get around: % of countries for which a visa is needed



Source: Neumayer 2006.

Note: Circles are proportional to GDP per capita; visas available at the border are not included.

no control. These include being landlocked, being in a remote location (especially if combined with small size), and having a high degree of ethnic or cultural heterogeneity within and across borders.

**Landlocked.** There are 43 landlocked countries in the world. Being landlocked reduces growth by at least half a percentage point.<sup>28</sup> Boxes 3.1 and 3.2 illustrate further the costs of being landlocked. Small surprise then, that many landlocked countries are among the world's poorest. But being landlocked in itself is not a cause of poverty—look at Botswana, Luxembourg, and Switzerland. The problem is being landlocked with poor neighbors or being landlocked far from markets.<sup>29</sup> Often the two go together. Africa has the most landlocked countries (15), and Eastern Europe and Central Asia the highest proportion—about half (see map 3.3). Bhutan, Lao People's Democratic Republic, and Nepal in Asia, and Bolivia and Paraguay in South America are other poor landlocked countries.

**Country size.** A large land area is often associated with abundant natural resources (see box 3.3). A large population

**BOX 3.1** *A country's neighborhood matters: regional integration and growth spillovers*

Spillovers of growth from across borders are among the main benefits of regional integration.<sup>9</sup> In a more integrated economic space, the long-run growth prospects of countries become interlinked as markets of neighboring countries become more accessible. Growth in neighboring countries enhances domestic growth, which benefits neighbors. This spatial multiplier enhances the rewards to good policy and contributes to convergence in living standards.

**Quantifying the benefits of growth spillovers**

From 1970 to 2000, membership in a common regional trade agreement (RTA) among neighbors was associated with a growth spillover of 13.6 to 15.3 percent, so every percentage point increase in the average growth rate of RTA partners brought a "growth bonus" of 0.14 percent to supplement domestic growth. Associated with this is a spatial multiplier of 1.14 to 1.18, with regional integration increasing the effectiveness of growth-promoting domestic policies by 14 to 18 percent.

In Europe and East Asia, where regional integration has been strongest, the benefits over the past few decades have been even larger. For these countries the

average growth spillover between 1970 and 2000 was 15.3 to 17.0 percent. This contributed to a slow, but steady, convergence in living standards, with the gap in prosperity between the poorest and richest OECD countries closing at an average rate of 1.59 to 1.85 percent a year. Along with this, the effectiveness of growth-promoting domestic policies has been supplemented by 18.1 to 20 percent.

In Sub-Saharan Africa the average growth spillover has been far weaker, signaling the relative lack of regional integration despite a plethora of RTAs. The growth spillover is estimated at only 2.9 to 3.9 percent, implying a spatial multiplier of only 1.01 to 1.04. This finding of virtually no growth spillovers holds when neighbors are defined by contiguity rather than RTA membership. A typical Sub-Saharan country's growth rate was basically independent of the growth rates of its neighbors.

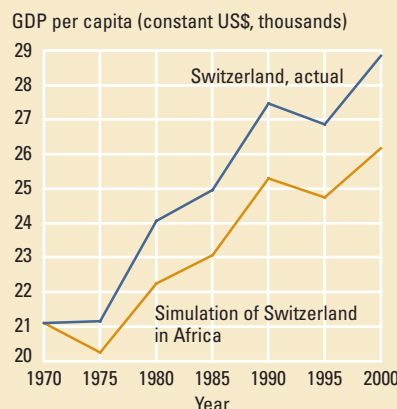
**Implications for landlocked and resource-poor countries in Sub-Saharan Africa**

Under current conditions, if the Sub-Saharan countries whose natural endowments are most favorable sustained a growth takeoff, the landlocked and

resource-poor countries of Central Africa would be left further behind.

If Switzerland had been subject to the same low spillovers experienced by the Central African Republic between 1970 and 2000, its GDP per capita in 2000 would have been 9.3 percent lower, with a cumulative GDP loss of \$334 billion (2000 constant U.S. dollars), or 162 percent of Swiss GDP (see the figure below).

**Putting Switzerland in Africa would have cost it \$334 billion**



Source: Roberts and Deichmann 2008. a. Collier and O'Connell forthcoming.

**BOX 3.2** *Bolivia and Chile's border—from wide to narrow?*

Bolivia illustrates the economic dependence of a landlocked country on its neighbors and how economic integration could help overcome these divisions. After a war with Chile in the late-nineteenth century, Bolivia lost its access to the Pacific, and Peru, Bolivia's ally, also lost territory to Chile.

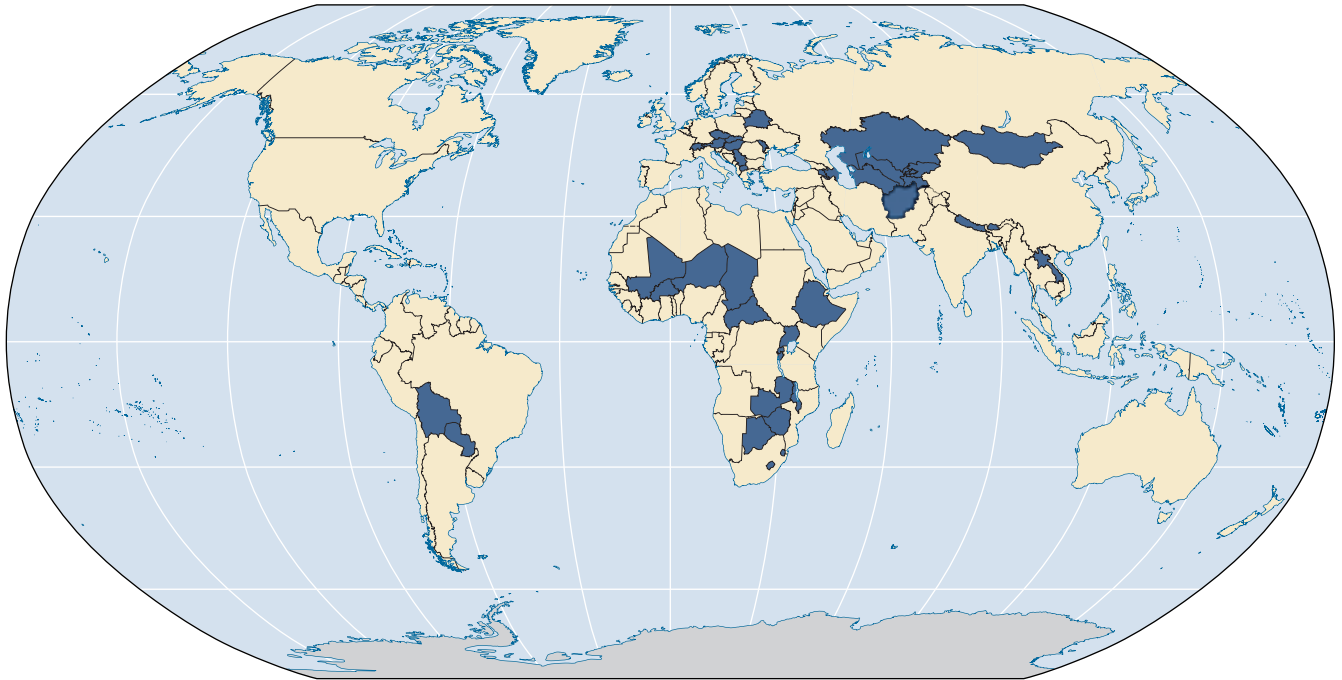
Chile and Bolivia have not had diplomatic relations since 1978, but they are now talking. A motive for Chile is natural gas. Since 1995 it has relied almost exclusively on gas from Argentina, but supplies have been limited by high demand in Argentina.

Bolivia has South America's second-largest natural gas reserves. So economic integration could be an incentive for resolving regional disputes. Chile would gain from energy imports from Bolivia; Bolivia would benefit from better access to ports, which would make it easier to export. Peru would likely be involved in any agreement because it provides an alternative, though less economic, route to the coast for Bolivia and because any corridor through Chile would likely pass through former Peruvian territory in Chile.

Sources: *The Economist* 2007b, Malinowski 2007.

provides a ready market and large labor force. Conversely, small countries lack the scale, capacity, and stock of production factors to achieve high economic growth by themselves. But as with being landlocked, size by itself is not a determining factor. What determines economic prosperity is a country's economic integration with the rest of the world.<sup>30</sup> Luxembourg ranks 167th in population but has the world's highest GDP per capita. Fully integrated in the European Union (EU), its highly specialized financial sector operates globally. Small countries should thus favor economic integration, because they will gain most from freer trade and openness.

In world regions that are more highly integrated, parts of a country therefore have less incentive to remain within a nation dominated by another cultural or ethnic group. Devolution in the United Kingdom and separatist movements in Spain confirm this. Similarly, the "re-balkanization" of Southeastern

**Map 3.3** Forty-three countries do not have direct access to the coast

Source: WDR 2009 team.

Europe with the disintegration of the former Yugoslavia was in part facilitated by the prospect of EU accession for the newly independent countries. Noneconomic considerations can dominate, however. Eritrea and Timor-Leste have seceded from their larger neighbors (Ethiopia and Indonesia) without the benefit of integration with a larger economic association.

**Sea-locked countries.** Being landlocked can generate an island effect, preventing a country from benefiting from neighboring suppliers and markets. Small islands in remote locations suffer similar isolation; they are essentially “sea-locked.” They face high transport costs for exports and imports, higher costs for energy and intermediate inputs, and typically higher wage costs and rents. The problems are acute for the small island nations of the Pacific.<sup>31</sup> Trade preferences to support them until they become competitive in world markets have generated large and unsustainable inefficiencies in production. And large per capita aid flows have had only limited impact on their competitiveness. Closely linking up with wealthier “patron” countries and increasing labor mobility may be the only strategies.<sup>32</sup> Small island states in the Caribbean, by

contrast, have more diversified economies and, being closer to rich markets, benefit more from tourism and trade.

Mauritius shows that good policy can overcome small size and remote location. It now has the second highest GDP per capita in Africa despite being more than 900 kilometers from the nearest mainland. Its location among the Middle East, South Africa, and India allows it to capture offshoring activi-

### BOX 3.3 *The benefits of size*

Five benefits of being a large country:

- Smaller per capita cost of providing many public goods, such as a judicial system or embassies.
- Larger home market, which can increase productivity and thus benefit economic growth.
- Stronger buffer to regional economic shocks—if a region that specializes in, say, agriculture suffers a recession, the impacts can be reduced through transfers from other regions, and workers can seek employment elsewhere in the country.

- More effective redistributive schemes to reduce gaps in after-tax incomes between rich and poor regions.
- Better ability to provide security, as the per capita cost of defense declines.

A possible disadvantage is the greater heterogeneity of preferences and thus the larger coordination costs in large democracies. Diversity also makes it harder to overcome collective action problems.

Source: Alesina and Spolaore 2003.

ties in manufacturing and banking, as well as a thriving stopover tourism industry.

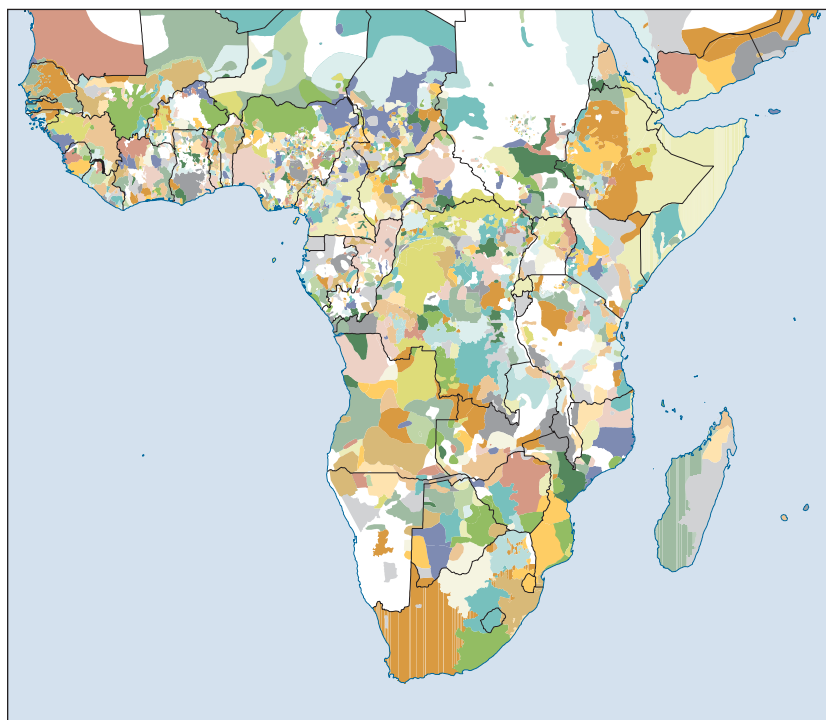
**Ethnic and cultural divisions.** Ethnolinguistic heterogeneity imposes a coordination cost on countries, because it often reflects differences in attitudes or interests that need to be reconciled by national governments. Consider the differences in opinion about joining the EU among the French- and German-speaking parts of Switzerland. This heterogeneity also has implications for labor mobility. For instance, the Euro zone may be a less resilient common currency area than the United States, because its higher cultural heterogeneity hinders adjustments to shocks through internal migration. Ethnic heterogeneity is often associated with civil conflict and with high costs for economic growth.

Empirical evidence for the impact of cultural diversity is mixed (see also box 3.4). Ethnic fragmentation is negatively associated with the quality of government and with economic growth.<sup>33</sup> The relationship between ethnic heterogeneity and conflict

is statistically significant only in countries where one group is in the majority but the minority groups are still powerful—for example, Burundi and Iraq.<sup>34</sup> In most cases ethnic or cultural differences are unlikely to be the cause of conflict. But ethnic differences are exploited to achieve other objectives, such as gaining political power or control over resources. Ethnicity also interacts in complex ways with other facets of society. Autocracy, for example, reduces growth in ethnically diverse countries more than in ethnically homogenous ones.

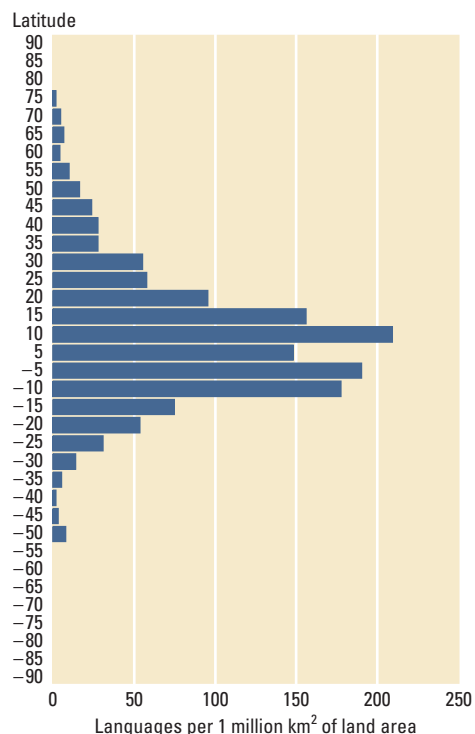
Linguistic diversity varies greatly between world regions. The *Ethnologue* database includes information on almost 7,000 languages, including their location. The heterogeneity of language groups is very high in Africa and generally increases with proximity to the Equator (see map 3.4 and figure 3.6). Although empirical cross-country studies suggest that linguistic fractionalization hurts economic performance, a regional trading language has traditionally helped overcome the divisions: Hindi and Urdu in a large part of South Asia,

**Map 3.4** Language diversity is very high in Africa



Source: World Language Mapping System, *Ethnologue* 2004.

**Figure 3.6** Globally, language diversity is highest near the equator



Source: World Language Mapping System, *Ethnologue* 2004.

Indonesian and Filipino in Southeast Asia, Arabic and Persian in the Middle East, Swahili in Eastern Africa, and Hausa in Western Africa. English, French, and Spanish have done the same, but in many countries they are used predominantly by an educated minority.

### *Economic costs of conflict and territorial disputes*

Impermeable borders tend to reduce economic growth. But full political unification between countries would not necessarily improve economic performance.<sup>35</sup> A full merger of two countries has a positive country size effect but an overall slightly negative impact on growth due to reduced trade with the rest of the world. Only in a few instances would both partners benefit from full political and economic integration. But integration of neighboring markets without political integration, on average, would increase growth across countries significantly.

Borders further reduce economic benefits where divisions are aggravated by conflict within or between countries. Even when conflict does not involve military action, the cost can be significant. Territorial disputes impose high international economic transaction costs because of insecure property rights and jurisdictional and policy uncertainty. Economic models suggest that the territorial dispute between Argentina and Chile reduced trade between the two countries by \$33 billion between 1950 and 1995.<sup>36</sup> The competing claims between Japan and Russia over the Kurile Islands lowered trade by \$535 billion between 1952 and 1995. And those between Indonesia and Malaysia cost \$11.5 billion between 1980 and 1995. Similar disputes exist over maritime boundaries, only about one-third of which are settled by treaty.<sup>37</sup>

When disputes turn to military confrontation, the costs are considerably higher—not only in loss of life, but also in economic terms. The cost of a “typical” civil war is about \$64 billion, and an average annual worldwide cost of about \$100 billion far exceeds global aid flows.<sup>38</sup> A civil war in a neighboring country is estimated to reduce a country’s annual growth by about half a

### **BOX 3.4** *Artificial states?*

Gathered in Berlin in 1884–85, the colonial powers determined Africa’s borders with little concern for social or economic divisions. Many borders in the Middle East were similarly drawn at the end of World War I.<sup>a</sup> Alesina, Easterly, and Matuszeski identify “artificial states” with a measure of how straight a country’s border is and whether these borders partition ethnic groups into two or more countries.<sup>b</sup> Northern Africa, Northeast Asia, and South Africa have the most artificial (straight) borders, while South Asia and Western Africa are the most partitioned. Eastern and Central Africa are among the top four regions in both categories.

Empirical analysis suggests that artificial borders hurt economic and social outcomes. But this link is less significant after controlling for colo-

nial origin or location in Africa. Artificial borders are not associated with a higher probability of war, reflecting similar results on ethnic diversity and conflict found by Paul Collier.<sup>c</sup>

So, avoiding economic and political problems associated with ethnic diversity would require cultural homogeneity within countries. In Africa this would imply a far larger number of countries. Yet the already small size of many African countries is perhaps a more severe problem—it prevents countries from reaching sustainable economic scale. As argued in this Report, the appropriate response to small size and ethnic diversity is closer integration and more permeable boundaries.

Source: WDR 2009 team.

a. MacMillan 2003.

b. Alesina, Easterly, and Matuszeski 2006.

c. Collier 2004.

percentage point. It causes neighbors to increase their military spending by 2 percent. Other costs include refugee flows and disruption of preferred trade routes. The civil war in the Democratic Republic of Congo closed river access to the sea for timber exports from the Central African Republic.

### **Economic concentration**

Economic output is spatially concentrated—by any measure and across geographic scales. Looking at grid cells, a quarter of the world’s GDP is produced on just 0.3 percent of the land area (about the size of Cameroon), half on 1.5 percent, and nine-tenths on 16 percent.<sup>39</sup> China, Japan, and the United States produced about half of global GDP in 2006, and the 15 largest economies produced about 80 percent.

Early in the Industrial Revolution, at the beginning of the nineteenth century, GDP per capita in today’s industrialized countries was about twice that of today’s developing and emerging countries (see table 3.1). But total GDP in China and India, which had far larger populations, was more than twice that in today’s G7 countries. By



**Table 3.1** The concentration of GDP and population growth shifted between 1820 and 1998

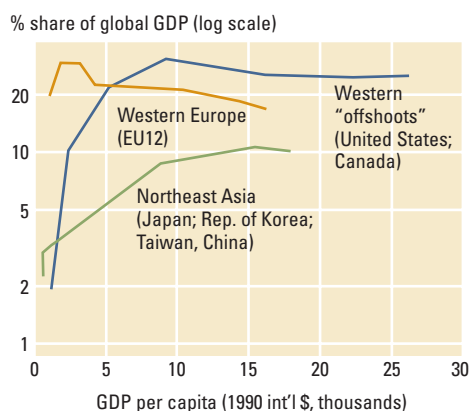
	Share of world GDP (%)			Share of world population (%)			Average annual GDP growth rate (%)	Average annual population growth rate (%)	Excess growth rate (GDP per capita growth)
	1820	1950	1998	1820	1950	1998	1820–1998	1820–1998	
G7	22.7	50.9	45.5	13.4	18.1	11.6	2.6	0.9	1.7
China and India	49.0	8.7	16.5	56.7	35.9	37.5	1.6	0.7	0.8
Rest of Asia	7.3	6.8	13.0	8.6	15.5	19.8	2.5	1.4	1.1
Latin America	2.0	7.9	8.7	2.0	6.6	8.6	3.0	1.8	1.2
Africa	4.5	3.6	3.1	7.1	9.0	12.9	2.0	1.3	0.7
Eastern Europe and the former Soviet Union	8.8	13.0	5.3	8.8	10.6	7.0	1.9	0.8	1.1

Source: Maddison 2006.

Note: The rest of Western Europe, Australia, and New Zealand are not included.

**Figure 3.7** Concentration increases at the global level, then a leveling off

Shares of world GDP at different levels of GDP per capita, 1820–1998



Source: Maddison 2006.

the middle of the twentieth century, the G7 countries accounted for more than half of global output (about 60 percent if the other western industrial countries are included). North America and Japan grew the fastest at 3.5 and 2.8 percent a year between 1820 and 1998.<sup>40</sup> The four largest European economies grew at an annual average of about 2 percent, not very different from growth rates in Africa, Eastern Europe, and the smaller Asian developing countries. But while GDP growth exceeded population growth by 1.7 points in the G7, it did so by only 0.8 points in China and India and by 0.7 points in Africa. Over the 180 years to the end of the twentieth century, these different growth rates moved the concentration of economic production more toward the northern industrialized countries.

### How did this concentration come about?

The concentration of economic mass in today's western industrialized countries and Japan has its roots in eighteenth-century economic and technological innovation. Europe's economic growth accelerated greatly during the Industrial Revolution, with modern manufacturing starting in Great Britain in the mid-eighteenth century and gradually spreading across the continent. At the beginning of this process, Western Europe had less than 20 percent of global GDP.<sup>41</sup> By the end of the nineteenth century, it had more than 30 percent, three-quarters of it in the four largest economies—France, Germany, Italy, and the United Kingdom (see also figure 3.7).

This growth occurred against a backdrop of frequent conflict between neighboring countries, constant changes of alliances, and mergers and disintegrations of countries. At the beginning of the nineteenth century, Germany included about 300 individual states. It had 1,800 customs borders, with Prussia alone having 67 local tariff zones.<sup>42</sup> Only in the 1870s did Germany fully integrate domestically. Even with a patchwork of economic regions in Europe, trade flows had always been large, thanks to local or regional agreements. These expanding trade links inspired the work of David Ricardo, who in 1817 famously described the exchange of textiles and port wine between Great Britain and Portugal in his theory of comparative advantage. Ricardo's work motivated further trade liberalization by governments, most of all Britain's.

Formal economic integration did not begin until the middle of the twentieth

century. Motivated by political as much as economic objectives, six European countries, accounting for about a quarter of world GDP, joined in a treaty liberalizing trade in coal and steel. Annual GDP growth accelerated in subsequent years to around 4.5 percent, up from only around 1 percent in the 35 years after World War I. Although the relative shares of European countries in world GDP dropped somewhat, the combined EU economy maintains a share of 25 percent, largely through enlargement to its current 27 member countries.

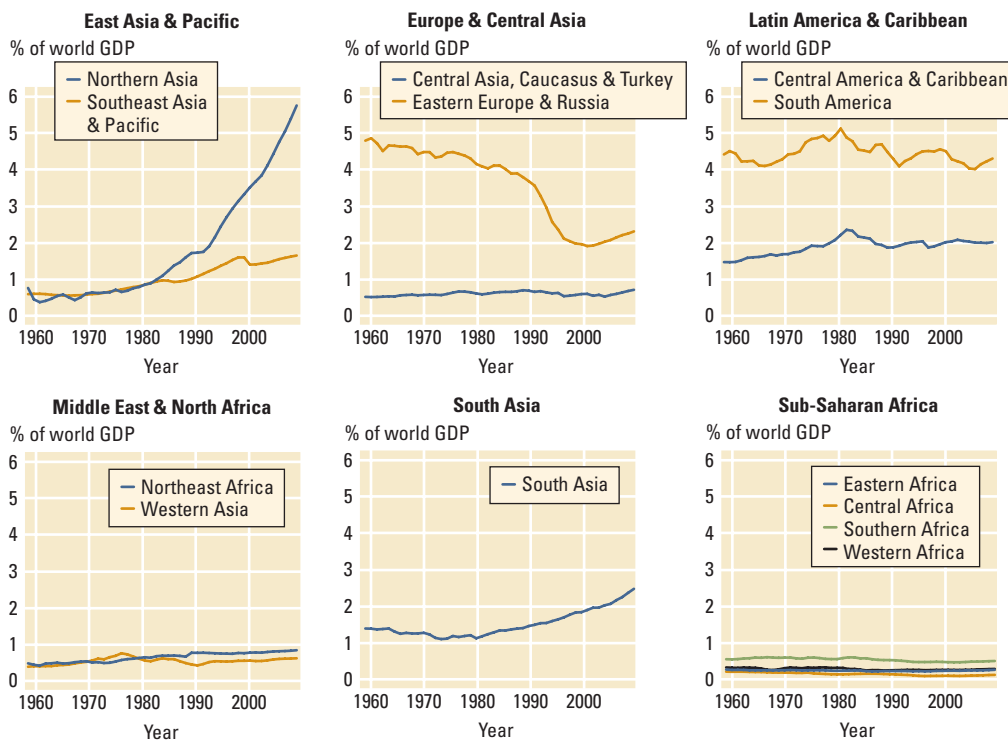
Europe’s economic progress was exported to English-speaking “offshoots” in Australia, New Zealand, and North America. Between 1820 and the late-twentieth century, their economies grew by about 3.6 percent, almost twice the population growth of 1.9 percent, driven by massive migration mostly from Europe and Asia. Their share of global GDP increased from 2 percent to 25 percent during that time, the lion’s share by the United States (22 percent). Cultural proximity and close trade ties meant that innovations crossed the Atlantic quickly in both directions.

Japan started to industrialize fairly late. In 1820 its GDP per capita was half that in North America and Western Europe, a ratio that did not change until the twentieth century. GDP growth between 1820 and 1870 was 0.4 percent a year. Industrialization began to accelerate after the Meiji Restoration in the 1860s. The fastest growth rates were in the second half of the twentieth century. Between 1950 and 1973, as the country opened to the world economy, Japan’s economy grew at a rate of almost 9 percent a year. By the late 1980s, its GDP per capita was higher than Western Europe’s.

*How did the rest of the world do?*

The share of the largest industrial economies in world GDP has fallen slightly, from 51 percent in 1950 to 46 percent in 1998.<sup>43</sup> Among emerging economies, Eastern Europe and Russia reduced their share from almost 5 percent to 2.4 percent in the late 1980s and early 1990s. The smaller shares of industrial countries and Eastern Europe are largely due to increases in Asia (see figure 3.8). Southeast Asia and the Pacific doubled its share

**Figure 3.8 Only Asia’s share in world GDP has risen noticeably since 1980**  
Shares of world GDP of developing and emerging economies, 2000 constant dollars



Sources: World Bank 2007j; Maddison 2006.

to about 1.8 percent, and South Asia’s share of global GDP rose from 1.4 to 2.4 percent. The largest increase has occurred in North-east Asia since the mid-1980s, essentially in China, where the share of global GDP rose from less than 1 percent to about 5.5 percent. Shares in the remaining *World Development Report 2009* regions remained essentially unchanged despite considerably higher population growth.<sup>44</sup>

**Why does this matter? The importance of market access**

The distribution of economic production globally matters greatly for the development prospects of countries because of the interaction of *density* and *distance* at a global scale. This is demonstrated by the close empirical relationship between trade as a driver of growth and two variables that define the well-known gravity model of trade: (1) the distance between trading partners, and (2) their economic size as measured by GDP

(see box 3.5). Trade decreases with distance and increases with GDP, so any country will trade more with nearby countries and with countries that have a larger GDP. Despite reductions in transport and communication costs, the trade-reducing impact of distance increased until about a half century ago, remaining “puzzlingly” high since then (see, for example, for Brazil in figure 3.9).<sup>45</sup>

This empirical evidence may be at odds with the rapidly increasing long-distance trade between, say, China and the United States or between Japan and Europe. But this increase in trade may not be so much due to trade cost reductions. It is largely driven by the other factor in the gravity trade relationship: economic output.<sup>46</sup> China’s GDP has increased, providing the economic mass to export goods to international markets and to import consumer goods, capital equipment, and intermediate inputs. Increasing trade, in a self-reinforcing process, generates scale economies in

**BOX 3.5 Market access and per capita incomes**

Quantifying market access (sometimes called “market potential”) is not just of theoretical interest. Empirical studies have shown that market and supplier access have a significant impact on growth and income. For instance, halving a country’s distance from its trading partners is associated with a 25 percent increase in per capita income—more than the combined effect of a coastal location and open trade policies.<sup>a</sup> Trade benefits a country by raising factor incomes (wages) through expenditures by trading partners for goods produced in that country. The level of expenditures is in large part determined by the size of the trading partner’s economy (*density*) and by physical market access, largely determined by proximity to trading partners (*distance*) and the effect of borders (*division*).<sup>b</sup>

Between 1970 and 2003, the distribution of per capita income spread out, reflecting greater global inequality among countries—the poorest countries now have smaller incomes relative to the United States (see the figures at the right). The distribution also moves to the right, implying that market potential is increasing almost everywhere as a result of global GDP growth. And its slope is getting steeper, so

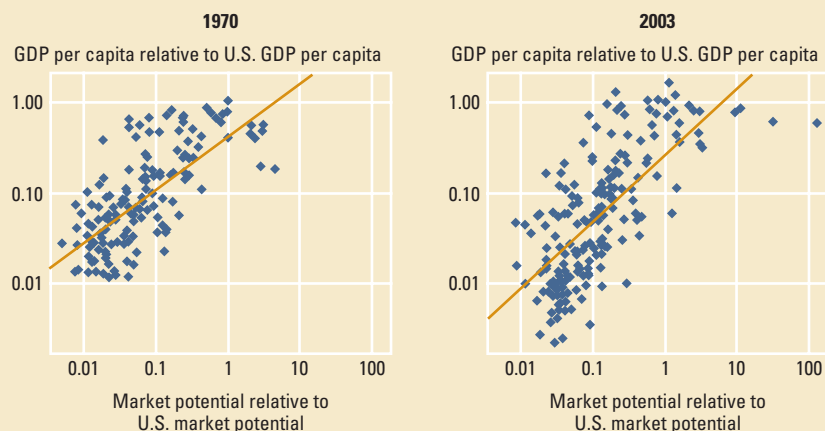
the returns to market potential are increasing—the same amount of market potential buys more per capita income—at least for some countries.

There continues to be a large variance of GDP per capita at any given market potential. Haiti’s market potential is higher than New Zealand’s. Its proximity to the United States raises its market potential, reflecting the interaction between economic size

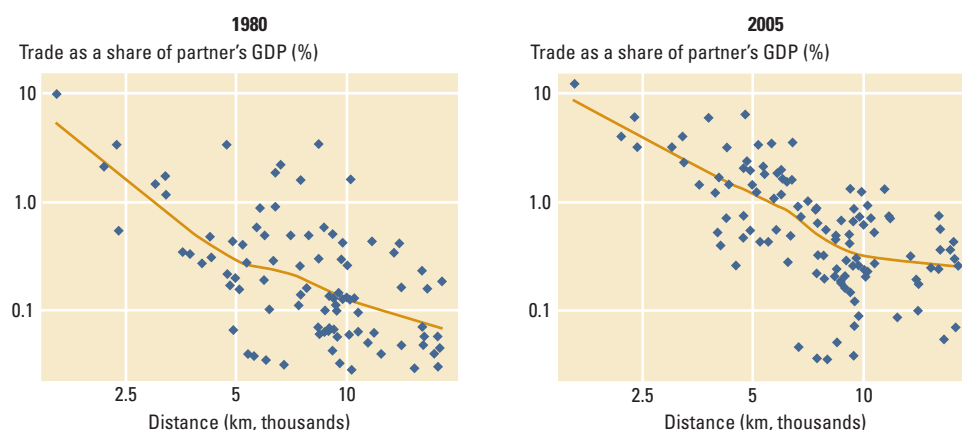
and distance from markets. For any given level, the size of the economy determines how well a country can take advantage of market access. Rich countries like Australia and New Zealand can compensate for a remote location by offering a fairly large market and supply capacity.

a. Redding and Venables 2004.  
b. See Mayer 2008.

**Market potential for countries has become more unequal**



Source: Mayer 2008 for this Report.

**Figure 3.9** The effect of distance between Brazil and its trading partners has remained considerable

Source: IMF 2007.

the trade infrastructure and services, such as efficient ports and frequent container shipping links (see chapter 6). Larger economies and richer countries can thus overcome the friction of long trade distances with higher economic density.

### Divergence, then convergence

The changing geographic distribution of world economic output reflects the concentration of economic mass initially in Western Europe and later in North America. More recently, some deconcentration has occurred as first Japan and then other economies in the East Asia region have grown. China and India are reclaiming their position among the countries and regions with the highest shares of global GDP. Country access to input and output markets influence the geographic distribution of absolute levels

of economic output. As these distributions change, so too do the prospects of national economies. These, in turn, influence development outcomes at the regional and country levels, reflected in levels and changes in income, health, and human capital. This human capital, most often considered an input contributing to human development, is also a development outcome that raises the quality of life for individuals.

Three broad trends:

- A general increase in income and basic living standards globally, but with some big exceptions.
- Considerable divergence of incomes between the richest and the poorest countries, but some global convergence in health and education.
- Some convergence within the faster growing regions.

**Table 3.2** GDP per capita increased tenfold, 1500–1998  
1990 international dollars

	1500	1820	1870	1913	1950	1973	1998	1998:1500
Western Europe	774	1,232	1,974	3,473	4,594	11,534	17,921	23.2
Western offshoots	400	1,201	2,431	5,257	9,288	16,172	26,146	65.4
Japan	500	669	737	1,387	1,926	11,439	20,413	40.8
Asia (excluding Japan)	572	575	543	640	635	1,231	2,936	5.1
Latin America	416	665	698	1,511	2,554	4,531	5,795	13.9
Eastern Europe and the former Soviet Union	483	667	917	1,501	2,601	5,729	4,354	9.0
Africa	400	418	444	585	852	1,365	1,368	3.4
World	565	667	867	1,510	2,114	4,104	5,709	10.1
Interregional spreads	2:1	3:1	5:1	9:1	15:1	13:1	19:1	

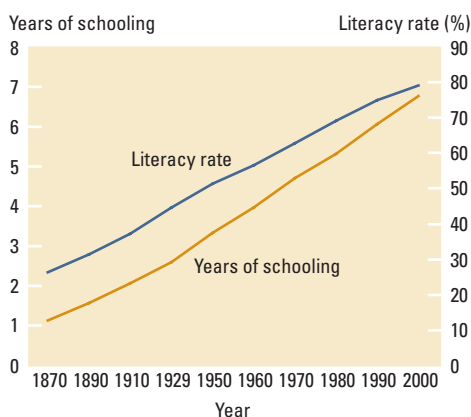
Source: Maddison 2006.

**General improvements**

Today’s generation, by almost any global summary measure of income and welfare, is better off than any previous generation in human history. GDP per capita in 1990 international dollars increased tenfold from \$565 to \$5,700 over the last 500 years, while population grew from 400 million to more than 6 billion (table 3.2). Since 1820 output growth has been about 2.2 percent a year, bringing with it a considerable rise in living standards. Life expectancy at birth rose from

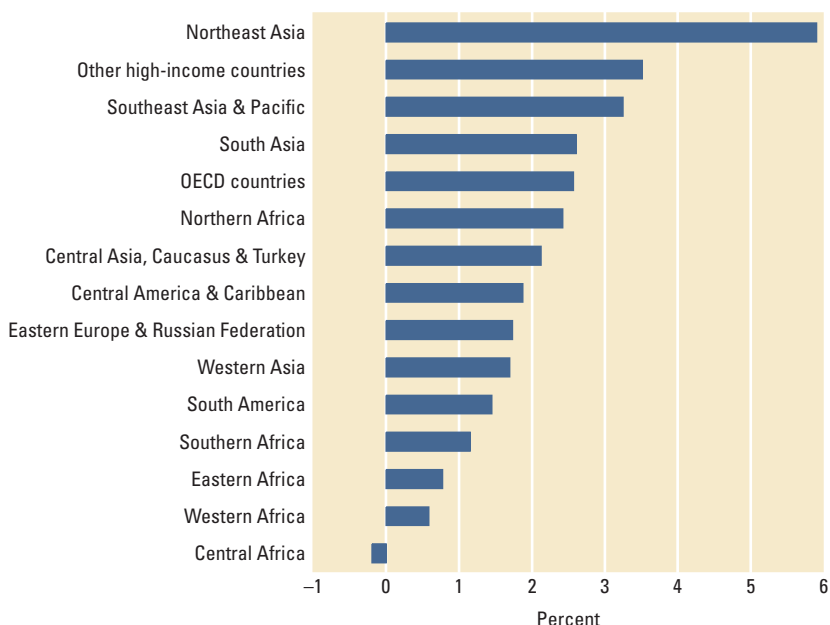
26.5 years in 1820 to 32.8 years in 1910 to about 68 years in 2005.<sup>47</sup> In the last 35 years alone, average global life expectancy grew by about 10 years. And a much larger share of the world’s population now has access to basic education. In 1870 the mean years of schooling was 1.1 years, and the adult literacy rate 25.5 percent.<sup>48</sup> By 1929, schooling had increased to 2.5 years, and by 2000, to 6.7 years, and literacy to 43.8 percent and then to 78.3 percent (see figure 3.10).

**Figure 3.10 Education outcomes have improved**  
Global average, 1870–2000



Source: Morrisson and Murtin 2005.

**Figure 3.11 East and South Asia have been the only regions catching up**  
Average annual growth rate of GDP per capita, 1960–2006



Source: World Bank 2007.

**Considerable income divergence between the richest and poorest countries, but improvements in health and education**

Over the past 500 years, per capita output increased 40-fold in Japan and 65-fold in Australia, Canada, New Zealand, and the United States (see table 3.2).<sup>49</sup> In Africa it increased only threefold, and in Asia (not including Japan), fivefold. Spreads between the poorest and the richest regions increased from a factor of 2 in 1500 and 5 in 1870 to almost 20 by the end of the twentieth century. During the past two centuries, the Gini coefficient of inequality increased by 30 percent. Per capita income inequality among world citizens increased by 60 percent, as measured by the Theil index, largely because of income divergence between countries rather than within countries.<sup>50</sup>

The main story is one of an enormous increase in per capita incomes in Europe and its offshoots. More recently this has happened in East Asia, with Japan, whose GDP per capita has increased tenfold since 1950, and was followed by the Republic of Korea; Taiwan, China; and countries in South Asia. GDP per capita in China, though still low in absolute terms, grew at 8.4 percent a year between 1990 and 2005. At the low end of the income distribution, total GDP in the Central Africa region increased threefold between 1960 and 2006, compared with Northeast Asia’s 30-fold increase (see figure 3.11). With population growth outpacing economic growth, per capita incomes in Central Africa fell by 8 percent in constant prices. Incomes in the poorest countries in the world—mostly landlocked and many in Africa, home to the “bottom billion” of the world’s population—declined by 5 percent during the 1990s.<sup>51</sup>

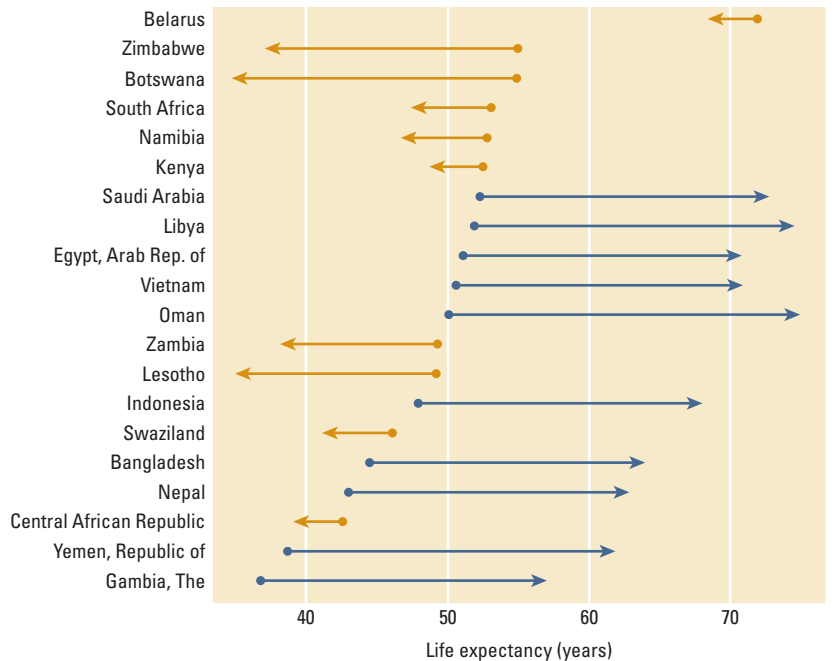


Between 1960 and the late 1980s, almost every country in the world showed continual increases in life expectancy at birth.<sup>52</sup> In South Asia it increased from 42 years to 60, and in Northern Africa from 47 years to 65. The exception was in Sub-Saharan Africa. Until the late 1980s, life expectancy increased slowly in Western, Central, and Eastern Africa and slightly faster in Southern Africa, where it rose from 46 years to about 60. Since then, however, the HIV/AIDS epidemic has caused a large increase in mortality, bringing life expectancy in Southern Africa below its level in 1960. In Central and Eastern Africa, life expectancy is down less dramatically, and Western Africa contained the epidemic and saw only a slight decline in the rate of improvement. Nine of the 10 countries showing the worst trends are in Sub-Saharan Africa, and most of these are in Southern or Southeastern Africa (see figure 3.12).

Similar to life expectancy, global inequality in access to education fell sharply from a Gini coefficient for years of schooling of 0.79 in 1870 to 0.39 in 2000.<sup>53</sup> The high Gini coefficient in the nineteenth century was largely due to near-universal primary education in Western Europe and its offshoots. Other world regions started expanding education much later, and inequality dropped

**Figure 3.12 Life expectancy decreased significantly in many African countries**

Countries with largest increase/decrease in life expectancy, 1970–2005

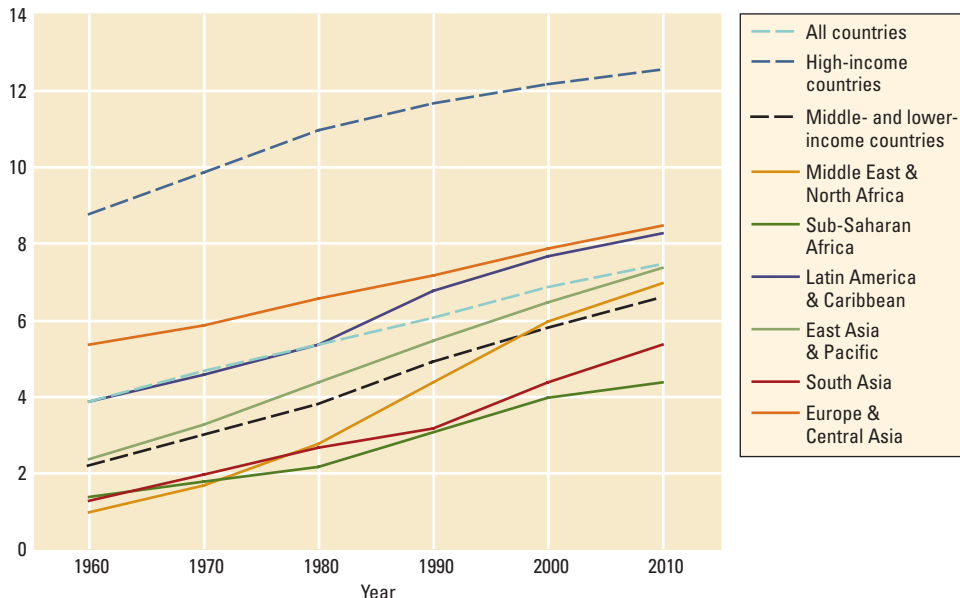


Source: World Bank 2007.

considerably after 1930, when primary education was expanded in many developing countries.<sup>54</sup> Between 1960 and 2000, the years of schooling among the working-age population increased across all world regions and income

**Figure 3.13 Education has become more equal since the 1980s**

Years of schooling for 15–46-year-olds (population-weighted averages)



Source: Cohen and Soto 2007.

groups (see figure 3.13).<sup>55</sup> The ratio of highest to lowest population-weighted average education dropped from 9.7 years to 3.1.<sup>56</sup> These improvements have been fairly uniform across regions, so the difference between the highest and lowest region has remained essentially constant. Because poorer countries start from a far lower level, however, their percentage improvements are much higher, suggesting eventual convergence.

**Some income convergence within faster-growing regions**

Neighboring countries can provide mutually beneficial economic linkages, spillovers, and complementarities that allow whole groups of countries to increase their incomes. If this increases growth rates in poorer countries,

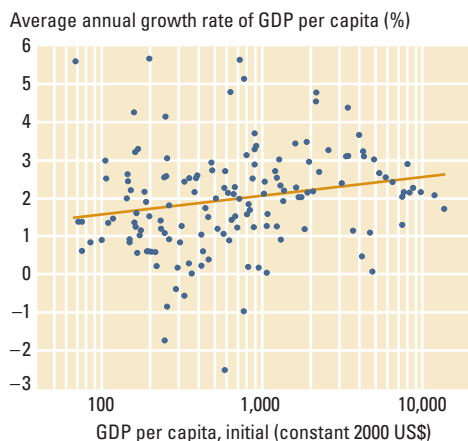
economies should converge over time. Will poor countries eventually catch up with the rich? The question received considerable attention among growth economists in the late 1980s and 1990s.<sup>57</sup> They produced tools and techniques to analyze convergence, relating growth to initial income, with the expectation that lower initial status is associated with higher growth rates. But there has been little, if any, convergence between countries globally over the past five decades (see figure 3.14). There is even some indication of divergence, though the trend is weak. Within world regions, the evidence is much more differentiated.

Regional integration and temporal dynamics make the study of convergence important. First, economic fortunes are shaped by what neighboring countries do, and successful economic integration—overcoming divisions—can pull weaker countries toward incomes that they cannot achieve in isolation. Higher convergence would be expected in regions that have integrated. Second, in fast-growing regions, there initially is divergence as the leading regional economies pull away, but later there is convergence as poor countries benefit from growth spillovers and begin to catch up over time.

In East Asia, the fastest-growing world region in recent years, convergence followed initial divergence. From 1950 to 1970, incomes diverged sharply as first Japan; and later Hong Kong, China; and then Singapore grew at very high rates (see figures 3.15 and 3.16a). In the 1970s other countries joined the fast-growth club, notably the Republic of

**Figure 3.14 Slight global divergence in per capita incomes, 1950–2006**

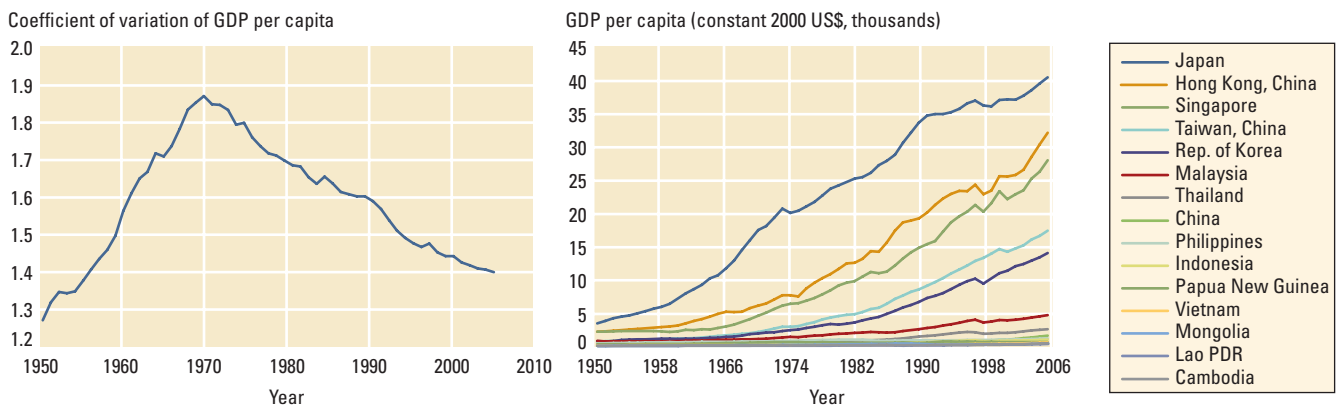
Countries with populations greater than 1 million



Source: World Bank 2007j, Maddison 2006.

**Figure 3.15 Divergence, then convergence in East Asia, 1950–2006**

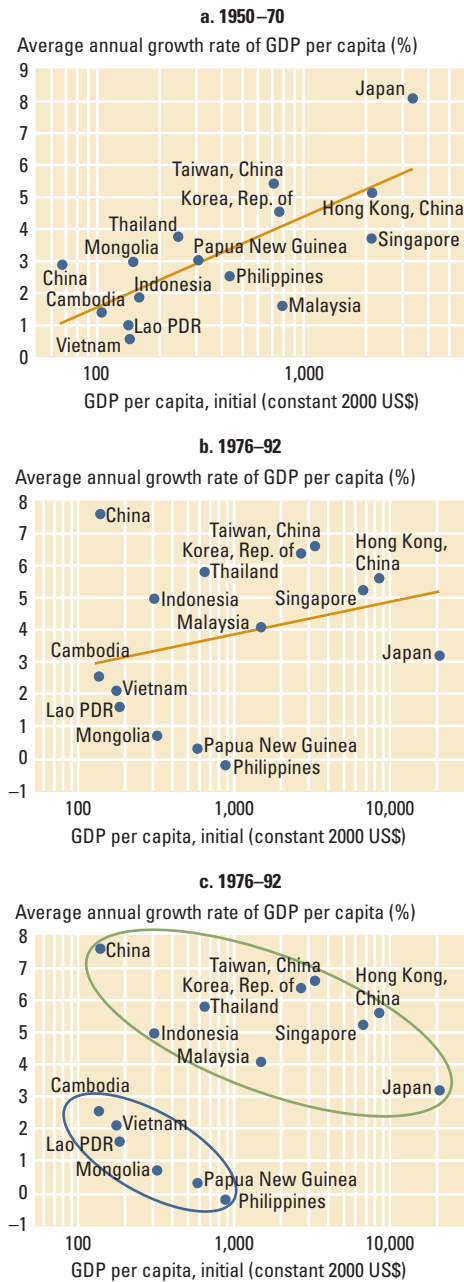
Countries with populations greater than 1 million, coefficient of variation and GDP per capita growth



Source: World Bank 2007j, Maddison 2006.

**Figure 3.16 The East Asian growth experience had two distinct phases**

Countries with populations greater than 1 million, in 1950–70 versus 1976–92



Source: World Bank 2007j; Maddison 2006.

Korea and Taiwan, China. Between 1976 and 1992, what looked like moderate divergence (see figure 3.16b) actually represented two groups of countries on separate but closely linked convergence paths (see figure 3.16c). Overall, this led to a strong regional convergence as the variation among country GDPs per capita—while still large—dropped to

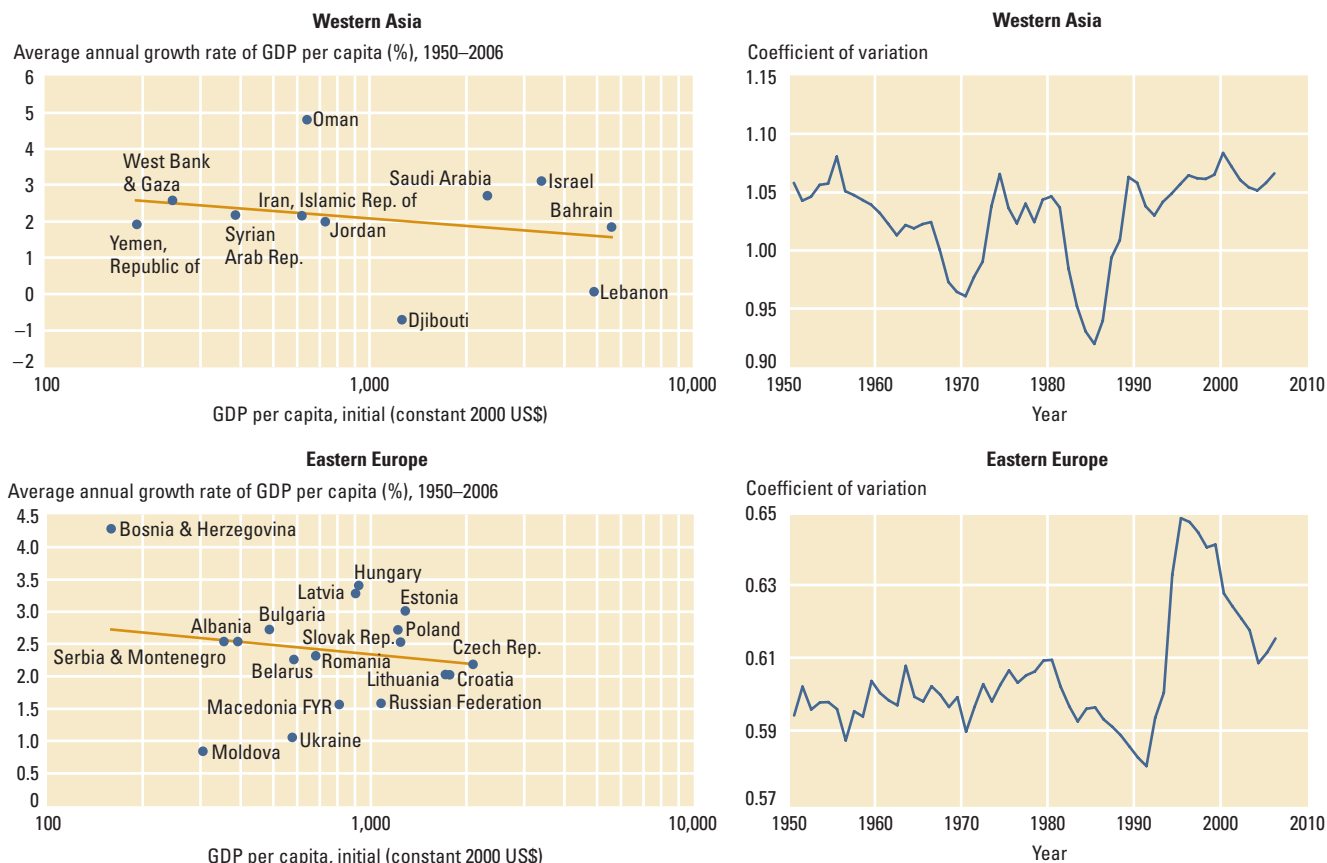
levels last seen in 1960. This convergence has much to do with market policies in China and Vietnam as well as with a special blend of regional economic integration against a backdrop of globalization.

There are few signs of convergence where growth has been sluggish and regional integration limited, as in Western Asia and Eastern Europe (see figure 3.17). Western Asia includes resource-rich countries, with low and high populations, as well as resource-poor countries, such as Jordan. Low levels of intraregional trade indicate low levels of integration. Eastern Europe shows low variation in per capita income until about 1990.<sup>58</sup> After the disintegration of the Soviet Union and the fall of the Berlin Wall, per capita incomes dropped drastically in some countries and moderately in others. This divergence was reinforced as the western-most countries reoriented their economic linkages toward Western Europe, eventually joining the EU. Belarus and initially Ukraine, by contrast, maintained close links to the Russian Federation, which only recently began benefiting from natural resource-driven economic growth.

The southernmost economies in the Latin America and Caribbean region experienced relatively low growth and limited convergence (see box 3.6). At the northern end of the region, in 1994, Mexico entered the first major regional free trade pact that includes both industrial and developing countries. The North American Free Trade Agreement (NAFTA) eliminated tariffs on most products traded between the United States, Canada, and Mexico. The evidence since then illustrates three points about formal regional integration processes:<sup>59</sup>

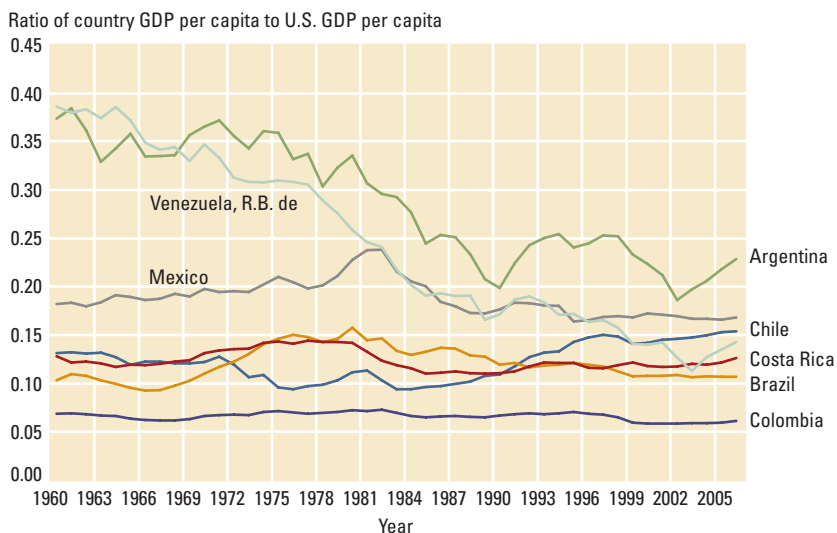
- Formal integration followed many years of preparation, gradual informal integration, and domestic policy changes. Mexico unilaterally reduced trade barriers and implemented regulatory changes long before the agreement took effect.
- The agreement led to large increases in trade and foreign direct investment (FDI) flows. Economic analysis suggests that without NAFTA, Mexico’s global exports would have been about 50 percent lower and its FDI 40 percent lower. This likely contributed to significant poverty reduc-

**Figure 3.17 Western Asia and Eastern Europe have had little integration—and little convergence**



Source: World Bank 2007; Maddison 2006.

**Figure 3.18 Mexico and other LAC countries have not been catching up with the United States**  
GDP per capita in the largest LAC economies relative to U.S. levels



Source: World Bank 2007; Maddison 2006.  
Note: LAC = Latin America and the Caribbean.

tion and income growth. GDP per capita in 2002 may have been as much as 4 percent lower without NAFTA.

- Despite these positive impacts on the Mexican economy, the agreement has not produced rapid convergence in incomes (see figure 3.18). Mexico has avoided major economic crises, suggesting greater stability that can have significant welfare effects.<sup>60</sup> But its performance relative to the U.S. economy has not differed much from that of several other Latin American economies.

The large differences in economic output will likely remain significant for some time. In fact, steady-state convergence estimates suggest that Mexican incomes will reach only about half of U.S. incomes. Among the main reasons are significant differences in the quality of domestic institutions, in the innovation dynamics of firms, and in the skills of the labor force. These will all

**BOX 3.6** *Neighborhoods matter: Southern Cone versus Southern Europe*

Half a century ago the countries in the southern cone of South America—Argentina, Brazil, Chile, and Uruguay—had per capita incomes similar to or higher than the three Southern European countries with which they had strong cultural bonds—Italy, Portugal, and Spain. The two groups have since followed different growth trajectories. For most of this period, the Southern Cone countries, except Chile, followed similar protectionist policies. Between 1950 and 2006 the

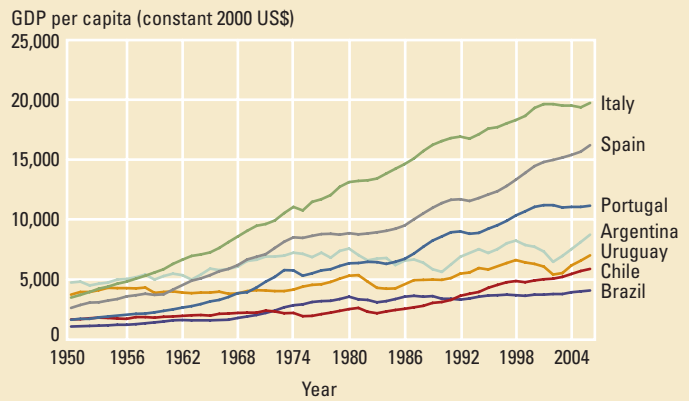
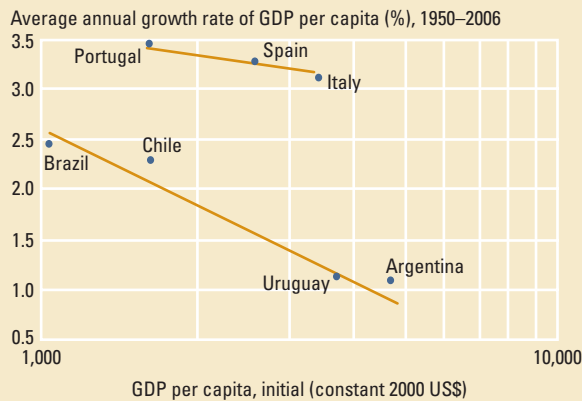
four countries' GDP per capita grew by an average 1.7 percent a year.

Economic dynamics in Southern Europe unfolded differently. Italy was one of the founding members of the European Community, and Portugal and Spain joined in 1986 after emerging from a long period under authoritarian regimes. From lower levels, they grew at more than 3 percent a year, far outpacing Latin America. While incomes converged in both regions, they did so faster in Western

Europe at around 1 percent a year than in South America at 0.3 percent. Italy, Portugal, and Spain benefited from regional growth spillovers, proximity to large markets, and cohesion policies within a single integrated Western European market. In the Southern Cone, regional integration was slow, and integration with wealthy markets in the Western Hemisphere was neglected for long periods.

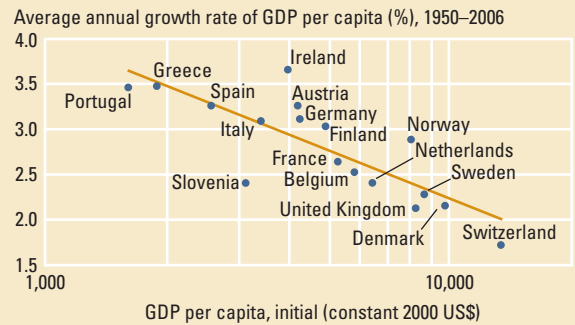
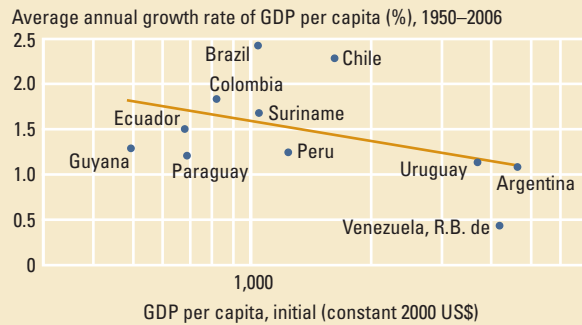
Source: WDR 2009 team. a. Lucas Jr. 2007;

**The economic fortunes of Latin America and "Latin Europe" have diverged**



Source: World Bank 2007; Maddison 2006.

**Convergence in South America has been moderate; in Europe strong**



Source: World Bank 2007; Maddison 2006.

benefit from closer integration with Mexico's northern neighbors, but the process will take considerable time.

**Geography, globalization, and development**

Four main aspects explain the persistent regional concentration of economic wealth over the past few centuries, with

new countries or regions only occasionally breaking into the ranks of the rich. First, physical geography has helped some countries become rich initially but continues to hold back others. Second, the forces of economic geography—starting from an initial advantage, such as technical innovation during the Industrial Revolution—facilitated agglomeration economies and



reinforced the concentration of economic activity. Third, regional spillovers increased economic activity in other countries within a region, further increasing the scale and scope of economic production. Fourth, entirely new regions of economic concentration emerged—as a response to congestion and a shift in established regions from manufacturing to services, “freeing up” manufacturing opportunities elsewhere. What does this imply for the prospects in today’s lagging world regions?

### *How much does geography matter today?*

**First-nature geography.** Physical endowments influence the development prospects of countries. For instance, agricultural intensification in areas of good agroecological endowments generates surpluses that can be shifted to more productive uses. But these assets are not distributed uniformly. As Landes (1998) puts it: “Nature like life is unfair, unequal in its favors.” Researchers have found a strong correlation between economic output and geographic characteristics. A simple regression of output density (GDP per square kilometer) on geographic variables—mean annual temperature, mean annual precipitation, mean elevation, terrain “roughness,” soil categories, and distance from coastline—captures 91 percent of the variability in the density of economic production.<sup>61</sup> A similar analysis explains 20 percent of the difference in per capita output between tropical Africa and industrial regions, and 12 percent of the difference between tropical Africa and other tropical regions. Climate also interacts with other factors, such as disease. Vector-borne diseases strike disproportionately in tropical countries, reducing productivity. Malaria is estimated to cause approximately 1 million deaths and more than 200 million clinical events among Africans each year.<sup>62</sup> Other purely geographic factors—such as being landlocked, which shaves half a percentage point off annual GDP growth, or a remote location—were discussed earlier.

Does this mean that geography dictates the destiny of countries? No. Physical geography helps explain initial growth

differences and some of the variation in economic outcomes. But most of these constraints can be overcome with enough resources. They are thus a proximate rather than an ultimate cause of underdevelopment. High levels of malaria, for instance, may be as much a symptom of persistent poverty as a cause (see box 3.7). They are a grave concern for development interventions but insufficient to explain global patterns of economic wealth or to predict future growth potential by themselves.

**Second-nature geography.** An alternative but complementary explanation for global development patterns shows how small initial differences between countries and regions (for instance, natural endowments) can, over time, generate large disparities. A central question in economic development is how much growth is due to differences in human and physical capital accumulation, and how much to the efficiency of using these factors.<sup>63</sup> Evidence from a growing number of studies confirms that levels of capital accumulation alone are insufficient to explain cross-country differences in growth and income. Instead, total factor productivity (TFP)—how efficiently factors of production are combined—tends to better explain differences in growth and income between countries.<sup>64</sup>

TFP is, however, a vague concept that subsumes several aspects of economic production. Most generally, it relates to better technology for combining inputs to generate products or services. This leads to cost reductions and thus increased competitiveness. Complementarities, spillovers, and economies of scale also explain differences in TFP. Geographically, these externalities imply benefits for producers to locate close to each other. Combined with scale economies that favor larger production units, the concentration of economic activities increases across geographic scales. European economic growth during the modern era was initiated by the industrial revolution, which generated major technological advances. Improved technology and population growth reinforced scale economies leading to concentrated centers of industrialization. These centers attracted workers

### BOX 3.7 *The influence of first-nature geography: is it possible to eradicate malaria?*

The species of *Plasmodia* that cause human malaria most likely reached their maximum global extent in 1900. Since that time the affected area has been progressively reduced by a regionally variable mixture of improving human conditions and deliberate control. The map below shows the difference between the widest hypothesized extent of the distribution of all types of human malaria around 1900<sup>a</sup> and the contemporary limits of *Plasmodium falciparum*,<sup>b</sup> the most clinically severe and epidemiologically important form of human malaria, in 2007. The formerly malarious areas are concentrated in the temperature latitude extremes of the parasite's ancestral distribution, in both the Northern and Southern Hemispheres.

Researchers have documented the strong inverse correlation between the economic prosperity of nations and their contemporary malaria burden.<sup>c</sup> Richer countries have less malaria, poorer countries more. This work also documents the many mechanisms, from individual to macroeconomic, for malaria to contribute to poverty. What if the constraint of malaria were lifted? Is it possible to eradi-

cate malaria? The question has never been satisfactorily answered at the global scale.<sup>d</sup>

But it is possible to start addressing the problem. In the map below, risk is classified as stable if more than 0.1 case is recorded per 1,000 population each year, unstable if below this figure, and zero if no cases have been recorded within the three most recent years of records. When overlaid on a population map for 2007,<sup>e</sup> 2.37 billion people were found to live in areas with any risk of *P. falciparum* transmission. Globally, almost 1 billion people lived under unstable, or extremely low, malaria risk. Conditions of low risk are typical in the Americas and in South and East Asia but are also common in Africa.

For 1 billion people at risk of unstable malaria transmission, malaria elimination is epidemiologically feasible. Epidemiological feasibility was determined by reference to historical experience during the global malaria eradication program and by inferring, through modeling, that transmission could be interrupted by taking insecticide-treated bednets to scale.<sup>f</sup> There are many reasons in many regions why elimination may not be a simple mat-

ter of epidemiological feasibility. Political instability and geographic accessibility are obvious examples, but these are operational and not technical obstacles.

What can be achieved with the 1.37 billion people suffering stable risk? Initial evidence suggests that a substantial fraction of those affected will be living in areas of very low prevalence.<sup>g</sup> A detailed investigation with mathematical models could estimate the impact from the existing toolkit of interventions. When this estimate combined with a detailed analysis of the data on the efficiency of historical interventions, considerable insight could follow. These approaches will help determine whether malaria is eradicable and, if so, under what time frame and with what resources.

Contributed by Simon Hay, David L. Smith, and Robert W. Snow.

a. Hay and others 2004; Lysenko and Semashko 1968.

b. Guerra and others 2008.

c. Sachs and Malaney 2002.

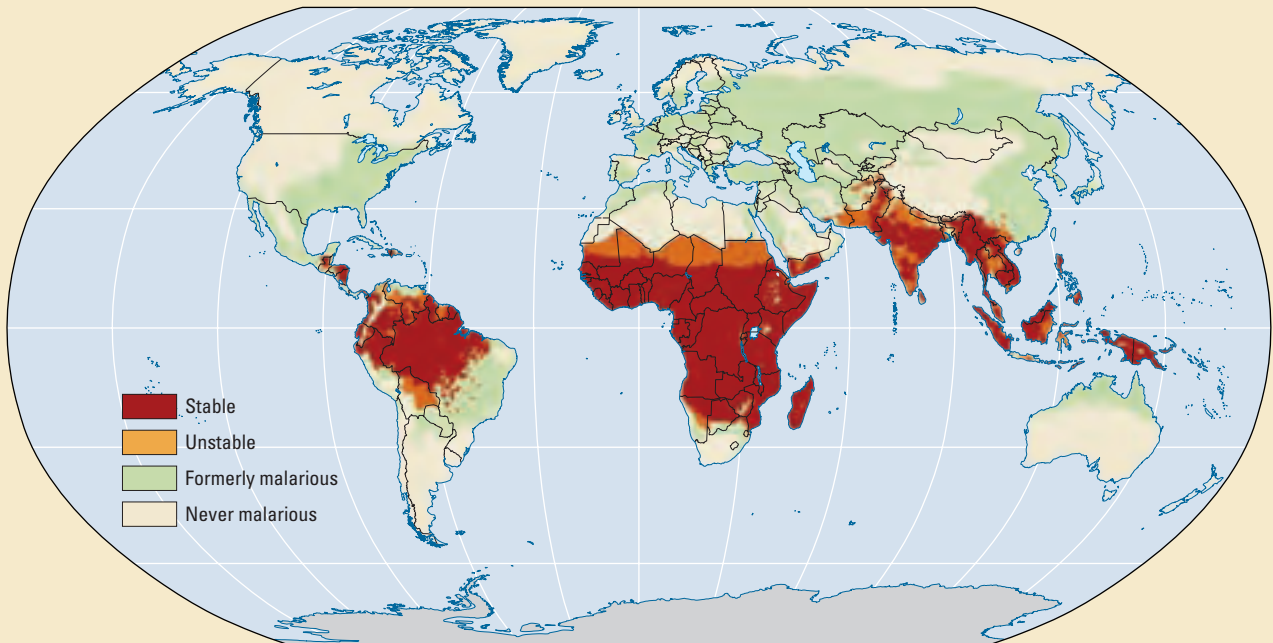
d. Roberts and Enserink 2007.

e. Balk, Deichmann and others 2006.

f. Hay, Smith, and Snow, forthcoming.

g. Guerra 2008.

#### Currently prosperous parts of the world were formerly malarious



Source: Malaria Atlas Project (MAP), Kenyan Medical Research Institute, and University of Oxford.

and new firms, instigating a virtuous, self-reinforcing process that led to even greater concentration.

***Development is contagious, tending to spread across regions.*** Although growth centers may start within specific areas in a country—the industrial belt in the northwest of England or the mill towns in New England—dynamic centers tend to spread out. At the international level, growth spreads to neighboring states, giving rise to regional growth centers. With enough openness and interaction between countries, the mechanisms for spreading growth are technological spillovers and increasing specialization, breaking up production processes. This makes it more likely that some of the demand for intermediate products will be satisfied from neighboring countries. This can greatly expand trade, which produces scale economies and steep increases in economic productivity. The larger labor and capital pools and the greater market size that emerge due to gradual improvement of transport links can lead to the rapid takeoff of a regional economy.<sup>65</sup>

***New regions of growth and wealth can emerge.*** This happens when growth in a core region has reached a point at which congestion and rising wages encourage entrepreneurs to seek new locations for production in nearby regions. This happened in Western Europe, when firms relocated manufacturing capacity to Central and Eastern European countries, and in North America, when Mexico attracted investment in manufacturing capacity for the U.S. and Canadian markets. This contagion model of region building would suggest that all economic activity remains within an expanding contiguous zone—but it does not.

Under some conditions, economic growth may leap to an entirely new region.<sup>66</sup> The location of this new center of global manufacturing depends on many factors, including market size, trade and transaction costs, initial human and physical capital endowments, and competition from other potential growth regions. This leapfrogging model matches the emergence of East Asia as a global hub initially for labor-intensive production and later for technologically more advanced production. Half a century

ago, Japan would have seemed an unlikely source of inexpensive electronics and consumer goods for the U.S. market given the distance between the two countries. But the emergence of containerized shipping allowed Japanese producers to be competitive in North American markets and later in the European markets.<sup>67</sup> The Republic of Korea and Taiwan, China, followed in Japan's footsteps. Manufacturing investments spread from there to South Asia, particularly Malaysia and Thailand, and then, after economic liberalization, to China.

### ***What do we learn from this?***

***Size matters a lot.*** To generate scale economies, a certain population and an economic mass need to be in place. In Europe during the Industrial Revolution, a relatively large and concentrated population provided both the labor that produced manufactures and the market that consumed them. North America, when it shifted from natural resources to industry, had a large population along its eastern seaboard, which grew quickly with immigration from Europe and elsewhere. East Asia has a vast population, with first Japan and later China serving as engines of manufacturing growth in the region. Each region benefited from a large home market, but much of the production was soon destined for export both within the region and to the rest of the world.

***Few countries have lifted their economic fortunes based only on exports of primary commodities.*** Botswana, a sparsely populated country with large mineral wealth and good policies, is one exception. Well-managed mineral resources can help generate capital that can be invested in other sectors, but few countries have done this successfully. Agriculture—important for subsistence, for rural income generation, and for specific regions in a country—cannot by itself lift poor countries to middle- or high-income status. Rural activities are either too small in scale to provide sufficient surplus for export—or, in cases in which agricultural production has sufficient scale, it often benefits only a few large landowners or agribusinesses. The verdict on services is still out. But it is unlikely that poor countries have enough

skilled white-collar workers to generate broad-based growth spillovers. India has a large export-oriented service sector, but it employs only about 560,000 of its more than 1 billion inhabitants, most in jobs in constant-return customer support and back-office tasks.<sup>68</sup>

**Manufacturing remains important.** Each successful world region has, at some point, made significant and broad-based gains with basic labor-intensive manufacturing. This process initially led to a diversification of production as countries grew richer and consumers demanded more varieties. As economies in these regions expanded, production and employment in individual countries started to specialize in what they were best at, giving rise to interlinked networks of production trading intermediate goods among countries within the region. This is the point at which China and some of the other “second-wave” economies in East Asia have arrived. In Europe and other regions that industrialized earlier, the share of manufacturing in the economy has fallen quite rapidly, with only highly specialized manufacturing remaining, such as machine tools or information technology (IT) equipment. In these countries, the service sector, including the research and design of products that will be manufactured elsewhere, now accounts for the largest share, by far, of employment and economic output.

**Openness helps a lot—but it has to be introduced with care.** Each of today’s successful regions initially developed its manufacturing sector behind a fairly substantive wall of tariffs and other protections. Only as their economies matured and became more dependent on foreign inputs and markets for their products did they gradually open their borders and integrate regionally and globally. The rise of interlinked production networks that cross international borders within each region required more coordination and cooperation among countries, not just for trade in goods and services, but also to settle on common standards and regulations.

The process proceeded somewhat differently in each region, most formally within Europe, where the EU’s political and economic integration superseded a patchwork

### BOX 3.8 *Integration takes a long time, and its benefits do not come overnight*

In Europe, after the diffusion of modern industrial technology and the expansion of trade links in the early nineteenth century, it took more than 100 years before formal integration processes began in the 1950s. Even then, the efforts were limited to agreements on narrowly focused economic issues between six countries. Gradually they expanded into additional areas of cooperation such as customs and nuclear energy. It took 16 years before these agreements were consolidated in the European Community in 1967. Membership expanded slowly, with three countries joining each decade between 1970 and 2000, and finally the addition of 12 Eastern and Central European countries by 2007. Just as the initial Coal and Steel Community formalized long-established economic and cultural ties between the member countries, each subsequent expansion followed a long period of ever-closer interaction between members and accession countries.

Formal, *de jure*, integration thus followed *de facto* integration, providing a framework and structure for deepening already close relations. This gradual process allowed institutions to develop and gave labor, financial, and product markets time to prepare for possibly harsh adjustments, particularly for recently joining countries with much smaller economies. Bulgaria and Romania, which joined in 2007, added 8.6 percent to the EU’s land area and 6.3 percent to its population but only 1 percent to its GDP.<sup>a</sup> So the convergence of social and economic outcomes across member countries will also take longer. Assessing the benefits from integration thus requires a long time horizon, as increased labor mobility, investment in private and public capital, and other structural changes accelerate growth in lagging member countries.

Source: WDR 2009 team.  
a. European Union 2007.

of bilateral agreements among a fairly large number of countries (see box 3.8). East Asia, by contrast, has created tightly linked entrepreneurial production networks with relatively little formal protocol. Initial integration in North America was facilitated by a shared language and cultural background between Canada and the United States. The relatively recent addition of Mexico has removed some divisions between economies of greatly different per capita incomes.

**Openness and integration are most beneficial for smaller or landlocked countries whose access to world markets depends on neighboring countries.** Luxembourg’s small size does not matter, because it is tightly integrated in the European economy and thus operates more like a specialized city in a large country. Switzerland’s being landlocked has not constrained the development of highly specialized manufacturing and service sectors. It can connect to world markets by air or through neighboring countries, and its neighbors are significant destinations for

its outputs. Integration has enabled the two countries to benefit from specialization and scale economies that would otherwise be achievable only in far larger countries.

To facilitate integration, industrial regions invested heavily in physical infrastructure that promotes intraregional trade. Initially, sea and river transport was most important for exporting manufactured products, requiring good coastal and river ports. More recently, interrelated production processes require more timely availability of intermediate products, which has moved a larger proportion of trade to road, rail, and air links.

### What's different for today's developers?

Are the conditions today different, or is this just a continuing or recurring phase of globalization similar to that of a hundred years ago? In fact, goods and factor markets may be no more closely linked today than they were a century ago. They may be somewhat more integrated for trade, no more integrated for capital, and less integrated for labor.<sup>69</sup> So how can lagging regions and countries join the group of leading world regions? Do they need to wait their turn, or are there ways for them to break out of a geographic determinism?

Some clear differences in the current phase of globalization and economic development relate to the dynamics of economic geography and the persisting divisions between countries. First, the scale and speed of economic integration in recent decades have been unprecedented. The economic liberalization in China and India, as well as in Russia and South America, adds huge numbers of unskilled workers to global production capacity.<sup>70</sup> In many ways this is a reemergence of those regions (Asia accounted for almost 60 percent of world GDP as recently as the early nineteenth century).

China and India, because of the enormous size of their home markets, are essentially world regions of their own. With no formal internal divisions, they benefit from scale economies and provide the incentive for investors and trading partners to

overcome their significant external barriers—the thick borders in the map that opened this chapter (see map 3.2). Smaller countries do not have this luxury. They must learn to manage their borders more rapidly to achieve economic integration with their neighbors to attain competitive production scale and to access world markets. Countries and regions that do this faster will have an advantage, but it will not be easy. By providing a vast unskilled labor pool—and relatively little human or physical capital—countries like China and India can absorb new manufacturing capacity for a long time. These are precisely the types of activities that might provide a path to middle income for the poorest countries. China also demonstrates the benefits of its economic rise for its neighbors. Almost all East Asian countries have sometimes significant trade surpluses with China in most manufacturing sectors.<sup>71</sup>

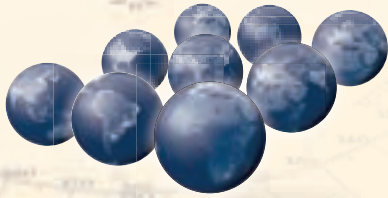
Second, there has been an unprecedented fragmentation of production processes. This includes not only the intrafirm division of manufacturing steps across several places, but more important the intraindustry trade of increasingly specialized components and services, sometimes over long distances. Advances in communications technology facilitate these complex buyer-supplier networks. Although integrated in global markets, production tends to be regionally concentrated. For smaller countries, this may be both a threat and an opportunity. The threat is that smaller countries with poor infrastructure and low skills will remain outside global trading networks. The opportunity is that, while spatial concentration remains beneficial for production, increasing specialization allows concentration and scale economies within subsectors in which even small players can carve out a niche.

In 1999 India's then-prime minister, Atal Behari Vajpayee, remarked on some of the same issues that have been discussed in this chapter: "We can change history but not geography. We can change our friends but not our neighbors."<sup>72</sup> Is he correct? On one level, certainly. Countries cannot just pack up and move to a better neighborhood the



way individuals can. But in an economic and political sense, countries can change their neighborhoods. Japan and the United States overcame deep divisions of history and geography to become close neighbors by developing extensive transport links and increasing economic interdependence. Mexico and Turkey may be changing neighborhoods by reorienting economic ties from their traditional cultural backyards to more prosperous countries in another part of their neighborhood. European integration ended centuries of division and war. Since December 2007, travel from the Portuguese Algarve to Estonia is possible without once showing identification.

Many world regions continue to face the impacts of significant division. But this Report shows that countries can improve their economic fortunes by changing their neighborhoods virtually and practically. For this, they must do two things. First, they must overcome the limitations and barriers of geography by developing close trade and transport links with markets and sources of investment in rich and emerging regions of the world (see chapter 6). And second, they need to seek strength in numbers by “thinning” their borders and integrating their economies with their physical neighborhood (see chapter 9).



## Overcoming Division in Western Europe

*The day will come when you France, you Russia, you Germany, all you nations of the continent, without losing your distinct qualities and your glorious individuality, you will merge into a superior unit, and you will constitute European fraternity.*

—Victor Hugo, from a speech at the 1849 International Peace Congress

Victor Hugo was laughed at when he said this, as were several of his predecessors who proposed European integration. It took the catastrophe of two world wars to get people to take the idea seriously and make policy makers ready for radical change. The scale of devastation and misery is the key to understanding the drive for integration: on top of the horrifying death toll, the war caused enormous economic damage. The war cost Germany and Italy four or more decades of growth and put Austrian and French gross domestic products (GDPs) back to levels of the nineteenth century.<sup>1</sup>

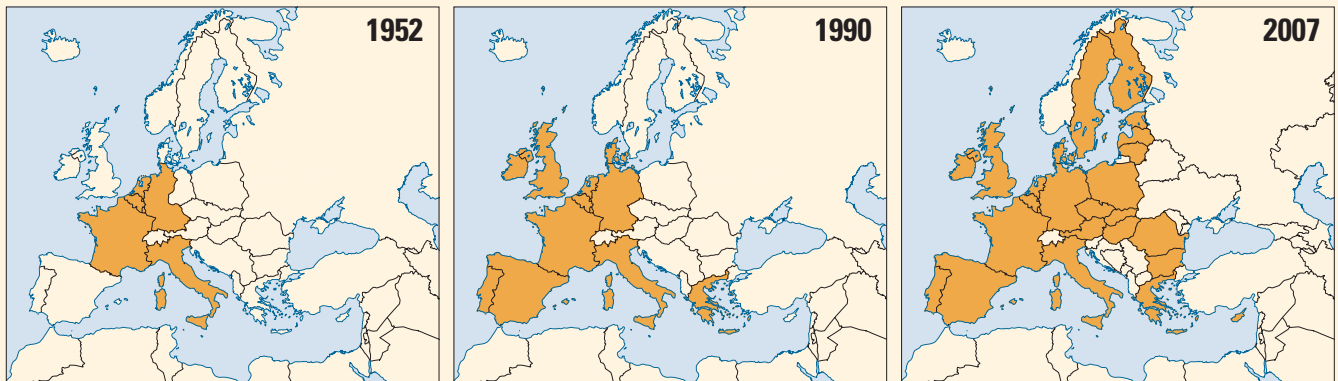
Overcoming division and its dramatic consequences was the objective of European leaders after World War

II. Destructive nationalism—and its economic dimension, protectionism—were indeed partly blamed for the disaster. Economic integration was thus viewed as the best way to avoid another war. That it should come through peaceful means and with the main objective of maintaining peace was—and remains—a unique endeavor. In this respect, European integration is a clear success. But it was not clear in the 1940s and 1950s that this vision of “Peace through Integration” would succeed, particularly because it came at the same time as the Cold War’s division between the East and the West.

Under American pressure, 13 European countries created the

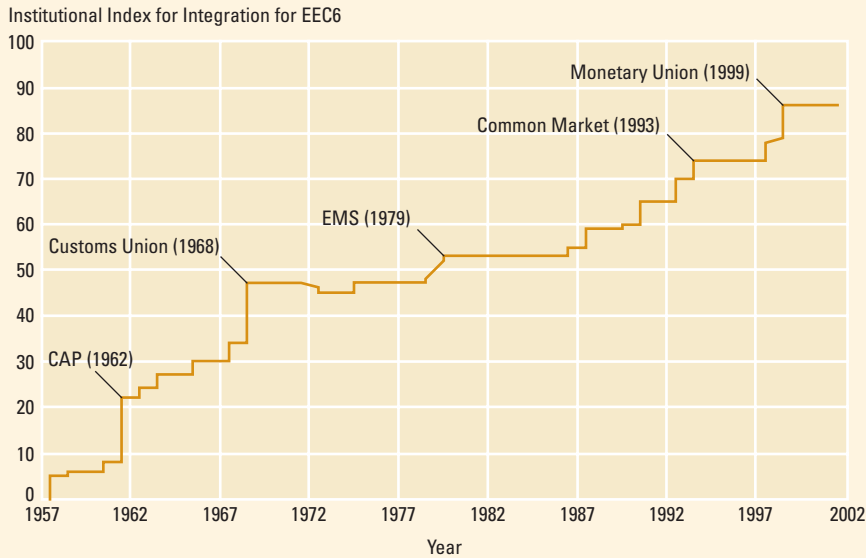
Organization for European Economic Cooperation (OEEC) in 1948 to implement the Marshall Plan. Its mandate was to reduce trade barriers, particularly quota restrictions. Europe in the early postwar years was a tariff- and quota-ridden economy. Removing trade barriers fostered the rapid growth of trade. Between 1950 and 1958, manufacturing exports grew by almost 20 percent a year in West Germany, 9.2 percent in Italy, and 3.8 percent in France. Additionally, average annual GDP growth was 7.8 percent in West Germany, 5 percent in Italy, and 4.4 percent in France. Correlation is not causality, and reconstruction was a strong engine of growth. But the rapid growth as European trade was

**Map G2.1** The division in Western Europe has gradually dissipated  
Stages of economic integration



Source: WDR 2009 team.

**Figure G2.1 The stairway to success**  
The institutional index of integration for the European Economic Community Six



Source: WDR 2009 team.

liberalized was changing the minds of European policy makers. European integration was not just a political project—it also made economic sense.

The European Coal and Steel Community (ECSC) was launched by France and Germany, who invited other nations to place these two sectors under its supranational authority. The project was both political and economic because it applied a supranationality onto two sectors that were considered strategic for economic and military

reasons. Belgium, Italy, Luxembourg, and the Netherlands joined the project in 1951, and these six would become the driving force behind European integration (see map G2.1). The ECSC showed that economic cooperation was more feasible than political or military integration.

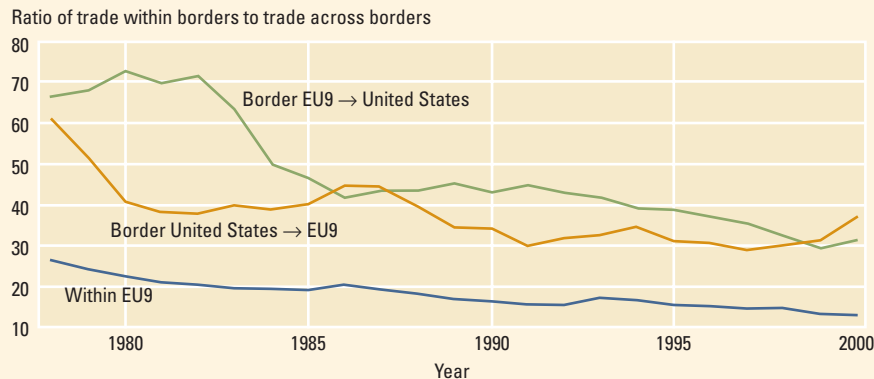
The Treaty of Rome in 1957 created the six nations of the European Economic Community (EEC). The move committed the six to unprecedented economic integration. Not only would

a custom union remove all tariffs for intra-EEC trade and establish a common external tariff, but also a unified economic area would promote free labor mobility, integrated capital markets, free trade in services, and several common policies. This degree of economic integration was not feasible without deep *political* integration. So, in retrospect, “using economics as a Trojan horse for political integration worked like a charm.”<sup>2</sup> As “guardians of the Treaty,” the Court and the European Commission would control those countries (especially France when de Gaulle returned to power) that came to reject the level of supranationality implied by the Treaty. From 1966 to 1986, however, the deep integration promised by the Rome Treaty stalled (see figure G2.1). Europeans began to erect barriers that took the form of technical regulations and standards, fragmenting markets—a classic reaction by lobbying industries to defend their rents.

The Single European Act (1986) relaunched the process of deepening economic integration—all the more stunning given the slow disintegration during the 1970s. Emphasizing the mobility of capital, the Single Act was also partly responsible for the birth of the European Monetary Union (EMU). Indeed, the fixed exchange rate of the European Monetary System implied, with free capital mobility, the loss of monetary sovereignty. This made the EMU more politically palatable for countries committed to fixed exchange rates.

Overcoming division means reducing the impact of borders on trade flows. Has this been so in the European Union (EU)? One way to answer the question is to compare the volume of trade within borders with the volume of bilateral trade between countries. The ratio of the two is the “border effect.” Fontagné, Mayer, and Zignago (2005) do this for the EU-9, the six founders plus Denmark, Ireland, and the United Kingdom. The border effect for reported intra-EU trade fell from around 24 in the late 1970s to 13 in the late 1990s—a

**Figure G2.2 Border effects between the European Union and the United States remain more than twice that within the European Union**



Source: Fontagné, Mayer, and Zignago 2005.

Note: The border effect is the reverse of the volume of trade within natural borders to the volume across borders.

substantial increase in integration (see figure G2.2) unmatched in the world. The border effect between the EU-9 and the United States, while decreasing fast during the period, remains more than twice that within the EU. Borders in the EU have become thinner, but they have not disappeared.

The European regional integration process has spread. As the EU deepened and enlarged, the cost of discriminatory treatment (the natural implication of any regional integration process) for outsiders increased, creating a “domino dynamic of regionalism.”<sup>3</sup> Even European countries that most valued their

sovereignty applied for membership. That the EU with its unmatched supranationality remains so attractive for outsiders is evidence of an enduring success.

Contributed by Philippe Martin.