RESHAPING ECONOMIC GEOGRAPHY IN EAST ASIA

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Edited by Yukon Huang and Alessandro Magnoli Bocchi
Reshaping Economic Geography in East Asia
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I am pleased to be associated with this collection of studies, a companion volume to the World Development Report 2009 (WDR 2009). The WDR 2009 provides a comprehensive overview, from a global perspective, of the importance of economic geography. In turn, this volume focuses on East Asia and the role of economic geography in shaping its development. As a member of the advisory panel for the WDR 2009, and having spent much of my career pioneering the principles that underpin the “new economic geography” or spatial economics, it is gratifying to see how these principles are now being used to deepen our understanding of the most dynamic region of the world and its development process.

An earlier volume of studies on East Asia that I edited focused on how spatial factors influenced both the process of regional integration and the location of production across countries (Fujita 2007). These outcomes reflect the tenets of the new economic geography: given first-nature factors and natural conditions, agglomeration forces lead to “clustering” (that is, the concentration of economic activity among firms) and give rise to scale economies. Once clustering takes off, proximity to markets reduces transport costs, and “agglomeration economies” encourage more and more firms to congregate. In this process, economies of scale and transport costs are important factors in shaping the size and nature of both cities and production centers.

These principles help to explain the so-called “flying geese model” of regional development that characterized East Asia from the 1970s to the early 1990s. In that model, Japan played the role of “lead goose”; over time, it shed, with a cascading effect, industrial activities in which it no longer had a comparative advantage to lower-income countries—first to the newly industrializing economies, then to several Association of South East Asian Nations (ASEAN) countries, and finally to China. This process was supported by the emergence of agglomeration economies in several “core” metropolitan areas of Japan, while complementary production centers in Asia’s mega cities represented the “periphery.”

However, over the past decade and a half, East Asia has moved from a mono-polar system, dominated by Japan, to a multi-core system, which is the outgrowth of greater regional integration, driven by specialization and scale economies, interindustry relocation, and trade-related production-sharing networks and by more diverse patterns of industrialization within the same country. Integral to this phenomenon have been the growing importance of innovation in driving economic growth and the emergence of China as the major assembly plant for the region (Gill and Kharas 2007). Also, despite the resounding success of East Asia, within countries there are signs of great stress, such as rising internal disparities, urban congestion, and environmental degradation.

The “flying geese model” does not fit well with this recent experience. The new economic geography, however, allows for such variation, and while it does not explicitly address issues of income distribution, there is no doubt that the existence or lack of scale economies—and the manner in which they are being exploited—greatly affect the creation and distribution of wealth. For example, the density of economic activity and the greater compensation being
given to those with technology-related skills have strong distributional impacts. Hence, the rural and urban divide is not the only dimension to create income disparities.

This collection of studies emphasizes the process of domestic integration: in East Asia, the continuing pressures for sustaining growth are bringing about a growing divergence in incomes between lagging and leading regions and urban and rural areas. In particular, these studies provide two perspectives. First, they describe the broad spatial transformations, as measured by trends in income, industrial output, population movements, and social indicators. Second, they assess how government policy, at the local, regional, and national levels, has affected the pattern of spatial development, especially its impact on growth and equity objectives.

For low-income countries such as Lao PDR and Vietnam, the concentration of economic activity is just beginning; there, economic growth is shaped primarily by how well the main agglomerations of population are connected to the major commercial centers. In larger, more diverse, and urbanized countries such as Indonesia, the Philippines, and Thailand, the concentration of economic activity around large metropolitan centers is well entrenched; however, there continue to be concerns about the extent of the agglomeration benefits and whether policies can deal adequately with long-standing spatial disparities.

China is perhaps the most notable example of how a large and spatially diverse country has managed to reshape its economic geography to achieve rapid growth, but challenges remain because of the sharply rising spatial disparities. In the Republic of Korea, however, the move from a developing to a developed country led to a gradual convergence in living standards across regions and eventually to broad equality in per capita incomes.

I have characterized East Asia before as the region of ultimate diversity: in incomes, language, culture, and inherited conditions. This is exemplified in the wide range of outcomes of these studies, which reflect each country’s stage of development, historic precedents, and differing policy approaches. Still, these studies illustrate how well the concepts underpinning the new economic geography can explain what is happening in East Asia. Despite a few exceptions, urbanization and related agglomeration benefits are part of the region’s success story, along with the related pressures on policy makers to deal with increasing spatial disparities. The challenge is how best to sustain efficient growth processes, while ensuring over time that even though incomes may diverge in the early stages of development, with good policies, living standards can—and will—converge.

Masahisa Fujita

References

Reshaping Economic Geography in East Asia illustrates how extensively spatial factors have influenced and informed by growth and development in the region. This study was conceived as a companion volume to and informed by the World Development Report 2009: Reshaping Economic Geography (WDR 2009). By providing case studies and illustrative examples and by deepening our understanding of the forces of economic geography in the East Asia region, this work helped to substantiate some of the key concepts in the WDR 2009. There is full consistency in terms of the analytical framework used and broad agreement on how economic geography has influenced growth trends across a diverse range of countries.

As in the WDR 2009, the underlying framework for this volume originates with the body of thought encompassed in the “new economic geography.” The new economic geography explains how spatial factors affect production and, in turn, trade and growth patterns (Gill and Kharas 2007). It all starts with the choices that firms make about the location of their activity—that is, the desire to concentrate production in one location so as to enjoy plant-level economies of scale and to be near customers and suppliers to reduce transport costs. Once a market has reached a certain scale, other firms are encouraged to locate there to take advantage of market size, thereby giving rise to “agglomeration economies”—in other words, the advantages of coalescing geographically.

But history also matters. Normally, the existence of a large manufacturing sector gives suppliers an incentive to locate in major commercial centers to take advantage of the larger market and greater potential access, reinforcing the original advantages. Factors of production, however, especially labor, are not mobile between countries in the same way that they are mobile within countries; thus cost structures may drive firms from larger, higher-wage areas to smaller, lower-wage areas both within and across countries. The lower the transport costs that firms face, the less likely firms are to congregate in one major center or in one country.

Changing spatial and production patterns can adversely affect income distribution. Economies of scale are likely to exist in manufacturing and in urban areas but are largely absent in agriculture and in rural areas. If this is true, then it provides an explanation for the persistence of urban-rural wage differences as well as the widening gaps between leading and lagging areas. Indeed, economies of scale may also result in a premium for skilled relative to unskilled workers and thus explain the widening income gaps in relatively open and rapidly growing economies, where innovation is likely to be an important factor shaping growth. This is likely to be the case in the middle-income economies of East Asia today.

As discussed in the WDR 2009, as a country or a region develops, both people and firms tend to concentrate in cities and prosperous areas. The resulting disparities in living standards across space underlie the unevenness of the growth process. While location matters at all stages of development, it matters less in a rich country than in a poor one. While WDR 2009 looks at this issue at three spatial levels—at the international level between countries, at the country level, and at the local level—this volume is largely about country experiences and, within
countries, about lagging versus leading regions and cities versus rural areas. This collection of studies focuses on how market forces and government policies influence the concentration of economic activities and the convergence of living standards across locations.

In this volume, the three dimensions of development highlighted in the WDR 2009—density, distance, and division—provide a conceptual framework for the geographic transformations.

- **Density** refers to the geographic “compactness” of economic activity and is measured by the level of output produced, or income generated, per unit of land area. It is thus highly correlated with both employment and population density. This is the defining characteristic of urbanization, and historically there is a very strong correlation between rising concentration of activity and level of development.

- **Distance** refers to the ease or difficulty of moving goods and factors of production between two locations. In this sense, distance is a physical as well as an economic concept. It is not just related to the physical distance between two locations but is also influenced by factors such as the quality and mode of transport and regulatory barriers. The main point is that locations closer to markets have an advantage. While the easiest way to reduce distance is through labor migration, improved connectivity through better transport and communications is also essential.

- **Division** refers mainly to the negative consequences of political borders separating countries and thus restricting the flow of goods, people, services, and ideas. However, division can also mean boundaries and regulatory barriers within countries, which impede the internal movement of factors of production. In our studies, the focus is largely on internal divisions within countries, although two studies discuss how cross-border issues can affect economic and social developments across countries.

For policy makers, the challenge is getting density right: fostering the appropriate concentration of economic activities to realize the potential benefits of agglomeration economies. If done well, convergence of living standards between lagging and leading areas and urban and rural areas will occur over time. But the distance between concentrated activities is also an important factor, which can be addressed both by favoring the mobility of labor and by reducing transport costs with infrastructure investment. In the process, any artificial or politically driven division—due to jurisdictional boundaries, ethnicity, language, or religion—can divide people, hamper economic activities, impede growth, and exacerbate social development.

Reshaping Economic Geography in East Asia also highlights the dramatic urbanization process under way in the region, evidenced by the number of globally recognized “mega cities” (those with populations over 10 million). Seven of the world’s 21 mega cities are in East Asia. Cities in East Asia generate about three-quarters of annual output and between a half and two-thirds of exports. Often, much of this is concentrated in one major city: Bangkok. Bangkok accounts for 40 percent of Thailand’s gross domestic product (GDP) and Manila for 30 percent. Other major centers such as Guangzhou, Jakarta, Seoul, Shanghai, and Tokyo are seen as driving their economies. East Asian cities have been able to deliver the agglomeration benefits required for growth and are now exceptionally well connected to the global economy. The region, excluding Japan, is home to 16 of the largest 25 seaports in the world and 14 of the largest 25 container ports. Without this improved connectivity, the region’s rapid expansion in trade volumes would not have been possible.

This collection of studies is organized in four sections. The first section comprises chapters dealing with the “context and concepts” for this volume. The second deals with Southeast Asia, specifically, the Association of South East Asian Nations (ASEAN) countries, and the third deals with Northeast Asia: China and the Republic of Korea. The fourth section provides an overview of lessons learned. The time perspective for most of the studies spans several decades; in many cases, outcomes and policies can be traced back half a century or more.
Leading off section 1, Nobuaki Hamaguchi provides the regional context in his description of the evolution of East Asia’s growth and trade patterns over the past several decades. He surveys the origins of East Asia’s success story as depicted first by the “flying geese model,” then by “the East Asian miracle,” and, more recently, by the “East Asian renaissance,” which highlights the rise of regional trade and financial networks and the emergence of China as an important economic player (Gill and Kharas 2007). A common theme is the role of agglomeration economies, the pattern of regional development, and the implications for income distribution at the regional and national levels.

The other papers in section 1 illustrate particular aspects of the three dimensions of the spatial transformations for economic development: density, distance, and division.

In chapter 2, Keijiro Otsuka and Tetsushi Sonobe explore an important facet of density, the agglomeration phenomenon: how do industrial clusters form, and what factors influence the degree and success of the processes involved? Drawing on several country case studies, they examine the pattern of cluster-based industrial development to identify key determinants, notably the role played by innovation. In chapter 3, Akihiko Ohno’s study of Lao PDR illustrates some of the complexities that arise when both density and distance affect small, landlocked, low-income countries, where the challenge is connecting isolated clusters of rural artisans (producers) to national and global markets. His solution is the emergence of a special type of trader—the culture broker—who can gain the trust of local artisans but also understands the demands of the external market and thus can overcome the distance factor that hampers development.

In chapter 4, Futoshi Yamauchi, Megumi Muto, Reno Dewina, and Sony Sumaryanto deal with the “distance” factor, explaining how spatial connectivity through improvements in the quality of roads relative to distance to commercial centers can affect incomes in rural villages in Indonesia. Aside from investment in transport infrastructure, the chapter argues that improved education is also important.

In chapter 5, Manu Bhaskaran draws attention to the negative consequences of divisions, highlighting how the largely artificial borders that separate contiguous nations can discourage factor mobility and distort investment choices. In this case, a more coordinated and free flow of labor and investment between Singapore and the southern tip of Malaysia—known as the Iskandar Development Region—could, in theory, convey substantial benefits to both countries. But, not unexpected, overcoming political sensitivities may be the real challenge. In chapter 6, Jonathan Rigg and Chusak Wittayapak illustrate another aspect of the “division” problem. The Greater Mekong subregion straddles six countries, with areas inhabited largely by relatively poor, ethnic minorities and logistically difficult to access but potentially rich in resources. As documented in their chapter, stronger regional cooperation supported by major infrastructure investments is vital to overcoming international barriers, but the potential for social disruptions and the need to compensate losers in the process also need to be considered.

Section 2 deals with the larger countries in Southeast Asia: Indonesia, the Philippines, Thailand, and Vietnam. Section 3 deals with Northeast Asia: China and Korea. These country case studies provide a broad historic overview of how economic geography has been shaping development. The outcome is reflected in the spatial patterns of production, growth, population settlements, and, in many cases, spatially differentiated measures relating to income and access to social services. In all countries, governments have sought to influence the process, and, as proposed in the framework of the WDR 2009, these policies reflect the nature of institutions in providing basic services and influencing market forces, the significance of connective infrastructure, and the impact of spatially targeted incentives.

Section 2 begins with chapter 7, by Dang Kim Son, which documents how rapid growth in a largely agrarian, low-income economy such as Vietnam has created regional disparities. Although all regions have benefited from the country’s recent successes, given Vietnam’s stage of development, high priority has been—and should continue to be—given to policies designed to improve connectivity across regions and raise rural productivity.
The case of Indonesia's spatial development does not lend itself to easy caricature. In chapter 8, Hall Hill, Budy P. Resosudarmo, and Yogi Vidyattama provide a comprehensive view of the relationship between location and the patterns of growth, population movement, and disparities over the past several decades. Although Jakarta has benefited from being the capital and hence has better connectivity globally, some resource-rich areas have also flourished over time, but more episodically. Indeed, there is no clear natural resource advantage, and Jakarta continues to perform relatively better than other areas. There is a great diversity in social and economic outcomes, and large differences in living standards exist across the major island groups, but progress has been remarkably even overall. Conflict, as expected, is a negative factor. Not explicitly addressed in this or the other Indonesian chapters is whether a large population spread across many islands puts pressures on maintaining more diverse and self-sufficient productive capacities than would be the case otherwise. In chapter 9, Francisco Javier Arze del Granado takes a more in-depth view of how recent fiscal decentralization efforts have affected the spatial pattern of development in Indonesia. It is perhaps too early to reach definitive conclusions, but the initial results suggest that decentralization may be an effective means to improve local service delivery and discourage migration, but it has not made much of a difference in terms of reshaping the location of industrial activity. In chapter 10, Ari Kuncoro analyzes the characteristics of Indonesian industries that the government has encouraged to relocate to less congested areas, to see if agglomeration benefits are derived from localization factors that would favor smaller urban centers—or from urbanization factors that require larger and more diverse urban settings. He finds that, depending on the nature of the industrial subsector, relocating industries to smaller cities can be consistent with market solutions, especially if accompanied by investments that improve transport connectivity.

The cases of the Philippines and Thailand illustrate the importance of economic geography in shaping developmental outcomes, especially the regional dimension of poverty. In chapter 11, Arsenio M. Balisacan, Hal Hill, and Sharon Faye Piza survey the relatively disappointing growth of the Philippines over the past decades. Whether these outcomes reflect a spatial misallocation of public expenditures or a failure to unify national markets and encourage more factor mobility is not yet clear. However, the glaring regional disparities and concentrated pockets of poverty suggest that a sharp increase in infrastructure investments to improve connectivity between the lagging and leading areas is long overdue. In chapter 12, Nitinant Wisawesuan studies Thailand’s experience, indicating that a quarter century of rapid growth has resulted in a sharp decline in the number of poor people. Nevertheless, significant regional disparities continue, although some regions appear to be catching up with the more densely settled Greater Bangkok area, in part because of industrialization dynamics linked to globalization.

Section 3 on China and the Republic of Korea begins with chapter 13, and an overview by Yukon Huang and Xubei Luo, of how China has reshaped its economic geography over a quarter of a century to create a more competitive productive structure and, in the process, has experienced major regional disparities. Drawing on the other China studies, the authors analyze the spatial impact of incentive and fiscal policies on investment patterns, industrial agglomeration, and regional growth trends. These policies have had a major distributional impact, as reflected in regional and rural-urban indicators of income and access to social services. In chapter 14, Yang Yao provides a broad sweep of how government policies over the past half century have shifted from decentralization to recentralization in response to historic events. He then relates these shifts to growth and distributional outcomes from a spatial perspective. His analysis provides revealing insights on the factors that have shaped government policies. In chapter 15, Zhao Chen and Ming Lu discuss how agglomeration economies have affected provincial growth rates and, in turn, given rise to rural-urban disparities. They note that more balanced interregional and urban-rural development is needed and that such policies will not necessarily compromise efficiency considerations. In chapter 16, Canfei He provides an in-depth analysis of the impact of agglomeration economies on the geographic clustering of industries. Using a comprehensive database, he shows how the location of industrial activity has shifted over time, with more agglomerated industries locating along the coast and more
localized, resource-based, or domestic market–oriented industries expanding in the interior provinces. His findings are reinforced in chapter 17, in which Chong-En Bai and Xu Lin conclude that the spatial pattern of firm-level specialization and competitive pressures are leading to a more efficient industrial structure in China. In chapter 18, Yue-man Yueng and Jianfa Shen show how the three major growth centers of Guangzhou, Shanghai, and Beijing and their related subregions (Pearl River delta, Yangtze River delta, and the Bohai Bay area) have catalyzed China’s modernization. In the process, this has triggered rapid urban restructuring and generated major spillover benefits to the surrounding secondary cities and rural areas.

The last chapter in this section (chapter 19), by Sam Ock Park, covers the experience of the Republic of Korea. With a per capita income far exceeding that of other countries (excluding Japan and Singapore), Korea illustrates the other end of the spectrum: how a successful country can transition from developing to developed status and from a low to a high degree of urbanization and, in the process, move from spatial disparity and bipolar concentration of industries to a new spatial division of labor between the core (Seoul) and the rest of the country. In the process, the spatial disparity of incomes and access to social services has been considerably reduced over time.

No region is as diverse as East Asia, endowed with a wide range of incomes and levels of development and with differing cultural and historical precedents. Section 4 contains a concluding chapter by Yukon Huang and Alessandro Magnoli Bocchi, which summarizes the diversity of country experiences, highlighting how the principles underpinning the new economic geography explain remarkably well the developmental experience of most East Asian economies. The “take-home” message is the following: independent of their particular stage in the development process, countries should work with—rather than try to counter—the forces of geography in shaping economic growth and development. Even under ideal circumstances, spatial disparities can be evidence of success rather than failure. But these processes take decades, if not generations, to work through. Policies that focus on making the growth dynamics more inclusive rather than more “balanced” will ultimately lead to outcomes that result not only in higher levels of income but also in more equitable living standards.

Yukon Huang and Alessandro Magnoli Bocchi

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**Abbreviations**

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<tr>
<th>Abbreviation</th>
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<td>ADB</td>
<td>Asian Development Bank</td>
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<td>AFTA</td>
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<td>APEC</td>
<td>Asia-Pacific Economic Cooperation</td>
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<td>ARMM</td>
<td>Autonomous Region of Muslim Mindanao, the Philippines</td>
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<td>ASEAN</td>
<td>Association of South East Asian Nations</td>
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<td>BOTABEK</td>
<td>Bogor, Tangerang, and Bekasi, Indonesia</td>
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<td>B2B</td>
<td>business to business</td>
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<td>B2C</td>
<td>business to consumer</td>
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<td>CAR</td>
<td>Cordillera Administrative Region, the Philippines</td>
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<td>CARP</td>
<td>Comprehensive Agrarian Reform Program, the Philippines</td>
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<td>CE</td>
<td>household consumption expenditure</td>
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<td>CRS</td>
<td>constant return to scale</td>
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<td>CV</td>
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<td>ETDZ</td>
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<td>FDI</td>
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<td>GE</td>
<td>general entropy</td>
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<td>GMS</td>
<td>Greater Mekong subregion</td>
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<tr>
<td>GNI</td>
<td>gross national income</td>
</tr>
<tr>
<td>GNP</td>
<td>gross national product</td>
</tr>
<tr>
<td>GRIPS</td>
<td>Graduate Research Institute for Policy Studies</td>
</tr>
<tr>
<td>GSO</td>
<td>General Statistical Office</td>
</tr>
<tr>
<td>HDI</td>
<td>human development index</td>
</tr>
<tr>
<td>IADB</td>
<td>Inter-American Development Bank</td>
</tr>
<tr>
<td>ICASEPS</td>
<td>Indonesian Center for Agriculture Socio-Economics and Policy Studies</td>
</tr>
<tr>
<td>ICL</td>
<td>income-contingency loan</td>
</tr>
<tr>
<td>ICT</td>
<td>information and communications technology</td>
</tr>
<tr>
<td>IDE</td>
<td>Institute of Developing Economies</td>
</tr>
<tr>
<td>IDR</td>
<td>Iskandar Development Region</td>
</tr>
<tr>
<td>IFPRI</td>
<td>International Food Policy Research Institute</td>
</tr>
<tr>
<td>IMDG</td>
<td>Infrastructure on Millennium Development Goals, Indonesia</td>
</tr>
<tr>
<td>IMF</td>
<td>International Monetary Fund</td>
</tr>
<tr>
<td>INPRES</td>
<td>social capital program, Indonesia</td>
</tr>
<tr>
<td>IT</td>
<td>information technology</td>
</tr>
<tr>
<td>JABOTABEK</td>
<td>BOTABEK plus Jakarta, Indonesia</td>
</tr>
<tr>
<td>JBIC</td>
<td>Japan Bank for International Cooperation</td>
</tr>
<tr>
<td>JBICI</td>
<td>Japan Bank for International Cooperation Institute</td>
</tr>
<tr>
<td>JETRO</td>
<td>Japan External Trade Organization</td>
</tr>
<tr>
<td>JJJ</td>
<td>Jing-Jin-Ji, China</td>
</tr>
<tr>
<td>LADB</td>
<td>Inter-American Development Bank</td>
</tr>
<tr>
<td>MAR</td>
<td>Marshall-Arrow-Romer</td>
</tr>
<tr>
<td>NAFTA</td>
<td>North American Free Trade Agreement</td>
</tr>
<tr>
<td>NATSEM</td>
<td>National Centre for Social and Economic Modelling</td>
</tr>
<tr>
<td>NCR</td>
<td>National Capital Region, Philippines</td>
</tr>
<tr>
<td>NDRC</td>
<td>National Development and Reform Commission, China</td>
</tr>
<tr>
<td>NEP</td>
<td>New Economic Policy, Malaysia</td>
</tr>
<tr>
<td>NIE</td>
<td>newly industrializing economy</td>
</tr>
<tr>
<td>PATANAS</td>
<td>National Farmer’s Panel, Indonesia</td>
</tr>
<tr>
<td>PCE</td>
<td>household consumption expenditure per capita or personal consumption per capita</td>
</tr>
<tr>
<td>PIL</td>
<td>polynomial inverse lag</td>
</tr>
<tr>
<td>PODES</td>
<td>village-level census conducted by Indonesia’s Central Bureau of Statistics</td>
</tr>
<tr>
<td>PPP</td>
<td>purchasing power parity</td>
</tr>
<tr>
<td>PTP</td>
<td>Port of Tanjung Pelepas, Singapore</td>
</tr>
<tr>
<td>R&amp;D</td>
<td>research and development</td>
</tr>
<tr>
<td>SARS</td>
<td>severe acute respiratory syndrome</td>
</tr>
<tr>
<td>SEAMEO</td>
<td>Southeast Asian Ministers of Education Organization</td>
</tr>
<tr>
<td>SEARCA</td>
<td>Southeast Asian Regional Centre for Graduate study and Research in Agriculture</td>
</tr>
<tr>
<td>SEZ</td>
<td>special economic zone</td>
</tr>
<tr>
<td>SME</td>
<td>small and medium enterprise</td>
</tr>
<tr>
<td>TBND</td>
<td>Tianjin Binhai New District</td>
</tr>
<tr>
<td>TFP</td>
<td>total factor productivity</td>
</tr>
<tr>
<td>TVE</td>
<td>township-and-village enterprise, China</td>
</tr>
<tr>
<td>WTO</td>
<td>World Trade Organization</td>
</tr>
</tbody>
</table>
East Asia has achieved economic growth of greater than 8 percent annually over the last two decades. Influenced by this high growth, the economic geography of the region has been transformed by the opposing forces of dispersion and concentration. On the one hand, industrialization has spread across the region as the intraregional trade of manufactured goods has grown substantially. On the other hand, productive activities have become geographically concentrated in each country, reinforcing the leading role of industrial agglomerations in the development process.

To explain the distribution of economic activities and associated patterns of trade, traditional international trade theory based on comparative advantage emphasizes the diversity of natural endowments, which creates differences in relative factor prices or technological advantages among countries. Given the assumption of production technology with constant returns to scale and immobility of production factors, where goods are traded under perfect competition without transportation costs, the comparative advantage perspective predicts that free trade will promote the efficient allocation of economic activities consistent with the first nature of each location across space.

The manifestation of this argument in the East Asian context is known as the “flying geese” pattern of catch-up industrialization (Kojima 2000). Up to a certain moment, Japan was the lead economy in this pattern. Intraregional division of labor developed as Japan became increasingly specialized in technologically advanced industries, while successively shedding industries in which it no longer held a comparative advantage; these industries, in turn, were relocated to nearby less-developed countries (the Asian newly industrializing economies, or NIEs). Over time, the “following geese” upgraded their industrial structures, following the “lead goose” trajectory, while shedding outdated industries to their own neighboring less-developed countries (members of the Association of South East Asian Nations [ASEAN] and China). When less-developed countries had prepared their basic situations correctly, freer international trade provided them with opportunities to integrate themselves into the regional production network, enabling the sequential takeoff of these economies. On the whole, the flying-geese analogy aptly describes the catch-up industrialization in East Asia.

In this context, the World Bank’s report The East Asian Miracle (World Bank 1993) presents extensive analyses of those basics that qualify a country as a “following goose.” The report stresses that, unlike other developing economies, East Asia achieved rapid growth with equity through the use of two sets of measures: fundamental policies and selective intervention. Fundamental policies include macroeconomic stability, large investments in human capital, stable and secure financial systems, limited price distortions, and openness to foreign technology. Selective intervention includes mild financial regulation, directed credit, selective industrial promotion, and trade policies that
push nontraditional exports (World Bank 1993: 10–11).

The report contends that the two types of policy tools are mutually complementary and cannot be addressed separately. For example, macroeconomic stability is fundamental to cultivate high savings as well as to achieve exchange rate stability, required for economic opening, which, in turn, engender feedback to growth and stability through large investments and exports. The accumulation of savings and achievement of highly productive exports were sustained by wealth-sharing public policies on education, landholdings, and small and medium-size enterprises. Because of their crucial complementarities, developing economies can miss development opportunities if they fail to coordinate these measures. Consequently, the World Bank (1993) concludes that the government’s commitment to social coordination through consistent and unbiased policies is the key to growth with equity.

Although providing the basic conditions for sound economic development remains necessary, a somewhat new scenario has unfolded in East Asia since the 1990s. Above all, the remarkable growth of the Chinese economy subsequent to market-oriented reforms has been a decisive feature. Based on China’s abundance of labor and the explosive growth of its market of middle-class consumers, scale economies in China have become the dominant factor attracting investment. Middle-income countries were rapidly surpassed by China’s leapfrogging growth. Countries in a lower stage of development cannot take it for granted that merely having the right basics will put them on track to catch up given the existence of exceedingly strong agglomeration economies in China. It is now impossible for any East Asian country to consider its development strategy without seriously considering the impact of China.

In addition, in contrast to the simplified version of the flying geese analogy, which stipulates a vertical division of labor, the manufacturing of high-technology products has spread to countries at heterogeneous levels of development. These industries tend to agglomerate in large urban areas in each country to benefit from access to consumers and higher productivity based on the large pool of educated workers and intermediate goods, as well as the availability of good infrastructure. Urbanization also stimulates the interaction of people, encouraging technological innovation and new kinds of economic activities.

Agglomeration economies have enabled Japanese industries to play the role of the cutting-edge “lead goose.” According to Fujita and others (2004), Japan accounted for 72 percent of total gross domestic product (GDP) in East Asia in 1990; within Japan, core economic regions represented 40 percent of the national total, which implies that Japan’s core regions, with a mere 0.18 percent of the total area and 2.5 percent of the total population of East Asia, represented 29 percent of the total regional GDP, displaying remarkable geographic concentration. Recently, Asian NIEs caught up with Japan in many technological areas such as semiconductors and information and telecommunications equipment manufacturing (for example, notebook computers and mobile telephones). Leading technological firms in Asian NIEs compete intensely with Japan’s firms in the global market. In these countries, the geographic concentration of high-technology firms is growing in places such as Daejeon, Hsinchu, and Seoul. Industrialization in China clearly is concentrated in coastal regions; agglomeration has intensified in many parts of the region, and the East Asian economy has been transformed from the traditional one-dimensional flying geese pattern to a pattern encompassing multiple technological centers.

According to the framework of the new economic geography (Fujita, Krugman, and Venables 1999), agglomeration is a self-organizing process that results from the balance of concentration and dispersion forces. As explained by Fujita (2007a), at least three types of concentration forces (forward linkages) are identified: the wide variety of consumption enhances consumers’ real income, the wide variety of intermediate inputs increases firms’ productivity, and the wide variety of talented people stimulates the creation of knowledge. These attract consumers, final goods producers, and innovative research, respectively. Scale
Regional integration, agglomeration, and income distribution in East Asia

Inequality cannot be overlooked because the concentration of wealth and power can foment discontent in the bypassed regions and threaten social stability. Government programs for income transfer from urban to rural areas are usually implemented in this context. However, if farmers residing in disadvantageous locations were to continue producing only generic goods under perfect competition, intensifying pressure from global trade liberalization would require subsidies, which are not sustainable in the long run. In Japan, for example, the dwindling prospects for traditional farming have encouraged farmers to migrate to cities, thereby accelerating the aging of society in rural areas and exacerbating related problems such as the difficulty of providing essential public services in such areas. In many developing countries, large cities tend to be overcrowded, leaving huge populations living in makeshift conditions.

Innovative ideas are needed to establish nontraditional agricultural production and make the periphery lively and livable without depending heavily on income transfers from the core region. In this context, Fujita (2007b) argues that the introduction of highly differentiated branded agriculture is a viable strategy. Branded agriculture makes full use of cheap land and labor, which are abundant resources in the periphery, while overcoming the disadvantages of unfavorable market access because consumers will buy differentiated products even at higher prices. For instance, Japan imported 359 tons of roses from Kenya in 2006, corresponding to roughly 8 percent of the quantity and 20 percent of the value of total imports of that product. As the data suggest, the unit price of Kenyan roses is very high not only because of the distance but also because roses are transported by air via the cold storage facilities of Dubai airport. Still, sales are growing thanks to high product quality. Being in the highland more than 1,000 meters above sea level and right on the equator, Kenya offers ideal natural conditions for such horticulture: constant daylight hours all year long and a large temperature gap between day and night, lowering the risk of insect infestations. This example suggests that remote rural areas can be connected to

...exert a pull on an even greater variety of consumer products, intermediate inputs, and talented people (backward linkages). Because the new economic geography models are built on this positive feedback mechanism, no a priori assumption of the difference in the first nature, as required in the models based on comparative advantage, is necessary to explain the formation of uneven economic geography. Because of the nature of increasing returns to scale, agglomeration enhances long-run economic growth (Romer 1986).

Yet, as a counterpoised dispersion force, high transportation costs necessitate that production be dispersed in proportion to the size of each local market without realizing agglomeration economies. Therefore, actual formation of agglomeration requires sufficiently low transportation costs (Fujita, Krugman, and Venables 1999). Consistent with this result, agglomeration in East Asia has developed together with the deepening of regional economic integration through increasingly numerous free trade agreements as well as unilateral and bilateral deals that reduce the costs of trading.

The foregoing discussion emphasizes that not only factor price differences but also scale economies play an important role in reshaping the economic geography of East Asia. A recent report published by the World Bank, An East Asian Renaissance (Gill and Kharas 2007), addresses this point. Compared to the focus on coordination failure of the earlier World Bank report (World Bank 1993), the later report contends that to sustain economic growth, especially for middle-income economies, product differentiation, knowledge creation, and agglomeration based in cities are expected to play key roles. If scale economies prevail, further improvement in market integration (both international and domestic) must foster the advantages of agglomeration, while mitigating the negative effects, such as road congestion, pollution, and inflated housing prices, through the appropriate provision of urban infrastructure and regulation of land use.

Although we expect agglomeration to enhance growth, this strategy inevitably exacerbates regional income disparities, especially in the rural-urban context.
a large market if they produce sufficiently differentiated products, take advantage of the local natural conditions, and establish innovative market access. Product differentiation of branded agricultural products must be understood in a broader sense, which involves the whole value chain—including quality control and logistics management—rather than innovations in the product itself. In contrast to the general perception of the periphery as a static supplier of generic foods, innovation is needed in the periphery as much as in large cities.

**Production networks in East Asia**

Intraregional trade accounted for 57.3 percent of all imports and 54.5 percent of all exports of East Asian countries in 2005. These shares increased over the past quarter century, as shown in figure 1.1, except for the temporary setback during the economic crises of the 1980s and the 1990s, which increased the share of exports out of the region to compensate for the precipitous drop in regional demand. The current share of intraregional trade approaches that of the European Union (EU); the pattern contrasts with that of the North American Free Trade Agreement (NAFTA), where the gap between the intraregional share of exports and imports in trade is widening because of the growth of imports from outside the region (mainly from the EU and East Asia).

As described in the preceding section, reasons for the steady growth of intraregional trade include the increasing trade of intermediate goods. As shown in figure 1.2, trade in intermediate goods dominates intraregional trade, corresponding to nearly 60 percent of total intraregional trade in 2005. It is multidirectional: as presented in table 1.1, Japan, the NIEs (Hong Kong and Taiwan, China; Republic of Korea; and Singapore), ASEAN-4 (Indonesia, Malaysia, the Philippines, and Thailand), and China export and import intermediate goods within the region. Although Japan is still the net supplier of intermediate goods in the region, its imports of intermediate goods from the remainder of East Asia are growing rapidly. Although the NIEs show a deficit of interregional trade in intermediate goods, the collective exports from these economies are already greater than those of Japan. The export of intermediate goods from China and ASEAN-4 has also grown substantially. According to METI (2007), in the electric machinery industry, which accounts for more than one-third of all intraregional exports of intermediate goods, the share of Japan’s exports dropped from 42 to 22 percent between 1995 and 2005, although the share of ASEAN-4 rose from 25 to 31 percent and the share of China rose from 5 to 17 percent. Localization of intermediate goods firms following the expansion of foreign direct investment for the assembly of final goods in ASEAN-4 and China and the reduction in tariffs on intermediate goods traded among ASEAN-4 countries have contributed to the dispersion of intermediate goods production.

Using data from the Institute of Developing Economies (IDE), we have compiled a trade matrix including transactions of semiconductors and integrated circuits to present an example of intraregional production linkage of electronic parts (IDE 2006; see table 1.2). The table presents the total value of output in the second column; the third column details the destination of shipments consisting of (1) same-country intermediate inputs, (2) intermediate inputs for electronic parts produced in other East

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**Figure 1.1 East Asia’s share of intraregional trade, 1980–2004**

Source: METI (2007: fig. 2-1-14).
Asian countries, (3) intermediate inputs for electronics and electronic final products in other East Asian countries, (4) intermediate inputs for other types of industries in other East Asian countries, and (5) other goods (for final consumption in East Asia and shipments to outside East Asia); and the fourth column gives the share of each destination. Among the listed countries, Japan boasts the highest value of regional shipments of these products (destinations 2, 3, and 4). Especially, US$9.7 billion worth of semiconductors and integrated circuits are exported to other East Asian countries for use as inputs for electronic parts production there. They are then used for local assembly of final goods or are exported. This suggests upstream characteristics of the Japanese semiconductors and integrated circuits for other East Asian countries, partly because of high product differentiation and partly because of intrafirm trade between mother factories in Japan and affiliated plants in other East Asian countries. In contrast, 70 percent of Chinese semiconductor and integrated circuits are consumed locally, and intraregional exports are few. Exports to final goods assemblers within the region (destination 3) are quantitatively similar for exports to Japan; Republic of Korea; Malaysia; and Taiwan, China. Sales outside of East Asia (destination 5) show higher shares for Korea, Malaysia, Singapore, and the Philippines.

Next, figure 1.3 portrays the remarkable concentration of the production of information technology–related products in East Asia. Of world production, more than 73 percent of VCRs and DVD players and 80 percent of personal computers are made in China. On the other hand, about 70 percent of hard disk drives and 43 percent of DVD-ROM drives are produced in other Asia, which includes 62 percent of the former and 38 percent of the latter in ASEAN countries. These products are used for assembling personal computers; for that reason, the production linkage between ASEAN and China is readily explainable. Japan still has large market shares in some products, such as 25 percent of flat-panel televisions and 39 percent of digital cameras, whereas Korea has 26 percent of mobile phone production. Technological advantages in these products sustain the competitiveness of firms in

### Table 1.1: Intraregional trade of intermediate goods in East Asia, 1995, 2000, and 2005

<table>
<thead>
<tr>
<th>Indicator and year</th>
<th>Japan</th>
<th>NIEs</th>
<th>ASEAN-4</th>
<th>China</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Intraregional exports</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1995</td>
<td>137.2</td>
<td>129.8</td>
<td>62.1</td>
<td>40.0</td>
</tr>
<tr>
<td>2000</td>
<td>143.9</td>
<td>174.3</td>
<td>108.3</td>
<td>63.8</td>
</tr>
<tr>
<td>2005</td>
<td>216.5</td>
<td>309.5</td>
<td>175.4</td>
<td>171.4</td>
</tr>
<tr>
<td><strong>Intraregional imports</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1995</td>
<td>–51.1</td>
<td>–201.9</td>
<td>–83.8</td>
<td>–40.9</td>
</tr>
<tr>
<td>2000</td>
<td>–72.1</td>
<td>–252.5</td>
<td>–93.9</td>
<td>–78.5</td>
</tr>
<tr>
<td>2005</td>
<td>–110.4</td>
<td>–386.1</td>
<td>–148.5</td>
<td>–228.7</td>
</tr>
<tr>
<td><strong>Balance</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1999</td>
<td>86.1</td>
<td>–72.1</td>
<td>–21.6</td>
<td>–0.9</td>
</tr>
<tr>
<td>2000</td>
<td>71.8</td>
<td>–78.2</td>
<td>14.4</td>
<td>–14.7</td>
</tr>
<tr>
<td>2005</td>
<td>106.1</td>
<td>–76.5</td>
<td>26.8</td>
<td>–57.4</td>
</tr>
</tbody>
</table>

Source: METI (2007: fig. 2-2-8).
these industries despite higher costs. Notwithstanding, their advantages might not last long because of “commoditization,” or rapid deterioration of prices resulting from short product cycles, which are expected to force firms to seek cost savings through off-shoring, as has already occurred for the production of laptop personal computers in Taiwan, China.

Summarizing these observations, figure 1.4 portrays the value chain of the electronics sector. Major trade flows are represented as solid arrows; broken arrows represent minor flows. This figure is fundamentally identical to the triangular trade scheme described by Fujita (2007a).

**Fragmentation**

The growth of intraregional trade with the relevant share of intermediate goods and the triangular trade scheme is related closely to the development of the intraregional trade flows.
production network. Ando (2006) identifies the explosive increase of vertical intraindustry trade in the machinery industry in East Asia in the 1990s. According to Kimura and Ando (2005), reductions in the costs of transportation and communication have enabled firms to cut production processes into pieces of tasks and to allocate each to the most suitable location given factor price differences.

This phenomenon is dubbed “fragmentation” in the literature on international trade theory, which includes the important report of Jones and Kierzkowski (2001). Fragmentation refers to the splitting up of a previously integrated production process into two or more stages. For example, consider a production process consisting of a capital-intensive stage and a labor-intensive stage. Fragmentation allows the firm to locate the former in a country endowed with more capital and the latter in a country endowed with abundant labor. The firm can thereby reduce marginal costs by taking advantage of factor price differences in contrast to locating the two production components together in either of the two countries. However, such cost savings are made possible by incurring a “setup cost” of establishing extra production plants and a “service-link cost” for using transportation and communication services to link the two operations. The firm’s choice of whether or not to split up production depends on the balance between the marginal cost saving and the additional costs.

Borrowed from Jones and Kierzkowski (2001), figure 1.5 depicts the decision making of the firm. The horizontal axis shows the quantity of production; the vertical axis shows the total costs of production. The sum of the setup costs and the service-link costs of fragmentation is considered as a fixed cost represented by \( F \). The line for the fragmentation case is drawn flatter, implying the marginal cost savings. Expanding output further than \( Q_1 \) entails a switch to fragmented production if a firm chooses the lower-cost production modality.

This illustration is not complete because the decision depends only on the scale of output. The diagram also does not address the interaction between transport costs and scale economies. To add geographic perspectives, we turn to a straightforward extension by modifying the graph to produce figure 1.6. Let \( F \) now represent the setup costs only. Total cost is given as TC.

![Figure 1.4 Triangular trade in East Asian electronics industry](image-url)
(integration) if a firm decides to integrate the production process at one location and produce under higher marginal cost without the fixed cost. Under free entry and exit, the total cost is equal to the total revenue (TR). Presuming that the service-link cost imparts a cost of transportation and communication per unit of fragmented production, which is discounted from the revenue, the total revenue for the fragmented firm denoted as TR* or TR** is lower than TR by the magnitude of the cost of linking the fragmented operations across the distance. Here, TR* is depicted as the total revenue of a firm that locates the affiliate in a distant location. As a result, the service-link cost is higher than in the case of TR**. Imagine that each firm produces $Q_1$. Consequently, the integrated firm produces at point A with zero profit. Given the output level, the firm can set up an affiliate abroad and conduct a multiplant operation. In figure 1.6, such a decision is represented by the move to point B. Although the firm can reduce its total cost by fragmentation, the strategy is not profitable because B passes above $TR^{**}$; that is, the cost is greater than revenue because of the service-link cost. For that reason, at the individual firm level, fragmentation will not occur. However, if the firm is able to sell $Q_2$ instead of $Q_1$, the move from point A to point C on TC (fragmentation) turns out to be profitable if the firm chooses to locate its affiliate in the location with a lower service-link cost such as TR**. The setup cost is compensated by sufficiently large scale economies. However, if the service-link cost is too high, point C is still not profitable.

Figure 1.6 enables us to examine the interaction between scale economies and transportation involved in the fragmentation. Clearly, if each firm’s output is given at $Q_1$, no individual firm will choose fragmentation. It is interesting that, with $Q_2$, fragmentation might be an outcome under the same service-link cost TR** and the same production technology TC (fragmentation), suggesting the possibility of multiple equilibriums.

What kind of a reality does this result describe? We can infer the following effect of externalities. Imagine that, initially, all firms integrate production in an industrial country. Technological developments in transportation and communication open the possibility of fragmentation, but each firm alone will find it unattractive to do so if the output size is insufficiently large for the given service-link cost. Presuming some sort of coordination that induces all firms to opt for fragmentation, the move creates industrial jobs and raises the income in the less-industrial country, increasing the total demand to $Q_2$ and enabling firms to operate profitably at point C under the service-link cost TR**. Therefore, the big push–like concerted shift (Murphy, Shleifer, and Vishny 1989) toward fragmentation is important when the service-link cost is reduced to a moderate level. This shift does not necessarily require government coordination, but the rush for Japanese investment in China in the 1990s might have been a self-organizing shift from point A to C.

If the service-link cost is sufficiently high, as in the case of TR*, fragmentation with output Q2 is still not profitable. This observation implies that fragmentation is more likely to occur with a lower service-link cost, suggesting the case of regional integration among the neighboring countries. Using firm-level micro data of Japanese multinational firms, Kimura and Ando (2005) find that Japanese firms
investing in East Asia are more likely to de-
internalize their production processes flex-
ibly and to conduct outsourcing activities
than those investing in other regions such as
Europe and North America. Fragmenta-
tion might be more sensitive to distance
than the case of ordinary trade because the
service-link cost entails frequent travel of
people in need of technical assistance and
just-in-time delivery of intermediate prod-
ucts across countries. East Asian countries
have lowered their international transac-
tion costs through trade policies facilitating
imports of intermediate goods, favorable
treatment of foreign direct investment, and
development of infrastructure. Kimura and
Ando (2005) also suggest the existence of
scale economies in infrastructure, strength-
ening the benefits of more intensely used
service links.

Receiving the spin-off labor-intensive
factories of the fragmentation process facil-
itates the industrialization of developing
countries. Governments in the region com-
petitively offer unilateral and bilateral pro-
visions to reduce the setup costs of offshore
factories and operational costs of linking
with factories in other countries. Neverthe-
less, Baldwin (2006) asserts that East Asian
integration is still fragile because each coun-
try’s preferential trade deals are neither dis-
ciplined by the World Trade Organization
(WTO) rules nor supported by a supra-
national regional-level management body
such as the European Union; consequently,
countries in the region are expected to
strengthen such de jure features.

In this respect, it is notable that trade
policy in East Asia has shifted from mere
export promotion, which is a fundamen-
tal policy tool analyzed by the World Bank
(1993), to regional integration and free trade
agreements. Initially, ASEAN was launched
to form the ASEAN Free Trade Area (AFTA)
for the 15 years since 1993. Subsequently,
ASEAN incorporated Vietnam, Myanmar,
Lao PDR, and Cambodia in the late 1990s;
leaders of China, Japan, and Korea have
been invited to the annual ASEAN sum-
mith since 1997 in an effort to establish a
political framework for ASEAN+3. China
agreed to establish a free trade area with
ASEAN by 2010. Japan signed bilateral
economic partnership agreements with six
ASEAN member countries (Brunei, Indo-
nesia, Malaysia, the Philippines, Singapore,
and Thailand), which are going to be
extended with an economic partnership
agreement between Japan and ASEAN as a
group (including Cambodia, Lao PDR,
Myanmar, and Vietnam). Aside from Thai-
lant, because of disagreements related to
opening of the rice market, Korea and 9
of 10 ASEAN members reached an agree-
ment in 2007 to form a free trade area, and
negotiations are being held to include trade
in services. In fact, ASEAN’s aggressiveness
in AFTA diplomacy is partly a response
to the rise of China, which ASEAN mem-
bers fear will bring a hollowing out of
investment. The substantial progress of
the AFTA is expected to contribute to
consolidation of the fundamentals for pro-
duction networks.

Border effect between China
and Japan

Our next task is to evaluate the magnitude
of transportation costs, emphasizing the
cost of crossing national borders (that is,
the border effect). For this, we have con-
structed a simple version of the McCallum
(1995) type of gravity model to analyze bor-
der effects involved in interregional trade

![Diagram](image-url)
between China and Japan. The estimated model is given as follows:

\[
\ln(x_{ij}) = \text{constant} + a_1 \ln(y_i) + a_2 \ln(y_j) + a_3 \ln(d_{ij}) + b \text{DUMMIES} + \epsilon_{ij} \quad (1),
\]

where \( x_{ij} \) denotes the shipment between region \( i \) and \( j \), and where \( y_i \) and \( y_j \), respectively, represent the GDP of regions \( i \) and \( j \). Furthermore, \( d_{ij} \) is the distance between \( i \) and \( j \), and \( \epsilon_{ij} \) is an error term (for a detailed explanation of the data, see the annex to this chapter). As DUMMIES, we included the following dummy variables:

- China: intraregional and interregional trade in China;
- Border_China: cross-border interregional trade from a Japanese region to a Chinese region;
- Border_Japan: cross-border interregional trade from a Chinese region to a Japanese region; and
- Inland: cross-border interregional trade from a Japanese region to a Chinese inland region.

The data set includes intraregional trade, that is, \( i = j \).

The estimated results are portrayed in table 1.3. It is apparent that this simple model has reasonably good explanatory power, with adjusted \( R^2 \) greater than 0.8. The elasticities of trade with respect to GDP of the region of origin and of the region of destination are, respectively, 0.86 and 0.72 according to equation 1, which includes observations of domestic regional trade in both China and Japan. These coefficients are estimated as larger in equation 2, which includes cross-border interregional trade. However, elasticity with respect to distance is of similar magnitude in both equations. In equation 1, the coefficient of the dummy variable China implies that the domestic trade among regions in China tends to be twice as large as that of Japan (\( e^{1.14} - 1 = 2.13 \)). In fact, as figure 1.7 shows, the domestic trade in China is heavily biased toward intraregional trade. The share of trade within each region in China is distributed between 62.5 and 85.8 percent for intermediate transactions and between 81.1 and 92.8 percent for final demand, compared to that of regions in Japan, which is distributed between 48.3 and 62.5 percent for intermediate transactions and between 69.6 and 83.3 percent for final demand. Given the large factor price differences within the country, if China reduces transport costs internally and its provinces become better linked, industrial specialization within the country is expected to develop, and interregional trade is expected to grow. Without such development, production is expected to concentrate heavily in the coastal regions: low-cost production there will require a large inflow of migrant workers from inland regions.

Our primary interest is the magnitude of the border effect. Our results show that, all things being equal, Chinese regions trade with the Japanese regions about 9 times less than they do with Chinese regions.

### Table 1.3 Gravity model estimates of China-Japan intraregional trade

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient (1)</th>
<th>Standard error (1)</th>
<th>Coefficient (2)</th>
<th>Standard error (2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>-8.28</td>
<td>2.20</td>
<td>-21.84</td>
<td>2.37</td>
</tr>
<tr>
<td>( \ln(y_i) )</td>
<td>0.86</td>
<td>0.08</td>
<td>1.21</td>
<td>0.08</td>
</tr>
<tr>
<td>( \ln(y_j) )</td>
<td>0.72</td>
<td>0.07</td>
<td>1.00</td>
<td>0.07</td>
</tr>
<tr>
<td>( \ln(d_{ij}) )</td>
<td>-1.22</td>
<td>0.05</td>
<td>-1.24</td>
<td>0.08</td>
</tr>
<tr>
<td>China</td>
<td>1.14</td>
<td>0.14</td>
<td>1.48</td>
<td>0.18</td>
</tr>
<tr>
<td>Border_China</td>
<td></td>
<td></td>
<td>-2.38</td>
<td>0.19</td>
</tr>
<tr>
<td>Border_Japan</td>
<td></td>
<td></td>
<td>-2.31</td>
<td>0.18</td>
</tr>
<tr>
<td>Inland</td>
<td></td>
<td></td>
<td>-2.76</td>
<td>0.15</td>
</tr>
<tr>
<td>Number of observations</td>
<td>226</td>
<td></td>
<td>450</td>
<td></td>
</tr>
<tr>
<td>Standard error</td>
<td>0.79</td>
<td></td>
<td>1.11</td>
<td></td>
</tr>
<tr>
<td>Adjusted ( R^2 )</td>
<td>0.82</td>
<td></td>
<td>0.90</td>
<td></td>
</tr>
</tbody>
</table>

Source: Author’s calculations.

Note: All estimated coefficients are statistically significant at the 1 percent level.

Equation 1, domestic regional trade, China and Japan; equation 2, both domestic and cross-border interregional trade.
Regional integration, agglomeration, and income distribution in East Asia

Although the Japanese regions’ cross-border trade with the Chinese regions is 10 times less than their domestic regional trade ($e^{2.31} - 1 = 9.07$), the Japanese regions’ cross-border trade with the Chinese regions is 10 times less than their domestic regional trade ($e^{2.38} - 1 = 9.80$). These magnitudes are half of McCallum’s estimate: that the cross-border provincial trade from Canada to the U.S. states is 22 times less than Canada’s interprovincial trade. The border effect from China to Japan must also be emphasized; that from Japan to China has almost equal magnitude, which suggests that the border handling of China is as efficient as that of Japan. Therefore, for Japanese multinational firms operating fragmented production operations between Japan and China, the service-link cost has been substantially lowered. Nevertheless, we find that if Japanese cross-border regional trade is with inland regions of China, the trade flow (both exports and imports) is about 15 times ($e^{2.76} - 1 = 14.80$) less than when it is with coastal regions. Therefore, we can conclude that the low border effect in China is restricted to the coastal regions, which implies that a fragmentation type of multinational setup in inland China is best discouraged.

It is also worth pointing out that the Huadong region (including Shanghai) exports 2.3 times more to the Huanan region (including Guangdong province) than to Japan’s Kanto region (including Tokyo), although the Huadong region is almost as far from the Huanan region (1,650 kilometers) as from the Kanto region (1,771 kilometers). The Kanto region’s regional GDP is 12.7 times larger than that of the Huanan region, suggesting the border effect. However, if we examine transactions for intermediate inputs only, Huadong region exports almost twice as much in intermediate goods to the Kanto region as to Huanan region. For that reason, we can infer that the border effect on intermediate goods is smaller than the border effect on final goods (for a description of each region, see the annex).

**Regional income inequality**

According to the United Nations (2006), in 2005, 21.0 percent of East Asia’s people resided in 182 urban agglomerations with populations greater than 750,000 (see figure 1.8). This ratio has increased steadily, from 8.4 percent in 1955, when only 35 such agglomerations existed. Rapid urbanization is a spectacular feature of East Asia.

Next, we construct the ranking of East Asian cities by population size for 1950 and 2005. In 1950 there were 35 cities with populations greater than 750,000; in 2005 there were 182. Figure 1.9 depicts the relationship between cities’ population size (log-transformed) and their rank numbers (log-transformed). They are placed on a remarkably straight line of almost identical slope ($\approx 0.75$) for the two years, illustrating the rank size rule. Although this regularity is known to pertain in the context of the
hierarchical urban system of a particular country, it is striking to see that the random growth of East Asian large cities has evolved according to the same kind of regularity. The degree of primacy represented by the slope of lines has not changed in East Asia.

Although most of the 20 largest cities in 2005 have remained in the ranking since 1950, Shenzhen and Dongguan of Guangdong province, which is located next to Hong Kong, China, were not even included in the list in 1950, but in 2005 they were ranked ninth and eighteenth, respectively. Including the two cities, 119 Chinese cities newly entered the list in 2005. It is also noteworthy that Jakarta, Manila, and Seoul rose in rank, respectively, from twelfth to third, ninth to sixth, and nineteenth to seventh, thereby transforming the top 10 largest agglomerations in East Asia. Although Tokyo and Osaka-Kobe remain first and fourth, other Japanese cities such as Kyoto, Nagoya, Fukuoka-Kitakyushu, and Sapporo have lowered their position.

An increasing number of people in East Asia are living in large urban areas. In China the number of such agglomerations is increasing rapidly. These new entrants to the city ranking thicken the lower tail of the rank size rule distribution, whereas in other countries, population growth is concentrated in fewer cities, shifting the line upward.

Therefore, figures 1.8 and 1.9 reveal that cities in East Asia have grown both in numbers and in size above the threshold population of 750,000 between 1990 and 2005. Although the degree of primacy of the hierarchy of cities in East Asia as a whole has not changed, the concentration of higher-ranking cities has tended to intensify in each country because of the agglomeration process.

**Income distribution**

Some other characteristics of the international economic catch-up in East Asia are interesting. Figure 1.10 depicts the relative size of nominal per capita GDP converted into U.S. dollars, taking Japan as the reference (Japan = 100). Because these figures are not PPP (purchasing power parity)-based data, they do not represent the purchasing power of the people in each country. Rather, because the location decision of the foreign direct investment (FDI) generally is made according to the nominal wage, the nominal figures are more appropriate. During 1990–2005, each economy in East Asia made progress toward catching up with Japan. A remarkable catch-up achievement was made by NIEs, but among NIEs, the importance of Singapore and Korea increased relative to Hong Kong, China, and Taiwan, China. The Chinese position also advanced, from just 1.4 percent of Japan to 4.9 percent, surpassing Indonesia and the Philippines.

Among the least-developed countries, Vietnam experienced leapfrogging growth. The disparity among ASEAN countries is shrinking. The difference between Malaysia and Cambodia dropped from one-sixteenth to one-eleventh, although the relative importance of Thailand and the Philippines declined slightly. For that reason, in East Asia in the last 15 years, although each country narrowed the gap with the leading economies, some countries made great strides, changing the order of the income level among countries.

The East Asian regional economy has been transformed from a one-dimensional structure led by Japan into an internationally diverse and balanced one after the emergence of industrial agglomeration in various countries. Meantime, the problem of income disparity has become more serious within each country because the core-periphery structure has been clarified.6 Figure 1.11 presents the trend of regional...
income inequality measured using the coefficient of variation (standard error/mean) of regional GDP per capita. The intensification of regional inequality is more pronounced in dynamically growing economies such as China and Thailand. Inequality in Korea is rising slightly but steadily, whereas Japan’s recent economic recovery is being led by agglomeration in the Tokyo metropolitan area, whose central business districts are witnessing a rush to build new buildings. Consequently, we can infer that, although the income disparity between regionally integrated countries is shrinking, the regional disparity within each country is rising as these economies grow. Because of agglomeration economies, some small areas of each country are driving national economic growth, among which income gaps are growing. These cities correspond to the increasing primacy in the upper tail of the rank size distribution given in figure 1.9.

For China, Fujita and Hu (2001) show that income disparities between the coastal areas and the interior increased during the initial stage of economic opening in 1985–94; industrial production showed strong agglomeration toward the coastal areas, although a trend toward convergence was apparent within the coastal provinces. Higher growth was related to production agglomeration, prompted by exposure to globalization (exports and foreign direct investment) and economic liberalization (reduction in the state enterprise share). See the other studies on China in this volume for more detailed analysis.

The case of Thailand also portrays a clear tendency toward strengthening of the core-periphery structure. In this case, the core includes provinces in Bangkok and its vicinities, the central region, and the eastern region. Many provinces with per capita regional GDP higher than the national average in 1981 are in noncore regions in the northeast. However, in 2003, most provinces with income higher than the national average were in the core regions. Moreover, the number of such provinces decreased from 36 in 1981 to 14 in 2003, leaving the remaining provinces below the average. It is also noteworthy that

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**Figure 1.9** Rank-size rule of large agglomerations (population over 750,000) in East Asia, 1950 and 2005

*Source: Author’s calculations based on United Nations (2006, 2007).*
the income gap between the poorer provinces and the national average widened. This core-periphery structure, which is more accentuated than in the Chinese case, might be related to the higher mobility of labor in Thailand, which strengthens the agglomeration effect through backward and forward linkages of the core region.

It follows that deeper economic integration and the related structural changes in economic geography can generate a mix of convergence and divergence of income inequality at different levels. First, within East Asia, some countries that have attracted industry have tended to grow faster, although others have not taken advantage of such trends and remain in the economic periphery. Second, within each country, industrial agglomeration occurs in a limited spatial range, sharpening the regional contrast between the core and the periphery, although the income gap within the core can be narrowed because of the sprawl of agglomeration economies.

**Discussion**

The East Asian economic geography has been transformed by the opposing forces of dispersion and agglomeration. Dispersion is related to factor price differences based on comparative advantage. Through such transformations, sequential catch-up industrialization, often described using the metaphor of flying geese, has occurred. Regional integration has lowered the cost of linking services and broadened the opportunities to divide labor by tasks in different locations. Intraregional trade in intermediate goods is rapidly growing within the regionally extensive production network. The international spread of industries has contributed to more rapid growth of low-income countries and to a narrowing of the income gap between the rich and poor countries. Regional integration, on the other hand, increases the relevance of scale economies, which in turn stimulate agglomeration. High economic growth is accompanied by urbanization. For this reason, economic development tends to concentrate geographically in each country. Because of increasing returns to scale, agglomeration enhances productivity and innovation, providing sources of long-run growth. These benefits of regional integration contributed to East Asia’s dominant position in the production of many types of industrial products, especially in the electronics industry.

Two main concerns might arise in relation to the agglomeration-based development strategy. First, excessively high density in certain agglomerations might diminish the advantages that they provide because of diseconomies from congestion and higher prices of immobile resources such as land and unskilled labor. Cities might grow beyond their optimal size, but industries might have difficulty relocating to a remote periphery because such areas frequently have poor access to markets and intermediate goods. Therefore, local governments must implement appropriate urban policies to mitigate diseconomies by providing...
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infrastructure and regulating land use, while encouraging specialization in knowledge-intensive activities.

Second, emphasizing the role of agglomeration inevitably widens regional income gaps. It is necessary to improve transportation connections with the periphery, which would enable urban industries to move activities that no longer are competitive to the periphery. Another possibility is to introduce product differentiation (in a broad sense), thereby taking advantage of the diversity of the natural conditions of the remote periphery.

Notes
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1. The total GDP of Northeast and Southeast Asia, excluding Japan, grew 8.9 percent in 1990–2004 (World Bank, World Development Indicators, 2006).


3. On the other hand, there has been little progress in de jure integration among the three major economies in East Asia. In fact, free trade area talks between China and Korea remain at a preliminary stage, whereas the negotiations regarding an economic partnership agreement between Japan and Korea have been interrupted for several years.

4. McCallum (1995) explains that the intensive use of transportation by air and land is partly responsible for the high magnitude of the border effect in North American regional trade, whereas most international trade in East Asia is transported by water.

5. The rank size rule is widely studied in urban economics. We generally expect Zipf’s law to hold, showing the gradient of $-1$. In this case, however, the slope is flatter.
7. Detailed figures can be found in Fujita and Hamaguchi (2008).

References


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Nations, Population Division, Department of Economic and Social Affairs (http://esa.un.org/unpp).


The estimation uses interregional transaction data from IDE’s Transnational Interregional Input-Output Table between Japan and China 2000 (IDE 2007). This data set comprises information from seven Chinese regions (Dongbei, Huabei, Huadong, Huanan, Huazhong, Xibei, Xinan) and eight Japanese regions (Hokkaido, Tohoku, Kanto, Chubu, Kinki, Chugoku, Shikoku, Kyushu); it reports intraregional and both intranational and transnational interregional flows of trade directed for intermediate inputs as well as for final demand. The following table gives the provinces included in each region.

The data classify the transaction data into 10 sectors (agriculture, livestock, forestry, and fishery; mining and quarrying; household consumption products; basic industrial materials; processing and assembly; electricity, gas, and water supply; construction; trade; transportation; services), which does not allow us to track the input-output relationship in detail. We designate a representative city for each region: Shenyang, Beijing, Shanghai, Guangzhou, Wuhan, Xian, and Chengdu for the Chinese regions in the same order as above; and Sapporo, Sendai, Tokyo, Nagoya, Osaka, Hiroshima, Takamatsu, and Fukuoka for the Japanese regions. Road distances between cities in China are from the Web site http://www.yusen.co.jp/china/english/distance/index.html. Using software Eki-spert of Val Laboratory Corporation, we obtain railroad distances between Japanese cities. The average distance within each region is defined as 

\[ d_i = \frac{S_i}{\pi \times \text{Rural}_i} \]

where \( S_i \) is the land area, \( \pi \) is the circular constant (≈ 3.14), and \( \text{Rural}_i \) is the ratio of rural to urban population in region \( i \). Namely, we assume that the region is a circle with the same land area and calculate its radius. The region with a higher ratio of rural to urban population has higher costs of intraregional trade because the population is more scattered. Therefore, the radius is multiplied by \( \text{Rural}_i \). To ascertain the distances between regions of China and Japan, we measure the great circle distance between representative cities using Google Earth. Market size variables \( y_i \) and \( y_j \), respectively, represent the total output and input of each region, except for the case of trade flows for final demand, for which \( y_i \) denotes aggregate demand in the recipient region.
Many successfully growing industries are based in clusters, particularly in developing countries where small and medium enterprises (SMEs) dominate. There is no question that industrial clusters stimulate industrial development by providing enterprises and their industries with advantages conducive to growth, such as information spillovers and low transaction costs (Sonobe and Otsuka 2006). Yet industrial clusters have developed disproportionately in advanced countries. Although there are industrial clusters in developing countries, very few are growing and thriving. Nonetheless, governments in developing countries as well as international organizations seldom pursue deliberate policies to promote the development of industrial clusters.

The absence of industrial development policy would not be much of a problem if there were no market failures. According to the theoretical literature on economic geography, however, the geographic imbalance in industrial development arises principally from market failures (Fujita, Krugman, and Venables 1999). Thus, a critical task boils down to identifying the market failures that have prevented poor countries and poor regions in developing countries from establishing industrial clusters. To realize geographically balanced economic development without sacrificing economic efficiency, empirical research must be carried out to identify and characterize the nature of market failures.

In this chapter, we examine the extent to which a pattern of cluster-based industrial development is common among different industrial clusters in different countries, whether the common pattern of development, if any, is induced by internally generated common economic forces, and what successful clusters have and unsuccessful ones lack. These questions are critically important, because if we can identify the common causes of successful cluster-based industrial development, we can prescribe policies that support or accelerate such processes effectively, while anticipating their future development. Another question that arises is whether and how it is possible to rectify the geographic imbalance of industrialization accompanied by the development of industrial clusters in selected areas without sacrificing industrial production and growth. To put it differently, what is the appropriate strategy to create new industrial clusters in less-developed regions?

We have conducted 12 case studies in East Asia (China; Japan; the Philippines; Taiwan, China; and Vietnam), 3 case studies in South Asia (Bangladesh, India, and Sri Lanka), and 5 case studies in Sub-Saharan Africa (Ethiopia, Ghana, and Kenya). The purpose of this study is to address the issues identified above based on our own case studies in Asia and Africa. Our main conclusions are that a common pattern of industrial development is observed among successful cases and that the main difference between successful and unsuccessful cases lies in the lack of “innovations” in the latter rather than in fundamental differences in the nature of development processes. A policy implication is that
it is possible to stimulate the development of stagnant industrial clusters by injecting missing knowledge conducive to the innovations.

This study is organized as follows. It begins by presenting a stage theory of cluster-based industrial development, followed by evidence for our theory from our own case studies. It then examines the changing locations of industries in the process of economic development in China and Taiwan, China. A final section discusses policy implications of the study.

**A theory of cluster-based industrial development**

An industrial cluster is defined as a “concentration of enterprises producing similar or closely related products in a small area” (Sonobe and Otsuka 2006). Based on our case studies, we have conceptualized the process of cluster-based industrial development by stages: (1) initiation, (2) quantity expansion, (3) quality improvement, and (4) “eruption.” The distinction among these stages is important because the type of market failure is different in different stages. The major characteristics of the development stages to be discussed are summarized in table 2.1.

**The initiation stage**

In general, there are good reasons for a new industry to locate in a certain place, typically in an urban or suburban area. A new industry in which production is technically complicated, such as machinery industries, tends to be established initially in large cities because it tends to be led by engineers, who are more readily available in large cities. Another type of new industry, in which cheap labor is used intensively and marketing is the key to success, such as garment and footwear industries, tends to be led by merchants and to be located in the suburbs or in the vicinity of large cities, where agriculture does not have a strong comparative advantage. If transport and communication costs are very high, however, merchant-led industrialization may take place in large cities because the advantages of close proximity to large markets outweigh those of cheap labor in less urbanized areas. Markets for intermediate inputs specific to the product do not yet exist, and because of the small scale of production, there is not yet any advantage in the division of labor among manufacturing enterprises and between such enterprises and merchants. Thus a pioneering enterprise must procure all of the required materials and parts directly and sell final products directly to consumers and end users.

**The quantity expansion stage**

The initiation of a new industry requires establishing appropriate production methods, marketing channels, and procurement sources, suitable to the given business environment. Compared with the cost of initiation, the cost of imitating the established production methods and marketing is miniscule. Once a pioneering enterprise succeeds in making a sizable profit, the massive entry of new enterprises follows. Typically, a swarm of new entrants who are former workers of incumbents, or spin-offs, appear at this stage, contributing to the formation of industrial clusters. In this process, the industry grows in terms of the volume of production but not in terms of the quality of products and productivity, because only imitation takes place. Hence

<table>
<thead>
<tr>
<th>Stages</th>
<th>Prior experience of managers</th>
<th>Education</th>
<th>Innovation, imitation, and productivity growth</th>
<th>Institutions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initiation</td>
<td>Merchants, engineers</td>
<td>Low</td>
<td>Imitate foreign technology directly or indirectly</td>
<td>Internal production of parts, components, and final products</td>
</tr>
<tr>
<td>Quantity expansion</td>
<td>Spin-offs and entry from various fields</td>
<td>Mixed</td>
<td>Imitate imitated technology; stagnant productivity; declining profitability</td>
<td>Interenterprise transactions and formation of industrial cluster</td>
</tr>
<tr>
<td>Quality improvement</td>
<td>Second generation of founders and newcomers with new ideas</td>
<td>Very high</td>
<td>Multifaceted innovations; exit of many enterprises; increasing productivity</td>
<td>Reputation and brand names; direct sales; subcontracts or vertical integration; emergence of large enterprises</td>
</tr>
<tr>
<td>Eruption</td>
<td>The same as in quality improvement</td>
<td>Very high</td>
<td>Sustained multifaceted innovations and productivity growth</td>
<td>Relocation of leading enterprises from congested cluster to less-developed areas</td>
</tr>
</tbody>
</table>
this stage is termed the quantity expansion stage. Industrial clusters facilitate transactions between assemblers and parts suppliers and between producers and merchants because the geographic proximity among enterprises in industrial clusters reduces not only transportation costs but also opportunistic behavior and other types of transaction costs. In a sense, the industrial cluster is an artificially created “community” intended to reduce transaction costs to make markets work. It is important to emphasize that different industries in different countries share striking similarities in the pattern of cluster-based industrial development, at least up to this quantity expansion stage.

Toward the end of this stage, the industrial cluster sets the stage for quality improvement. First, a variety of useful human resources, such as engineers, designers, merchants, parts suppliers, and skilled workers, have been attracted to the cluster. Second, because of the active entry of followers, the price of products falls and, consequently, the profitability of producing low-quality products declines. Under such conditions, the profitability of producing high-quality products by employing useful human resources is high.

The quality improvement stage

If the entrepreneurs in the sense of Joseph Schumpeter (1912) are available in the cluster, they tend to innovate at this stage by carrying out “new-combination,” which is another name for innovation. Then the industrial cluster graduates from the quantity expansion stage and enters the quality improvement stage (Sonobe and Otsuka 2006). The innovative enterprises improve the quality of products by employing designers, engineers, and skilled workers. Such enterprises establish a reputation and brand name and develop their own distribution network to solve the problem of the “market for lemons” that arises from asymmetric information as to whether the product is really an improvement. The enterprises offer long-term subcontracts to dependable parts suppliers to procure specially designed parts or undertake a vertically integrated production system. The innovative enterprises expand the scale of operation to take advantage of established brand names and possibly embark on exports. Such “multifaceted innovations” are carried out by highly educated managers who are able to learn from the experience of more-developed countries. If such managers are not available, the multifaceted innovations usually do not take place. As a result, industrial clusters either do not grow or eventually are overwhelmed by cheap imports. In our view, the critical difference in industrial development between Asia and Africa lies in the presence and absence of innovations. A number of industrial clusters have succeeded in the transition to the quality improvement stage, not only in East Asia but also in South Asia, whereas few have succeeded in doing so in Africa (Akoten and Otsuka 2007; Akoten, Sawada, and Otsuka 2006; Iddrisu and Sonobe 2007).

Ideas embodied in imported high-quality parts and components are often useful for the “imitative innovations.” In this sense, a liberal trade system facilitates the transition to the quality improvement phase. Also useful are ideas brought about by global buyers and foreign direct investments. However, learning from abroad is not a panacea: the knowledge acquired from the experience gained in the quantity expansion stage is often necessary to assimilate and adapt new knowledge to the local production environment.

As aptly pointed out by Marshall (1920), the advantages of industrial clusters are (a) information spillovers or imitation, (b) division of labor among enterprises, and (c) development of skilled labor markets. Sonobe and Otsuka (2006) argue that the availability of useful human resources for innovation is another advantage of industrial clusters. This is critically important, because the first advantage of the industrial cluster cited by Marshall—that is, imitation—cannot be of any significance without innovation. Two negative externalities, however, are generated in the developed cluster: one is congestion, and another is rampant imitation of innovative ideas, which reduces the private returns to innovation below the social returns. Thus the quality improvement stage may be followed by the eruption stage.
**The eruption stage**

If we draw the map of an industrial cluster at the end of the quality improvement stage, while showing production “isoquant” contours, what emerges would look like a volcano in which the amount of production is the largest in the center of the cluster and declines as the distance from the center increases. The pioneering enterprises, which initiated the industry, are naturally located in the center. They tend to be more innovative than others because their founders had foresight and their children tend to be highly educated. Indeed, there are many cases in which educated sons of the founding entrepreneurs are the first to attempt quality improvement (Sonobe and Otsuka 2006). Their successful quality improvement boosts the scale of their production, thereby increasing the “altitude of the volcano.” Such innovations give rise to further congestion in the central area of the cluster. Moreover, innovative enterprises expect to suffer losses from imitation by local enterprises that are not innovative. Thus, partly because of congestion and partly because of the fear of imitation by rivals, innovative enterprises tend to relocate their production base outside the existing cluster. This relocation may be termed an eruption, in which lava (or innovative enterprises) flows out from the crater (or the center of the cluster) and lands at the foot of the mountain or farther away.

The eruption is likely to be “big” or “long distance” to the extent that new innovations are major, because motivations to expand the scale of production in remote areas where congestion is absent and to escape from the imitation are large. Behind such eruption would be superior new technological ideas and superior management and marketing abilities of enterprise managers. The eruption is also likely to be big if the main purpose of the relocation is to seek cheap labor abroad. In our view, the relocation of industry from developed to developing countries envisaged by Vernon’s (1966) product cycle theory is an example of a big eruption. Although a big eruption may eliminate industrial clustering in the original location, it may create a new one abroad. Furthermore, the original cluster may remain as a technology and marketing center, even though the scale of production declines. Another key factor inducing the relocation of industries to remote areas where the industry has not developed is the policies of local governments to attract new industries in underdeveloped areas. In contrast, the eruption is “small” or “short distance” if the innovations are minor, the subcontracting with suppliers or the transactions with local merchants are important, or local government provides new and spacious industrial zones nearby. At this stage, industrial policies in the less developed region may be able to attract innovative enterprises so as to reduce the geographic imbalance of industrialization.

**Evidence from case studies**

To substantiate our arguments, we attempt to provide supportive evidence taken from our case studies of the motorcycle industry in Japan (Yamamura, Sonobe, and Otsuka 2005), the machine tool industry in Taiwan, China (Sonobe, Kawakami, and Otsuka 2003), and the electric machinery industry in China (Sonobe, Hu, and Otsuka 2004).

Figure 2.1 (panel A) shows the change in the number of motorcycle enterprises in Japan from 1946 to 1964. Clearly the number of enterprises increased sharply up to the early 1950s, because of the sizable entry of new enterprises. Roughly speaking, the annual growth rate of the total number of motorcycles produced was as high as 100 percent in the early 1950s. According to figure 2.1 (panel B), the engine quality index, computed by Taylor’s formula, did not rise until 1953, indicating that this period corresponded to the quantity expansion stage. After the mid-1950s, however, the quality index rose steadily, and a number of enterprises that used lower-quality engines exited. While the growth rate of production decreased to less than 50 percent a year, the average size of the surviving enterprises grew approximately 10 times in the six-year period in the late 1950s. A key role in this quality improvement stage was played by Soichiro Honda, the founder of the Honda Motor Company. Indeed, Hamamatsu city,
where Honda was originally located, became the leading cluster of this industry, dominating the clusters in Tokyo and Nagoya. But Honda “erupted” to Suzuka city, far from Hamamatsu, to begin vertically integrated mass production of high-quality products in huge factories.

Table 2.2 shows the characteristics of managers of machine-tool enterprises in Taichung, Taiwan, China, by type of enterprise (that is, innovator or imitator), which roughly correspond to the establishment periods. Among the 43 sample enterprises, 7 are identified as pioneers of the industry, which attempted to produce machine tools for the first time through trial-and-error processes in the 1950s and 1960s. Six of the 7 pioneers used to work at other machinery-producing enterprises, and 5 had only a primary education. It took them 12.6 years, on average, to commence the production of machine tools after founding their enterprises. By contrast, most enterprises established in the 1970s and the early 1980s were spin-offs and began producing machine tools immediately after their establishment. During this period, a large number of specialized parts suppliers emerged, and both final products and parts were highly standardized. To keep profitability from declining, the founders of the industry began attempting to produce numerically
controlled machines, again through trial-and-error processes.

The major innovation, however, was carried out in the early 1980s by two new enterprises, which table 2.2 refers to as innovators. Before founding their enterprises, the managers completed graduate studies and worked for the pioneering enterprises. They were innovative not only because they were among the first to produce numerically controlled machines in Taiwan, China, but also because they introduced a new business model of outsourcing all of the parts to suppliers through long-term subcontracting arrangements, which drastically reduced the costs of producing numerically controlled machines. As soon as they began mass production and instituted drastic price cuts, the innovators overwhelmed the pioneers and the early imitators. A number of spin-offs from the innovators imitated the production methods, but they were not as successful as the innovators. The pioneers turned out to be efficient imitators, while the worst imitators in the quality improvement phase were the early imitators.

In the machine tool industry in Taichung, only a short-distance eruption to suburban areas took place, partly because access to a large number of subcontractors in the cluster was critically important and partly because city governments in the Taichung area set up new industrial zones to attract innovative enterprises.

The last example comes from the electric machinery industry in Wenzhou (see table 2.3). According to our interviews with experienced managers, firms began to compete on the basis of quality in the second half of the 1980s, when a few enterprises began using machines to inspect product quality and attempted to establish brand names. In 1990 the importance of engineers was comparatively low, a long-term subcontracting system did not exist, and final products were commonly marketed through anonymous marketplaces and local merchants. These are precisely the characteristics present in the quantity expansion stage. Indeed, the number of enterprises increased in the early 1990s.5 Throughout the decade, particularly in the late 1990s, the size of enterprises expanded in terms of real value added and number of employees. Also, the ratio of engineers to employees and the number of subcontractors increased dramatically. Moreover, direct marketing by means of sales agencies and own retail outlets became much more important than indirect marketing through wholesalers and other intermediate merchants. Because large enterprises that established brand names merged with unsuccessful enterprises, the number of independent enterprises decreased 25 percent from 1995 to 2000. The average value added shown in table 2.3 excludes that of subsidiaries, and, if that were included, the average value added of independent enterprises in 2000 would be 1.6 times higher than the number shown in this table. In this growth process, successful enterprises moved to nearby industrial zones constructed by local governments.

While the figure and tables shown in this section are merely suggestive, the three cases discussed are consistent with the predictions of the endogenous model of cluster-based industrial development formulated in the previous section. The other five cases in East Asia that are not discussed here are equally supportive of our arguments (Sonobe and Otsuka 2006).

It is no exaggeration to say that microenterprises and SMEs in developing countries in general and Sub-Sahara Africa in particular are all located in industrial clusters. In our view, this is because transportation costs and transaction costs are too high for microenterprises and SMEs outside industrial clusters. The vast majority of these firms are microenterprises, which have just
a few workers and are operated by artisans who received apprentice training but no formal training. The scope and depth of their understanding of management, marketing, and technology tend to be highly limited. Thus industrial clusters have been generally stagnant and remain in the quantity expansion stage.

A notable exception is the leather-shoe industry in Addis Ababa, Ethiopia (Sonobe, Akoten, and Otsuka 2007). This industry began about 70 years ago with a factory established by an Armenian merchant. The workers of this factory started their own workshops, which in turn produced a number of new entrepreneurs. The repetition of spin-offs created a large cluster consisting of more than 1,000 shoe-making workshops in the city. The long history of the industry also produced another type of important human resource: the highly educated, young entrepreneurs, who are the sons and grandsons of the owners of the long-established shoe enterprises. These new entrepreneurs have recently been carrying out multifaceted innovations.

Multifaceted innovations are also being attempted by relatively highly educated entrepreneurs in a few other industrial clusters in Sub-Saharan Africa, including a small cluster of metal-processing enterprises in Nairobi, Kenya, after a period in the quantity expansion stage, during which the profitability of producing low-quality products declined. These firms are adopting new marketing and new procurement strategies and trying to improve their products. Some of them have already erupted to more spacious industrial areas to expand their production and take full advantage of the favorable effect of their attempts. These cases from Africa lend support to the endogenous model of cluster-based industrial development.

Evidence of changing industrial locations

It is difficult to trace the birth, formation, and subsequent development of an industrial cluster, as well as its eventual relocation. Because the industrial cluster is usually located in a geographically small area, township-level data with fine classification of industrial subsectors are needed, which are rarely available in many countries. This is why many studies on this subject rely on episode or case studies. Our review is based on case studies in the western side of Taiwan, China, and the Yangtze River region in China conducted by the authors in collaboration with local experts (Sonobe and Otsuka 2006).

Taiwan, China, is known for the importance of industrial clusters and the prevalence of subcontracting systems, but it is also known for its geographically dispersed pattern of industrial development (Otsuka 2007). This section examines how the geographic concentration and dispersion of industries took place. In China in the 1980s, one of the most successful models of industrial development was the “Sunan model,” in which collective township-and-village enterprises supported by the township-and-village governments grew rapidly based on cooperation with state-owned enterprises and learned from them through the recruitment of engineers and managers (Otsuka, Liu, and Murakami 1998). This section advances and examines the broad hypothesis that, since the 1990s, the formation of industrial clusters has been one of the critical factors underlying the sustained, rapid growth of the Chinese economy.

Development of suburban clusters in Taiwan, China

We now examine how industrial locations and the division of labor evolved in five manufacturing industries in Taiwan, China, from the mid-1970s to the mid-1990s.

For this study, we obtained data on the production and employment of manufacturing establishments, aggregated up to the township level, by industry, for 1976, 1986, and 1996, from the Director-General of Budget, Accounting, and Statistics of the Executive Yuan, Taiwan, China. A township is an administrative unit below the county level (and county-level city) and above the village level. The areas under study are limited to the western part of Taiwan, China, which consists of the northern, central, and southern regions. The mountainous eastern region is excluded from our analysis because it accounts for only 5 percent of total manufacturing employment in Taiwan, China. From 1976 to 1996, there were several
reshaping economic geography in east asia

subdivisions and mergers of townships. After adjusting for these changes, we obtained the consistent data of 275 “townships” for this study.

Until the mid-1980s, the manufacturing sector of the Taiwanese economy enjoyed relatively favorable growth led by expanding export markets. The wages of unskilled workers, however, rose sharply in the late 1980s, and the currency appreciated abruptly against the U.S. dollar in 1986 and 1987. The contribution of net exports to the economic growth rate declined from 50 percent in the mid-1980s to 20 percent in the mid-1990s, and exported products became increasingly intensive in the use of skilled labor, according to Chan, Chen, and Hu (1999).

We chose five major manufacturing industries in Taiwan, China: apparel, plastic products, machines, electric appliances, and computers. The production processes of these industries can be divided into a number of subprocesses, and the extent of vertical disintegration varies across enterprises, areas, and industries as well as over time. The five industries correspond roughly to the two-digit classification adopted in Taiwan, China’s, census data. To represent a new and growing industry, however, we selected the computer industry from the two-digit electric machinery industry. Moreover, the electric appliances industry does not include the subsector producing audio and visual equipment and parts, as data for this subsector are not available for 1976. Likewise, the computer industry in 1976 is not included in our analysis because of the lack of data.

As table 2.4 shows, these five industries had sharply contrasting growth records over the last few decades. The apparel industry is in decline: it accounted for nearly 12 percent of total manufacturing employment in 1976, but less than 4 percent in 1996. Its extremely large negative growth rate of employment in the period from 1986 to 1996 is explained mainly by the relocation of production from Taiwan, China, to mainland China (Tu 2000), which is a big eruption, according to our theory. The other industries, except the machinery and computer industries, were also increasingly affected by competition from low-wage countries. The machinery industry lost employment share slightly in the first period, but it regained employment share in the second period, presumably because it succeeded in shifting from standardized and conventional machines to high-quality numerically controlled machines, as discussed earlier. The highest growth rate in the second period was recorded by the computer industry.

To examine from where and to where the spatial dispersion and concentration took place, table 2.5 exhibits changes in the share of employment in urban, suburban, and rural areas in total employment of each industry. The classification of areas is based on the administrative classification as follows: (a) urban areas consist of the 44 wards of Taipei and Kaohsiung municipalities and Keelung, Taichung, and Tainan cities; (b) suburban areas consist of 104 townships that are either adjacent to the urban areas defined above or designated as (township-level) cities; and (c) rural areas consist of the remaining 127 townships.

Table 2.4 Share of manufacturing employment and annual growth rates of employment in Taiwan, China, by industry percent

<table>
<thead>
<tr>
<th>Indicator and year</th>
<th>Apparel</th>
<th>Plastic products</th>
<th>Machinery</th>
<th>Electric appliances</th>
<th>Computer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Share of manufacturing employment</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1976</td>
<td>11.7</td>
<td>9.1</td>
<td>4.8</td>
<td>1.3</td>
<td>—</td>
</tr>
<tr>
<td>1986</td>
<td>9.1</td>
<td>11.6</td>
<td>4.5</td>
<td>1.4</td>
<td>1.2</td>
</tr>
<tr>
<td>1996</td>
<td>3.9</td>
<td>7.5</td>
<td>7.9</td>
<td>1.4</td>
<td>4.2</td>
</tr>
<tr>
<td>Annual growth rate of employment</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1976–86</td>
<td>1.1</td>
<td>6.1</td>
<td>2.9</td>
<td>3.9</td>
<td>—</td>
</tr>
<tr>
<td>1986–96</td>
<td>−9.2</td>
<td>−5.1</td>
<td>4.9</td>
<td>−0.1</td>
<td>11.3</td>
</tr>
</tbody>
</table>

Source: Authors’ calculations based on the employment data for the areas under study.
— Not available.
From this table, it is clear that the employment share of the suburban areas increased steadily throughout the two periods in every industry under study. Furthermore, the employment share of suburban areas tended to increase when the industry was growing. This seems to support the hypothesis of eruption, which argues that the industrial cluster tends to move to suburban areas when the industry grows. In contrast, the share of the urban areas decreased in the first period in every industry, but it increased slightly in the second period in the apparel and electric appliances industries. The share of the rural areas increased in every industry in the first period but decreased in the second period in every industry except the machinery industry. These observations indicate that, due to the eruption, the center of manufacturing sectors moved from urban areas to suburban areas, but not to rural areas, most likely because of the disadvantages associated with remoteness.

New industries generally are born in urban environments that have well-developed transportation and communication facilities and favorable access to new information, a variety of intermediate inputs, and skilled labor (see, for example, Henderson, Kuncoro, and Turner 1995). Although the computer industry was new in Taiwan, China, in the mid-1980s, its location was concentrated in the suburban areas between Taipei and Taoyuan rather than in urban areas, because the base of the electric and electronics industries had been established in these suburban areas by the late 1970s (Chang 1992). Furthermore, the Industrial Technology Research Institute, which facilitated international technology transfer to Taiwanese enterprises, is located near Taoyuan (Hong and Gee 1993). Thus suburban areas had a high share of employment in the computer industry from its inception, and this share continued to rise, which is consistent with our contention that the center of manufacturing is often established in suburban areas.

**Development of clusters in the southern Yangtze River region**

Southern China, such as Guangdong province, grew most rapidly in the 1980s, producing relatively low-quality products using unskilled young migrant workers. As the Chinese economy began the quest for quality improvement and started shifting from unskilled labor–intensive to more skilled labor–intensive industries in the early 1990s, the center of economic development shifted from the south to the lower Yangtze River region, such as southern Jiangsu. In Jiangsu, industrial clusters did not develop in the 1980s, as the location of collective enterprises was determined largely by township-and-village governments. Although it is not recognized in the literature on the Chinese economy, once the collective township-and-village enterprises were privatized and the development of private enterprises was promoted in Jiangsu.
province, enabling the establishment and location of enterprises to be determined by profit incentives, clustering began in this province. This seems to provide the prima facie evidence that industrial clusters have clear advantages over stand-alone enterprises in production and management efficiency. Here we compare the experience of Jiangsu with that of Zhejiang, where industrialization began at poor farmers’ houses and was supported by the development of dense SME-based industrial clusters in a countless number of locations.

We attempted to collect unpublished data at the township level for 1990, 1996, and 2002. Typically, townships in the areas under study have a population of about 50,000. The following sampling scheme was adopted. We randomly selected 50 counties each in Zhejiang and Jiangsu provinces and then chose 2 townships from each county. Because there are approximately 40 townships in each county, applying a random selection technique might have yielded many townships where major industrialization did not take place. Therefore, we asked the county governments to choose the 2 most important industries in the county and then chose 2 townships with the most prosperous industries. The collection of appropriate data was difficult primarily because large efforts were required to prepare the detailed data requested and also because past data are not well kept in the government offices. Thus we received data from 135 townships, out of 200, for 2002 and only 97 for 1990. The response rate was much lower from Zhejiang province, where the distinction between collective and private enterprises, which we asked them to report, might be difficult to draw because of the so-called “red-cap” enterprises.

According to official statistics, gross domestic product (GDP) per capita in Zhejiang and Jiangsu provinces is about twice as high as the average in China, and it is about 15 percent higher in Zhejiang than in Jiangsu. The income figure in Jiangsu province, however, includes poor areas north of the Yangtze River, which account for two-thirds of the area in this province. According to our interviews with government officials at various levels, southern Jiangsu was more prosperous than Zhejiang in the 1980s, but the latter caught up with the former in the 1990s by taking advantage of the dominance of private industries and the development of industrial clusters.

Table 2.6 exhibits the number of sample townships from which we obtained data, the average number of enterprises, and the average number of workers and real value of production by location (that is, northern Jiangsu, southern Jiangsu, and Zhejiang) and year. We do not include the data for state-owned enterprises or urban collective enterprises. As shown in the table, rapid industrialization clearly took place in all three regions. Compared with the other two regions, Southern Jiangsu had a substantially smaller number of enterprises per township, although they were larger in size or had slightly less employment and production value, which indicates that large-scale enterprises originally supported by township-and-village governments were prevalent in southern Jiangsu. In this region, the real value of production increased six-fold over the 12-year period, whereas the number of workers increased only 50 percent, which implies that labor productivity increased explosively. The fact that the number of workers almost doubled from 1990 to 2002 in northern Jiangsu indicates that the enterprises were catching up with those in southern Jiangsu. The number of workers and the value of production were higher in Zhejiang than in southern Jiangsu partly because we do not include state-owned enterprises and urban collectives, which are much more common in the latter region and partly because we failed to obtain data from the southern regions of Zhejiang, which were less developed.

Almost all of the enterprises were private in Zhejiang from the beginning, and half of them were private in northern Jiangsu in 1990. Despite the prohibition of private enterprises, the share of the private sector was comparatively high in northern Jiangsu, because small family-based enterprises operated by farmers and ex-farmers with seven workers or fewer, which were considered legal, were included in the number of private enterprises. In southern Jiangsu, privatization began in the early 1990s and was almost completed by the early 2000s.
To explore the role of industrial clusters in regional development, we obtained data on the most important industry of each township in accordance with the two-digit industrial classification, which consists of approximately 200 subsectors. For example, the subsector of the transportation equipment industry includes the automobile, motorcycle, and ship-building industries. We computed the production and employment shares of the most important industry in total production and employment in the township, which are intended to capture the extent of specialization. These shares, called “specialization rates,” are shown in Table 2.7 by location and year.

While the regional average of the specialization rates varies from 30 to 40 percent, the figure at the township level ranges from less than 5 percent to more than 90 percent. One difficulty in interpreting the specialization rate arises from the production of intermediate inputs. When parts and components are produced internally by enterprises in the most important industry, they are counted as the production of this industry. They are not counted, however, if they are produced by specialized parts suppliers. Because the collective enterprises tend to produce parts internally, the specialization rate tends to be higher where collective enterprises dominate. This may explain why the specialization rate is not necessarily higher in Zhejiang province, where collective enterprises are relatively few and private enterprises rarely adopt a vertically disintegrated production system. Yet the specialization rate in terms of employment share was higher in Zhejiang province than in Jiangsu province, which

<table>
<thead>
<tr>
<th>Location and indicator</th>
<th>1990</th>
<th>1996</th>
<th>2002</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Northern Jiangsu</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of sample townships</td>
<td>48</td>
<td>59</td>
<td>66</td>
</tr>
<tr>
<td>Average number of enterprises</td>
<td>237</td>
<td>366</td>
<td>558</td>
</tr>
<tr>
<td>Average number of workers</td>
<td>3,807</td>
<td>5,680</td>
<td>8,495</td>
</tr>
<tr>
<td>Real value of production*</td>
<td>123.5</td>
<td>424.6</td>
<td>1,136.5</td>
</tr>
<tr>
<td><strong>Southern Jiangsu</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of sample townships</td>
<td>16</td>
<td>21</td>
<td>23</td>
</tr>
<tr>
<td>Average number of enterprises</td>
<td>83</td>
<td>147</td>
<td>262</td>
</tr>
<tr>
<td>Average number of workers</td>
<td>6,160</td>
<td>6,254</td>
<td>8,995</td>
</tr>
<tr>
<td>Real value of production*</td>
<td>268.4</td>
<td>762.6</td>
<td>1,649.8</td>
</tr>
<tr>
<td><strong>Zhejiang province</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of sample townships</td>
<td>33</td>
<td>39</td>
<td>46</td>
</tr>
<tr>
<td>Average number of enterprises</td>
<td>320</td>
<td>663</td>
<td>950</td>
</tr>
<tr>
<td>Average number of workers</td>
<td>10,894</td>
<td>16,489</td>
<td>23,350</td>
</tr>
<tr>
<td>Real value of production*</td>
<td>863.3</td>
<td>1,256.5</td>
<td>2,739.7</td>
</tr>
</tbody>
</table>

* Million yuan in 2002 prices. The factory shipment price index reported by the State Statistical Bureau (2003) was used as deflator.

<table>
<thead>
<tr>
<th>Location and indicator</th>
<th>1990</th>
<th>1996</th>
<th>2002</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Northern Jiangsu</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Employment share</td>
<td>25.8</td>
<td>30.5</td>
<td>32.2</td>
</tr>
<tr>
<td>Production share</td>
<td>31.9</td>
<td>34.6</td>
<td>37.3</td>
</tr>
<tr>
<td><strong>Southern Jiangsu</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Employment share</td>
<td>27.3</td>
<td>28.9</td>
<td>33.4</td>
</tr>
<tr>
<td>Production share</td>
<td>35.8</td>
<td>33.7</td>
<td>44.9</td>
</tr>
<tr>
<td><strong>Zhejiang province</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Employment share</td>
<td>33.9</td>
<td>35.8</td>
<td>36.4</td>
</tr>
<tr>
<td>Production share</td>
<td>31.5</td>
<td>30.0</td>
<td>36.8</td>
</tr>
</tbody>
</table>

Source: Authors’ calculations based on township data.
strongly suggests that small labor-intensive industries tend to form dense industrial clusters in this province.

The specialization rate increased over time particularly in the two Jiangsu regions, which indicates that industrial clusters were established and strengthened over time. This is likely to reflect the impacts of privatization because it allows industries a free choice of location. In our own observation, spin-offs are common as privatization progresses. A major effect of privatization may well be to enhance the efficiency of industrial production by promoting the formation of industrial clusters in specialized areas (Sonobe and Otsuka 2003).

Judging from the fact that the formation of industrial clusters began less than a decade ago, it is likely that a greater number of industrial clusters will be formed, strengthened, and refined in the southern Yangtze River region. It is also noteworthy that private enterprises in this region seldom move to inland areas where wages are lower.11

**Policy implications**

It is a mistake to assume that geographic disparity is always undesirable from the social point of view, because industrial clusters have the advantages of reducing transaction costs and providing expanded opportunities for innovation. Because of lower transaction costs, markets work in industrial clusters, and ample job opportunities can thereby be created for the poor. Because innovation possibilities are enlarged, sustainable growth of industries becomes possible. Because in the early stage of development, industrial clusters develop primarily in urban and suburban areas, these social benefits can be obtained by sacrificing geographic balance. Since a number of industrial clusters already exist in large cities in developing countries and since they are generally stagnant, we strongly advocate policies to stimulate multifaceted innovations in these clusters by providing appropriate training programs for managers of enterprises. This is particularly relevant in Sub-Saharan Africa, where both the supply of entrepreneurs and the access to advanced technologies, management know-how, and marketing strategies are severely limited.

Another important policy implication of this study is the desirability of promoting a “big eruption” by setting up production environments conducive to the operation of large factories in less-developed areas, by constructing industrial zones, and by providing training for the future cadre of the industry. It may also be possible to establish new industrial clusters by constructing model plants and technology transfer centers. Currently, however, our knowledge is far from adequate to select appropriate industries in appropriate locations while using appropriate technologies. In other words, we have to seek development strategies that ensure that the benefits of correcting “market failures” and “geographic imbalance” exceed the costs of “government failures.”

**Notes**

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1. Although we have completed the data collection in these studies, the analysis is currently under way in several cases.

2. Since we are interested in development, we do not elaborate on the declining stage of industries.

3. For example, the Bingo Working Clothes Cluster in Hiroshima prefecture in Japan used to be a major production area of traditional Japanese casual wear, called mompe. When the demand for mompe declined, traders selling mompe throughout Japan brought in the idea of producing new types of garments (Yamamura, Sonobe, and Otsuka 2003).

4. See case studies of the garment and motorcycle clusters in China (Sonobe, Hu, and Otsuka 2002, 2006) and the garment cluster in Bangladesh (Mottaleb and Sonobe 2007).

5. However, some enterprises might have exited in this period.

6. Sonobe and Otsuka (2006) also report the case of Kanto, in the vicinity of Tokyo, during the postwar period, where the geographic dispersion far outweighed the geographic concentration.

7. Sunan literally means southern Jiangsu.

8. In Taiwan, China, manufacturing firms with multiple establishments are the exception.
The number of establishments per firm was less than 1.05 during the periods under study.

9. These changes in industrial location have been discussed in the recent empirical literature on economic geography. See, for example, Fujita, Krugman, and Venables (1999).

10. Fake collectives or red-cap enterprises were essentially private but disguised themselves as township-and-village enterprises (Oi 1999). Their formation of industrial clusters in Wenzhou in the early 1980s was facilitated by the establishment of specialized local markets for products and materials by local governments, and when these clusters made inroads into national and international markets later, important roles were played by traders who migrated out from Wenzhou (Xu and Tan 2001).

11. In our observations, the wage gap between the coastal and inland regions in China is not so large as a result of the active migration of workers, despite the restrictions placed on the migration to urban areas.

References


Spatial agglomeration of economic activity is an ineluctable corollary of economic development, and this presents a major policy concern regarding rural-urban disparity. Conventional economic theory predicts that higher factor prices in the agglomerated area create a dispersion effect. In developing economies, however, the urban-to-rural trickledown effect has not delivered satisfactory results. For this reason, building prosperous rural industries constitutes an effective step toward achieving more equitable economic growth (Otsuka, Estudillo, and Sawada forthcoming).

Rural nonfarm industries can be classified into two types: one based on exogenous manufacturing technologies and the other based on indigenous technologies. The first appears as a result of the spillover of urban industrial activities in accordance with differentiated factor prices. This type of rural industrialization occurs only at the periphery of cities as a byproduct of urban industrialization and only after industrialization has generated a rural-urban disparity in factor prices.

The second type consists of industries that were originally artisan manufacturing industries producing low-quality commodities intended for self-consumption or, at most, local markets. They are sluggish by nature and unable to raise their competitive edge sufficiently to embark on a commercial drive into wider markets. These features of rural industrialization give rise to the argument by Hymer and Resnick (1969) that rural industry is bound to wither as the commodities produced by modern technologies penetrate the rural market. Several papers, however, reveal that rural nonfarm household industries based on indigenous technologies (hereafter, rural indigenous industries) intensify in tandem with economic development, especially at its incipient stages.

Added to this, a large number of studies reveal that rural industrialization takes the form of clustering (Itoh and Tanimoto 1998; McCormic 1999; Ohno 2001; Sandee and Rietveld 2001; Weijland 1999). The dominant form of industrial cluster in developed economies is the large company that controls networks of small suppliers, while the dominant form of rural cluster in developing economies often is a mere geographic concentration of independent household producers. As Weijland (1999) points out, as long as rural households produce small quantities of goods, attaining sufficient economies of scale to attract traders is a major advantage of rural clustering.

In Lao PDR numerous weaving clusters emerged after economic liberalization. They produce cloth intended for urban and overseas markets. These clusters are village based in most, if not all, cases. In the neighboring villages of a weaving cluster, only a few weavers earn enough to support a minimum standard of living. The difference between villages in a cluster and neighboring villages is the presence of master weavers. These master weavers take the role of traders for the cluster and work under a putting-out contract. Individual weavers in neighboring villages, in contrast, must sell their own products in the
reshaping economic geography in east asia

marketplace. Traders thus play an important role in the emergence of rural clusters.

This chapter investigates the weaving clusters of Lao PDR with reference to the role of traders. It is based on unique case studies of weavers surveyed from 1995 to 2006. Hand weaving is a typical rural indigenous industry, and it opens the way for supporting industries, such as sericulture, cotton growing, silk reeling, cotton spinning, dyeing industries, and the like. Promoting this type of industry is a more effective measure for alleviating poverty in wider rural areas than promoting an industry based on exogenous technologies. This chapter argues that the role of traders in rural weaving clusters is more than what the Weijland thesis envisages and that the multimodal characteristics of traders lead to various growth trajectories of weaving clusters. In addition, this chapter emphasizes peculiar conditions for rural clustering in a society at an incipient stage of development.

Market segregation at an incipient stage of development

Rural and urban markets are often segregated, especially at early stages of development. Transportation costs and transaction costs are the two major elements of segregation.

Lao PDR is a landlocked, resource-scarce country with the lowest per capita income in Asia. Market development—the integration of rural markets into urban markets or even into overseas markets—remains at an initial stage. Lao PDR has not yet reached high levels of urbanization. However, as a result of the ASEAN (Association of South East Asian Nations) Free Trade Area (AFTA) regime, the Lao economy has been integrated into the Thai economy at a rapid pace. In addition, there exists little difference between Lao and Thai languages. Agglomeration in the Lao context thus needs to be considered within a wider regional perspective.

Transportation costs

After the communist takeover of 1975, Lao PDR opened its doors under the rubric of the New Economic Mechanism.

Being a mountainous country, Lao PDR has high internal transportation costs, which have hindered the formation of a unified national market. The main road—Route 13—that links northern, central, and southern Lao PDR was unpaved and poorly maintained until the turn of this century. This constricted regional commerce, especially during the rainy season. This still holds true for the most remote areas, many of which are cut off from the rest of the country during the rainy season. Commerce with rural economies thus incurs high transportation costs. Reducing transportation costs would contribute a great deal to market integration.

Transaction costs

Asymmetric information and the resulting opportunistic behavior in market exchanges impede efficient market exchanges by raising the level of transaction costs. The lack of effective sanction mechanisms aggravates the problem (Humphrey and Schmitz 1998; Mead 1984; Schmitz and Nadvi 1999).

In a society at an incipient stage of development, as is the case for Lao PDR, formal sanction mechanisms such as the justice system and the police are either absent altogether or, at best, available only in urban areas and, even then, to a limited extent. However, recent studies reveal that, even without formal sanction mechanisms, the existence of informal trust-based mechanisms checks agents’ opportunism.

Trust

To bolster trust, sanction mechanisms are required. The mechanisms range from village ostracism, bad reputation, or humiliation to the simple termination of business relationships. It is useful to distinguish between two types of trust: process-based trust and community-based trust.

Process-based trust arises through long-term recurrent transactions, as the tit-for-tat strategy dictates (Axelrod 1984). This trust emerges in a dyadic relationship. Community-based trust, on the other hand, rests on the norms of obligations and cooperation that are rooted in social similarity, such as
ethnicity, being native to the same place, and
the like. Community-based trust is reliable
because it involves social sanction mecha-
nisms as a collective punishment. Thus
once any pair of traders recognizes that they
share social similarities, community-based
trust comes into play without the need for
frequent interactions.

The two types of trust provide differ-
ent sanction mechanisms. Processed-based
trust is attached solely to a relevant trading
pair, so the cheated will sanction the cheater
by terminating their business relationship.
Community-based trust entails sanctions
by other members of the community. In a
community, once sanctioned, the mem-
ber loses future opportunities to do busi-
ness with other community members. Fear
of such censure works as a self-enforcing
norm that ensures compliance with infor-
mal contracts.

**Severance of trust**

The discussion so far suggests that urban
and rural societies maintain incompatible
sanction mechanisms. This incompatibil-
ity is assumed to disturb the transactions
between urban and rural societies.

Table 3.1 shows the level of villagers’ trust
for different groups of economic agents.
There exists a distinct severance of trust
between insiders and outsiders. Higher trust
of insiders suggests the existence of informal
sanction mechanisms, while higher distrust
of outsiders predicts difficulties in transac-
tions between villagers and outsiders due to
the lack of effective sanction mechanisms.

For this reason, commerce beyond the vil-
lage boundary has to cope with transac-
tion costs associated with distrust between
trading parties. In urban markets, urban
traders have a marked advantage over vil-
lagers in the sphere of market information
and negotiation skills.

The following anecdote tells how the sev-
erance of trust hampers the ability of villag-
ers to transact with outsiders. In the largest
public market in Vientiane City, Talat Sao,
there are approximately 100 cloth shops.
Many weavers come to the city to sell their
cloth to these shops. Some weavers from
remote areas, however, hesitate to sell their
products themselves. Instead, they use an
arbitrage trader to sell their products, while
they wait near the market. The weavers pay
the arbitrage trader a mediation fee of 1 per-
cent of the sales price. The arbitrage trad-
ers are migrants to Vientiane from the same
area as the weavers: the weavers consider
them to be insiders.

Urban and rural markets in developing
economies are assumed to be regulated by
a different nexus of institutional arrange-
ments. Urban agglomeration can be viewed
as a systematic integration of various com-
cmercial customary laws as well as formal
legal regulations. This accumulation of con-
suetudinary law in urban society curtails
transaction costs and accelerates further
agglomeration. In rural societies, commu-
nity sanction mechanisms govern transac-
tions within a community.

Business dealings are, in principle, much
easier among people who share the same
institutional arrangements, because trading
parties “speak the same language” (Hicks
1969). In contrast, dealing with outsiders
is hindered by the severance of trust, which
works as a force of segregation.

**Hypotheses on the emergence
of traders**

Traders have been evicted from the main-
stream textbooks of economics. Recently,
however, there is growing recognition
that traders play a critical role in market
development (Fafchamps and Minten
1999, 2001). Research on the emergence
of traders in peasant societies classifies
traders according to three hypotheses:
the insider, the outsider, and the culture
broker hypotheses. This classification is

---

**Table 3.1 Trust of villagers in various economic agents in Lao PDR**

<table>
<thead>
<tr>
<th>Economic agent</th>
<th>Trustworthy</th>
<th>Cannot say</th>
<th>Not trustworthy</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Insiders</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Relatives</td>
<td>81.6</td>
<td>14.6</td>
<td>3.8</td>
<td>100.0</td>
</tr>
<tr>
<td>Village people</td>
<td>54.2</td>
<td>32.3</td>
<td>13.5</td>
<td>100.0</td>
</tr>
<tr>
<td>Village retailers</td>
<td>41.1</td>
<td>30.3</td>
<td>28.6</td>
<td>100.0</td>
</tr>
<tr>
<td>Village traders</td>
<td>38.4</td>
<td>42.4</td>
<td>29.2</td>
<td>100.0</td>
</tr>
<tr>
<td>Outsiders</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Retailers in towns</td>
<td>10.2</td>
<td>29.3</td>
<td>61.5</td>
<td>100.0</td>
</tr>
<tr>
<td>Traders coming from towns</td>
<td>9.2</td>
<td>31.5</td>
<td>59.3</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Source: Author’s survey.
Note: The number of respondents is 826. Arranged by level of trust.
deeply associated with the distinct sanction mechanisms mentioned above.

- The **insider hypothesis** (Hayami and Kawagoe 1999; Landa 1994) argues that the difficulty of performing business transactions under imperfect information can be mitigated when trading partners are fellow villagers, because information among villagers is relatively symmetrical and informal sanction mechanisms ensure the enforcement of contracts. Thus insiders have a better chance of trading successfully with villagers than outsiders do.

- The **outsider hypothesis** suggests that peasants in traditional societies are too passive to be entrepreneurial traders and they are disadvantaged when it comes to having access to urban markets. Thus innovators emerge from the outside world, such as the overseas Chinese, the Parsees of India, and the like (Geertz 1963; Weber 1930). The notion of the trader’s dilemma also endorses the outsider hypothesis (Evers and Schrader 1994). The dilemma argues that insiders are often required to share income with their fellow villagers according to the social norms of the peasant community. Insiders are thus subject to social constraints on the maximization of private profits. In contrast, remaining an outsider allows traders to operate a business without being constrained by the community norms of peasant societies.

- **Culture brokers** facilitate and mediate relationships among different cultures. The culture broker hypothesis stresses that in developing economies neither urban traders nor village producers are familiar with the rules and norms of the other world. Thus interpreters familiar with both worlds play a pivotal role in the commercial integration of rural and urban economies. Such a marginal person is referred to as a culture broker (Neale 1984).

These hypotheses are not mutually exclusive. A field study on which this chapter is based found that a wide variety of traders endowed with different socioeconomic characteristics are actively conducting business by using their respective advantages to overcome transactional difficulties. Investigating how these traders engage in their business throws light on the emergence of various types of rural clusters and their different growth paths. Taking the severance of trust into account, it is possible to hypothesize that culture brokers play the most crucial role in integrating rural markets into urban and overseas markets.

**Profile of the Lao PDR hand-loom industry**

This section profiles the Lao hand-loom industry. It discusses income from nonfarm activities, offers a brief history of Lao textiles, and discusses techniques for weaving Lao cloth.

**Income from nonfarm activities**

Table 3.2 shows annual sources of cash income for rural households in Lao PDR (N = 826, surveyed in 2003). A major portion of cash income comes from self-employed businesses, while agriculture yields only 18 percent of cash income. This indicates the importance of self-employed businesses for poverty reduction. These businesses are made up of a variety of rural industries, such as hand weaving, basket making, brewing of indigenous drinks, bamboo mat making, and so forth.

**Brief history of Lao textiles**

Lao cloth is broadly classified into figured cloth woven in the northern and central part of Lao PDR and ikat (mad mii) woven mainly in the southern part. This chapter deals solely with the former, which is hereafter referred to simply as “cloth.”

### Table 3.2  Source of income of rural households in Lao PDR

<table>
<thead>
<tr>
<th>Source of income</th>
<th>Amount (1,000 kip)</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agriculture</td>
<td>1,854</td>
<td>18.00</td>
</tr>
<tr>
<td>Agricultural wage</td>
<td>388</td>
<td>3.77</td>
</tr>
<tr>
<td>Self-employment</td>
<td>4,149</td>
<td>40.55</td>
</tr>
<tr>
<td>Salary</td>
<td>2,851</td>
<td>27.67</td>
</tr>
<tr>
<td>Remittance</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Domestic</td>
<td>83</td>
<td>0.81</td>
</tr>
<tr>
<td>Overseas</td>
<td>558</td>
<td>5.41</td>
</tr>
<tr>
<td>Other income</td>
<td>418</td>
<td>4.06</td>
</tr>
<tr>
<td>Total income</td>
<td>10,305</td>
<td>100.00</td>
</tr>
</tbody>
</table>

Source: Author’s survey.

Note: US$1 = 10,500 kip.
Lao cloth is patterned with ample designs using supplementary wefts: nonstructural threads added to the basic weave. The patterns of Lao cloth reflect the cultural, religious, and ritual symbols of ethnic groups, regions, and even villages. When cloth is woven for home consumption or traded within a local community, villagers only need to weave cloth with indigenous patterns specific to their ethnic group or local community. In reality, weavers know only a few ancestral patterns.

For centuries Lao weavers spun cotton and reeled silk, dyed fabrics with plants, and wove mainly for personal use rather than for commercial ends (Connors 1996). Hand weaving declined rapidly in the 1950s as a result of stiff competition from imported machine-woven cloth. After the communist takeover, this situation changed drastically, as the isolationist policy was conducive to revival of the hand-weaving industry.

The recent history of Lao PDR has been turbulent. Greater contact between ethnic and regional groups during the turbulence blurred the historical and cultural significance of traditional patterns, making them merely fashionable designs.

In November 1986 Lao PDR opened its doors to the international market economy. This affected the hand-weaving industry in two significant ways. First, new markets were brought to the industry by the overseas Lao who left the country at the time of the Civil War, the Thais who share a similar culture regarding cloth making, and foreign tourists. Second, imported factory-spun yarns enabled weavers to produce high-quality cloth. These two events led to a weaving renaissance in Lao PDR.

Although the emergence of the new markets presented income-generating opportunities for the villagers, it also imposed new constraints on them, such as the need to obtain information about patterns demanded in the market and to secure funds to purchase high-priced imported yarns. Rural weavers seldom have formal training or education, and they face severely constrained working capital. Thus rural artisan clusters are deemed to be passive by nature and unable to break into wider markets by themselves. If this is true, what explains the mushrooming of weaving clusters since Lao PDR opened its doors? As shown in this chapter, traders did much for the prosperity of the weaving clusters by coping with the constraints.

Weaving techniques of Lao cloth

The organization of production and structure of marketing vary considerably with the type of commodity and thus involve distinct transactional difficulties (Siamwalla 1978). Lao cloth is woven on a hand loom with the help of a vertical heddle. A vertical heddle is the lacy mesh with pattern rods above the warp, which reflects the number of changes required to make figured cloth with complex patterns. While weavers can produce a vertical heddle of a few traditional patterns, pattern designers can produce various patterns to be produced on a vertical heddle.

A vertical heddle helps less experienced weavers to produce cloth with a twill and satin weave design. In addition, it makes patterns transferable. Weavers can produce a vertical heddle by referring to a sample cloth, although doing so is arduous work. They copy the information on the pattern of sample cloth by counting the number of warp yarns that appear on the surface for one weft yarn at a time and transfer the information onto a vertical heddle through the reverse action of the weaving process. With this method, weavers can infringe on patterns, causing post-contractual problems. As the quality of cloth can be visually inspected with ease, adverse selection is not a serious problem. Thus moral hazard is the major contractual problem inherent in cloth transactions.

Marketing and contractual arrangements

This section describes marketing channels, the taxonomy of contractual arrangements, and contractual choice.

Marketing channels

The majority of weavers are women living in villages, because hand weaving is a side business for farm households. Master weavers either employ weavers at their workshop (hereafter referred to as workshop weavers)
or deal with weavers working at home (hereafter referred to as home weavers), or they use a combination of the two (see figure 3.1). Master weavers, who are generally pattern designers, furnish market information on patterns in the form of vertical heddles.

Retailers, basically town-based traders, have their shop in an urban marketplace. Other traders observed in our research are itinerant traders and commission traders. The former reside in a village and deal with fellow villagers, while the latter cover several villages. Independent weavers deal directly with retailers without relying on intermediaries. They reside in the vicinity of consumption centers. They purchase yarns at their own expense and weave cloth of traditional patterns they have inherited. The cloth is generally of low quality.

**Taxonomy of contractual arrangements**

Contractual arrangements observed in this field study are found along a spectrum that has “make or buy” as polar cases (see figure 3.2). Various relational contract systems exist in between. They can be classified into three contractual arrangements: the putting-out system, the yarn-on-credit system, and the advance-order system. On the continuum of transactions from the spot market to the factory system, the putting-out system is closer to the factory system, while the advance-order system is most akin to spot-market transactions.

The putting-out system often appears as an interim stop between the craft shop, or the guild system, and the factory system (Wardell 1992). Landes (1969) finds the reasons for the transition in “the usual difficulty of compelling performance by cottage workers” and “the poor quality of hand work,” which are collectively referred to as “the frictions inherent in putting-out.” However, hand weaving is a side business for women, mostly married, in rural households. They weave when they find time outside of household chores. Little needs to be said about the difficulty of guiding such weavers into a centralized unit. Hence, relational contracting is the rule in the cloth market.

The relational contract is subject to the agents’ opportunism, as Landes points out. Three major problems are related to Lao cloth: (1) infringement of patterns that principals develop; (2) sale of the covenanted cloth to other traders who offer a higher price than the agreed-upon one; and (3) embezzlement of yarns provided by a principal.

This section begins by describing the contrast between the putting-out and the yarn-on-credit system. Under the former, a principal provides his or her agents with yarns for processing and later collects woven cloth for a piece-rate payment. The provision of yarns is not merely for the convenience of the agents, who face severe constraints on working capital; rather, it is also advantageous to the principal, as it binds his or her agents to deliver the cloth with the patterns to which the principal can claim title. Furthermore, the fact that the principal can claim ownership of the provided yarns also makes the exclusive delivery binding on the agents. Although the agents’ opportunity to sell the covenanted cloth is deterred, embezzlement of yarns remains a serious problem, as the agents (weavers in this case) are tempted to embezzle the provided weft yarn by reducing the number of picks or by saying that not enough weft yarn was provided to weave the covenanted amount of cloth.
Under the yarn-on-credit system, in contrast, the principals sell yarns to the agents on credit in return for stipulating the purchase price of cloth. When the cloth is delivered, the agents are paid the remaining balance of an agreed-upon price after deducting the price of yarns advanced. The principals check the quality of the delivered cloth and may reduce the price if the quality is found to be unsatisfactory. The possibility of punishment for embezzlement of yarns is built into the contract in the form of reduced payments after inspection of the delivered cloth. However, this contract attenuates the moral obligation of the agents to deliver cloth exclusively to the principal, because the agents can claim ownership of the yarns. Therefore, the infringement of intellectual property rights on cloth patterns or the sale of covenanted cloth to a third party is more likely to be serious.

Under the advance-order system, the principals only guarantee the purchase of the products at a stipulated price. As yarns are not advanced, the agents have to purchase them at their own expense. Therefore, the agents cannot help but use low-quality yarns due to their weak financial position. Needless to say, yarn embezzlement does not take place in this system. However, agents are vulnerable to the temptation to sell the products to traders offering higher prices. Therefore, under this system the principals refrain from furnishing their agents with market information on patterns, and the cloth remains of low quality.

Besides these relational contracts, spot-market transactions are common. Although no post-contractual problems take place in spot transactions, the cloth transacted is of very poor quality.

**Contract choice**

Rural weavers cannot afford to purchase high-quality yarns due to working capital constraints, and they find it difficult to obtain market information on fashionable patterns in urban and overseas markets. Therefore, it is hard for weavers to produce good-quality cloth by themselves, even though it yields higher profits. Therefore, to obtain high-quality cloth, traders need to advance appropriate yarn and furnish weavers with fashionable patterns. However, this triggers post-contractual problems, such as infringement of patterns, embezzlement of yarns, and sale of the covenanted cloth to a third party. Traders have to cope with these problems to run a successful business.

These contracting systems have distinct features with respect to post-contractual problems (see table 3.3). This chapter considers community-based trust and the ability to place a hold on patterns to be the sanction mechanisms that constitute the principal’s ascendancy over an agent.

A hold on patterns depends on the private information of the principals. Master weavers, when they are principals, can preserve their hold on patterns because they are the designers as well. Urban retailers as principals can preserve a hold on patterns as a result of day-to-day contacts with consumers. As cloth with an attractive pattern enjoys stable orders and higher prices, the agents contracting with principals who have a strong hold on patterns can secure constant orders. Hence, the threat of termination of the business relationship deters the agents’ opportunism. Process-based trust is not considered here, because relational contracting generally involves recurrent transactions.

<table>
<thead>
<tr>
<th>Contracting system</th>
<th>Sale to others and pattern infringement</th>
<th>Yarn embezzlement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Putting-out system</td>
<td>Weak</td>
<td>Large</td>
</tr>
<tr>
<td>Yarn-on-credit system</td>
<td>Medium</td>
<td>Medium</td>
</tr>
<tr>
<td>Advance-order system</td>
<td>Large</td>
<td>None</td>
</tr>
</tbody>
</table>

Source: Author’s survey.
In the interest of brevity, the discussion is limited to the choice of contract between weavers and master weavers. A similar picture can be applied to the choice of contract in other transactions.

For rural weavers, the putting-out system is the first choice, because the principals, who are master weavers as a general rule, advance good-quality yarns and furnish market information on fashionable patterns. In addition, the principals guarantee the purchase of the processed products. For the principals, this effectively protects their intellectual property rights on patterns, as this system assures exclusive delivery of the products. Thus the putting-out system provides the best conditions for both agents and principals.

The agents’ opportunism is, however, an inherent problem in the putting-out system. It can be assumed that the principals who have strong ascendancy over agents are more likely to choose the putting-out system. As a natural corollary, traders who adopt the putting-out system rather than conducting business through spot transactions can establish prosperous weaving clusters.

When the principals can rely on only one or the other sanction mechanism, meaning that they have weak ascendancy over agents, post-contractual problems arise. The problem of yarn embezzlement surfaces first, because a sense of guilt is weaker for yarn embezzlement than for the sale of cloth to a third party. The principals are obliged to choose the yarn-on-credit system to cope with yarn embezzlement, even though the agents’ moral obligation of exclusive delivery is weak.

When the agents’ opportunism is more hazardous, the advance-order system is chosen even though only weaker benefits can be obtained by linking rural producers to urban markets. Spot-market transactions prevail when the principals are unable to restrain the agents’ opportunism, and the quality of cloth deteriorates accordingly.

**Weaving clusters and traders**

Among numerous weaving clusters in Lao PDR, this study selected 11 clusters that show distinct growth trajectories (see table 3.4). It is assumed that the dynamics at work can be explained by the ability of traders to use different sanction mechanisms.

**Why does space matter?**

We start with two cases in which distance determines the features of clusters. Xam Nua and Xam Tai of Houa Phan province, the most remote region of Lao PDR, are renowned for their hand weaving (see figure 3.3). Xam Nua is three days by bus from Vientiane, while Xam Tai is four. The consequence is that the margin between the wholesale price and the purchase price is about 5 percent for the Xam Nua trader and 47 percent for the Xam Tai trader. This difference reflects the distance of “an extra day.”

The distance of “an extra day” does not denote a mere increment of transportation cost, because the bus fare is too small to explain the difference in profit margin. Traders in Xam Nua, mostly master weavers, take orders from urban retailers in a recurrent manner, receiving product information on fashionable patterns and colors under the advance-order system. Some master weavers have constant orders from Thai retailers who specify patterns and colors in detail.

In Xam Tai, master weavers do not exist. Xam Tai weavers consign their cloth to commission traders, setting the price limit. The traders sell the products to urban retailers in Luang Prabang and Vientiane. Although Xam Tai weavers are known to be highly skilled, they weave cloth of low quality. When asked why they do not weave quality cloth, they responded that they fear the risk of frozen stock. It takes several months to weave a piece of high-quality cloth. This makes them risk averse. The same holds true for the traders. Distance of “an extra day” does not impose prohibitive transportation
costs, but it affects the attitudes of the weavers as well as the traders in association with risk. Thus distance hampers the emergence of master weavers.

Clusters producing low-quality cloth: itinerant and commission traders

An itinerant trader, Ms. P deals with approximately 300 weavers under the yarn-on-credit system, covering several villages in Vientiane province about 80 to 90 kilometers north of Vientiane City. As the weavers know only a few indigenous patterns, there is weak demand for that line of cloth.

Itinerant traders facilitate the market activities of weavers in remote areas. They cover wider areas than commission traders or master weavers do. However, wider coverage itself inevitably entails a drawback in that the traders do not share a similar social background with the weavers. Therefore, itinerant traders cannot resort to community-based trust for resolving conflicts. As Ms. P is from a village renowned for hand weaving, she possesses market information on fashionable patterns. However, she hesitates to furnish the information to her weavers, because she cannot count on them to deliver cloth exclusively to her: she has no power over them. Thus Ms. P trades cloth of low quality.

Ms. Q, a commission trader in a village about 40 kilometers from Vientiane, contracts with 56 village weavers under the yarn-on-credit system. She also runs a small general store. As there is neither a pattern designer nor a master weaver in the village, the villagers weave cloth with a few indigenous patterns that fetch low prices. The products go mainly to local markets. Ms. Q not only
advances yarn on credit but also sells daily necessities to the weavers on credit to secure the delivery of cloth from them. In addition, she lends money to her weavers without charging interest and accepts repayment in cloth. The credit-tying contract is a device that allows the commission trader to secure the delivery of cloth from the weavers.

Although Ms. Q shares a similar social background with the weavers, she suffers from the weavers’ opportunism. Four to five weavers per month sell their cloth directly to retailers in the market without delivering it to Ms. Q. As she knows the cloth pattern of each weaver, such opportunism is easily detected when she visits the market in Vientiane. However, Ms. Q thinks there is no way to prevent this from taking place. Because she is not a pattern designer, her ascendancy over the weavers is weak.

Itinerant and commission traders have weak ascendancy over their agents in that the former cannot resort to community-based trust and the latter have a weak hold on patterns. Thus they are subject to the agents’ opportunism. Even though they contribute to the formation of weaving clusters, the clusters produce low-quality cloth. So long as these traders do not furnish market information on patterns, they cannot be a substitute for the master weavers.

**Clusters producing products intended for overseas markets**

This section reviews three of several documented cases of master weavers who contributed to the formation of weaving clusters in which the products are intended for overseas markets (see table 3.5). Two of them reside in Vientiane, and one resides in Savannakhet, the second largest town in Lao PDR. Each master weaver contracts exclusively with her own weaving cluster on a large scale. As the table shows, the master weavers are not insiders: they live in urban areas and are medical doctors or graduates of foreign universities. They have acquired the rules and norms of urban society. At the same time, they contract with migrant weavers from their native area, with the exception of Ms. C.

Ms. A migrated to Vientiane from Houa Phan province during the Vietnam War. She quit a government post (as a medical doctor) due to low wages and started a weaving business in 1986 when Lao PDR opened its doors. She deals exclusively with more than 200 weavers from two villages under a putting-out contract. The villagers migrated from Houa Phan province for the same reason as their principal. Ms. A is known as an eminent pattern designer in Vientiane. She provides her weavers with vertical heddles embodying patterns that she has designed and silk yarns that she has dyed. During the dry season, Ms. A accepts the delivery of an average of 500 to 600 pieces of cloth from her weavers. The number drops to about half during the rainy season when farm work reaches its peak. Her weaving business brings monthly earnings of 8.19 million kip (US$8,712 in August 1996) in the dry season. Her success is due to community-based trust and her strong hold on patterns.

Neighbors villages are different from villages with a weaving cluster, even though they

<table>
<thead>
<tr>
<th>Name and birthplace</th>
<th>Description</th>
<th>Social similarity with weavers</th>
<th>Number of weavers under control</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ms. A. (Hua Phan)</td>
<td>A medical doctor and an eminent pattern designer</td>
<td>Yes</td>
<td>219</td>
</tr>
<tr>
<td>Ms. B. (Saravan)</td>
<td>Has a long-term contract with a large cloth shop in Japan; lives in Savannakhet and runs a weaving workshop there</td>
<td>Yes</td>
<td>More than 200</td>
</tr>
<tr>
<td>Ms. C. (Savannakhet)</td>
<td>University graduate (France) and can communicate in French and English</td>
<td>No</td>
<td>57</td>
</tr>
</tbody>
</table>

*Source: Author’s survey.*
have similar historical backgrounds. While almost all of the households in the cluster engage in weaving, only some households in the neighboring villages weave. This is because the weavers there do not have a contract with master weavers. They do not have access to the fashionable patterns desired in urban markets. In addition, they lack working capital and can only afford cotton yarns. Cotton cloth has a narrow profit margin compared to silk cloth. Master weavers who are also traders thus have an important role to play in the formation of weaving clusters.

Ms. B was born in a village in Saravan province and moved to Savannakhet (the capital of Savannakhet province) after her marriage. In 1998 she started a weaving business with support from a Japanese dyer who recommended indigo dyeing. Since 1999 she has contracted with a medium-size cloth shop in Japan that furnishes designs for the cloth. What is noteworthy is that Ms. B contracts with the weavers of her native village about 70 kilometers away from her residence. She adopts the putting-out system, even though monitoring is difficult. The cloth woven in this case is plain, unlike the figured cloth of other master weavers. Thus Ms. B does not provide vertical heddles to her weavers. Her strong hold on product specifications is derived from her long-term business relations with the foreign retailer. This relation and community-based trust enhance her ascendancy over the agent weavers.

Community-based trust helps to curtail monitoring costs. Ms. C, a master weaver from Vientiane, illustrates the role of community-based trust. Ms. C graduated from university in France and exports her products to France as well. She is a migrant from the southern province of Savannakhet where weaving is not prosperous. In Vientiane and its environs, she is unable to find weavers from her native village, which has forced her to deal with migrant weavers from Houa Phan province. Due to the lack of community-based trust with the weavers, Ms. C has to employ three local people to monitor the weavers' opportunistic behavior. She is the only master weaver discussed here to rely on such supervisors; the others rely instead on community-based trust.

In conclusion, the master weavers who are involved in rural weaving clusters on a large scale are those who can exploit an ambivalent position as outsiders as well as insiders. They are socially differentiated from their agent weavers in that they are highly educated and have urban experience. They are culture brokers. As they reside in or in the vicinity of large towns far from their agent weavers, their businesses are less likely to be constrained by the community norms that demand income redistribution. Although direct monitoring is difficult, community-based trust and a strong hold on patterns deter the opportunistic behavior of agent weavers. This allows the master weavers to conduct a large-scale weaving business.

The discussion so far reveals the two faces of community norms. While the community norms often facilitate efficient transactions by producing community-based trust, the community may impede capital accumulation in the hands of inside traders, creating a trader's dilemma. It is the culture broker who can maneuver through these two faces of the community most effectively.

**Three clusters taking distinct trajectories in Luang Prabang**

A final set of weaving clusters are from Luang Prabang, the former royal capital and a World Heritage site that lies on the upper Mekong River. On the fringe of the town, there are three weaving clusters: clusters X, Y, and Z. The residents of clusters X and Y were on the side of the ousted regime. After the communists came to power in 1975, they were forced to settle on the Mekong riverbank, where little farmland is available. A typical picture of proto-industrialization emerged there.

In 1994 a weaver of cluster X (Ms. E) was approached by a Lao trader, who was a broker for Thai traders from Hoei Xai, a trading post on the opposite shore of Chiang Kong in Thailand. The trader travels by boat along the Mekong River. The weaver entered into a contract with the broker and embarked on a weaving business as a master weaver. Several weavers in cluster X followed the same path as Ms. E.

At the end of the 1990s, a road to Nan (Nan province of Thailand) through Xayabury
province was opened to traffic. Master weavers in cluster X began to transact directly with cloth retailers in Nan. Ms. F had worked as a broker of master weaver Ms. E. She brought the cloth to a retailer in Nan and conveyed to Ms. E the information on pattern and color specified by the retailer. In the course of her work, Ms. F became a trader and spun off, taking some of the weavers away from Ms. E. In the meantime, several other master weavers emerged in cluster X.

In cluster Y, no master weavers emerged. This is possibly because there are more weavers in cluster X, which consists of several villages located on the riverbank. This scale-economy effect may explain why Hoei Xai traders first approached cluster X. In the meantime, the weaving activities of cluster Y were absorbed by the traders of other clusters.

Cluster Z followed a different pathway. In 1978 the provincial government constructed a market hall for selling cloth to tourists on the condition that the villages sell their products only at the hall. The hall was renovated in 1991 and has 73 seats at present. Some villagers collect cloth from other areas, including cluster Y, through spot transactions. As the majority of customers are foreign tourists who buy indigenous cloth as a souvenir, the weavers do not have to take into account the taste of wider markets. This cluster does not foster entrepreneurship.

While the weaving industry of cluster Z has stagnated, several shops opened in cluster X to cater to the growing tourist traffic. This is because the weavers of cluster X are capable of taking in market information on patterns and colors, especially those of Thais. They were quick to seize the opportunity to weave high-quality cloth.

The above contrast emphasizes the importance of traders in facilitating rural clusters. In addition, any policy intervention that blocks the transmission of market information will not promote rural clusters.

**Decline of trust**

As trust in trade is calculating by nature, it may decline as the level of punishment decreases or the level of profit from a breach of contract increases. Decline of trust occurred during the economic turmoil in the second half of the 1990s. The kip depreciated sharply against the U.S. dollar, with wide fluctuations, from US$1 equivalent to 940 kip in August 1996, 2,150 kip in December 1997, and more than 10,000 kip in 2000. Consequently, the price of imported yarns as well as the wholesale price of cloth rose drastically. This is particularly true for quality silk yarns for warps imported from China.

The devaluation of the kip over a prolonged period made agents think that the profit from one-shot opportunism would outweigh the future benefits obtained from recurrent transactions. In addition, several traders started to offer higher prices for cloth, encouraging weavers to breach their contracts.

This section considers the example of master weaver Ms. A to illustrate the decline of trust and consequent institutional changes. Although Ms. A is an eminent pattern designer who contracts with weavers with whom she shares a similar social background, she could not avoid the turmoil. During a subsequent interview in 2000, after the turmoil had subsided, she said that she had changed from using putting-out contracts to using the yarn-on-credit system. She introduced contract letters that have the following four provisory clauses: (a) a person who receives advanced yarns is required to weave the stipulated sheets of cloth; (b) the cloth delivered needs to be inspected, and substandard quality leads to a reduction in the agreed-upon price; (c) breach of this contract incurs penalty charges worth twice as much as the stipulated price of cloth; and (d) when the pattern provided by the principal is transferred to a third person, 50,000 kip has to be paid as a fine. It is a good guess that Ms. A has suffered from agents’ opportunism.

Process-based trust can be obtained after engaging in time-consuming recurrent transactions, as the Nash equilibrium in the repeated prisoner’s dilemma game (Axelrod 1984). This equilibrium can be maintained on condition that the payoff matrix remains stable. The currency turmoil affected the payoff over a long period of time, increasing the gains from one-shot opportunism. As the case of Ms. A indicates, the upheaval even destroyed community-based trust. After the
currency crisis, the trust-based contracts were in some cases replaced by spot transactions. Policy makers should take note: a stable macroeconomy is critically important for preserving informal sanction mechanisms, which support market development.

**Retailers as urban-based traders**

This section shifts the focus to retailers, examining whether they contribute to rural clustering in a positive manner. The following is based on interviews with 13 cloth retailers in *Talaat Sao*.

Most retailers in *Talaat Sao* neither have a hold on patterns nor are able to rely on community-based trust. A typical example is Ms. K of Vientiane origin. She has been purchasing cloth from independent weavers residing on the periphery of Vientiane on a spot basis for more than 20 years. Over time, she has selected “skilled and reliable weavers” (in her words) one by one and entered into yarn-on-credit contracts with them. In this case, recurrent transactions engendered process-based trust. Clientelism, however, does not always assure effective enforcement of contracts. An oft-heard complaint from retailers, including Ms. K, is that some weavers do not deliver the promised products even if the retailers advance yarns on credit. Embezzlement is also commonplace. According to Ms. K (interviewed in December 1997, just after the currency turmoil broke out), 7 agent weavers among 50 did not deliver the products. She visited them to urge delivery, but they pleaded illness or the like. She suspects them of selling off the advanced yarns for rice. To reduce such damage, she tries to contract with weavers of different villages as much as possible. This is because, according to her, when such a problem occurs with one weaver, it spreads to others in the same village. This is a case of contagious equilibrium.

Ms. K decided to replace the yarn-on-credit system with the advance-order system. Some retailers in *Talaat Sao* also switched from the yarn-on-credit system or even the putting-out system to the advance-order system. The main reason for this shift was the rise in agents’ opportunism, as the number of traders in the market increased. For retailers who cannot rely on community-based trust, the relational contract is vulnerable to agents’ opportunism. Currency turmoil added momentum to this shift.

Urban retailers cannot be active market integrators because they do not share a similar social background with weavers and they do not design patterns. When the retailers adopted the relational contracting system, they gained a distinct selection of goods. Since the currency turmoil, however, things have turned around drastically. The retailers in *Talaat Sao* now sell a similar range of cloth, because they began to buy cloth on a spot-market basis. A retailer said that they now have to compete not on quality but on price.

**Conclusions**

This chapter has shown that the emergence of traders is indispensable for the development of rural clusters; traders who can maneuver incompatible sanction mechanisms between rural and urban societies play a particularly important role. This notion is critically vital for the transaction of commodities, which entails post-contractual problems. The weaving clusters observed have followed distinct growth trajectories. This is largely explained by the multimodal characteristics of traders, who have different sets of sanction mechanisms.

Insiders such as commission and itinerant traders contribute to the establishment of rural clusters. However, they engage in cloth business on a small scale, dealing with cloth of poor quality intended for domestic markets. They are unable to access information regarding the taste of overseas consumers or are unable to resort to community sanction mechanisms. In addition, they are subject to the trader’s dilemma.

Culture brokers deal with quality cloth for overseas high-end consumers on a large scale. They not only have access to information on the taste of wider markets but also can resort to community sanction mechanisms. Thus they can furnish rural producers with information on fashionable patterns while evading post-contractual problems.

Hicks (1969) and North and Thomas (1973) argue that the evolution from personalized exchange to impersonal exchange, supported by legal sanction mechanisms,
central to the process of growth and development. However, this chapter has discussed the evolution before formal sanction mechanisms have been implemented effectively.

The findings suggest that policies to foster traders need to specify a target. Fostering culture brokers is not an easy task. Educating able villagers from target areas in urban settings serves as the initial step. Education not only enhances the human capital of villagers, but also helps them to acquire the property of outsiders, including urban experiences when education is obtained in an urban setting. Thus education facilitates the emergence of culture brokers.

A possible measure is to hold trade fairs to assist local producers in establishing connections with urban and overseas businesses. Take the Japanese experience in the early Meiji period, for example, when numerous trade fairs were held all over the country. This disseminated information on rural commodities to urban businesses. Ohno and Jirapatpimol (1998) point out that some master weavers in northern Thailand gained a link with urban and overseas markets through such trade fairs.

Needless to say, informal sanction mechanisms need to be superseded by formal sanction mechanisms in the course of economic development. The implementation of formal sanction mechanisms needs to prioritize areas related to the transactions between foreign outsiders and domestic traders as long as the commodity possesses an international competitive edge.

Another important policy implication of this chapter is that economic uncertainty jeopardizes trust by inducing one-shot opportunistic behavior and leading to a payoff matrix and a prisoner’s dilemma. A stable macroeconomy is thus an important ingredient of both process-based and community-based trust for economic development.

Notes
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1. Transactions relying on community-based trust segregate rural communities, impeding the spillover effects of clustered activities in rural areas.

2. Vientiane City (hereafter Vientiane) is the capital of Lao PDR, while Vientiane province extends to the north of Vientiane.

3. Heddle is the name of the small cords through which the warp is passed in a loom after going through the reed and by means of which the warp yarns are separated into two sets to allow passage of the shuttle bearing the weft.

4. Urban businesses do not advance yarns to the weavers of Xam Nua because yarns are available in local markets. In the case of bulk orders, the urban principals advance money to the master weavers.

5. In spite of the weavers’ opportunism, Ms. P has to advance yarns to secure the collection of cloth because several itinerant traders are doing business in the area.

References
Itoh, Motoshige, and Masayuki Tanimoto. 1998. “Rural Entrepreneurs in the Cotton-Weaving


Economic growth often accompanies spatial inequality. Spatial connection to high-growth centers offers a pathway out of poverty in local economies, by improving economic returns to investment and reducing costs in transportation and the search for both human and physical resources, which alters the allocation of household resources. In general, an improvement in spatial connectivity is expected to increase allocative efficiency in the local economy, because the mobility of resources becomes faster and less costly and price disparity becomes smaller (for example, Minten and Kyle 1999).

However, it is not clear how better spatial connectivity—among neighborhood local areas or between local areas and distant economic centers—changes poverty and income distribution. In other words, it is not clear who gains from better spatial connectivity. Improved spatial connectivity in the local economy may have heterogeneous impacts on households with different endowments. To investigate this issue, we use recently available household panel data from Indonesia.

In rural contexts, once a village is connected by a new road to a nearby town where jobs are available, the household allocation of labor is expected to change so that they gain from earning opportunities in the town’s labor market. If entry to the labor market is easier for educated agents, the allocation of labor changes among households with educated members. More educated agents may try to capture better employment or urban market opportunities that are available in larger economic centers farther than the local town (without migrating). In this case, road access to the larger economic center is more important.

Similarly, if the local town has efficient markets for agricultural products, landed farmers will benefit from the new local road, but landless households will not, because farmers have surplus products to sell, whereas landless households do not. Increasing demand for food from larger economic centers may induce some landed farmers to invest in agroprocessing, increasing nonfarm income. In this case, the effects could be heterogeneous across different locations and across households with different endowments.

The recent literature provides some studies suggesting that returns to human and physical capital in rural areas critically depend on spatial connectivity, which affects the allocation of household resources, such as labor (see Fafchamps and Shilpi 2003, 2005; Fafchamps and Wahba 2006). Fafchamps and Shilpi (2003) show that the distance to cities is crucial for determining wage opportunities and employment structure in Nepal, and thus nonfarm employment (either wage or self-employment) is concentrated in and around cities. Since road construction improves the access to (nonagricultural) labor markets or urban consumers, it increases wages and employment choices for rural residents. Certain types of employment become available with improved spatial linkages. For example, Fujita and Muto (2007) show that the effect of spatial linkages on
brand agriculture depends on the differentiation of products.

The connectivity to urban centers can benefit laborer households more than farm (landed) households by improving the access to nonagricultural employment opportunities. Foster and Rosenzweig (2001) present recent evidence from India that the landless prefer public investment in local road construction because it improves their access to labor markets, while the landed prefer investment in irrigation because it augments returns to land.

The improvement in spatial connectivity also has implications for product markets, reducing transportation margins. Minten and Kyle (1999) show that price variations are largely due to transportation costs in the Democratic Republic of Congo. An interesting finding is that traders benefit from bad road conditions, which lower the purchase price of products (thus increasing their profit). Therefore, spatial connectivity can potentially increase farmers’ income by reducing traders’ profit margin.

Numerous studies have estimated the returns to infrastructure investment such as road construction under various assumptions, mostly at the aggregate level (Binswanger, Khandker, and Rosenzweig 1993; Fan, Zhang, and Zhang 2004). To analyze the dynamic effects of infrastructure investment on income growth at the household level, it is necessary to combine, by household and village locations, both household and spatial panel data over a long span of time with sufficiently large changes in infrastructure.

In this paper, we endeavor to capture the improvement in spatial connectivity by constructing a measure that captures inter-village road quality in a region (from the Indonesian village census). We combine this measure and distance to economic centers: subdistrict, district, and provincial capitals (from the village survey we conducted in 2007). Our main idea is that inter-village road quality determines the means of transportation used in the local economy and therefore the average speed of resource mobility (including human), which affects allocative efficiency in the local economy.

Potential gain in allocative efficiency is also affected by the distance to economic centers at different levels, as these economic centers offer different economic opportunities.

Previous studies on the spatial connectivity of rural households were limited in the sense that they perceived connectivity only as access to local towns or as distance from growth centers and were unable to discuss the combination of both. But in actual policy choices, public investment planners face decisions regarding the allocation of resources among trunk roads (which lead to economic centers) and local roads. They also face policy choices regarding the balance between fiscal spending on education and on roads. Therefore, this paper can bridge the gap between academic studies and infrastructure planning.

Empirical results show that improvements in the quality of local roads in the local area (which are positively correlated with speed of transportation) have an impact on income growth and the transition to nonagricultural activities and that the impact depends on the distance to economic centers and household education. Education significantly increases the benefit from an improvement in spatial connectivity, which is augmented by distance from the provincial center. Education and local road quality are complementary, increasing income growth. Therefore, whether the improvement in local connectivity (measured by average road quality) is pro-poor or not depends on village location and the initial household-level endowment of education.

Data

We use data from two sources. First, the main data come from village- and household-level surveys that we conducted in 2007 for 98 villages in seven provinces (Lumpong, Central Java, East Java, West Nusa Tenggara, South Sulawesi, North Sulawesi, and South Kalimantan) under the Japan Bank for International Cooperation (JBIC’s) Study of the Effects of Infrastructure on Millennium Development Goals in Indonesia (IMDG). The 2007 village survey captured the physical distance and time to various points of economic activity such as markets, stations, and
capital towns. Figure 4.1 shows the location of surveyed villages.

The survey was designed to overlap with villages in the 1994–95 National Farmer’s Panel (PATANAS) survey conducted by Indonesian Center for Agriculture Socio-Economics and Policy Studies (ICASEPS) to build household panel data. The 1994–95 PATANAS survey focused on agricultural production activities in 48 villages chosen from different agroclimatic zones in seven provinces. In 2007 we revisited those villages to expand the scope of research through a general household survey conducted under the IMDG survey. In the 2007 round, therefore, we added 51 new villages in the seven provinces.

In the revisited villages, we resampled 20 households per village from the 1994–95 sample and followed the split households. In the new villages, we sampled 24 households from two main hamlets in each village. Because one of the 48 villages in the 1994–95 PATANAS (in West Nusa Tenggara province) was not accessible for safety reasons in 2007, 98 villages were available for various research objectives. In our panel analysis, we constructed household income panel data from 34 villages in six provinces (Lumpong, Central Java, East Java, West Nusa Tenggara, South Sulawesi, and North Sulawesi) using both the 2007 household and 1994–95 PATANAS surveys.

Second, 1996 and 2006 PODES data were used to construct road quality data. PODES is a village census conducted by the Republic of Indonesia’s Central Bureau of Statistics.

**Descriptive analyses**

This section describes the data dealing with spatial connectivity (specifically intervillage road improvement and distance to economic centers) and household income (specifically income dynamics and nonfarm self-employment).

**Spatial connectivity**

In this section we describe village census data (PODES) with a focus on transportation and road quality variables and characterize changes in local road quality in the period of 1996 to 2006. The data cover all villages in the census years. For our research, we use the 1996 and 2006 rounds of PODES, as our household panel data were collected in 1995 and 2007. In the panel analysis, we take the difference between 1996 and 2007 to represent changes in the average quality of roads in local economies.

The PODES data have the information on major intervillage traffic. If the major traffic is on land, the survey asks about the

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**Figure 4.1 Location of surveyed villages in Indonesia**

Source: National Coordinating Agency for Surveys and Mapping for boundaries as of 1990; GPS coordinates collected during IMDG 2007 for the location of surveyed villages.
type of widest road for this purpose: asphalt, concrete, or cone block; hardened; soil; and others. Another question identifies whether four-wheel or larger vehicles are able to use the road all year long. From this information, it is possible to construct indicator variables for (a) major intervillage traffic = land or not, (b) type of widest road = asphalt, concrete, or cone block or not, (c) type of widest road = hardened or not, (d) type of widest road = soil or not, (e) type of widest road = others or not, and (f) four-wheel or larger vehicles can use the road all year long = yes or no.

We use the measure of the type of widest road to capture the speed of transportation in the local economy. The average is taken at the subdistrict, district, and provincial levels in each round.

\[
z_{t(j)} = \frac{\sum_{m \in N(j)} z_{t,m}}{\#N(j)},
\]

where \(z_{t,m}\) is the indicator variable, which takes the value of 1 if major intervillage traffic is on land and the road is constructed of asphalt, concrete, or cone block (good quality) and 0 otherwise (bad quality), \(N(j)\) is a set of villages within village \(j\)’s neighborhood, and \(\#N(j)\) is the number of villages in \(N(j)\). Therefore, \(z_{t(j)}\) is the probability of having good-quality transportation, which is assumed to be positively correlated with the average transportation speed in the local economy.

Table 4.1 shows the provincial averages of asphalt road indicators in 1996 and 2006. To have comparability between the two years, we use 1996 provinces for villages that changed province or district from 1996 to 2006. First, in both years, we observe interprovincial disparities in average road quality. Second, the average proportion of intervillage roads that are made of asphalt has improved in many provinces.

Table 4.2 shows tabulations of villages matched between 1996 and 2007 based on changes in intervillage road quality (asphalt or not). In many provinces, many villages have seen an improvement in intervillage road quality, although a large number of villages have seen no change in quality and a non-negligible number of villages have seen deterioration in quality. The reason for deteriorating road quality is not obvious from the data, but it may be related to inadequate maintenance or the construction of poor-quality new roads.

Next, taking the difference between the two rounds, we can see improvement and deterioration in the quality of roads in local economies:

\[
\Delta z(j) = z_t(j) - z_{t-1}(j).
\]

In all regions, the changes are symmetrically distributed, with either improvement or deterioration, although the majority shows relatively small changes around 0 (see figure 4.2). At the subdistrict level, improvement and deterioration coexist over the 10 years in Indonesia, which allows us to examine the impact of intervillage changes in road quality on household income dynamics. Comparison of the change in road quality (at the subdistrict level) between Java and non-Java regions shows that areas in Java experienced a faster improvement than areas outside Java.

Regarding distance to economic centers, we assume that the physical distance has been constant throughout the period, so it is
taken as predetermined. This information is important because we hypothesize that the development of spatial connectivity has an uneven impact on village economies, depending on the distance to major points of economic activity. Table 4.3 shows distances to the economic centers in all 98 villages, using data from the 2007 village survey.

**Household income**

In the analysis of household income dynamics, we use household panel data from two

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**Table 4.2** Changes in intervillage road quality (asphalt, concrete, or cone block or not) in Indonesia, by province, 1996–2006

<table>
<thead>
<tr>
<th>Province</th>
<th>No change</th>
<th>Percent of villages in each province</th>
<th>Difference: improved minus deteriorated</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Remain good</td>
<td>Remain bad</td>
<td>Deteriorated</td>
</tr>
<tr>
<td>Jawa Barat</td>
<td>516</td>
<td>546</td>
<td>230</td>
</tr>
<tr>
<td>Lampung</td>
<td>373</td>
<td>60</td>
<td>53</td>
</tr>
<tr>
<td>Maluku</td>
<td>249</td>
<td>349</td>
<td>91</td>
</tr>
<tr>
<td>Jambi</td>
<td>586</td>
<td>154</td>
<td>101</td>
</tr>
<tr>
<td>South Kalimantan</td>
<td>303</td>
<td>47</td>
<td>42</td>
</tr>
<tr>
<td>East Java</td>
<td>1,067</td>
<td>438</td>
<td>279</td>
</tr>
<tr>
<td>Aceh</td>
<td>989</td>
<td>1,907</td>
<td>689</td>
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<td>Kalimantan Timur</td>
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<tr>
<td>Bali</td>
<td>1,277</td>
<td>1,277</td>
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<td>Sulawesi Tengah</td>
<td>349</td>
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<td>Sulawesi Tenggara</td>
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<td>Kalimantan Barat</td>
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<td>3,653</td>
<td>1,756</td>
<td>807</td>
</tr>
<tr>
<td>Total</td>
<td>20,044</td>
<td>13,550</td>
<td>4,305</td>
</tr>
</tbody>
</table>

Table 4.3  Distance to economic centers in select villages of Indonesia
kilometers

<table>
<thead>
<tr>
<th>Province and village</th>
<th>Subdistrict</th>
<th>District</th>
<th>Province</th>
</tr>
</thead>
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<td>Lampung</td>
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<td></td>
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<td>1</td>
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<tr>
<td>Mean</td>
<td>6.9</td>
<td>32.7</td>
<td>141.1</td>
</tr>
</tbody>
</table>

Source: Authors’ calculations using IMDG 2007 Version 1.
rounds conducted in 1995 and 2007 in six provinces, as mentioned. In both surveys, we collected detailed information on income-generating activities. From each activity, we aggregated incomes to construct a household-level income measure.

To merge the income data for 2007 with the data for 1995, we aggregated incomes from original and split households using the 1995 household units. Some households split from the 1995 households (called original households), but it is important to aggregate incomes from both original and split households in 2007 to be comparable with the original households in 1995. The results are quite similar, which implies that attrition (split) bias in our panel analysis is not large (see figures 4.3 and 4.4 on per capita income growth and change in non-agricultural income share).

Table 4.4 shows descriptive statistics of key variables: number of household members ages 15–64, household income, growth of household income, share of non-agricultural income and nonfarm self-employment income in total income, landholding size, and household head’s education in 1995. First, the share of both non-agricultural and nonfarm self-employment income increased in the period. Second, about 23.6 percent of the sample households were landless. Third, about 10 percent of the household heads had completed high school or above. Lastly, nominal household income grew about 1.8 percent. However, regression analysis always includes location averages (dummies),

<table>
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<th>Table 4.4 Descriptive statistics: household income, nonagricultural income share, landholding, and education in select villages of Indonesia</th>
</tr>
</thead>
<tbody>
<tr>
<td>Variable</td>
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<tr>
<td>Number of household members ages 15–64, 1995</td>
</tr>
<tr>
<td>Number of household members ages 15–64, 2007</td>
</tr>
<tr>
<td>Household income, 2007 (100,000 rupiah)</td>
</tr>
<tr>
<td>Household income, 1995 (100,000 rupiah)</td>
</tr>
<tr>
<td>Income growth (percent)</td>
</tr>
<tr>
<td>Nonagricultural income share, 2007 (percent)</td>
</tr>
<tr>
<td>Nonagricultural income share, 1995 (percent)</td>
</tr>
<tr>
<td>Nonfarm self-employment income share, 2007 (percent)</td>
</tr>
<tr>
<td>Nonfarm self-employment income share, 1995 (percent)</td>
</tr>
<tr>
<td>Landholding size, 1995 (hectares)</td>
</tr>
<tr>
<td>Landless indicator, 1995</td>
</tr>
<tr>
<td>Head’s years of schooling, 1995</td>
</tr>
<tr>
<td>Head completed at least primary school, 1995 (0 = not completed)</td>
</tr>
<tr>
<td>Head completed high school or above 1995 (0 = not completed)</td>
</tr>
</tbody>
</table>

which control price changes specific to each location (village).

Provincial averages are compared in table 4.5. First, the shares of nonagricultural income in 2007 are higher in Java provinces than outside Java. Second, this does not necessarily imply higher income (or growth) in Java provinces. Third, landholding size is smaller in Java provinces than outside Java. It is easy to link the diminishing role of land with the increase in nonagricultural activities in rural areas, but this does not mean higher income or higher income growth in our sample.

To merge the household panel data with spatial data on road quality constructed from PODES (1996–2006), we use the information on subdistrict, district, and provincial identification. In the analysis, we interact subdistrict- and district-level road quality variables with household and village-level variables such as education and distance to the district center.

Figure 4.5 (panel A) shows the relationship between a change in the proportion of asphalt roads (at the subdistrict level) and per capita income growth in our sample. Since price change and province-level aggregate factors affect income growth (as well as the change in road quality), we control province effects to obtain the residuals. Therefore, the figure shows the effect of a change in local road quality on the residuals. Changes in local road quality and income growth are positively related, which supports our hypothesis.

Second, figure 4.5 (panel B) depicts the relationship between changes in the proportion of asphalt roads and the share of nonagricultural income. It clearly shows a

<table>
<thead>
<tr>
<th>Table 4.5 Provincial averages: household income, nonagricultural income share, landholding, and education in Indonesia</th>
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<tbody>
<tr>
<td><strong>Variable</strong></td>
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<tr>
<td>Number of household members ages 15–64, 1995</td>
</tr>
<tr>
<td>Number of household members ages 15–64, 2007</td>
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<td>Household income, 2007 (100,000 rupiah)</td>
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<td>Household income, 1995 (100,000 rupiah)</td>
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<tr>
<td>Income growth (percent)</td>
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<tr>
<td>Nonagricultural income share, 2007 (percent)</td>
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<tr>
<td>Nonagricultural income share, 1995 (percent)</td>
</tr>
<tr>
<td>Nonfarm self-employment income share, 2007 (percent)</td>
</tr>
<tr>
<td>Nonfarm self-employment income share, 1995 (percent)</td>
</tr>
<tr>
<td>Landholding size, 1995 (hectares)</td>
</tr>
<tr>
<td>Landless indicator, 1995</td>
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<tr>
<td>Head’s years of schooling, 1995</td>
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<tr>
<td>Head completed at least primary school, 1995 (0 = not completed)</td>
</tr>
<tr>
<td>Head completed high school or above, 1995 (0 = not completed)</td>
</tr>
</tbody>
</table>

positive association between the two changes. Although we face some identification issues in the estimation we conduct below, these relationships back up our hypothesis.

Next we investigate the relationship between the household head’s years of schooling and income growth or change in nonagricultural income share. In this exercise, we use observations (villages) that experienced a positive change in road quality in their subdistrict. Figure 4.6 (panels A and B) shows per capita income growth and nonagricultural income share, respectively. By controlling village effects we get the residuals to, observe intravillage variations. An interesting finding is that, as the household head’s years of schooling increase, income growth stays intact up to around completion of junior high school, but it increases substantially from completion of senior high school or higher. There seems to be a threshold in level of schooling beyond which a change in local road quality and education jointly increase the impact on income growth.

In contrast, figure 4.6 (panel B) shows a clear negative (monotonic) effect on change in nonagricultural income share. Less-educated households (measured by the household head’s schooling) are likely to have a higher share of nonagricultural income (activity) when road quality improves in their neighborhood.

We describe nonagricultural income opportunities in rural Indonesia, using the 2007 household survey data for 98 villages, with the focus on nonfarm self-employment and its linkage to the spatial connectivity of villages to economic centers. As shown in table 4.6, the mean share of nonagricultural income in total household income is about 44 percent, and the

![Figure 4.6 Impact of years of schooling of household head on per capita income growth and change in nonagricultural income in select villages of Indonesia](image)

(Source: Authors’ calculations using PATANAS 1994/95 and IMDG 2007 Version 1.
Note: Both figures use observations with change in the subdistrict-level intervillage proportion of asphalt roads greater than zero.)

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Total</th>
<th>Distance to district center</th>
<th>Distance to provincial center</th>
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</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>0–15</td>
<td>16–30</td>
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<tr>
<td>Mean share in household income by nonagricultural sector</td>
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<td></td>
</tr>
<tr>
<td>Self-employment (nonfarm)</td>
<td>22</td>
<td>21</td>
<td>24</td>
</tr>
<tr>
<td>Nonagriculture employment</td>
<td>22</td>
<td>30</td>
<td>21</td>
</tr>
<tr>
<td>Farm activities</td>
<td>36</td>
<td>32</td>
<td>38</td>
</tr>
<tr>
<td>Agriculture employment</td>
<td>19</td>
<td>18</td>
<td>17</td>
</tr>
<tr>
<td>Share of households with</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>At least one self-employment activity</td>
<td>37</td>
<td>32</td>
<td>40</td>
</tr>
<tr>
<td>At least one manufacturing activity</td>
<td>13</td>
<td>11</td>
<td>12</td>
</tr>
<tr>
<td>Distribution of all households by distance</td>
<td>100</td>
<td>30</td>
<td>37</td>
</tr>
</tbody>
</table>

(Source: Authors’ calculations using IMDG 2007 Version 1.)
share of nonagricultural income declines as the distance from either the district or provincial center increases. Within nonagricultural income, which is composed of nonagricultural labor income and nonfarm self-employment income in this analysis, the share of nonagricultural labor income declines with distance from economic centers. However, the mean share of nonfarm self-employment income in household income does not necessarily decline.

In fact, the distance from the district center does not necessarily reduce the share of households that engage in nonfarm self-employment activity. In particular, this is the case for self-employment activities that involve manufacturing or processing activities. For example, the share of households with at least one nonfarm self-employment manufacturing activity is 11 percent among households living within 15 kilometers of the district center, while the share is 16 percent among those farther than 30 kilometers. Manufacturing activities account for nearly half of self-employment activities in the survey. The main products include processed food, such as dried fish and crackers, wood (or bamboo) products, and garments (see Table 4.7).

Next, we illustrate the density (frequency) of households with self-employment activities by distance from district centers, using figures based on kernel density estimates. Our goal is to understand how nonfarm self-employment activities are linked with spatial connectivity of villages to economic centers and what type of self-employment activities are made possible by spatial linkages. In Figures 4.7 and 4.8, we compare the density pattern of households having at least one self-employment manufacturing activity with the density pattern of households having other self-employment activities. The density pattern of all households (either with or without self-employment) is also presented as a reference (dotted lines). We

### Table 4.7 Type of self-employment activities in select villages of Indonesia, by distance to economic centers

<table>
<thead>
<tr>
<th>Activity</th>
<th>Distance to district center</th>
<th></th>
<th></th>
<th></th>
<th>Distance to provincial center</th>
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<th></th>
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<tbody>
<tr>
<td></td>
<td>Total</td>
<td>0–15</td>
<td>16–30</td>
<td>30 or more</td>
<td>0–60</td>
<td>61–120</td>
<td>121–400</td>
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<tr>
<td>Manufacturing</td>
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<td></td>
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<td></td>
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<tr>
<td>Processed food</td>
<td>26.9</td>
<td>25.1</td>
<td>26.3</td>
<td>29.1</td>
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<td>28.8</td>
</tr>
<tr>
<td>Wood, bamboo products</td>
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<td>3.8</td>
<td>16.7</td>
<td>10.5</td>
<td>5.5</td>
<td>3.4</td>
</tr>
<tr>
<td>Cloth, textiles</td>
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<td>8.7</td>
<td>6.9</td>
<td>3.5</td>
<td>5.9</td>
<td>4.8</td>
<td>8.5</td>
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<tr>
<td>Building materials</td>
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<td>0.3</td>
<td>0.3</td>
<td>0.7</td>
<td>0.3</td>
</tr>
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<td>Others</td>
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<td>7.7</td>
<td>5.7</td>
<td>6.6</td>
<td>6.7</td>
<td>10.0</td>
<td>3.4</td>
</tr>
<tr>
<td>Nonmanufacturing</td>
<td>51.6</td>
<td>53.7</td>
<td>56.7</td>
<td>43.8</td>
<td>50.4</td>
<td>53.1</td>
<td>55.6</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>

Source: Authors’ calculations using IMDG 2007 Version 1.

### Figure 4.7 Self-employment activities, by province-level road density in select villages of Indonesia

Source: Authors’ calculations using IMDG 2007 Version 1.
also separate households into two groups—one with better spatial connectivity to the economic centers and one without—and compare the results.3

Figure 4.7 (panels A and B) shows that self-employment manufacturing activities exist more at distant (but not very distant) places from district centers. This relationship is particularly evident among households in provinces where the density of national and provincial roads is relatively high than among those where it is relatively low. This implies that improving road networks beyond the district level may enable manufacturing self-employment activities to emerge at distant places from district centers (but not very distant places). Although we need further investigation about why manufacturing activities are generally high in villages located between 40 and 55 kilometers from the district center, this may be related to better access to local resources (for example, woods)4 and the reasonable range of transportation time or cost (for example, within two hours) needed to reach more consumers, including those in urban provincial centers.

Figure 4.8 (panels A and B) shows similar density patterns to the previous ones. That is, self-employment manufacturing activities exist at distant (but not very distant) places from the district center. However, there is no clear difference in this pattern between households in villages where speed of access to the nearest district center is relatively high or where speed is relatively low.5 This implies that the possibility for distant households to engage in nonfarm self-employment activities may not be changed by an improvement in district-level roads via faster speed (reduced time) of transportation.

**Empirical framework**

In the analysis we estimate the following equations on income growth and change in nonagricultural income share, both first differenced between 1995 and 2007 to eliminate fixed effects. The equations for both income growth and nonagricultural income share are written as:

\[
\Delta y_{ij} = \alpha + \gamma_1 \Delta z(j) + \gamma_2 x_0^{\ast} \Delta z(j) + \gamma_3 d_j \Delta z(j) + \Delta z_{ij},
\]

where \(\Delta y_{ij}\) is income growth (or change in nonagricultural income share) for household \(i\) in village \(j\), \(\Delta z(j)\) is change in the average road quality in the neighborhood of village \(j\), \(d_j\) is the distance to a center (discussed below), \(x_0^{\ast}\) is household \(i\)'s landholdings and level of education in the initial period, and \(\Delta z_{ij}\) is an error term. As mentioned, fixed effects are differenced out.

We assume that distance to the economic activity center is predetermined and so is taken as exogenous. The economic activity point can be the subdistrict, district, or provincial center. The interaction of \(\Delta z(j)\) and \(d_j\) captures how the benefit from an improvement in spatial connectivity varies with village location and distance from economic activity points.

---

3. Figure 4.7 (panels A and B) shows that self-employment manufacturing activities exist more at distant (but not very distant) places from district centers. This relationship is particularly evident among households in provinces where the density of national and provincial roads is relatively high than among those where it is relatively low. This implies that improving road networks beyond the district level may enable manufacturing self-employment activities to emerge at distant places from district centers (but not very distant places).

4. Although we need further investigation about why manufacturing activities are generally high in villages located between 40 and 55 kilometers from the district center, this may be related to better access to local resources (for example, woods) and the reasonable range of transportation time or cost (for example, within two hours) needed to reach more consumers, including those in urban provincial centers.

5. Figure 4.8 (panels A and B) shows similar density patterns to the previous ones. That is, self-employment manufacturing activities exist at distant (but not very distant) places from the district center. However, there is no clear difference in this pattern between households in villages where speed of access to the nearest district center is relatively high or where speed is relatively low. This implies that the possibility for distant households to engage in nonfarm self-employment activities may not be changed by an improvement in district-level roads via faster speed (reduced time) of transportation.
In the above specification, we also attempt to capture heterogeneous effects of the spatial development by the initial-stage holding of assets and endowment of education at the household level. We use the information on landholding size and household head’s education in 1995.

The error term potentially consists of aggregate and household-specific shocks: 
\[ \varepsilon_{ij} = v_{ij} + \xi_{ij}. \]
To control province-specific shocks, we could include province dummies. However, village-specific shocks are correlated with local economic development, which is again correlated with dynamic change in average road quality. Thus 
\[ E\left[ \Delta v_i \Delta z(j) \right] \neq 0. \] In the estimation below, therefore, we control village-level dynamic shocks in the first-differenced specification.

\[
\Delta y_{ij} = \alpha + \gamma_{1} x_{ij}^1 \Delta z(j) + \gamma_{2} x_{ij}^2 \Delta z(j) + \text{villagedummies} + \Delta \xi_{ij}. \tag{4.4}
\]

This specification enables us to see intra-village variations in the response to the development of spatial connectivity (as the village average is controlled). Village-specific income shocks (affecting growth) are controlled by village dummies. We assume that the correlation between household-specific shocks and area-wide spatial development is not important.

We use income aggregated from both original and split households in 2007. Therefore, our results are robust to attrition bias potentially arising from endogenous household split dynamics. In the analysis, however, the migration process of individuals is taken as exogenous, which may bias our estimates given that the migration process defines the denominator used to calculate per capita income.

**Empirical results**

In this section we summarize our main results from the household analysis. Specifically, we examine household income growth, changes in the share of nonagricultural income, and changes in the share of nonfarm self-employment income. In preliminary analyses, we found that the subdistrict-level measure of road quality explains these changes better than district-level and province-level measures of road quality, probably because it has enough variations in the sample and because the development of localized spatial connectivity is important to opening access to wider economic activities (such as are available at district and provincial centers).

To capture potential heterogeneous effects of improvement in the subdistrict average road quality on income growth, we introduce some heterogeneity in the analysis: household head’s education level and landownership in 1995 at the household level and distance to subdistrict, district, and provincial centers at the village level.

The main analytical point is to investigate the role of postprimary education and initial landholding in income growth when spatial connectivity is improving in the local neighborhood and then to investigate the relationship between this and the connectivity with more distant economic centers. We include village dummies to control village-specific shocks containing price changes specific to the village economy.

In table 4.8, columns 1 and 2 use years of schooling completed, interacted with the distance to subdistrict, district, and provincial centers. The results confirm that the schooling effect is significantly positive (in the specification with the squared term). Interactions with distances are not significant. Column 3 uses the indicator that takes the value of 1 if the household head has completed high school or higher and 0 otherwise. Consistent with figure 6 (panel A), the effect is significantly positive.

The effect increases as the distance from the provincial center increases, and it decreases as the distance from the district center increases. Returns to schooling decrease if the village is far from the district center, but distance from the provincial center significantly augments the returns. Thus if the village is near the local center (district center) but the local economy is located far from the provincial center, the benefit from the improvement in spatial connectivity is larger among relatively educated villagers.

These results suggest that being a local center in a remote area is key. The marginal benefit from an improvement in local road quality is large in remote areas, probably because capital accumulation is at a low level. However, our results show that the district center is always important in the
local economy, given localized economic interactions at the district level. There seem to be two important dimensions in economic connectivity: links to the local economy (district capital) and a larger economic demand center (provincial capital). In the former, proximity to the center is always beneficial for the educated, but areas far from the center (that is, districts far from the provincial capital) are more likely to benefit from an improvement in local road quality. Regardless of the interaction with distance, education always increases the marginal benefits from an improvement in local road quality.

Columns 4 and 5 include the effects of landholding size. Although landholding does not show significant effects on income growth, the exercise proves the robustness of our previous findings on schooling.

Land is an important conventional input in agricultural production. But because the land is already in use in 1995, its conversion to nonagricultural or financial resources always incurs opportunity costs. In our findings on income dynamics, land does not matter in income growth or in nonagricultural transition, which does not exclude its static contribution to agricultural production.

Next we examine a change in the share of nonagricultural income (see table 4.9). Columns 1 and 2 examine the effects of schooling on the share of nonagricultural income. Consistent with figure 4.6 (panel B), we find that schooling decreases the change in nonagricultural income share. That is, the (positive) effect of road quality is larger among uneducated households. Distance from the subdistrict center diminishes this effect.

Columns 3 and 4 include the size of landholding interacted with the distance to economic centers. Landholding does not matter in the transition to nonagricultural activities. Education effects remain robust with landholding size.

There are three possible reasons for the negative effect of schooling on the change in share of nonagricultural income. First, the educated are more likely to have nonagricultural income opportunities than the less educated at the initial stage, and therefore the improvement in local road quality has a smaller marginal effect on the transition to
the nonagricultural sector among the educated. Second, the more educated households also have more assets for agricultural production, and thus the improvement in road quality increases the productivity of their farm activities.

Third, individual-level selectivity may cause this result. At the individual level, the educated are more likely to move out of the household over time to pursue higher-income opportunities in nonagricultural sectors. The comparison of completed schooling between current members and nonmembers shows higher average schooling among nonmembers. In the household with an educated head, other members are also likely to be educated. Therefore, if the migration selection is important in the period of 1995–2007, an inverse correlation between schooling (at the household level) and the transition to nonagricultural work is feasible. This is because educated agents migrate, and relatively less educated agents stay.

Yamauchi et al. (2008) and Dewina and Yamauchi (2008) recently showed evidence supporting the above third possibility. The young and educated, relative to the household head, tend to move out of their households (Dewina and Yamauchi 2008). If out-migrants work in nonagricultural sectors, the share of labor supplied in non-agricultural sectors in the extended family (including out-migrants) increases as the local spatial connectivity improves and the household head’s education is greater, and the distance from provincial capital augments the positive complementary effect (Yamauchi and others 2008).

Table 4.10 shows results for a change in nonfarm self-employment as a share of income. We use the same specifications adopted in the previous analyses. In column 1, we find that the schooling effect critically depends on village location. Distance from the provincial center reduces the schooling effect, while distance from the subdistrict center increases the effect. This probably means that nonfarm business activities tend to pay off in areas close to economic centers with large (heterogeneous) demand such as the provincial center. Large demand enables households to cover a relatively large setup cost. The distance effects are all negative in the landholding effect, which is also consistent with our finding.
Table 4.10 Change in average road quality and nonfarm self-employment income share in select villages of Indonesia

<table>
<thead>
<tr>
<th>Independent variable</th>
<th>(1)</th>
<th>(2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Educ</td>
<td>0.0676</td>
<td>-0.0016</td>
</tr>
<tr>
<td>Educ_Distance subdistrict</td>
<td>0.0077</td>
<td>0.0183</td>
</tr>
<tr>
<td>Educ_Distance district</td>
<td>0.0081</td>
<td>0.0099</td>
</tr>
<tr>
<td>Educ_Distance province</td>
<td>-0.0021</td>
<td>-0.0022</td>
</tr>
<tr>
<td>Land size</td>
<td>0.1860</td>
<td></td>
</tr>
<tr>
<td>Land_Distance subdistrict</td>
<td>-0.0065</td>
<td></td>
</tr>
<tr>
<td>Land_Distance district</td>
<td>-0.0017</td>
<td></td>
</tr>
<tr>
<td>Land_Distance province</td>
<td>-0.0004</td>
<td></td>
</tr>
<tr>
<td>Village dummies</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>R²</td>
<td>0.0708</td>
<td>0.0747</td>
</tr>
<tr>
<td>Number of observations</td>
<td>644</td>
<td>644</td>
</tr>
</tbody>
</table>

Note: Numbers in parentheses are absolute t-values, using robust standard errors with village-level clusters. Education variable: 1 = household head completed high school or higher; 0 = otherwise. The dependent variable is the change in nonfarm self-employment income share; the independent variables are interacted with change in average road quality.

Table 4.11 Summary of parameter signs in select villages of Indonesia

<table>
<thead>
<tr>
<th>Independent variable</th>
<th>Per capita income growth</th>
<th>Nonagricultural income share</th>
<th>Nonfarm self-employment income share</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(1)</td>
<td>(2)</td>
<td>(3)</td>
</tr>
<tr>
<td>Educ</td>
<td>+</td>
<td>+</td>
<td>++</td>
</tr>
<tr>
<td>Educ_Distance subdistrict</td>
<td>-</td>
<td>-</td>
<td>++</td>
</tr>
<tr>
<td>Educ_Distance district</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Educ_Distance province</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Land size</td>
<td>n.a.</td>
<td>n.a.</td>
<td>n.a.</td>
</tr>
<tr>
<td>Land_Distance subdistrict</td>
<td>n.a.</td>
<td>n.a.</td>
<td>n.a.</td>
</tr>
<tr>
<td>Land_Distance district</td>
<td>n.a.</td>
<td>n.a.</td>
<td>n.a.</td>
</tr>
<tr>
<td>Land_Distance province</td>
<td>n.a.</td>
<td>n.a.</td>
<td>n.a.</td>
</tr>
<tr>
<td>Village dummies</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>R²</td>
<td>0.1093</td>
<td>0.1119</td>
<td>0.1004</td>
</tr>
<tr>
<td>Number of observations</td>
<td>589</td>
<td>589</td>
<td>644</td>
</tr>
</tbody>
</table>

Note: Three signs are significant at 1 percent level. Two are significant at 5 percent level. One is significant at 10 percent level. Minus (−) means coefficient is minus and plus (+) means coefficient is plus. Blank cells: Variables are not statistically significant.
n.a. Not applicable (not included in the specifications).
Note: Education variable: 1 = household head completed high school or higher; 0 = otherwise. The independent variables are interacted with change in average road quality.

Table 4.11 summarizes the signs of our parameter estimates. First, interesting results are concentrated in education effects. In general, land does not matter in the dynamics of household income and nonagricultural transition. Second, while education augments the impact of road quality improvement (spatial connectivity) on per capita income growth, it decreases the impact on nonagricultural transition. Third, a similar contrast is observed in the role of distance to different economic centers. In the transition to nonagricultural activities among educated households, the marginal impact of an improvement in local road quality is large in locations distant from local economic centers (subdistrict capital), but in income dynamics, the impact is large in villages far from the provincial capital.

In our definition, nonagricultural activities only cover activities done by current...
household members. This excludes non-members who work in locations distant from their village (not able to commute from their village). Therefore, it is still possible that we are missing migration-linked nonagricultural transition. Instead, income growth includes agriculture-based growth, which, for example, includes improved marketing of agricultural products (for example, vegetables). In this activity, connecting to larger demand centers seems to be a driving force.

Policy discussion
This paper is intended to bridge the gap between academic studies and infrastructure planning. Previous academic studies on spatial connectivity of rural households were limited in the sense that they perceived connectivity only as access to local towns or distance from growth centers and were unable to discuss the combination of both. But in actual policy choices, public investment planners face decisions on the allocation of resources among trunk roads (which lead to economic centers) and local roads. Public investment planners also face policy choices regarding the balance between spending on education and spending on roads.

The analyses described in this paper suggest that the more educated households can raise their income with better spatial connectivity at the local level. Better-quality local roads may also improve the access of remote villages to trunk roads and thus help the more educated to engage in better job or business opportunities in the district capital (local economy) or provincial capital (larger economic center).

However, the effect on income growth is augmented both by proximity to the district center, which is significantly positive, and by distance from the provincial center, which is significantly negative. Although we cannot include it in the empirical analysis due to data limitations, this difference may be due to the market space as well as the value added of different income-generating activities. First, income-generating activities exist that focus on the market, with a district capital as the local economic center. These may include activities such as food processing with low value added (such as dried fish or chips and crackers) and marketing of staple foods. In this case, proximity to the economic center is a key, as it reduces transport-related transaction costs. However, other types of activities have a wider market area, especially catering to urban economic centers such as provincial centers. These may include higher value added goods, such as bamboo or wood products, that are sold in large urban markets. Another example is high-quality vegetables for the urban market. In this case, the added value is high enough to cover the transaction costs due to transportation, making distance from the provincial center not an obstacle, provided that it is connected to economic centers. Better road connectivity to the provincial center in the form of better local roads may give remote villages the chance to market such value added products.

In the former case, improving the trunk roads connecting villages to closer district centers is important, as is improving local roads that provide access to trunk roads. In the latter, it is important to develop the network of trunk roads that connect villages to distant economic centers, such as the provincial capital, as well as to improve local roads.

Poverty reduction strategies adopted by low-income countries, especially those in Africa, are entering a second stage in which they are becoming more growth oriented. Compared with the previous generation of strategies emphasizing the allocation of resources to primary education and health, the current generation focuses on growth strategies. Yet little is known about the combination of public investments that induces growth. This paper suggests that investing simultaneously in connecting local neighborhoods spatially with one another as well as in connecting them to distant economic centers pays off. It also suggests that investing in both higher education (high school and above) and roads is important. Although the actual approach should be country driven and country specific, such findings can add value to the next generation of growth-oriented poverty reduction strategies.

Conclusions
This paper has examined the impact of spatial connectivity on household income growth
and nonagricultural income share, combining household panel data and village census data in Indonesia. Empirical results show that the impact of an improvement in road quality in the local area (positively correlated with an increase in transportation speed) on income growth and the transition to nonagricultural activities depends on the distance to economic centers and household education and landholding size. In particular, postprimary education significantly increases the benefits from an improvement in local connectivity in remote areas. Postprimary education and local road quality are complementary, increasing income growth. Therefore, the effectiveness of improved local connectivity (measured by household income growth) depends on village remoteness and initial household-level endowment.

Notes
Futoshi Yamauchi is a research fellow and Reno Dewina is a research analyst with the International Food Policy Research Institute (IFPRI); Megumi Muto is a senior economist with the Japan Bank for International Cooperation (JBIC) and Sony Sumaryanto is a senior researcher with the Indonesian Center for Agriculture Socio-Economics and Policy Studies (ICASEPS). The authors would like to thank JBIC for financial support. This study is based on a collaboration of JBICI, IFPRI, and ICASEPS.

1. 1994–95 PATANAS survey consists of two subsurveys. Income and production data are available from the second part, which contains 34 villages in six provinces excluding South Kalimantan. To merge the household panel data with spatial data on road quality constructed from PODES (1996–2006), we use the information on subdistrict, district, and province identification. In the analysis, we interact subdistrict-level road quality variables with household- and village-level variables such as landownership and distance to district center. At this stage, we cannot construct road quality data for two subdistricts in North Sulawesi, as they have missing information in PODES. When we constructed village panel data from PODES for other studies to analyze village dynamics, we had a problem in linking villages across rounds because of village divisions and mergers partly due to the decentralization process in the country. To solve this problem, we linked subdistricts and then linked villages within each subdistrict by their names. In this chapter, however, because we only use subdistrict-level information—the average proportion of asphalt roads in intervillage roads—the above problem is less important.

2. We use Epanechnikov kernel function and a default bandwidth in the application. We also have performed estimations with alternative bandwidths, but the key messages presented in this paper are almost the same.

3. We use two types of spatial connectivity indicators. First, we calculate the national and provincial road density, in terms of road distance per area, as a proxy for road network for each of seven surveyed provinces, using data in JBIC (2004) because development of both a road network within an economic region (for example, a province) as well as a route to economic centers is important for measuring spatial connectivity. The road density ranges from 0.04 in South Kalimantan province to 0.13 in North Sulawesi province. Second, we calculate indicators of speed (kilometers per minute) to reach the district or provincial center, using data on time to get there by the most common mode of transportation, as physical distance may have different implications for the connectivity to economic centers, depending on factors such as road and traffic conditions. In fact, indicators of speed are not significantly correlated with physical distance in our data.

4. The data show that manufacturing activity related to wood (including bamboo) accounts for more than 25 percent of all manufacturing activity in villages located 40–55 kilometers from the district center, while the main manufacturing activity in other areas is food processing.

5. The high-speed group includes villages where the speed (kilometers per minute) to reach the nearest district center is equal to or more than 0.56 kilometer in dry season, and the low-speed group includes other villages.

6. In our empirical setting with a small number of villages in each subdistrict, we cannot identify the effect of a change in the subdistrict-level road quality on household-level outcomes. As figure 3 shows, the effect seems to be positive for income growth and negative for nonagricultural income share. In preliminary analyses, we could not find significant effects with province-level dummies except in a few cases. Therefore, we focus on intravillage distributional effects (with village dummies controlling for price changes and village-level shocks) in our parametric estimation.

References
Spatial networks, incentives and the dynamics of village economies


This chapter argues that both Singapore and Malaysia potentially could enjoy considerable synergies if the Iskandar Development Region (IDR) would become integrated more seamlessly with the Singapore economy through the freer movement of people, goods, and capital. However, political barriers do present a major challenge to realizing these synergies. The fact that Singapore and the IDR are in different political jurisdictions is further complicated by several political difficulties related to the legacy of Singapore’s bitter separation from Malaysia in 1965, ethnic tensions, the affirmative action program pursued by Malaysia, and the presence of vested interests.

This chapter is structured as follows. It begins by sketching the key factors determining the relationship between Singapore and Malaysia and then assesses their current economic relationship as well as Singapore’s current ties with the IDR. This is followed by an assessment of the key features of the two countries’ economic development that will influence the manner in which they could collaborate on the IDR, an analysis of the impact of political differences on their economic relationship, and a discussion of the various channels through which synergies could be realized for Singapore’s economy through greater collaboration with the IDR. The chapter concludes with an assessment of the way forward. The relation between the focus of this chapter and the World Development Report 2009 is presented in box 5.1.

Background

The IDR was formally launched by Malaysian Prime Minister Abdullah Ahmad Badawi in November 2006. The Malaysian government had earlier appointed Khazanah Malaysia, its holding company for a large number of state-owned companies, to take the lead in developing the IDR. Given that the IDR is fairly well developed, with significant industrial, logistical, tourist, and business centers, the aim of the initiative is to take the IDR to an even higher level of development so that it becomes “a strong, sustainable conurbation of international standing” (see Khazanah Malaysia 2006). By 2030, the region is projected to have a per capita income equal to that of a developed country.

Encompassing an area of 2,216 square kilometers, the IDR is located in the southern part of Malaysia’s Johor state, just across the narrow Johor strait that separates Singapore from Malaysia. It already has an international airport, a successful port that has drawn some shipping lines away from Singapore, good road and rail links to other parts of Malaysia as well as Singapore, townships, tourist resorts that attract visitors from Singapore, and a population of 1.4 million. The area embraces a large manufacturing hub that is globally competitive and has benefited from the relocation of manufacturing production from Singapore.
Key factors driving the relationship between the two regions

This section sketches the current state of the economic relationship between Singapore and the IDR and identifies key features of the Singapore and Malaysian economies that affect their relationship.

Current economic ties

With only a 1-kilometer-wide strait dividing Singapore and Malaysia and a long history of close economic integration, the movement of goods, people, and capital between Singapore and Malaysia and between Singapore and the IDR is quite substantial.

In terms of trade, Malaysian goods comprise 15 percent of all imports into Singapore, and Singapore exports 13 percent of its exports to Malaysia. The top-traded items include electrical and electronic products and refined petroleum products. The former reflects the existence of production networks of major electronics firms with collaborating facilities in both Singapore and the IDR. Many goods are shipped to southern Malaysia from the outside world through Singapore’s port, generating substantial traffic in goods between Singapore and the IDR. Similarly, many goods manufactured in the IDR are shipped through Singapore’s port.

Table 5.1 shows Malaysia’s position as a destination for outward investment from Singapore. Although an important destination, Malaysia has received a declining share of Singapore’s investment since the Asian financial crisis. China now receives the lion’s share of Singapore’s outward direct investments, and Singapore has started investing in India, which had not attracted much Singapore investment in the past. Other emerging markets like Vietnam have also seen Singapore investments more than double in the past few years. Malaysia now has to compete with newly industrialized countries like China and India for its share of Singapore direct investment.

Singapore companies, especially the smaller ones, see Malaysia and, in particular, Johor as the natural place to relocate production when costs rise in Singapore. An example is the shift of Super Foods, a maker of instant coffee and foodstuffs, from its base in Singapore to Pasir Gudang in southeast Johor, just across the water from Singapore. The plant currently employs 150 workers. Naigai Nitto, a Japanese company with headquarters in Singapore, also runs several

<table>
<thead>
<tr>
<th>Recipient</th>
<th>1996</th>
<th>2001</th>
<th>2005</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASEAN</td>
<td>32.3</td>
<td>19.8</td>
<td>23.8</td>
</tr>
<tr>
<td>Malaysia</td>
<td>17.3</td>
<td>8.4</td>
<td>8.6</td>
</tr>
<tr>
<td>Hong Kong, China</td>
<td>12.0</td>
<td>8.6</td>
<td>6.6</td>
</tr>
<tr>
<td>Indonesia</td>
<td>7.0</td>
<td>4.2</td>
<td>7.5</td>
</tr>
<tr>
<td>Philippines</td>
<td>1.8</td>
<td>2.1</td>
<td>1.9</td>
</tr>
<tr>
<td>Thailand</td>
<td>2.8</td>
<td>3.4</td>
<td>4.1</td>
</tr>
<tr>
<td>India</td>
<td>0.5</td>
<td>0.6</td>
<td>1.0</td>
</tr>
<tr>
<td>China</td>
<td>11.5</td>
<td>11.8</td>
<td>13.8</td>
</tr>
</tbody>
</table>

Source: Singapore Department of Statistics. a. Year-end stock for all sectors.

Divisions are preventing two countries from fully extracting the benefits of the growing density of economic clusters in Singapore. The challenge for Singapore and Malaysia is to capture the benefits of proximity, thereby reducing international fragmentation and increasing regional concentration. Our main policy recommendation is for both countries to seek ways to eliminate the barrier of distance.

The discussion of Singapore and Malaysia relates to the following issues raised in the WDR:

- Scale economies. Increased integration of economic activities between Singapore and Johor would yield dividends from agglomeration and large-scale economies, which Singapore has not been able to exploit fully due to its small size.
- Factor mobility. A key route to achieving factor mobility is to achieve freer flow and mobility of skills, knowledge and ideas, labor, and capital.
- “Bridge” the distance gap. Facilitating the convergence of the markets would reduce transportation costs and directly enhance trade between the two countries.

Density, distance, and division: Singapore and Johor

This chapter is written in the spirit of the World Development Report (WDR) 2009, which focuses on density, distance, and division:

- Rising density. Rapid urbanization is increasing the density of urban agglomerations. More and more activity is being concentrated in increasingly denser cities. Singapore is rapidly emerging as a global center of commerce, attracting clusters of economic activity that are densely located within its limited territory.
- Falling distance. The concentration of economic mass in urban agglomerations reduces the distance between economic producers, now concentrated more proximately to each other in cities. The flow of goods, services, equity capital, direct investment, and technology is higher the shorter the distance between two centers of economic activity.
- Persisting divisions. The number of borders between countries has increased threefold since 1950. Until Singapore gained independence in 1965, Singapore and Malaysia operated mostly as a single economic entity. Before 1965, other than customs checks (Singapore was a free port), there were no barriers between the two territories.
of its logistics and warehousing operations near Tanjung Pelepas in the IDR.

The close ties are also evident in the number of commuters who cross the border daily. An estimated 205,000 Malaysians work in Singapore, of which 60 percent commute in and out through the checkpoints every day. Most of the commuters are engaged in the electronics and electrical industry. Almost 60 percent of these commuters are Johor born. Most of the workers who traverse the border daily are part of the unskilled or semiskilled workforce, drawn by wages in Singapore, which can be between two and three times the wages they would receive in Johor. This is one of the reasons why Johor’s unemployment rate is low. Conversely, about 130,000 Singaporeans visit Malaysia every day for tourism and work.²

A Comparison between Singapore and Malaysia (IDR)

Table 5.2 outlines some of the key features differentiating Singapore from the IDR (or Malaysia where data for the IDR are not available). This brief analysis and accompanying tables seek to highlight some of the key features of the relationship between Singapore and the IDR.

First, there are strong complementarities. Singapore is rich, well developed, and well regulated, and its educational system produces a relatively highly skilled labor force that is increasingly first world in terms of capacity. However, it is beginning to encounter constraints in terms of land and labor, and it needs to do more to unleash entrepreneurial energies. Singapore is ranked one of the most competitive economies in the world, whereas Malaysia has seen its competitiveness rankings fall over the years; they are now substantially lower than Singapore’s except in business process outsourcing, where the A T Kearney Index ranks Malaysia third in the world and Singapore eleventh. The IDR is well endowed with land, unlike Singapore, where only 15 percent of the territory is developed. Although its population

Table 5.2 Comparison of Singapore and the IDR

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Singapore</th>
<th>Iskandar Development Region, Malaysia</th>
</tr>
</thead>
<tbody>
<tr>
<td>Area (square kilometers)</td>
<td>692.7</td>
<td>2,216.3</td>
</tr>
<tr>
<td>Population¹</td>
<td>4.5 million</td>
<td>1.383 million</td>
</tr>
<tr>
<td>GDP</td>
<td>US$136.9 billion</td>
<td>US$20.0 billion</td>
</tr>
<tr>
<td>Population density (people per square kilometer)</td>
<td>6,376</td>
<td>631.8</td>
</tr>
<tr>
<td>GDP per square kilometer</td>
<td>US$197.6 million</td>
<td>US$9.0 million</td>
</tr>
<tr>
<td>GDP per capita²</td>
<td>US$30,422</td>
<td>US$14,790</td>
</tr>
</tbody>
</table>

Main constraints

Land

Geological and political limits of land reclamation are being reached; 30 square kilometers were reclaimed in past 40 years. Geographical and political constraints are being met; only 15 percent of land in the IDR is under development, leaving considerable land available for economic development purposes.

Labor

Against a current population of 4.5 million, Singapore has a “planning parameter” of 6.5 million by a notional year X, representing the maximum population that its officials believe Singapore can accommodate. Population density is low, and many Malaysians from other parts of the country migrate to the IDR for work. There is ample flexibility to expand and enough room to accommodate inward migration from other parts of Malaysia to raise IDR’s population and workforce, as needed.

Education

Singapore’s education system is highly ranked globally: for example, the National University of Singapore is ranked 33rd in the world.³ Malaysia’s education system has been criticized. Two of its universities used to be ranked among the top 200 global universities, but no longer enjoy this ranking.

Main strengths and weaknesses

General competitiveness

Singapore is ranked among the world’s top 10 in general competitiveness surveys. Malaysia is ranked well behind Singapore in general competitiveness surveys.

Logistics

Singapore is ranked first in the World Bank Logistics Performance Index. Malaysia is relatively well ranked, at 27 in the same survey, just behind Republic of Korea and Spain, but still far behind Singapore.

Ease of doing business

Singapore ranks first in World Bank rankings. Malaysia is relatively well ranked at 24, which puts it behind only Hong Kong, China, and Thailand in East Asia.

Governance

Singapore is above the 90th percentile in all key areas except voice and accountability. Malaysia is relatively highly ranked (80th percentile) for government effectiveness but ranks poorly in other areas.

(continued)
is small, there is a large, growing, and still-youthful population in the rest of peninsular Malaysia that can be tapped by businesses operating in the IDR should the need arise. The mobility of labor across the peninsula is sufficiently fluid given that workers from all over Malaysia already work in the Johor’s industrial estates as well as in Singapore.

Second, there are some competitive elements in the economic relationship between the two territories. The ports clearly compete, as seen in the growth of the IDR’s Port of Tanjong Pelepas after a successful effort to lure two large shipping customers away from the Port of Singapore. Competition is also evident in related logistics businesses, such as recent efforts to set up bunkering facilities.

### Key features of Singapore’s economy

The Singapore economy has gathered substantial momentum in recent years after a period of sharply fluctuating GDP growth in 1998–2003, a period marked by painful domestic restructuring and significant external shocks (recession in the United States, including a downturn in technology demand in 2001–02, and the outbreak of severe acute respiratory syndrome [SARS], in 2003). More recently, the economy has been growing rapidly, by 8.8 percent in 2004, 6.6 percent in 2005, 7.9 percent in 2006, and around 7.5 percent in 2007, according to preliminary estimates.
Some characteristics of Singapore’s growth carry important implications for the relationship with Malaysia and the IDR.

First, Singapore is in a new phase of growth in which it is reaping the benefits of the economic restructuring, deregulation, and policy changes carried out in 1996–2004. Its economy is drawing in substantially more foreign professionals, workers, and investors than before. New engines of growth have emerged (high-value manufacturing, such as pharmaceuticals, petrochemicals, and electronic components, as well as new financial services, such as wealth management and hedge funds). Long-stagnant activities, such as construction, are growing strongly again.

As a result, Singapore’s gross domestic product (GDP) growth averaged close to 8 percent in 2004–07, above the 3–4 percent level that the Singapore government estimates is its long-term potential growth rate. Consequently, capacity is becoming constrained: unemployment fell to a decade low of 1.7 percent in the third quarter of 2007, causing wages to accelerate. Rents for homes and offices are soaring, in many cases doubling or even tripling over year-earlier levels. Road congestion has worsened significantly as well. It is becoming increasingly difficult for incoming expatriate families to secure places in international schools for their children.

Third, a key plank in Singapore’s growth strategy is to build itself up as a global city, one that aspires to be more than just a regional hub for Southeast Asia. Rather, Singapore ambitiously seeks to transform itself into a city, like London or New York, capable of being a hub for global financial market activities and business operations.

Fourth, the composition and distribution of Singapore’s growth remains uneven and may be getting more so. The poorer segments of the population are not enjoying the benefits of growth and bore a disproportionate share of the burden of economic adjustment during the economic restructuring in the early 2000s. The bottom quintile of the income distribution experienced a fall in real income in 2000–05, with the bottom 50 percent seeing a substantial deceleration (see Chan 2007). Data from the Department of Statistics show that locally owned companies underperform foreign-owned companies in terms of profitability. This is creating political pressures that are likely to persuade policy makers eventually to refine Singapore’s growth strategy to achieve a more balanced and equitable growth. This chapter argues that improved access to the IDR for poorer Singaporeans and less profitable Singapore companies would allow both groups to improve their relative position as a result of lower costs of living and business operations in the IDR.

Fifth, Singapore is aging rapidly. The proportion of the population above 65 years of age rose from 3.4 percent in 1970 to 4.9 percent in 1980, 6 percent in 1990, 7.2 percent in 2000, and 8.5 percent in 2006. These features of Singapore’s economy raise important questions for its relationship with the IDR. Can Singapore become a global city without expanding its relationship with the IDR?

Key features of the Malaysian economy

Unlike Singapore, which has overcome a period of slower growth, Malaysia has not yet regained the vigor it lost after the Asian financial crisis (see table 5.3). The Philippines, in contrast, grew 7.5 percent in the first half of 2007, substantially exceeding the growth of Malaysia. Some trends in Malaysia’s growth experience stand out.

A good part of the deceleration in growth post-crisis is due to a sharp fall in the ratio of investment to GDP, from above 40 percent in the years just prior to the crisis to 20.9 percent in 2006. This is despite fairly strong public sector investment spending, showing that the fall has been primarily due to desultory private investment.

Malaysia’s competitiveness has taken a hit as measured by general competitiveness indexes such as those constructed by the World Economic Forum and the Institute for Management Development. This suggests that Malaysia has not adjusted to the much more competitive global economy that has emerged as China, India, and others such as Vietnam have liberalized and reformed their economies.
More recently, Malaysian export growth has been weak, mainly due to the slowdown in demand for the technology-related products in which it specializes. Yet the other technology-dependent economies such as Korea, the Philippines, and Singapore have had different experiences. Singapore has found new manufacturing activities that have been able to offset the technology slowdown, while the Philippines has found sources of growth outside manufacturing.

However, Malaysia has made some progress in developing a competitive position in exportable services. It has been consistently ranked by A T Kearney as third in the world after India and China as a location for business process outsourcing. Malaysia’s exports of educational and medical services have also been rising. Malaysia continues to grow as a tourist destination. In all of these areas—education, medical services, and tourism—Singapore struggles to attract customers who are highly price sensitive, giving lower-cost Malaysia the edge among this group of customers. However, Singapore’s more rigorous educational and medical standards and regulations, coupled with its investment in cutting-edge equipment and its success in assembling a critical mass of specialists who have rare skills in these activities, gives it the edge in providing higher-priced medical and educational services. Thus while Singapore and Malaysia (IDR) may well compete with one another in the areas of educational and medical space, they are complementary in a larger sense.

Within Malaysia, Johor is a major pole of economic growth and has a manufacturing and services economy that is globally competitive in key areas. Johor has enjoyed better flows of foreign direct investment (FDI) than any other state in Malaysia for the last three years. Foreign investments approved in Johor rose sharply from RM 1.4 billion in 2002 to RM 5.9 billion in 2005. In the field of education, Johor has some key universities, including the Universiti Teknologi Malaysia.

Malaysian policy makers realize that they need to create new strategies to reignite Malaysia’s economic dynamism. To this end, they have been reforming the economy. Capital controls have been eased substantial-ly. Government-linked companies have been restructured to raise efficiency. Significant efforts have been made to improve the delivery of public services. Most recently, the government has implemented the policy of setting up economic growth corridors, of which the IDR is just one. Two others have been announced, with another two to follow.

### Potential synergies between Singapore and the IDR

In this section, we identify areas where Singapore’s economy could enjoy synergies from greater economic integration between Singapore and the IDR. Synergies are defined here as the achievement of greater welfare for each country individually as a result of cooperation than they would enjoy if they did not cooperate. The combination of the two territories creates more welfare in total than the individual sum of the welfare of each country prior to cooperation.

We see several channels through which synergies could be realized if Singapore and the IDR were to cooperate more together.

- **Rational use of resources.** Reallocation of scarce resources such as land and labor to higher-value uses would create higher economic output.

- **The benefits of scale and diversity.** The size of the combined Singapore and IDR economies would be substantially larger (table 5.1), allowing more scope for businesses and consumers to exploit economies of scale and other benefits of scale.

- **Leveraging off each other’s competitive advantages.** There are important differences in competitiveness between Singapore and the IDR (Malaysia). Each territory could leverage off the relative

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### Table 5.3 Economic growth before and after the Asian financial crisis, by country, 1991–2006 percent a year

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>China</td>
<td>11.9</td>
<td>10.6</td>
</tr>
<tr>
<td>Indonesia</td>
<td>7.3</td>
<td>5.6</td>
</tr>
<tr>
<td>Japan</td>
<td>1.7</td>
<td>2.0</td>
</tr>
<tr>
<td>Korea, Rep. of</td>
<td>7.7</td>
<td>5.5</td>
</tr>
<tr>
<td>Malaysia</td>
<td>9.6</td>
<td>5.5</td>
</tr>
<tr>
<td>Philippines</td>
<td>2.8</td>
<td>5.2</td>
</tr>
<tr>
<td>Singapore</td>
<td>8.7</td>
<td>7.2</td>
</tr>
<tr>
<td>Thailand</td>
<td>8.2</td>
<td>4.8</td>
</tr>
</tbody>
</table>

Source: Collated by Centennial Group using CEIC database.
advantage of the other. For instance, the IDR could benefit from being associated with Singapore’s higher rankings in governance and ease of doing business.

- **Dynamic benefits of competition.** Increased interaction would bring about more opportunities for competition, stimulating efforts to overcome performance gaps and leading to improvements in the lagging territory.

Reallocating land alone would yield significant net gains to Singapore: moving some activities from Singapore to the IDR would allow this land to be used for even higher-value activities, resulting in a net addition to GDP.

**Reallocation of land and labor to higher-value uses**

Several aspects of the successful reallocation of resources would make sense for both Singapore and the IDR. First, whole business or industrial sectors could be moved from Singapore to the IDR, if doing so were mutually beneficial. In the past, for instance, Singapore has made policy changes that resulted in the elimination of entire sectors. For example, the removal of tariffs in the early 1970s led to the movement of automobile assembly out of Singapore, and the 1980s environmental decision to end support for pig farming resulted in the movement of activity to neighboring countries.

Second, the more labor- or land-intensive operations of a particular activity could be moved to the IDR from Singapore, leaving high-productivity work that is done more profitably in Singapore. For example, a watch manufacturing plant could shift to the IDR the manufacture of low-cost watches that do not need a high level of skilled labor or precision engineering capital equipment, enabling it to concentrate its scarce factory space and expensive workers in Singapore on higher-value watches or watch components. There are a number of important issues to consider here.

First, Singapore’s economic planners are determined that manufacturing should remain a key segment of Singapore’s economy. Singapore will therefore not follow Hong Kong, China’s, example: manufacturing in Hong Kong shrunk in the 1980s, and Hong Kong became a mostly services-producing economy. By providing the right incentives and economic fundamentals, Singapore continues to attract highly capital-intensive and technologically intensive manufacturing, as seen in the surge to a record high S$20 billion in net investments in manufacturing in 2007. Many of the new manufacturing investments in Singapore relate to capital-intensive activities such as petrochemicals or pharmaceuticals (capital intensive as well as requiring a regime that protects intellectual property) or in cutting-edge alternative energy (such as solar cells). However, to accommodate these new industries without straining the capacity of industrial zones in Singapore, lower value added manufacturing activity needs to be relocated out of Singapore.

Second, Malaysia itself has become a labor importer and is not a labor-surplus economy, so it might be said that relocation of labor-intensive activities from Singapore to Malaysia does not make sense. But Malaysia has maintained relatively liberal immigration policies, allowing about 2 million foreign workers (mainly Indonesians) to work in Malaysia. Moreover, Malaysia does not need to offer Singapore companies Chinese-level or Indian-level labor costs: so long as Malaysian labor costs are substantially below Singapore’s, the greater familiarity that its business environment offers to Singapore companies (given historical, linguistic, and cultural legacies) will make relocation to Malaysia or the IDR a viable proposition for many Singapore businesses.

Third, the relocation would not be of existing activities but of future ones. For example, some of the growth in aviation, educational, and other activities needed to service Singapore’s ambitious growth in the future could be located in the IDR.

For the IDR, with 85 percent of its area undeveloped, including 58 percent of land now devoted to agriculture, land is not a binding constraint, and the case for relocating activities to it is relatively straightforward. Relocation of activities could be accommodated and would be beneficial so long as the value created from relocation exceeds the value of agricultural and other rural activities that are replaced. For
Back-office support services

To be viable, such support services need office space (land) and relatively lower-paid staff. Neither are Singapore’s strengths. As wages and rentals rise in Singapore, activities that can be shifted profitably out of Singapore could include all types of simple transactions processing, basic bookkeeping and accounting, customer service or call centers, draftsmanship for architectural firms, and so forth.

Source: Estimates by Centennial Group.

Singapore, the analysis is more complex. Table 5.4 assesses the potential benefits to Singapore of relocating activity to the IDR.

This analysis supports the case for substantial benefits from relocating present or future activities from Singapore to the IDR. The net benefits would be considerable:

- Singapore as well as the IDR would realize a one-off gain in GDP, as land and labor are released to higher-value activities. This would apply mostly to manufacturing, port, warehousing, and back-room support services;
- Greater competitiveness and business flexibility would come as Singapore businesses are able to provide a range of products and services profitably, the production of which can be located in

### Table 5.4 Benefits of relocating and undertaking complementary activities

<table>
<thead>
<tr>
<th>Activity</th>
<th>Potential for relocation</th>
<th>Benefits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manufacturing</td>
<td>Substantial manufacturing activity has already shifted from Singapore to districts such as Johor Baru, Pasir Gudang, Kulai, and Senai in the IDR in the past 20 years. Each manufacturer has plants in both the IDR and Singapore, each focusing on a different component or finished good. As land, labor, and other costs continue to rise in Singapore, manufacturing activity will probably continue to relocate to the IDR. The policy incentives and infrastructure exist to support such relocation.</td>
<td>Year-to-date 2007 alone has seen S$20 billion of new manufacturing projects committed to Singapore, against an average in past years of less than S$10 billion. Most of this is in very capital- and skill-intensive areas (petrochemicals, alternative energy technologies, high-end electronics). This will raise input costs, making lower value added per worker in manufacturing activities less viable in Singapore. Shifting such activities to the IDR would be best for Singapore: being close to Singapore would mean that such activities would continue to use Singapore-based financial, transportation, and logistics services, while releasing resources for the higher-end activities entering Singapore.</td>
</tr>
<tr>
<td>Port</td>
<td>Five port terminals occupy 6 square kilometers of land, 0.8 percent of total land in Singapore. Three of these directly abut the central business district, where very high-value financial and business services are constrained by lack of office space.</td>
<td>Releasing the land from use by the port to use by finance business activities would result in a net addition to GDP. Road congestion would improve considerably, as container lorries would not compete with other users for scarce road space. Singapore’s marine services sector (specialized legal, logistics, finance for shipping) is already well developed and has critical mass. Like London, the reduction of actual port activities in Singapore will probably not result in such activities moving out of Singapore.</td>
</tr>
<tr>
<td>Airport</td>
<td>The airport occupies 13 square kilometers of land. A third terminal will bring capacity to 70 million passengers a year, sufficient to accommodate growth well into the next 20 years. Sufficient land has been reclaimed for a third runway and a fourth terminal: hence the land constraint is not as binding as in ports.</td>
<td>Benefit comes not from relocating aviation services from Singapore to the IDR but rather from complementing the primary airport in Singapore with a secondary airport in the IDR connected directly to Changi. This would allow Singapore as a metropolis to have the number of airports that successful global cities have.</td>
</tr>
<tr>
<td>Tertiary educational and research institutions</td>
<td>Singapore has three full-fledged universities with several campuses for other tertiary activities (such as business schools and research institutes). As the economy climbs the value added ladder and is pressed to generate its own innovations and intellectual capital, the need for more tertiary institutions will grow substantially. Already, a fourth university is planned, even as the new third university is ramping up in Singapore.</td>
<td>The IDR plans to devote large areas to educational institutions and is wooing universities to locate campuses there. Provided the immigration and transportation issues can be eased, locating some of Singapore’s future tertiary institutions in the IDR could benefit both territories.</td>
</tr>
<tr>
<td>Warehousing</td>
<td>Warehouses currently occupy about 6.1 square kilometers of land in Singapore.</td>
<td>If port activities shift out of Singapore, a good part of such land will be released to other, potentially higher-value uses.</td>
</tr>
<tr>
<td>Tourism</td>
<td>Singapore’s problem has been the declining duration of average tourist stay and slow increases in average expenditure per tourist as well as an insufficient number of repeat visits by tourists. An inadequate range of visitor attractions and high costs probably account for this.</td>
<td>IDR and Singapore can complement one another: (a) Singapore’s airport connectivity brings in large numbers of tourists, which IDR can leverage; (b) IDR is developing theme parks, mangrove nature reserves, and other attractions that can offer tourists in Singapore wider choices; (c) IDR offers cheaper accommodations for cost-conscious tourists.</td>
</tr>
<tr>
<td>Back-office support services</td>
<td>To be viable, such support services need office space (land) and relatively lower-paid staff. Neither are Singapore’s strengths.</td>
<td>Malaysia has been consistently ranked third worldwide in business process outsourcing according to A T Kearney. Skilled workers are available in Malaysia who can relocate to the IDR.</td>
</tr>
</tbody>
</table>
Singapore or the IDR, depending on where it is more profitable;

- If additional land and labor from the IDR were available, these constraints would ease to some extent in Singapore and relieve cost pressures there. It would effectively push out the production possibility frontier, enabling Singapore to make a credible bid to become a global city of the standing of London or New York. Without the IDR, Singapore would not have the advantage of a secondary airport or the space to build tertiary educational institutions capable of supporting its growth.

The benefits of scale and diversity

If there were no political barriers between Singapore and the IDR, a larger joint economy would offer several benefits to economic agents.

First, with a larger land area, larger population, larger market, and larger economy, there would be more economies of scale or, at least, the promise of a rapidly growing economy that would offer considerably greater economies of scale. This could attract manufacturers or service producers who desire a home market of a certain minimum size and who might otherwise decide to locate operations elsewhere.

Second, a larger joint economy with a more diverse mix of skills, types of companies, types of business activities, and a greater variety of business locations (some cheap, some expensive) could accommodate the diversity of talents, business activities, consumer preferences, and skill sets that make for a successful urban conurbation of global scale.

Third, Singapore’s small and medium enterprises (SMEs) could operate in the lower-cost IDR. Otherwise, rising costs in Singapore would squeeze them out.

Similarly, Singaporeans at the bottom end of the income distribution could benefit if they had the option of living in the IDR and commuting to Singapore, in the same way that lower-paid workers in Manhattan live outside the city and commute to work each day. This would also apply to Singaporean retirees who are living on fixed pensions or are relying on a limited amount of retirement savings: the lower costs of living in the IDR would enable them to stretch out their retirement funds for much longer than if they were living in Singapore. This is particularly pertinent given the rising concerns over the adequacy of retirement financing in Singapore. At a broader level, seamless movement of people between the two territories would enhance standards of living by giving greater choices to consumers, who can weigh the advantages of living in Singapore, such as proximity to workplace and more-developed physical, regulatory, and cultural infrastructure, to the advantages of living in the IDR, such as cheaper living costs, open spaces, and less congestion.

Leveraging off each other’s competitive advantages

Table 5.5 expands on some of the factors differentiating Singapore from the IDR, focusing specifically on various indicators of competitiveness. Although no separate measure of competitiveness is available for the IDR, Malaysia’s competitive positioning will probably reflect the IDR’s position in most instances.

The wider the differences in competitive advantage between the two territories, the more likely it is that synergies will be released were they to collaborate more effectively. Singapore is better governed, a place where it is easier to do business, and more efficient in logistics. Malaysia and the IDR offer one of the world’s best places for business process outsourcing and an environment that is much more supportive of entrepreneurship than Singapore. If Singapore and the IDR could be connected more seamlessly, each territory could leverage off the other’s strengths and reap more benefits.

Increased competition: costs and benefits

There is a fear on both sides that there will be competition as well as complementarities in the relationship between Singapore and the IDR. This may be true, but there are two arguments against this. First, the likely complementarities far exceed the areas where there might be competition. Second, and more important, competition need not be
a negative. A real case study is of the impact of Port of Tanjung Pelepas (PTP) on Singapore. The opening of PTP did lure two of the Port of Singapore’s largest customers. It also resulted in a loss of pricing power for the Port of Singapore. However, the net effect is what is important. PTP’s emergence forced the Port of Singapore to restructure to reduce costs, improve efficiency, and be more sensitive to customer needs. The overall impact was that both PTP and the Port of Singapore grew in revenues and profitability.

Similarly, there probably will be further dynamic effects of competition should there be greater economic integration between the two territories.

The way forward

In this section, we look at what prerequisites have to be in place for a more integrated Singapore-IDR region to form and succeed. We also assess the political obstacles that make successful collaboration difficult to achieve.

Economic and other prerequisites for synergies to be released

Increased collaboration can be structured in a number of ways: from a collection of sector-specific collaborations to complete economic integration in which political boundaries are irrelevant. However this collaboration is structured, effective economic collaboration or integration between Singapore and the IDR can only happen if a number of conditions are in place. Four areas of weakness seriously compromise the ability to expand collaboration between the two territories.

Lack of seamless connectivity for people and goods. However Singapore and the IDR collaborate, realizing materially important benefits that come from significant reallocation of activities between the two territories requires a fairly seamless flow of goods and people between and within the two territories. In concrete terms, this means improvements in the following key areas.

First, transportation is inadequate. Currently, there are only two access routes by road and one by rail, with the rail service too limited and infrequent to be of significance. There is no mass transit link that would allow large numbers of people to move between the two territories at low cost and with high frequency of services. Consequently, there is substantial congestion, with delays of up to an hour or more at peak periods for the causeway route. This is enough to deter the reallocation of many activities from Singapore to the IDR. Multiple routes of access involving several modes of transportation are needed. Another land link to supplement the two existing land routes would help. Extending Singapore’s mass transit railway into the IDR would improve the ease of access considerably.

Second, border controls for immigration, customs, and security checks are time-consuming enough to deter the free flow of people and goods. Passports are required, and forms have to be filled in and checked by immigration officers. Except for a limited number of individuals who have work permits or student passes, there are no quick and easy immigration checks with special passes or smart cards. Security checks on the Singapore side are intrusive and time-consuming.

Third, taxes and related barriers need to be removed. Malaysia imposes special taxes on vehicles transporting cargo into Singapore from Malaysia, to encourage use of its

<table>
<thead>
<tr>
<th>Name of index or rank</th>
<th>Malaysia</th>
<th>Singapore</th>
</tr>
</thead>
<tbody>
<tr>
<td>World Economic Forum Global Competitiveness</td>
<td>21</td>
<td>7</td>
</tr>
<tr>
<td>Institute for Management Development World Competitiveness</td>
<td>23</td>
<td>2</td>
</tr>
<tr>
<td>A T Kearney Globalization Index (2006)</td>
<td>19</td>
<td>1</td>
</tr>
<tr>
<td>A T Kearney FDI Confidence Index (2005)</td>
<td>—</td>
<td>18</td>
</tr>
<tr>
<td>A T Kearney Global Services Index</td>
<td>3</td>
<td>11</td>
</tr>
<tr>
<td>World Bank Governance Indicators (percentile rank, 2006)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Political stability</td>
<td>58.7</td>
<td>94.7</td>
</tr>
<tr>
<td>Government effectiveness</td>
<td>80.6</td>
<td>99.5</td>
</tr>
<tr>
<td>Regulatory quality</td>
<td>68.8</td>
<td>99.5</td>
</tr>
<tr>
<td>Control of corruption</td>
<td>68.0</td>
<td>98.1</td>
</tr>
<tr>
<td>World Bank Logistics Performance Index</td>
<td>27</td>
<td>1</td>
</tr>
<tr>
<td>World Bank Doing Business Indicators</td>
<td>24</td>
<td>1</td>
</tr>
<tr>
<td>Transparency International Corruption Perceptions Index</td>
<td>43</td>
<td>4</td>
</tr>
<tr>
<td>Global Entrepreneurship Monitor Report 2006</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Percentage of population involved in early-stage entrepreneurial activity</td>
<td>11.1</td>
<td>4.9</td>
</tr>
<tr>
<td>Percentage of population who are established business owners</td>
<td>7.3</td>
<td>3.4</td>
</tr>
</tbody>
</table>

Sources: Collated by Centennial Group from World Economic Forum; Institute for Management Development; A T Kearney; World Bank; Transparency International; and Global Entrepreneurship Monitor Web sites. — Not available.
own ports and airports. Similarly, Singapore imposes restrictions involving timings, entry fees, and daily charges on Malaysian vehicles entering Singapore as part of its policy of restraining the use of motor vehicles to reduce congestion.

Need to improve law and order. Rising crime in Johor has claimed victims among both Johor residents and travelers from Singapore. Some well-reported cases of gruesome murders, violent robberies, and car thefts have alarmed Singaporeans, who have become accustomed to a very low level of crime. The law-and-order situation could deter Singaporeans and others from visiting the IDR region if current trends continue. There is also the perception among Singaporeans that petty corruption (such as officials requiring incentive payments for government services) is common in the IDR.

Policy regime: security of investments and savings. Both Singapore and Malaysia have generally been investor-friendly jurisdictions where the rule of law operates and where both domestic and foreign investors conduct business with legal protections that are effective. However, Singaporean investors remember the Malaysian treatment of the CLOB over-the-counter market for Malaysian shares that operated in Singapore and how these shares were sequestered for a number of years after Malaysia imposed capital controls in September 1998. These shares were only released to Singaporean investors several years later and only after the payment of costly fees to an intermediary company set up by Malaysia. This history deters many Singaporeans from wholeheartedly investing in Malaysia. For their part, Malaysians were upset by the seemingly arbitrary decision of Singapore not to allow Malaysians from west Malaysia who worked in Singapore to take out their contributions to the Central Provident Fund when they left Singapore, unlike the treatment accorded to other foreigners and Malaysians from east Malaysia.

Policy regime: visas for foreign professional workers. Singapore and Malaysia have taken different approaches to the treatment of foreign professionals. Singapore has liberalized its policies even further, wooing global talent aggressively and offering liberal entry to such talent. Malaysia has been very open to receiving workers for jobs that Malaysians no longer want to do, such as construction work, domestic help, plantation work, and low-end factory work. But its approach to foreign professionals has been mixed. In some cases, Malaysian officials have articulated their willingness to allow the entry of foreign talent in areas such as information technology (IT) as part of its ambition to excel as an IT hub. However, in practice, actually securing visas for such and related professionals has been difficult. Moreover, the mood seems to have soured in recent months, with officials now discouraging the inflow of semiprofessional workers, such as trained hotel staff. For the IDR to really take off, a more pragmatic approach to foreign professionals may be necessary.

What are the obstacles?

Improved political relations between Singapore and Malaysia are a sine qua non for effective collaboration. Without a clear demonstration that a new regime of political relations exists between the two countries, investors and businesses will not have the confidence that a deterioration in political relations would not result in problems for business or discriminatory policies that would harm the value of their investments. This is where the obstacles are serious enough to raise questions about whether the full synergies between Singapore and the IDR can ever be obtained.

A troubled historical legacy. Economic cooperation between Singapore and Malaysia takes place in the context of a relationship molded by a troubled political and historical legacy. Singapore is a small island off the southernmost tip of Malaysia and was considered for long periods of its early history to be part of the kingdoms and sultanates that controlled southern Malaysia. In the years before it was occupied by the British in 1819, Singapore was seen as belonging to the Johor-Riau-Lingga Sultanate, which was split as a result of the interventions of the British and Dutch
colonial powers that then dominated the region. For the better part of its modern history since its refounding in 1819 by the British as a major port and regional center, Singapore’s economy has been materially integrated with what is now Malaysia. Even after Singapore separated from Malaysia in August 1965, there was a short period until 1967 when the economies remained highly integrated, with the free flow of labor and capital between the two countries and companies incorporated in one territory functioning in the other without too much trouble. It was only after 1967 that the Singapore and Malaysian economies went their separate ways: economic policies diverged, the commonly owned airline was split into two national airlines in 1972, and the currency union ended in 1973.

There are several important reasons why political factors might hold back economic ties between Singapore and the IDR.

**Ethnic relations.** Ethnic differences unfortunately affect the relationship between the two countries. Singapore is a majority Chinese country, where the Chinese are about 76 percent of the population, the Malays are about 15 percent, and the Indians are around 6 percent. Malaysia is the reverse: Malays and other indigenous groups make up more than 60 percent, while the Chinese proportion is now around 25 percent, and the Indians account for about 10 percent.

Singapore left the Federation of Malaysia in August 1965 mainly as a result of ethnic tensions between the Malays who were the majority in peninsular Malaysia and the Chinese who were the majority in Singapore. Two major race riots erupted in Singapore in 1964 in which many were killed. A bout of racial violence in Malaysia in 1969 in which hundreds died added to the bitter legacy.

Following separation, various bilateral issues became sore points in the relationship and remain today, sometimes decades after they first emerged as problems, attesting to the difficulty involved in settling differences quickly. Issues included the price of water supplied to Singapore under what many Malaysians deemed to be a one-sided agreement, the release of provident fund savings due to Malaysians working in Singapore, disputed ownership of a rocky outcrop, and the location of customs, immigration, and quarantine facilities for rail travel between Singapore and Malaysia.

**Divergent economic policies.** Although both Malaysia and Singapore are highly open economies that have been friendly to foreign investors and foreign trade, there are some differences in economic policies.

The first difference is the pursuit of ethnic-based economic policies in Malaysia. After the racial convulsions of 1969, Malaysia followed a policy (NEP) of affirmative action favoring the indigenous communities of Malaysia, such as the Malays and the various east Malaysian ethnic groups, a policy that many Chinese and Indian Malaysians felt discriminated against them. Singapore sought to pursue a policy of meritocracy, but in the early years of rapid growth, its own Malay community felt marginalized. These experiences helped to nurture resentments on both sides against each other. Because the NEP imposed ownership and other restrictions on businesses operating in Malaysia, it affected the way largely Chinese-owned Singapore investments operated in Malaysia.

Second, following Singapore’s separation, Malaysian policy makers noticed that substantial economic benefits accrued to Singapore from its economic ties with Malaysia: Singapore’s port and airport handled a considerable proportion of goods and people being carried in and out of Malaysia, for instance. In many cases, Malaysia followed a nationalist policy of developing its own ports and airports to rival those of Singapore, using taxes and other economic interventions to reduce Singapore’s role in the Malaysian economy. For example, a levy was introduced in the 1980s on lorries carrying Malaysian-made goods for export through Singapore port to divert goods to the port that Malaysia had developed in one part of the IDR (Pasir Gudang Port).

Many of these problems were specific to Johor, where the IDR is located. For instance, the agreement on the supply of water by Johor to Singapore is seen by Johor as particularly unfair to it, as it gives Singapore exclusive use of Johor’s main water source
up to a certain level of demand and at a price that is not indexed to inflation and has limited scope for adjustment. The issue of sovereignty over Singapore is also particularly felt in Johor, where many people feel that Johor was somehow cheated out of its historic ownership of Singapore by the British colonialists as well as by the federal government, which agreed to the separation of Singapore from Malaysia in 1965. These issues cloud relations with Singapore. This means that simple issues of bilateral economic interaction become easily politicized and thus difficult to resolve.

**Conclusion: can these obstacles be overcome?**

Ultimately, policy makers have to ask themselves whether they can achieve their ambitious goals without finding ways to overcome these political obstacles. Can Singapore achieve its aim of becoming a global city on the scale of London or New York without the IDR? And can the IDR be the strong, sustainable metropolis of global significance it aims to be without substantial integration with Singapore? The answers in both cases are clear: neither side can achieve its aims without the other. Thus they will have to sink their political differences or abandon their ambitions and settle for a much more mediocre set of goals.

**Notes**

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1. Originally known as the South Johor Economic Region, it was renamed the Iskandar Development Region in November 2006 in honor of Sultan Mahmud Iskandar, sultan of Johor, the state in which the IDR is located.

2. Data on the movement of people between Singapore and the IDR were given in a speech by Malaysia’s International Trade and Industry Minister Rafidah Aziz, which was reported in *Singapore Business Times*, August 29, 2007.

**References**


Spatial integration and human transformations in the Greater Mekong subregion

Jonathan Rigg and Chusak Wittayapak

At the core of the World Development Report 2009 (WDR 2009) is the contention that, while the concentration of economic activity is positive because it both stimulates further economic growth and is an inevitable outcome of such activity and growth, it also tends to lead to greater spatial inequalities, which are undesirable. The report proposes that the solution to this development conundrum is the better integration of markets. Such integration will enhance economic concentration (a “good” thing), while tempering the tendency to deepen spatial inequalities (a “bad” thing).

Drawing on the experience of the countries of the Greater Mekong subregion (the GMS), which are undergoing just such a spatial transformation in one of the world’s most economically dynamic regions, this chapter highlights the practical difficulties and policy challenges of achieving such a win-win outcome. We do this, first by focusing on spatial integration as a necessarily unsettling and destabilizing process; second, by emphasizing the societal and environmental outcomes and side effects of the concentration of economic activities and the integration of markets; and third, by viewing geographic space not as the mere stage on which certain activities occur, but as socially produced and politically charged. Regarding the last point, we wish to avoid, for example, simply assuming that remoteness is a problem, that policies and programs to stimulate spatial integration are necessarily beneficial, and that people are affected by and respond to the challenges of marginality and integration in similar ways. We start from the premise, therefore, that the devil really is in the details. Like Ravallion, we are interested in exploring the “churning that is found under the surface of the aggregate outcomes” (Ravallion 2001: 1812).

We do not seek to challenge the core assumption of the WDR 2009 that regional spatial integration and concentration tend to increase aggregate output; the evidence, both national and international, from the countries of the GMS suggests—strongly—otherwise. Rather, we are intent on highlighting the inequalities, inconsistencies, and incongruities that accompany this process. In particular, we seek to show not only that economic concentration does lead to deeper spatial inequalities but also that spatial integration—the “solution” to such a tendency—is accompanied by its own negative and undesirable side effects. We end the chapter by reflecting on the policy implications of these processes.

The GMS: an idea becomes a subregion

The GMS encompasses six countries centered on mainland Southeast Asia: Cambodia, China (originally Yunnan province only, but since 2005 also including Guangxi Zhuang Autonomous Region), Lao People’s Democratic Republic, Myanmar, Thailand, and Vietnam (see figure 6.1). The GMS program was launched in 1992 and given further impetus in November 2001 when
the Strategic Framework for the GMS was adopted at the Association of South East Asian Nations (ASEAN) ministerial conference. At the first GMS summit held in Phnom Penh at the end of November 2002, the leaders of the subregion endorsed a 10-year strategic framework with five strategic thrusts:

- Strengthen infrastructure linkages through a multisectoral approach;
- Facilitate cross-border trade and investment;
- Enhance private sector participation in development and improve its competitiveness;
- Develop human resources and skill competencies; and
- Protect the environment and promote sustainable use of the subregion’s shared natural resources.

In a document with the title *Linking Nations, Connecting People*, the rationale for the GMS program is summarized in the following terms (ADB 2005a: 7):

[To promote] closer economic ties and cooperation among the six countries. Its vision is to create a more integrated, prosperous, and equitable Mekong subregion, complementing national efforts to promote economic growth and reduce poverty and augmenting domestic development opportunities to create subregional opportunities. It seeks to encourage trade and investment among GMS countries, ease the cross-border movement of people and goods, and meet common resource and policy needs.

Underpinning the GMS are different “logics.” The economic logic of the GMS lies in the productivity returns that can be garnered from the spatial integration of countries with complementary economies. Complementarity, here, is rooted in difference; it is because the GMS countries and their economies are different—in wealth as much as in composition—that economic cooperation is worthwhile (see table 6.1). The geographic logic is founded on the Mekong, the hydrological thread that links the countries of the GMS. And the political logic arises from the era of peace and rapprochement that saw the six countries of the GMS make the transition from Cold War foes to post–Cold War friends from the early 1990s, reflected in their membership (with the exception of China) in ASEAN.

Of the five strategic thrusts noted above, the first two relate explicitly to regional spatial integration in physical terms, the third and fourth relate to private and public sector regional cooperation, and the last relates to regional resource cooperation and management. The 11 “flagship” programs that will deliver this strategic framework are all oriented toward integration of the subregion, with a particular focus on three economic corridors (ADB 2005c):³

- North-south economic corridor;
- East-west economic corridor;
- Southern economic corridor;
- Telecommunications backbone and information and communications technology;
- Subregional power interconnection and trading arrangements;
- Cross-border trade and investment;
- Private sector participation and competitiveness;
- Human resources and skills competencies;
- Strategic environmental framework;
- Flood control and water resource management; and
- Tourism development.

From the start, therefore, the GMS had a strong infrastructural justification underpinned by a set of assumptions that resonate with the WDR 2009. Political rapprochement and an easing of security tensions in the subregion provided the opportunity for cooperation, but the “program’s first priority was … to create the vital links within and between countries and promote the development of the subregion’s resource base” (ADB 2005a: 9). These linkages connect the rural poor to urban-centered services, jobs, and amenities; connect remote regions to the national (and wider) economy; and connect backward rural economies with the modernizing urban core. There is no doubt that the GMS program is ambitious. By mid-2006, 26 GMS projects were being funded to the tune of US$6.5 billion.⁴ In the Kunming Declaration of July 2005, the GMS countries reaffirmed the commitments they had made at the first GMS summit held in Phnom Penh in November 2002 (ADB 2005b: 17):

Cross-border infrastructure is key to economic development and prosperity in the region. A well-built, seamless, multimodal infrastructure is essential to the facilitation of trade, movement of people, and the provision of basic services throughout the whole region. We therefore commit ourselves to fully “connecting the GMS.” To that end, we commit to sustained and greater inputs to strengthen the subregional infrastructure linkages through a multisector and holistic approach.

### Openness, progress, and inequality in the GMS

Before we consider in more detail why and how spatial integration leads to an unsettling of categories and scales and the
### Table 6.1 Openness, progress, and inequality in the GMS, 1990–2006

<table>
<thead>
<tr>
<th>Indicator and year</th>
<th>Cambodia</th>
<th>China</th>
<th>Lao PDR</th>
<th>Myanmar</th>
<th>Thailand</th>
<th>Vietnam</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population (million)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1990</td>
<td>8.6</td>
<td>1,143</td>
<td>4.1</td>
<td>40.8</td>
<td>55.8</td>
<td>66.0</td>
</tr>
<tr>
<td>2006</td>
<td>14.2</td>
<td>1,315</td>
<td>5.7</td>
<td>56.5</td>
<td>65.2</td>
<td>84.2</td>
</tr>
<tr>
<td><strong>Economic progress</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average annual growth in per capita GDP, 1990–2005 (percent)</td>
<td>—</td>
<td>9.11</td>
<td>3.75</td>
<td>—</td>
<td>3.52</td>
<td>5.93</td>
</tr>
<tr>
<td>Per capita income (current US$)</td>
<td>220</td>
<td>415 (223)</td>
<td>271</td>
<td>—</td>
<td>1,945</td>
<td>144</td>
</tr>
<tr>
<td>2006</td>
<td>510</td>
<td>1,999 (842)</td>
<td>601</td>
<td>176</td>
<td>3,133</td>
<td>724</td>
</tr>
<tr>
<td><strong>Percent of GDP (2006)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Agriculture</td>
<td>30.1</td>
<td>11.8</td>
<td>44.8</td>
<td>48.4</td>
<td>10.7</td>
<td>20.4</td>
</tr>
<tr>
<td>Industry</td>
<td>26.2</td>
<td>48.7</td>
<td>29.5</td>
<td>16.2</td>
<td>44.6</td>
<td>41.8</td>
</tr>
<tr>
<td>Services</td>
<td>38.6</td>
<td>39.5</td>
<td>25.7</td>
<td>35.4</td>
<td>44.7</td>
<td>38.1</td>
</tr>
<tr>
<td><strong>Development, well-being, and inequality</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Poverty (percent of population living on less than PPP US$1 a day)</td>
<td>46</td>
<td>32.5</td>
<td>52.7</td>
<td>—</td>
<td>10.2</td>
<td>50.7</td>
</tr>
<tr>
<td>2005</td>
<td>12.7</td>
<td>7.1</td>
<td>21.3</td>
<td>—</td>
<td>0.0</td>
<td>6.5</td>
</tr>
<tr>
<td>Poverty (percent of population living on less than PPP US$2 a day)</td>
<td>76.3</td>
<td>71.5</td>
<td>89.6</td>
<td>—</td>
<td>43.1</td>
<td>87.0</td>
</tr>
<tr>
<td>2005</td>
<td>54.5</td>
<td>29.4</td>
<td>67.7</td>
<td>—</td>
<td>16.2</td>
<td>39.7</td>
</tr>
<tr>
<td>Percent of population living in poverty (percent of national poverty line)</td>
<td>34.7</td>
<td>—</td>
<td>32.7</td>
<td>26.6</td>
<td>9.8</td>
<td>19.5</td>
</tr>
<tr>
<td>Number of US$1-a-day poor (million)</td>
<td>4.0</td>
<td>377</td>
<td>2.2</td>
<td>—</td>
<td>5.7</td>
<td>32.4</td>
</tr>
<tr>
<td>2003</td>
<td>4.5</td>
<td>173</td>
<td>1.6</td>
<td>—</td>
<td>0.4</td>
<td>7.9</td>
</tr>
<tr>
<td>Human development index</td>
<td>0.512</td>
<td>0.627</td>
<td>0.449</td>
<td>—</td>
<td>0.707</td>
<td>0.610</td>
</tr>
<tr>
<td>2004</td>
<td>0.583</td>
<td>0.768</td>
<td>0.553</td>
<td>0.581</td>
<td>0.784</td>
<td>0.709</td>
</tr>
<tr>
<td>Gini coefficient</td>
<td>31.8</td>
<td>40.7</td>
<td>30.40</td>
<td>—</td>
<td>46.22</td>
<td>34.91</td>
</tr>
<tr>
<td>2004</td>
<td>38.05</td>
<td>45.50</td>
<td>34.68</td>
<td>—</td>
<td>41.96</td>
<td>37.08</td>
</tr>
<tr>
<td><strong>Openness and integration</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Openness ratio (ratio of total trade to GDP at current market prices)</td>
<td>35.8</td>
<td>27.7</td>
<td>33.8</td>
<td>2.8</td>
<td>64.9</td>
<td>50.8</td>
</tr>
<tr>
<td>2006</td>
<td>117.2</td>
<td>65.7</td>
<td>56.7</td>
<td>—</td>
<td>123.3</td>
<td>136.4</td>
</tr>
<tr>
<td>Foreign direct investment (US$ million)</td>
<td>32</td>
<td>11,006</td>
<td>280</td>
<td>149</td>
<td>2,151</td>
<td>474</td>
</tr>
<tr>
<td>2006</td>
<td>318.4</td>
<td>64,468</td>
<td>650</td>
<td>128.8</td>
<td>8,837</td>
<td>4,100</td>
</tr>
<tr>
<td>Investment rate (ratio of gross domestic investment to GDP)</td>
<td>11.3</td>
<td>36.2</td>
<td>—</td>
<td>1.3</td>
<td>40.0</td>
<td>29.6</td>
</tr>
<tr>
<td>2006</td>
<td>20.8</td>
<td>44.9</td>
<td>—</td>
<td>11.09</td>
<td>27.9</td>
<td>35.41</td>
</tr>
<tr>
<td>Tourist arrivals (million)</td>
<td>0.22</td>
<td>1.02</td>
<td>0.35</td>
<td>0.12</td>
<td>6.95</td>
<td>1.35</td>
</tr>
<tr>
<td>2006</td>
<td>1.70</td>
<td>3.38</td>
<td>1.26</td>
<td>0.21</td>
<td>13.82</td>
<td>3.58</td>
</tr>
<tr>
<td>Registered migrants in Thailand</td>
<td>9,492</td>
<td>—</td>
<td>1,164</td>
<td>89,318</td>
<td>n.a.</td>
<td>—</td>
</tr>
<tr>
<td>2004</td>
<td>104,789</td>
<td>—</td>
<td>99,352</td>
<td>610,106</td>
<td>n.a.</td>
<td>—</td>
</tr>
</tbody>
</table>

**Sources:** ADB (2007a, 2007b); Ali and Zhuang (2007); Caouette and others (2007).

**Note:** The per capita GDP figures in parentheses for China are for Yunnan province and Guangxi Zhuang Autonomous Region; the data on registered migrants in Thailand should be treated with caution because of the large number of unrecorded migrants.


n.a. Not applicable.

— Not available.
destabilization of lives and livelihoods, we wish to set out the positive effects that have flowed, directly and indirectly, from GMS integration.

A mid-term review of the GMS program, published in June 2007, observes that the "GMS economies have grown at one of the fastest rates in the world since the early 1990s, as many of them started the transition from central planning to market-based systems and began opening up and integrating their economies with the other countries in the subregion, the rest of Asia, and the world" (ADB 2007b: 4). Table 6.1 presents the empirical indicators of economic and social development among the countries of the GMS since the grouping was formally established in 1992. There are a number of points to note: first, the clear progress that has been achieved by the countries of the GMS over the period since 1992, particularly in terms of poverty reduction and per capita GDP (all the more remarkable bearing in mind the Asian economic crisis of 1997–99); second, the degree to which the region has become more open, whether measured in terms of the openness ratio, foreign direct investment (FDI), tourist arrivals, migration streams, or investment rate; third, the manner in which economic progress and greater openness have been accompanied, particularly in the reform economies, by widening inequalities (and also see table 6.4); and finally, the large number of people who are living close to poverty, reflected in the differential between the incidence of US$1-a-day and US$2-a-day poverty.

Of course, in considering historical causality we must be wary of post hoc rationalization—the logical fallacy of assuming that, because one thing follows another, they must be causally linked. With this in mind, the following questions are relevant: Has greater openness driven the economic gains of the last 10–15 years? Have deepening inequalities been an outcome of market reforms? And what is the relationship among economic reform in general, the GMS initiative in particular, and economic progress, on the one hand, and inequality, on the other?

The GMS mid-term review notes that openness and integration per se are not sufficient, in themselves, to deliver broad-based and inclusive development (ADB 2007b: 12–13). Three issues stand out. First, there is the question of the quality of integration. Regional road arteries such as the GMS economic corridors need to be accompanied by rural feeder roads and improvements in domestic infrastructure if they are to deliver benefits that are broad based in both their social and spatial impacts. In an econometric analysis of the impacts of cross-border road infrastructure on trade and foreign direct investment in the GMS, Edmonds and Fujimura (2006) conclude that improvements in road infrastructure boost trade, particularly when domestic road infrastructure is good. In other words, the focus on transnational (cross-border) links must be accompanied by payment of an equal level of attention to the national infrastructural dimension. A related point is evident in Warr and Menon’s (2006) general equilibrium model of road improvement and poverty reduction in Lao PDR, in which they note that the pro-poor impacts are significantly greater when households without road access are provided with dry-season access than when dry-season roads are upgraded to all-weather status. Second, it cannot be assumed that the poor and the vulnerable—the destitute, the elderly, ethnic minorities, women—will find equal and equivalent benefits from regional and national integration. Indeed, they may counterintuitively be “crowded out” by the process of integration (ADB 2007b: 12). And third, regional integration can be accompanied by certain adverse effects, most obviously in the realm of environmental degradation. We explore the last two issues in more detail below.

**Scales and sites: the empirics of spatial transformations in the GMS**

The core of this chapter focuses on the effects of spatial transformations on people and places. But to get to that point, it is valuable to set out the spatial, policy, and historical contexts within which, and on which, those effects are set. In doing this, it will become clear why the GMS offers such a rich ground for reflecting on the issues debated in the WDR 2009.
Lagging countries, lagging regions, lagging people

The GMS region shows marked inequalities in income and poverty at the international and interregional levels. More than half of the population of Lao PDR and Cambodia live below the PPP (purchasing power parity) US$2-a-day poverty line, compared with less than one-fifth of the population in Thailand (table 6.1). More significantly, in Thailand, more than half of the country’s total poor population of a little over 7 million are concentrated in the north-east region; in Lao PDR and Vietnam, the poor are disproportionately concentrated in upland areas and among ethnic minorities (see table 6.2), while in all the countries of the GMS, poverty is to a large extent a rural phenomenon (see table 6.3). The GMS project is directed, in no small way, at addressing these spatial manifestations of poverty, whether they reflect inequalities among countries, among regions, or between rural and urban areas. There is good evidence that income-expenditure inequalities have widened significantly in the transition economies of the GMS over the course of the last 10–15 years (see table 6.4). Only in Thailand have incomes grown faster for the poor(er) than for the rich(er).

In drawing (relatively) unconnected regions and areas into the mainstream, GMS policies are likely to be narrowing inequalities at some scales, while widening inequalities at others. More precisely, interregional inequalities are likely to narrow, while intraregional inequalities will widen. This is because of the way in which better access bestows differential benefits on social classes and population groups. Generally, men are in a better position to benefit than women, young(er) than old(er), rich than poor, majority populations than minority groups, and the educated than the less well educated. This is not a reason to curtail further integration, but it does highlight the existence of a variegated landscape of opportunity that represents both a development challenge and a political dilemma.

Border sites and cross-border interactions: economic and environmental

Research undertaken in borderland areas of the GMS notes the increase in economic activity made possible by improving transport links, receding political and bureaucratic barriers to exchange, and a shared economic vision. The deepening of transboundary economic relations is seen by governments, businesspeople, and multilateral agencies as providing considerable scope for local development. These borderland sites, therefore, take on particular qualities that are, in part, a product of their geographic location. They may develop in such a way that they become “enclave” zones relative to other areas, sites of particular economic dynamism and, also, social tensions. For Swe and Chambers, “Frontier towns represent a nexus where opportunities for profit… abound” and which are “increasingly serving as strategic nodes for commerce and growth in a singular segment of a multisegmented region state [that is, the GMS]” (Swe and Chambers 2008: 2). Moreover, while obstacles to trade persist, from transit taxes (including bribes) to stifling bureaucratic inefficiencies, the growth of commerce is seen as a “positive-sum game for all countries in terms of profits gained” (Swe and Chambers 2008: 3).
Gainsborough (2007) undertook research in two Vietnamese borderland sites, in Lao Cai in the north, on the Vietnam-China border, and in Tay Ninh in the south, on the Vietnam-Cambodia border. His interest lay in unpicking the relative roles of the state, private enterprise, and multilateral institutions in orchestrating trade flows across these frontiers. In the context of this chapter, Gainsborough wonders whether the policies and programs of the GMS have had any effect on cross-border flows or whether this is just wishful thinking. He concludes, “In relation to the GMS it is hard to argue against the view that there has been a significant increase in the intensity of cross-border flows of goods, people, money, and information since the early 1990s” (Gainsborough 2007: 8; see also table 6.5). He also suggests that Asian Development Bank (ADB) investments linked to the GMS program have played a defining role in delivering improved infrastructure and raising prosperity that, in turn, lie behind the increased trade flows.

A concern in Gainsborough’s study is to ascertain who the “actors” are in cross-border trade and what their relationships are with the state. However, while there has been an increase in the number of private actors in his two border case studies, their success is contingent on their close links with the state and state enterprises and agencies. He says, “I have … argued in this article that there are important ways in which the growth of private and transnational actors may be associated with a strengthening—not a decline—of state power in some areas” (Gainsborough 2007: 15).

Border zones are, self-evidently, political and politicized spaces: the frontier makes them so. As Sturgeon writes in her book on border landscapes in China and Thailand, “Borders are processes replete with politics, both as margins of the nation state (border-as-margin) and as cross-border social relations (border-as-line)” (Sturgeon 2005: 201). What is less often investigated is the way in which the politics of access fall unequally on groups living in and outside the border zone. The GMS may be trying to go “beyond borders” (ADB 2005b), but this must be seen—for the time being—as just an articulated desire. Borders matter, with the result that there is a quite distinctive border or frontier geography.

The increase in economic activity in borderlands arises partly because integration permits the exploitation of space and the more efficient and intensive use and extraction of natural resources. Cross-border market forces are shaping the transformation of the agricultural sector in the Mekong corridor as production is oriented toward the demand profiles of China, Vietnam, and Thailand (Lao PDR 1999: 35). Sometimes acute environmental pressures have arisen from such spatial integration. Improvements to the east-west economic

<table>
<thead>
<tr>
<th>Country</th>
<th>Q1 (poorest 20 percent)</th>
<th>Q2</th>
<th>Q3</th>
<th>Q4</th>
<th>Q5 (richest 20 percent)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cambodia (1993–2004)</td>
<td>0.69</td>
<td>1.27</td>
<td>1.84</td>
<td>2.39</td>
<td>3.38</td>
</tr>
<tr>
<td>Laos (1992–2002)</td>
<td>1.47</td>
<td>2.22</td>
<td>2.85</td>
<td>3.40</td>
<td>3.82</td>
</tr>
<tr>
<td>Myanmar</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Thailand (1992–2002)</td>
<td>2.35</td>
<td>2.27</td>
<td>1.86</td>
<td>1.51</td>
<td>0.38</td>
</tr>
</tbody>
</table>

— Not available.

### Table 6.5 Expanded trade flows in the Greater Mekong subregion two-way trade (US$ million)

<table>
<thead>
<tr>
<th>Time period</th>
<th>Vietnam and Cambodia</th>
<th>Vietnam and China</th>
</tr>
</thead>
<tbody>
<tr>
<td>Early 1990s</td>
<td>30–40</td>
<td>300*</td>
</tr>
<tr>
<td>1995</td>
<td>118.1</td>
<td>691.6</td>
</tr>
<tr>
<td>2000</td>
<td>178.9</td>
<td>2,937.5</td>
</tr>
<tr>
<td>2003</td>
<td>300</td>
<td>4,800</td>
</tr>
<tr>
<td>Annual increase, 1995–2003 (percent)</td>
<td>19.3</td>
<td>73.0</td>
</tr>
</tbody>
</table>

corridor, for example, led to the “massive illegal movement of live animals [from Lao PDR] into neighboring countries [Thailand and Vietnam]” (UNEP 2001: 55). Consumer demand in China has fueled an unsustainable harvesting of nontimber forest products in provinces like Luang Prabang and Luang Namtha and their funneling, along the valley of the Nam Ou and the Nam Tha, to markets and consumers in China (ADB 2000: 8; see also Lao PDR 2000b: 44; Hoang 2007). In northern Lao, the rapid expansion since 2000 of Chinese rubber concessions has threatened the sustainability of ethnic minority–operated ecotourism activities (Schipani 2007).

Our view of the livelihood and environmental effects of spatial transformations such as those linked to (but not limited to) the GMS project entertains the possibility, indeed the likelihood, that they will be mixed in general and will vary across population groups. This latter issue is explored in greater depth below. It is also the case that, while environmental tensions may be particularly noticeable across borders, they are not limited to border zones, and the market effects that more open borders engender may have considerable spatial “reach.”

Agents, agency, and impacts of spatial transformation in the GMS

Of all the investments in physical infrastructure, none, arguably, has done more to transform regional economic landscapes, spatialities of production and consumption, household livelihoods, and individual mind-sets than has investment in roads. This section, therefore, deals specifically with the impact of roads and the movement of people.

Roads

For many analysts, the benefits of spatial integration—and the costs of isolation—are self-evident: “Investment in physical infrastructure will significantly contribute to the pursuit of socially inclusive development. … Roads appear to have strong indirect and direct effects on poverty reduction” (Ali and Pernia 2003: 2, 10). The road-building imperative that informs the GMS initiative is based on the premise that the most effective means with which to narrow spatial economic inequalities is by drawing people and places into the market mainstream. Poverty has a strong spatial component, and the poor are concentrated in those areas where the market has a weak presence. Roads can bring both the market to the people and the people to the market, thus becoming arteries through and along which spatial inequalities in development and service provision can be bridged. That roads are developmental is taken, often, as both obvious and unproblematic: “Remoteness is an important cause of rural poverty” (World Bank 1999: 7), and a “well-managed road network is one of the essential prerequisites for economic growth, and, given the growing focus on developing rural areas, it is a sine qua non for balanced and equitable growth for all sectors of the community” (Lao PDR 2000a: 64; see also UNDP 1996: 3; Lao PDR 2000c: 9).

There is also strong evidence that road improvements help in delivering social development and reducing poverty. Using the 1997–98 and 2002–03 Lao Expenditure and Consumption Surveys, Menon has studied the impact of road improvements on household well-being. He concludes, “Road improvement in rural areas can contribute to lowering poverty incidence, improving educational participation of primary school-age children, and reducing the rate of illness” and calculates that around one-quarter of the reduction in poverty over the period between the two surveys could be attributed to the conversion of dry-season access roads into all-weather roads (cited in ADB 2007b: 10). Road improvements increase access to opportunities beyond the local area, boost the potential for in situ local economic development by reducing transaction costs, and bring services such as schools and health centers within easier reach of people, particularly in rural areas. This is also confirmed in a second study of Lao PDR, which concludes that “reducing transport costs through rural road improvement generates significant reductions in poverty incidence” (Warr and Menon 2006: 16).

That roads change things in profound and significant ways is without question. But two additional questions have to be asked:
How? and For whom? As Leinbach says, “We still know all too little about the ways in which rural transport should be improved and how to deliver benefits to more needy populations” (Leinbach 2000: 2). This extends from their effects on individual mobility to their distributional implications and their direct and indirect effects on agricultural and nonagricultural productivity. For Johnston (2007: 171–72; see also van de Walle 2002), the three main fallacies that have dogged work on transportation and development are (a) the presumed direct causal link between transport improvements and economic growth, (b) the belief that improved transport will inevitably lead to higher agricultural output and better service provision and use, and (c) the fact that the benefits of such improvements will hold attractions for all and be distributed equally through a population.

Roads and spaces of inequality. There is little doubt that building or upgrading roads—in general—increases aggregate output and has a positive effect on poverty. It is also true that people in areas without easy road access often seem to crave better transport. It is one of the interventions that local people mention most often and prioritize most highly. So roads are not interventions “imposed” on local people from above; they are usually enthusiastically welcomed from below as well.

The first general point to make is that market integration tends to accentuate social differentiation by giving certain groups the ability to accumulate wealth. Where community regulation is weak or where power imbalances are great, natural resources may be appropriated whether by the state, by outsiders, or by wealthy and influential local people. Lowlanders entering upland areas, using roads as access conduits, often have advantages over local people in terms of language, financial resources, contacts, and business acumen. Rather more contentiously, some analysts believe that, although road-led market integration benefits some, it may harm others. Furthermore, one does not have to look at the more radical literature to unearth concerns about the marginalizing effects of road construction and spatial integration in the GMS. An ADB report, for example, claims in the context of Lao PDR that the “penetration of the market may be aggravating … social differentiation with the emergence of an entrepreneurial (capitalist) group of farm households, on the one hand, and a dispossessed labor-selling group of households, on the other” (ADB 1999: 6).

In 1999 scholars at the National University of Laos studied the impacts of the upgrading of Route 7 on 227 households in six villages in the provinces of Houa Phanh and Xieng Khouang (NUOL 1999). The study lists a large number of positive impacts of road upgrading but also notes that, in all the study villages, poor households had a markedly lower level of engagement with the sorts of new market-based activities that road upgrading encourages: “The lack of capital available to the poorest group, and their related lower participation in current economic activities, suggests that these households will be at a disadvantage in relation to the economic opportunities afforded by road improvement … Potential benefits from increased market access will be relatively lower … In this way, road development may indirectly lead to increased differences between wealth groups” (NUOL 1999: 55–56).

The big winners from road construction are, almost inevitably, the wealthy and middle-income households who have the resources to exploit a latent resource (ILO 1997: 6). Poorer households often find themselves unable to exploit and therefore benefit from the economic potential of roads. At the same time, because roads can disturb established patterns of activity—by, for example, increasing logging or accelerating the exploitation of natural resources more generally—they can harm those groups (tribal), households (poor), and individuals (women) who depend on the natural environment for their livelihood and well-being.

The spatial poverty traps facing women are different from those facing men. This is a product not only of poverty per se (or only of poverty) but also of cultural norms, economic circumstances, and productive and reproductive demands and needs. “To most women it does not really matter that much if
they are able to make the once-a-month trip to Vientiane [Lao’s capital] in one and a half hours instead of three or four compared to the time-consuming daily necessities of carrying water and fuel for household needs” (Trankell 1993: 84). For some women, the key spatial development needs are not, therefore, off-farm and extra-village, but on-farm and intra-village. It is improved transport of water and firewood from the river and forest to home that would do most to revolutionize women’s lives, not the ability to access a local urban center more easily (see table 6.6).

Transport issues related to gender are underpinned and overlaid by class- or wealth-based inequalities. Poor families do not have the means or the time to travel. This applies to women and men. Moreover, we know from the experience of Thailand that cultural and social change can very quickly undermine our assumptions about the gendered nature of mobility. In the 1970s women in Thailand were relatively immobile compared with men; cultural norms about seemly behavior militated against female mobility, and there were, in any case, few off-farm employment opportunities available for women. By the early 1990s, the moral envelope of accepted practice had been torn open, and modern factories selectively employing young women had blossomed so that women became, often, more mobile than men. Beyond class and gender, ethnicity and generation can also have a determining effect on patterns and impacts of spatial integration. The minority inhabitants of Lao’s Nakai plateau, for instance, are among the poorest people in a very poor country, and the construction of roads into the area has played a central role in driving environmental deterioration and livelihood collapse. The sequence of changes is outlined in a study of three villages on the Nakai plateau undertaken in November 2000 (Culas 2001). In 1995 a laterite logging road was cut to the villages of Ban Makfeuang, Ban Navang, and Ban Theung. This was used as such for only two or three years, until 1997–98. The road did not become an axis of development for villagers because no one owned a truck or even a motorbike. Instead, the road became the means by which outsiders could penetrate the area. Lowland Lao and Vietnamese traders created higher demand for rare woods, endangered species, and nontimber forest products more generally (Culas 2001: 29). Some of this wealth did trickle down to the largely Brou and Sek inhabitants of the three villages, but only to some households and usually in small quantities. The great benefits accrued to outsiders, leaving the villages with a degraded resource and villagers, particularly poor villagers, with a yet more tenuous existence.

It is from grounded, local-level, and often qualitative studies such as these that it is possible to build an understanding of the pattern of data revealed in table 6.4. We can surmise that, without the reforms and the market and spatial integration of the last 10–15 years, the countries and the people of the GMS, in general, would almost certainly be poorer, but they would also be more equal.

### Roads: creating new spaces of isolation.

One of the less understood aspects of spatial integration is the manner in which improving access can actually, and counter-intuitively, increase isolation. At the regional level, fears have been expressed that, in connecting centers of economic activity in the GMS, those outside the corridors of connection and nodes of activity may actually find themselves more isolated: “With current focus only on transborder economic flows, it [the GMS program] is at risk of doing little beyond fostering an entrepôt region, defined by increasingly complex corridors linking poles of activity,

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**Table 6.6 Effects of improved roads and transport**

<table>
<thead>
<tr>
<th>Category</th>
<th>Effects of improved roads or transport</th>
</tr>
</thead>
<tbody>
<tr>
<td>Women</td>
<td>Women are less likely to be able to take advantage of improving transport facilities, even when cost is not an issue, because they face social barriers to mobility such as the stigma of riding a bicycle or traveling alone outside their community.</td>
</tr>
<tr>
<td>Women and men</td>
<td>Women and men have different transport needs. Women’s needs tend to be for frequent, local journeys; men’s tend to be for less frequent, longer trips. Women’s trips are directed at meeting household consumption requirements; men’s trips are for income generation and production.</td>
</tr>
<tr>
<td>Rich and poor</td>
<td>Richer families have the time to travel, the products to sell, and the money to purchase goods. The poor are short of time and money, and better roads often do not increase incomes because they have nothing to sell.</td>
</tr>
<tr>
<td>Very poor</td>
<td>The very poor usually walk and “inhabit a localized walking world” (Hettige 2006: 18); roads deliver little for this marginal and marginalized group.</td>
</tr>
</tbody>
</table>

*Source: Information extracted from Hettige (2006).*
but with very little else within or between” (Oehlers 2006: 467). Local-level studies demonstrate most convincingly how and why increased isolation may result from programs of infrastructural development and market integration.

It seems that two processes are under way. On the one hand, when roads are upgraded, this can accentuate “tarmac bias,” making off-road communities more cut off and isolated rather than less so, as market activities are concentrated along the roadside and traders restrict their activities to near-road locations. At the same time, roads operate as axes of attraction for people living off-road, encouraging spontaneous migration to the roadside. There is little work from Southeast Asia on the spatially marginalizing effects of road improvements—anecdotal evidence aside—but Porter’s research on the Jos plateau in Nigeria is instructive (Porter 1995: 10–12; see also Porter 2002). Bush village populations declined as individuals, households, and sometimes entire villages relocated to the roadside. Loss of population led to a loss of local markets in off-road areas, and this, in turn, led to a loss of market connection. Dirt roads fell into disrepair, and bush transport services dwindled. The effects were felt particularly keenly by women and the poor, whose livelihood interests tended to be local rather than extra-local and who could not afford, either financially or in terms of time, to travel to the roadside. Cultural and reproductive impediments to travel also constrained women’s mobility. Porter concludes that many bush markets on the Jos plateau were “in a stage of terminal decline, kept going only by local women who patronize the market both as traders and purchasers” (Porter 1995: 11).

Roads, spatial integration, and the environment. As indicated in the discussion of the Nakai plateau, it is often the deleterious environmental effects of spatial integration that do most to undermine the livelihoods of some of the poor. An ADB report on environmental management in the remote GMS watersheds of Cambodia, China, Lao PDR, and Vietnam explores poverty-environment linkages and states, “The conventional wisdom is that poor people in remote areas have few livelihood alternatives and may over-extract resources in an attempt to survive” (ADB 2000: 18). But this, the report argues, only occurs when land and resources become scarce, and resources become scarce largely because of pressures that are nonlocal in origin, including in-migration, establishment of new protected areas or hydropower developments, and unsustainable commercial logging. Furthermore, a “power imbalance leads to a fundamental inequity in the flow of ecological goods and services between the uplands and lowlands” (ADB 2000: 5).

These pressures are brought to bear through processes of spatial integration. In Saravan, Lao PDR, the increasing presence of Vietnamese traders is raising fears that traditional livelihood systems will collapse (Denes 1998: 11). In the Sii Phan Done area of Champassak province close to the border between Lao PDR and Cambodia, Bush (2004) suggests that the general decline in fish stocks is caused by market integration, driven by political rapprochement and infrastructural improvements, which are tying the area into wider regional trading networks. In the 10 years between 1989 and 1999, the availability of fish and rattan for the residents of Ban Nong Hin in Champassak declined precipitously (UNDP 2002; see also table 6.7).

There is little doubt that, in the end, spatial integration delivers greater economic returns; but, and here we depart from the WDR 2009, we question whether market integration will moderate the inequality-widening effects of the concentration of economic activity, at least initially. Instead, we propose a temporal sequence to the triangular relationship among infrastructure-integration, environment-livelihoods, and inequality. To being with, better access

| Table 6.7 Decline in the availability of nontimber forest products in Ban Nong Hin, Champassak province, Lao PDR, 1989–99 |
| --- | --- | --- |
| Product | 1989 | 1999 |
| Wildlife | An abundance of animals are available in “your own backyard.” | Many species have disappeared, and a two-day trek may yield nothing. |
| Fish | One hour’s fishing yields 4–5 kilograms of fish. | One hour’s fishing yields 0.5 kilogram of fish. |
| Rattan | One day’s collecting yields 300 stems. | One day’s collecting yields 20–30 stems. |

Source: Adapted from UNDP (2002: 82).
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leads to accelerated exploitation of natural resources and environmental decline. In extreme instances, this may take the form of a boom-and-bust cycle. Returns to this boom are unequally allocated, both socially (richer and better connected groups and individuals) and spatially (nonlocal groups and individuals). In time, the local economy is reoriented and restructured as connections permit new activities to colonize local spaces and local people to access nonlocal opportunities. This end point, however, can be seen as arising from the environmentally destructive and selectively immiserizing earlier stage in the process of spatial integration. The best example from the GMS of how spatial integration can create poverty and erode livelihoods is reflected in the debate over the focal site strategy of the Lao government (see box 6.1).

**People, migration, and mobility**
The discussion thus far has tended to present “ordinary” people in the GMS as being squeezed, molded, and incentivized by spatial integration effects that are beyond their control. This, though, overlooks the agency of individuals and the surprising and unexpected ways in which they take advantage of opportunities afforded by spatial integration policies. Nowhere is this more dramatic, at least for the GMS, than in the revolution that has occurred in people’s mobility. The discussion here serves to temper the tone of the last section, while also injecting a destabilizing human component into what we regard as the rather too neat-and-tidy depiction of the economics of spatial integration depicted in the WDR 2009.

Since the mid-1970s in Thailand, from the mid-1980s in China, Lao PDR, and Vietnam, and from the early 1990s in Cambodia and Myanmar, the GMS has become a region, increasingly, “on the move” (see figure 6.2). This includes patterns of daily mobility and longer-term and longer-distance migration, both national and international. The work on migration in the GMS is quite extensive, although there is variation in knowledge among countries. For Thailand, we know a growing volume of evidence demonstrating that internal resettlement in Laos is having a major and mainly negative impact on the social systems, livelihoods, and cultures of many indigenous ethnic communities and people” (Baird and Shoemaker 2007: 868; see, for example, ADB 2001; Baird and Shoemaker 2005; Ducourtieux, Laffort, and Sacklokham 2005; Evrard and Goudineau 2004; Rigg 2005; Thapa 1998; UNDP 1997; Vandergeest 2003). Some of these problems are connected with the way in which resettlement has been carried out; but others relate to assumptions about the positive effects of integration and concentration. Besides the implications of these policies for human well-being, area-based development has had a profound effect on economic geographies in the uplands by concentrating populations in particular sites (close to roads), barring access to traditional shifting-cultivation fields, encouraging permanent-field agriculture and, in particular, wet rice cultivation, and capturing the forested spaces and their value for the state and its associates. The focal site strategy illustrates what can happen when the rationale of development collides with the messy reality of local cultural and economic geographies.

**BOX 6.1 Development through concentration? The Lao PDR government’s focal site strategy**

The Lao government’s rural development policy concentrates resources and services in particular areas, bringing people to these development centers, rather than vice versa. The focal site strategy in its current form was formally endorsed in February 1998 and has become a central plank in the government’s Rural Development Program. Focal sites are “integrated rural development clusters par excellence, located in the most deprived areas where presently there are no or only minimum development activities taking place” (Lao PDR 1998: 5) with the intention of creating “development centers” or “growth poles” for rural areas “that will thwart or at least slow down the present trend toward widening gaps between rural and urban areas, but also within the rural areas themselves” (Lao PDR 1998: 6 [emphasis in original]). (Closely allied to the focal site strategy are two other initiatives: the Land-Forest Allocation Program and Village Consolidation.) Under the program, upland (minority) villagers practicing shifting cultivation are resettled in focal sites where government services—schools, health centers (souk sala), and so on—are provided as well as market access through better roads.

The focal site strategy has become highly contentious because there “is a compelling and
reasonable amount (although the data are poor for international migrants); for Myanmar and Lao PDR, we know rather less.8

In terms of international flows among the GMS countries, Thailand acts as the fulcrum in an emerging regional labor market. While many moves are undocumented, it is thought that there are between 1.5 million and 2.0 million GMS migrants in Thailand and probably between 2.0 million and 2.5 million across the subregion as a whole.9 The main GMS migrant flows are as follows:

- Unskilled migrants from Myanmar, Cambodia, and Lao PDR to Thailand, of which the Myanmar migrant stream is easily the most substantial, followed by Lao PDR and Cambodia;
• Unskilled migrants from Myanmar to China;
• Skilled migrants from Vietnam to Lao PDR and Cambodia; and
• Skilled migrants from China to Myanmar and Lao PDR.

Studies show that the majority of international migrants in Thailand are employed in manual, unskilled activities, usually in those 3-D jobs that Thais resolutely avoid (those that are dirty, dangerous, and difficult). These include agricultural work, fishing and fish processing, construction, domestic work, and the commercial sex industry. Despite the ease of transport in Thailand, the location of these international labor migrants reflects their geographies of origin. Thus Lao migrants are disproportionately employed in the border provinces of the northeast; those from Cambodia are employed in the eastern provinces close to Cambodia; and migrants from Myanmar are employed in provinces in the north and south of the country, usually abutting the border with Myanmar (World Bank 2006: 37).

The creation of an increasingly vital space of human activity across the countries of the GMS has forged the context within which a whole series of development processes have been initiated, molded, augmented, or accelerated, including the delocalization of work, de-agrarianization, livelihood diversification, household reconfiguration, and cultural re-identification. Notwithstanding the evident importance of migration and mobility, it is striking how far rural development studies, particularly by development economists, have tended to skirt the issue. Dercon states, rhetorically: “Surely, studying these [population] movements must be at the core of understanding rural poverty and policies to reduce it” (Dercon 2006: 8). Given that such movements are so much a part of the processes that arise from spatial integration, this must be counted a significant omission.

We hypothesize that when levels of spatial integration are low, migration will be restricted to a small number of the non-poor in rural areas, mainly young(er) men, who move primarily for economic reasons. The costs and risks of migration will limit migration in general. As spatial integration proceeds, the incidence of migration increases and spreads to other classes (that is, the poor as well as the nonpoor) and to women, although it will remain a young(er) person’s prerogative. With high levels of spatial integration, the opportunity will arise for a partial re-localization of life (rather than livelihoods), as daily mobility replaces longer-term migration. This phase may also see the permanent dislocation of some people from their natal villages, as they make the decision to pursue their lives elsewhere.

Policies and politics of spatial transformation

The GMS program has made an imagined region, increasingly real (Kaosaard and Dore 2003), and it is seen by many as a role model of successful cross-border, regional cooperation. One attempt to tease out the “success factors” distinguishes between those characteristics that are inherent to the region and therefore exceptional (geography) and those that focus on the manner in which the GMS regional cooperation objectives have been structured (institutions) and achieved (strategies, sponsorship) and which are therefore repeatable (see table 6.8). There is little doubt that, in headline terms, the GMS has been a success. However, in this chapter we have been intent on excavating between the lines of the “text” of GMS cooperation and, in particular, its impacts on people (well-being, equity) and places (environment). A recent mid-term review of the GMS strategic framework (ADB 2007b) accepts that an important distinction can be drawn between the impressive progress that has been made in terms of the “hardware” aspects of cooperation, as opposed to the “software” components, where progress has been more problematic. This relates to a number of the issues highlighted in this chapter.

Those critics of the GMS outside the ADB, not surprisingly, have been more strident in their views, seeing many of the individual projects as typically “poorly conceived,” “disastrously implemented,” and ultimately designed to serve the sectional interests of an elite few: “Perhaps more
Spatial integration and human transformations in the Greater Mekong subregion

importantly, however, the ADB has been at the center of driving a broader process of economic change that is rapidly unraveling the social fabric of Mekong communities and disconnecting human economies from their relationship to the environment” (Cornford and Simon 2001:7).

Policy implications: humanizing the spaces of development in the GMS

This chapter has sought to question the assumption that spatial integration is unalloyed in terms of its effects. We have unpicked the view that investing in infrastructure, improving access, and drawing people and places more fully into the mainstream of national, regional, and international life will deliver developmental benefits in an unproblematic manner. In making this case, however, we do not wish to suggest that such processes are anti-developmental. The aggregate outcomes are invariably positive, at least in terms of economic development and with attendant positive effects on the depth and incidence of poverty. But it is important not to be completely seduced by the big picture. Up close, it is clear that this large-scale image consists of a mosaic of sometimes contradictory processes and effects that are best illuminated through grounded, micro studies. The grand, strategic market–integrating aims of the GMS, for example, resonate little with poor female-headed households struggling to find a way to get water back to their homes or with tribal groups who depend for their subsistence and meager incomes on their surrounding natural environment.

In writing this, however, we do not subscribe to the view that these individuals are living in a state of subsistence affluence and should be insulated from change. Rather, we highlight their multiple vulnerabilities and different capacities and the need to be cognizant of and sensitive to these vulnerabilities and capacities. A focus on the human context clearly shows that people are not, for example, equally mobile or equally able to take advantage of market integration (an obvious point perhaps, but often lost in the big picture). There is a mobility transition, for example, where “immobile” groups can become mobile in a surprisingly short space of time. As recently as the end of the 1990s, more than two-thirds (69 percent) of registered migrants to Thailand from Cambodia, Lao PDR, and Myanmar were male. By 2005, however, the figure had dropped to barely half (53 percent). There are few rules about patterns of human behavior that hold fast in the vortex of social and economic change in the GMS.

While the debate over “openness,” “reform,” and “transition” in the former socialist countries of the GMS tends to take

<table>
<thead>
<tr>
<th>Factor</th>
<th>Perceived benefit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Geography</td>
<td>A reasonably compact land mass, where every member shares land borders with at least three other members</td>
</tr>
<tr>
<td></td>
<td>A location within an economically dynamic region where markets are growing and where the development of subregional trading links is seen as beneficial by all</td>
</tr>
<tr>
<td></td>
<td>No great differences in size, population, or power (note that it is not China but regions of China that belong to the GMS)</td>
</tr>
<tr>
<td>Strategy</td>
<td>Broad long-term vision</td>
</tr>
<tr>
<td></td>
<td>Focus, particularly initially, on small concrete, confidence-building measures</td>
</tr>
<tr>
<td></td>
<td>Realistic number of well-defined, sometimes modest, targets</td>
</tr>
<tr>
<td>Institutional structure</td>
<td>A framework to build a shared identity and purpose but one which is not overly rigid and institutionalized (for example, the GMS opt-in, opt-out approach for infrastructure initiatives)</td>
</tr>
<tr>
<td></td>
<td>An incremental approach that does not require unanimity</td>
</tr>
<tr>
<td></td>
<td>(But) a well-defined program that enjoys the support of all members</td>
</tr>
<tr>
<td>Sponsorship</td>
<td>External support through an “honest broker,” to facilitate cooperation and provide assistance (in this case, the ADB, with its own substantial budget)</td>
</tr>
<tr>
<td>Timing</td>
<td>Patience with mid- to long-term planning horizons</td>
</tr>
</tbody>
</table>

Source: Extracted and adapted from DAC (2005: 10).
place and be orchestrated at the national and macroeconomic levels and can be traced through statistics such as those in table 6.1, the effects of these policies are played out at the local, household, and individual levels. This is reflected in how the “livelihood footprints” (Rigg 2005; Bouahom, Douang-savanh, and Rigg 2004) of households are being respatialized as integration delivers new possibilities for making a living and new ways of escaping from poverty.

Consider the story of Mrs. Chandaeng, who lives close to the Mekong River around 60 kilometers west of Vientiane, the capital of Lao PDR. She was born and raised in the war-shattered province of Xieng Khouang, several hundred kilometers to the east. The death of her husband while she was a young mother and a family dispute forced her to leave her home in Xieng Khouang. She eventually settled in a village on the banks of the Mekong in 1991. At that time her prospects were not good. She had six young children to raise and support, no land beyond her house plot, no education, few skills, and no husband. A decade later, in 2001, she was building a new house and was comfortably off in village terms. Her ability to survive—and, indeed, finally to prosper—as a landless, widowed mother of six was linked, ultimately, to the fact that four of her children managed to secure work in neighboring Thailand, remitting home around US$25–US$50 a month. Her son was working as a laborer on a shrimp farm in southern Thailand, while her three daughters, Wan (19 years old), Lot (17), and Daeng (15), were employed as housekeepers in Bangkok. She may have explained her children's sojourns in Thailand in terms of “when you are poor, you have to go,” but the outcome was a degree of economic prosperity and security. There is a direct link between the ability of Mrs. Chandaeng to break out of her structurally ordained status as a poor, vulnerable woman and the spatial integration policies of the GMS and the Lao government.

A strong temporal dimension shapes the transformations brought about by (and through) spatial changes; there is also a “geography” to space. By this we mean that the dehumanized “spaces” of integration need to be seen as humanized “places” of engagement, where inherited structures, prevailing power hierarchies, cultures of engagement, and so forth, give those “spaces” particular and unique qualities that have a bearing on how spatial interactions and dynamics operate and evolve. There is evidence from Xishuangbanna in China’s Yunnan province, for instance, that minority groups have been surprisingly astute and effective in taking advantage of the new opportunities that have arisen from market and cross-border integration. Janet Sturgeon speaks of them as willing and successful “neo-liberal subjects” who have taken a lead in outsourcing rubber from Xishuangbanna to Lao’s Sing district in Luang Namtha province. While in Lao, some of the minority groups may be vulnerable and marginalized, the story from this part of China is of minority farmers taking advantage of cross-border possibilities, permitting them to transcend their backward status and peripheral location (Janet Sturgeon and Nick Menzies, personal communication, 2008).

Solutions to the “problem” of remoteness and isolation invariably have social and political consequences. As recent papers (for example, Ali and Zhuang 2007; ADB 2007a) have (re)emphasized, the benefits of Asia’s growth are not being distributed equally, whether over space, across population groups, between the genders and generations, or according to ethnic group. Access to economic opportunities is linked to social structures. Market access has, simultaneously, positive and negative effects, which are unequally distributed. Income inequality does not map neatly onto other inequalities. A focus on the modern (urban) sector—and the opportunities that are seen to reside there—is as likely to deliver new and sometimes deeper inequalities as to deliver growth. Too often the “take-away” point is reduced to the assertion that spatial integration delivers economic benefits; this, however, should not be separated from the riders “not everywhere,” “not equally,” and “rarely in similar ways.”

The broader policy implications that flow from this discussion can be distilled down to three. First, the hardware-driven logic of the GMS needs to be allied to and integrated with the rather softer pro-poor policies and
imperatives being pursued and encouraged by the ADB and other agencies and institutions. Even if we assume that income and expenditure are adequate and appropriate indicators of well-being, “The behavior of average incomes may tell us little about the economic well-being of different subgroups of the population” (ADB 2007a: 8). To put it another way, we need to be concerned about what happens at the margins—social and spatial—when subregional integration is pursued. Second, it is clear that the benefits of subregional integration are tied to the nature of national integration. Thailand’s excellent physical infrastructure creates the national context through which additional regional benefits can be leveraged; the same does not apply to Lao PDR or Myanmar. In addition, the national policy environments create the context in which regional initiatives bite. It is not, therefore, only the regional dimension that counts, but the national one too. The third policy implication is that, while the balance of effects arising from the GMS project may be positive, the negative side effects are far from negligible. The “do nothing” status quo is not tenable in two respects: integration is happening, will happen, and should be encouraged; at the same time, this integration will inevitably lead to negative side effects, and these need to be identified, managed, and ameliorated.

In an important recent book on development and governmentality in Indonesia, Tania Li (2007) seeks to challenge those analysts who “separate the study of government rationalities from the study of situated practices.” For her, like us in this chapter, “engaging with the ‘messy actualities’ of rule in practice is not merely an adjunct to the study of government—it is intrinsic to it” (Li 2007: 283). To ignore the inequalities, inconsistencies, and incongruities that are part and parcel of strategies of integration and concentration is a notable oversight, not a trifling thing.

Notes
Jonathan Rigg is a professor at Durham University. Chusak Wittayapak is assistant professor in the geography department at Chiang Mai University. This chapter benefited from two ongoing research projects, one funded by the Danish Council for Development Research (grant #91206) on rural-urban dynamics in four countries of Asia and Africa (see http://www.geogr.ku.dk/projects/ecosoc/rud/) and the second funded by the Canadian Social Sciences and Humanities Research Council on the challenges of the agrarian transition in Southeast Asia (see http://www.caac.umanitoba.ca/en/chatsea_intro.html). The authors would like to thank those scholars who have generously permitted us to refer to their unpublished work: Jytte Agergaard (University of Copenhagen), Paul Chambers (Payap University), Nick Menzies (University of California, Los Angeles), Robin Roth (York University), Janet Sturgeon (Simon Fraser University), Sarah Turner (McGill University), and Thein Swe (Payap University).

1. See http://www.adb.org/GMS/Program/default.asp.
3. “The basic idea of economic corridors is that, by focusing on the same geographic space, investments in priority infrastructure sectors, such as transport, energy, telecommunications, and tourism, will maximize development impact while minimizing development costs. The objective of the transport corridors is to develop a highly efficient system—allowing for easy circulation of goods and people around the Mekong subregion. At the same time, they are expected to form the basis of corridors of economic growth and social development in the subregion, attracting investment and skills” (ADB 2005b: 17).
4. See http://www.adb.org/GMS/Program/default.asp.
5. Although note the general lack of data on social and economic conditions in Myanmar.
6. “From this analysis, we conclude that the development of cross-border road infrastructure in the GMS has had a positive effect on the regional trade. The result that cross-border roads have distinct effects from domestic road infrastructure suggests promotion of regional trade may require deliberate policy shifts toward investments in roads in border areas” (Edmonds and Fujimura 2006: 14).
7. Sarah Turner (2007) has also conducted research in Lao Cai, but in her case focusing on ethnic minorities, the trade in textiles, and cross-border relations. The politics of access bestows advantages on those living at the border, because only border residents can cross at the minor “open entrance crossings” with a permit (that is, without a passport) and without any taxes being levied. Others are required to use the formal national-level border crossing points. Thus
Hmong traders (mostly women) living close to the border are at an advantage over other Hmong traders. Ethnic Han Chinese and Vietnamese (Kinh) traders are able to use the national-level crossing points, and their extra-local networks facilitated this process. Turner shows how state policies have created a variegated landscape of access, which influences the livelihood options open to different groups.


9. Caouette and others (2007: 19) provide a higher range of 1.8 million to 4 million intraregional, cross-border migrants in the GMS. For more detailed maps of migrant flows between the countries of the GMS, see http://www.rockmekong.org/pubs/Year2005/Migration_Mekong/map.pdf.

10. ”The Greater Mekong subregion provides perhaps the benchmark for successful subregional and cross-border cooperation in Southeast Asia. Over the 12-year course of its existence, it has steadily evolved from a disparate collection of wary neighbors into a highly effective collaboration that can now point to numerous infrastructure investments directly attributable to the GMS initiative” (DAC 2005: 40).

11. The mid-term review concludes,”Placing more emphasis on the ‘soft’ aspects of subregional cooperation will be critical to achieving the goals and objectives of the GMS. … Complementary measures are needed to translate advances in physical connectivity into accelerated improvements in livelihoods and poverty reduction. … [In addition] improved physical connectivity and mobility of people and goods can have undesirable consequences, such as the transmission of communicable diseases, illegal migration of workers, and environmental degradation, which need to be contained and mitigated. This proposed shift in emphasis does not mean less concern for developing subregional infrastructure, as unmet needs for infrastructure investments in the GMS are huge. What it calls for is a more balanced approach which ensures that benefits from subregional economic cooperation and integration are maximized and far outweigh the costs involved” (ADB 2007b: 34).

12. There is good reason to think that economic reforms and trade openness lead to greater inequality. The available evidence “suggests a contemporaneous increase in globalization and inequality in most developing countries. Despite the ambiguities involved in identifying the relationship between openness and distributional changes, it seems fair to say that the evidence has provided little support for the conventional wisdom that trade openness in developing countries would favor the least fortunate (at least in relative terms)” (Goldberg and Pavcnik 2007: 76–77). The paper notes that the relationship between openness and inequality is country, time, and case specific and needs to be analyzed in the context of prevailing policies.

References


Chiang Mai: Chiang Mai University, Social Research Institute.


Before 1945, Vietnam was an agricultural economy with a large gap in income and living standards between the urban and rural population. Even in rural areas, the farmers who made up 90 percent of the population only managed 25 percent of the farming area. In 1945 Vietnam gained independence, and the government instituted land reform, redistributing 800,000 hectares of land to more than 2 million farmer households. The state reduced land rent by 25 percent and cut most taxes for farmers, which helped to improve social equality in rural areas, promote agricultural production, and narrow substantially the gap in income and living standards between rural and urban areas.

In the years between the 1960s and the early 1980s, Vietnam’s agricultural production declined considerably due to war and a central planning economy. Since the mid-1980s, Vietnam has embarked on an era of market-oriented reform. The land and production materials of cooperatives were distributed to farmer households. The private sector has been encouraged, and trade liberalization has been pursued. As a result, agricultural production, in particular, and economic growth, in general, improved.

In the past 30 years, Vietnam has experienced a period of robust development and renovation. For the past 20 years, the annual growth rate of the Vietnamese economy averaged 7 percent. The human development index (HDI) increased more than 6 percent, from under 0.69 in 1999 to 0.73 in 2004. According to the World Bank, the poverty rate dropped from 58.2 percent in 1993 to 19.5 percent in 2004 and to 16.0 percent in 2006.

Despite these significant successes, concerns have arisen regarding the socioeconomic disparities between the rich and the poor, between the urban and the rural areas, between the plains and the highlands, and among ethnic groups. These disparities are having many negative impacts on the economy, society, and environment and on the efficiency and sustainability of the development process. As Vietnam becomes increasingly globalized, industrialized, and market oriented, these socioeconomic disparities may threaten the sustainability of the country’s renovation and development.

This paper is based on published data of official studies and surveys of the General Statistical Office (GSO), some ministries and sectors, and researchers inside and outside the country. It seeks to describe the current disparities in Vietnam’s agriculture and rural areas and to offer recommendations for improving the situation.

**Current spatial disparities and policy issues**

Since Vietnam shifted to a market economy in the mid-1980s, industrialization and urbanization have accelerated rapidly. From 1992 to 1997 (before the Asian financial crisis), average gross domestic product (GDP) growth was 9 percent a year. By 2007 the share of agriculture in GDP declined to 20 percent, while that of industry and services was 42 and 38 percent, respectively. Foreign investment increased dramatically. In the period of
2001–05, the revenue of foreign enterprises rose 30 percent a year, and the revenue of private enterprises rose 34 percent a year. Based on the five living standard surveys conducted by the GSO in the 13 years between 1993 and 2006, the poverty rate declined 42 percent, moving 35 million people out of poverty.\footnote{1}

Vietnam’s agricultural structure changed substantially during this time period. According to the GSO, from 2001 to 2006, the area devoted to rice paddy declined by nearly 341,900 hectares, while production output increased from 32.5 million tons in 2000 to 35.8 million tons in 2006, due to the use of new rice varieties and the application of modern cultivation techniques. Productivity increased from 42.4 quintals per hectare in 2000 to 48.9 quintals per hectare in 2006. The production output of export crops, such as coffee, rubber, tea, and pepper, also rose. The production value of livestock increased 7.1 percent annually. The export of agroforestry and fishery products increased rapidly, to US$9.6 billion in 2006, 2.3 times higher than in 2000. Forest coverage expanded from 34.2 percent in 2000 to 37.5 percent in 2004, an annual increase of 0.7 percent (MARD 2005). From 2001 to 2006, aquacultural yield tripled to 1.7 million tons, and fishery catch increased 20 percent to more than 2 million tons, for a combined catch of 3.7 million tons.

The agroforestry and fishery processing industry grew 14 percent annually, focusing on vegetables, fruits, and timber. Rural crafts increased 15 percent annually. Currently, the country has around 2,020 craft villages with more than 1.5 million households, creating more than 10 million jobs and playing an important role in addressing unemployment in rural areas (MARD 2007). Since 1996, average income per capita has tripled in rural areas. The living conditions of rural people have improved in terms of the supply of clean water and electricity, means of communication, development of small enterprises and rural crafts, and incidence of poverty.

Urban and industrial areas grew rapidly as agricultural land was claimed from rural areas. Farmers received low prices for their land, but, once the land was used for other purposes and managed by enterprises or localities, rather than individuals, the price of land rose dramatically. This price difference created social inequality and gave rise to disputes in many regions.

A large number of rural workers have migrated to urban areas, and migration has helped to narrow the income and employment gap between rural and urban areas. In 1995 average income per capita in current prices was 2.6 times higher in urban than in rural areas. In 2006 the difference was nearly 2.1 times (GSO 2006, 2007b).

In 2007 Vietnam became a member of the World Trade Organization (WTO). Before that, Vietnam was a member of the Association of South East Asian Nations (ASEAN), Asia-Pacific Economic Co-operation (APEC), and other bilateral and multilateral agreements. The process of international integration has helped to narrow the economic, cultural, and social gaps between Vietnam and other countries.

All of these processes have concentrated investment, infrastructure, labor, land, and capital in urban areas. They also have improved spatial linkages, expanding infrastructure and services and improving market accessibility for many regions. In general, the socioeconomy of the country has been developing, but Vietnam’s urban, industrial areas have been developing much faster than its rural, agricultural areas (see table 7.1). In other words, spatial disparity has become a big concern.

### Disparities between rural and urban areas

By the end of 2004, there were about 14.2 million rural households, of which 10 million

<table>
<thead>
<tr>
<th>Zone</th>
<th>GDP per capita (US$)</th>
<th>GDP growth rate$^a$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Red River delta</td>
<td>753</td>
<td>8.68</td>
</tr>
<tr>
<td>Northeast</td>
<td>417</td>
<td>8.08</td>
</tr>
<tr>
<td>Northwest</td>
<td>300</td>
<td>7.98</td>
</tr>
<tr>
<td>North central coast</td>
<td>368</td>
<td>7.62</td>
</tr>
<tr>
<td>South central coast</td>
<td>585</td>
<td>7.59</td>
</tr>
<tr>
<td>Central highlands</td>
<td>420</td>
<td>9.39</td>
</tr>
<tr>
<td>Southeast</td>
<td>1,967</td>
<td>8.46</td>
</tr>
<tr>
<td>Mekong River delta</td>
<td>826</td>
<td>8.71</td>
</tr>
</tbody>
</table>


\footnote{a. Adjusted based on the official national growth rate.}
worked in agriculture, accounting for 74.3 percent of total employment (see figure 7.1). The household production and business structure has become increasingly diversified. The share of income from livestock and nonagricultural activities in total household income is increasing. Average income per capita in rural areas rose from 2.1 million dong in 1995 to 6.1 million dong in 2006.²

Despite the remarkable improvement in living standards of the Vietnamese people generally, and rural people particularly, the expenditure and income gap between rural and urban areas is still wide, as shown in the Vietnam household living standards surveys (see figure 7.2). The difference in monthly income per capita between urban and rural areas continues to grow, from 1.8 times in 1993 to 2.1 times in 2006.

Besides, there is a difference in accessibility to information, markets, employment, and education, which is difficult to measure. For example, according to the GSO’s Enterprise Survey 2006 (GSO 2008a), 21 percent of enterprises in rural areas said that the quality of rural roads is poor compared with 13 percent of enterprises in urban areas; 25–30 percent of rural enterprises considered traffic a hindrance to development, compared with only 14–20 percent of urban enterprises; and 8 percent of rural enterprises complained about the condition of telephone service, compared with 0 percent of urban enterprises. Twice as many rural as urban enterprises thought that the supply of electricity is unreliable and a hindrance to their business, while 9 percent of rural enterprises complained about the poor quality of education and training, compared with only 1 percent of urban enterprises. Finally, 31 percent of rural enterprises complained about the quality of vocational education, twice the percentage of urban enterprises voicing this complaint.

**Poor living standards**

Rural households have low income and thus spend much of it on basic living expenses, such as food and drink (see table 7.2). Meanwhile, urban households have higher income and thus more disposable income. The disparity in living standards is evident in the nutritional value of food consumed (see table 7.3). The main source of energy for rural people is starch (rice), while that for urban people is protein (livestock and fishery products). Urban dwellers eat twice the meat per capita as rural dwellers. Rural people mainly consume pork, while urban people consume a diverse menu of
livestock products (for example, poultry, cattle, eggs, and milk).

Living standards and the incidence of hunger and poverty have improved significantly in recent years. However, the gap between the plains and the highlands is still wide (see table 7.4). Infant mortality is between 31 and 34 percent in the highlands, compared with between 14 and 20 percent in the plains. The malnutrition rate follows the same pattern.

**Low rate of savings and investment**

According to the Ministry of Planning and Investment, in the period between 1996 and 1998, rural dwellers made up 80 percent of the total population but only 29–33 percent of social consumption expenditure (*Saigon Economics Times*, June 10, 1999). Rural people were able to save, on average, only 172,000 dong a year in 1994 and 700,000 dong a year between 2001 and 2006. On July 1, 2006, the average savings of rural households was 6.7 million dong, an increase of 3.5 million dong compared with October 1, 2001. Despite the improvement, such levels of savings are too low for productive investment.

While saving is low, most farmers, farm owners, household heads, and private enterprises usually mobilize their own capital for investment; very few turn to banks for credit. Therefore, their ability to buy land, hire labor, purchase equipment, renovate technology, change production structure, and industrialize agriculture and rural areas is limited. Most farmers use backward technology, and few households have fixed assets. About 30 percent have breeding facilities as their main asset. And 14–18 percent have other small fixed assets such as gardens, cattle, sows, breeding boars, and pesticide pots. Few have high-value fixed assets such as warehouses, cars, and trailers. When income rises, farmers tend to purchase durable equipment. In 2005 each rural household invested an average of 1.2 million dong in durable equipment, up slightly from 1 million dong a year in the period of 1998–2000 (GSO 2002, 2007a).

In general, backward technology and small-scale production lead to lower labor productivity in agriculture than in society as a whole, where labor productivity has increased rapidly thanks largely to international investment, technology, and modern management (see figure 7.3).

**Regional disparities**

To narrow these types of disparities, Vietnam has adopted many policies. For example, the government has constructed clinics, schools, markets, and cultural centers and upgraded
roads, electricity, communication, and irrigation systems in highland provinces. Consequently, the index of health care and education is similar in the plains and the highlands (see table 7.5). However, the economic disparities among groups of people and areas have had many negative impacts on the economy, society, and environment.

Uneven job opportunities

The rural population was 60.7 million in 2005, accounting for 73 percent of the total population of the country. The rural labor force was approximately 33.3 million, making up more than 75 percent of the country’s labor force. The number of employed workers in rural areas increased from 28.6 million (80 percent of total employment) in 1996 to 32.9 million in 2005 (76 percent of total employment). In the period of 1990–2000, the agricultural sector contributed almost 37 percent of the newly created jobs. The indexes for the industrial sector and the service sector were 19.8 and 43.5 percent, respectively. The situation was totally different in 2000–06, when 5.7 million jobs were created. The industrial sector employed 57 percent and the service sector employed 49 percent of workers in these new jobs, capturing the jobs lost in the agricultural sector. The number of laborers in the agricultural sector declined 1.5 percent during this period (2006 compared with 2000).

It is becoming more and more difficult to create jobs in rural areas. The annual growth of new rural jobs is 1.7 percent, which is lower than that of the country as a whole. The proportion of employed workers in rural areas has decreased gradually. From 1996–2005, the percentage of unemployed who were in rural areas was more than 80 percent a year. In 2005, 3.53 million people were unemployed, and nearly 87 percent of the unemployed were in rural areas. In addition, the unemployment rate was higher in rural than in urban areas (10.2 and 9.8 percent, respectively, in 1996, 9.1 and 6.6 percent, respectively, in 2000, and 9.3 and 4.5 percent, respectively, in 2005).

Compared with the situation in other Asian economies and the world, in Vietnam labor is highly concentrated in rural areas. This partly reflects the current trend toward capital-intensive rather than labor-intensive use of technology in industry.

Labor productivity

Labor productivity is much lower in rural than in urban areas. Rural workers use backward tools and technology, resulting in low productivity and income. Urban workers in the industrial and service sectors use advanced technology and apply modern management techniques, resulting in high productivity and income.

Food security

For the past 15 years, Vietnam has enjoyed stable growth of agricultural production, which has ensured food security for the majority of the population. Cereal production increased from 301 kilograms per capita in 1990 to 479 kilograms per capita.
Rural development issues in Vietnam: spatial disparities and some recommendations

in 2004 (see figure 7.4). Vietnam exports a large quantity of rice and retains its position as the second-largest rice exporter in the world. The consumption of many agricultural products such as vegetables, fruits, meat, seafood, and forestry products as well as the volume of agricultural exports have expanded constantly. Production of food per capita is as follows: vegetables, 67 kilograms, fruit, 29 kilograms, seafood, 28 kilograms, and meat, 25 kilograms.

At the local level, only the Red River delta and the Mekong delta grow more than enough rice to satisfy local demand. Other areas, especially the highlands and some coastal areas, are not self-sufficient in food production. They produce other products and buy rice for consumption.

When natural disasters, epidemics, and unemployment depress income in an area that does not produce sufficient rice to meet demand, residents cannot afford to buy food, leading to food insecurity at the local level despite a surplus of food in the country as a whole. To obtain food security at the local and household levels requires outside sources of income and access to markets. It is also important for the state to maintain a reserve of food and to offer other forms of support during emergency situations.

**Nutritional structure**

Although the country does not face starvation, disparities still exist in the quality and makeup of food as a result of income differences among groups of people. Food still absorbs most of the poor’s income, preventing them from investing in production and improving their standard of living.

As Vietnam’s food security has improved, so has its nutritional status. There were approximately 10.9 million malnourished Vietnamese in 2004 compared with 15.9 million in 1994. However, nutritional status mirrors income, with the percentage of malnourished people much higher in rural than in urban areas. The rate of underweight children less than five years of age in the highlands is twice that in urban areas. Also, 42.3 percent of children in remote areas were malnourished in 2004, compared with 23.4 percent in urban areas. As shown in figure 7.5, mountainous areas such as the northeast, north-west, and central highlands have the most malnourished children in the country. They also have the highest rate of children whose diets lack protein, fat, vitamin A, iodine, and
other essential ingredients. At the same time, children in cities are at risk of obesity due to excessive amounts of food. Such differences lead to significantly different levels of physical and intellectual development between areas.

**Migration**

The economic disparities between areas push labor out of underdeveloped areas and pull labor into developed ones. Vietnam has experienced waves of migration both of jobs and of workers from rural to industrial, urban areas. In Vietnam, the southeast is the main source of jobs, in addition to Hanoi and Ho Chi Minh City. The Red River delta and the Mekong River delta are the main source of workers. As shown on table 7.6, most of the Vietnamese labor force is unskilled. The flow of immigration is to the southeast region (including Ho Chi Minh City). The number of people moving within the Red River delta is huge, but not shown clearly in the table. The reason is that most of the immigrants to Hanoi are included in the Red River delta.

According to the statistics of the Vietnamese Household Living Standard Survey in 1999 (GSO 2000), most of the immigrants to Hanoi were from the central north and the Red River delta, and some were from the northern mountainous area, while most of the immigrants to Ho Chi Minh City came from the Mekong River delta, the southern area, the central highlands, the central area, and the Red River delta (see figure 7.6).

**Economic growth rate**

In general, provinces with a high share of agriculture in their economic structure (which means those with a low level of industrialization) often have lower economic development indexes than those with a high share of industry in GDP (see table 7.7). Industrialized provinces contribute more to the national budget and thus have more political power. This is the reason why local authorities tend to give priority to accelerating industrial development and reducing the contribution of agricultural production to the local economy. In this race, provinces without advantages for industrial development will certainly lag behind in economic growth.

**Poverty rate**

Vietnam has achieved significant progress in poverty alleviation; however, there is still a considerable difference in poverty density among regions. Regions with a high proportion of poor households often lack natural and socioeconomic resources, have few advantages for economic development, and lack accessibility to markets. They are often the mountainous, island, remote, or ethnic minority areas, which are far from urban centers and are underdeveloped in terms of industry and services. Although from 2000 to present, the absolute density of poverty has changed, the relative density has remained nearly stable. The next population census will be conducted in 2010.

As shown in figure 7.7, regions with a high poverty rate are in the northwest, northeast (mountainous areas in the north), and along the range of mountains in the west (west of the north central coast and central highlands). The region with the lowest poverty rate is the southeast, which is the most industrial region in the country. The delta and coastal areas have a low poverty rate.

### Table 7.6 Labor and migration situation in Vietnam, 2004

<table>
<thead>
<tr>
<th>Region</th>
<th>Percent of the national labor force (percent)</th>
<th>Percent of workers who are unskilled</th>
<th>Percent of people living in urban areas (percent)</th>
<th>Net immigration (number of persons)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Red River delta</td>
<td>22.6</td>
<td>68.5</td>
<td>24.5</td>
<td>−4,656</td>
</tr>
<tr>
<td>Southeast</td>
<td>14.9</td>
<td>67.8</td>
<td>53.7</td>
<td>94,424</td>
</tr>
<tr>
<td>Mekong River delta</td>
<td>21.3</td>
<td>85.7</td>
<td>20.2</td>
<td>−38,632</td>
</tr>
<tr>
<td>North central coast</td>
<td>12.4</td>
<td>84.1</td>
<td>6.0</td>
<td>114</td>
</tr>
<tr>
<td>South central coast</td>
<td>8.2</td>
<td>74.9</td>
<td>29.0</td>
<td>−8,017</td>
</tr>
<tr>
<td>Northeast</td>
<td>11.8</td>
<td>81.8</td>
<td>18.7</td>
<td>−11,717</td>
</tr>
<tr>
<td>Northwest</td>
<td>3.2</td>
<td>88.8</td>
<td>13.8</td>
<td>−379</td>
</tr>
<tr>
<td>Central highlands</td>
<td>5.6</td>
<td>84.3</td>
<td>28</td>
<td>−1,676</td>
</tr>
<tr>
<td>Vietnam</td>
<td>100</td>
<td>77.3</td>
<td>26.5</td>
<td>0</td>
</tr>
</tbody>
</table>

However, regions with the highest population density (which are the most developed regions) also have the highest poverty density. They are the Red River delta, the central coast, and the Mekong delta. Only the southeast has a high level of economic development but a small absolute number of poor households.
GNI and other equality indexes

While Vietnam has been developing economically, social and economic inequality has been lower than in other countries in the region. From 1993–2004, Vietnam’s GNI (gross national income) was almost unchanged, while the economy grew rapidly. From 2004–06, GNI went down a little. Vietnam’s GNI has remained stable thanks largely to improvements experienced by the three middle quintiles of income. In 2006 these three groups accounted for 50 percent of total expenditures. However, the gap between the richest and the poorest group widened during this period, and GNI varied considerably among regions in the country (see table 7.8).

According to statistics of the population and housing census in 1999, poor areas in the mountains of the north, the north central coast, the south central coast, and the central highlands have a high GNI compared to the national average. In the future, Vietnam needs to address not only poverty but also inequality (see figure 7.8).

Investment

Due to differences in natural and socioeconomic conditions and in investment incentives, foreign investment varies by region, as
does the creation of jobs and income (see table 7.9). Capital, technology, management skills, and job creation will, in turn, alter the local infrastructure, service sector, and urbanization of the localities, further widening the gap among localities.

**Causes of disparities**
Spatial disparities are caused by many factors. First, differences in natural conditions such as topography, land, climate, and resources create differences in the ability of each region to adapt to different modes of production and to make use of comparative advantages. In addition, the socioeconomic characteristics of each region play a role, including population density, language, culture, quality of blue- and white-collar skills, and business culture (such as the ability to cooperate, entrepreneurial mindset, interest in education, and understanding of the need to save and invest).

Geographic factors also play an important role in the economic development of each region. Coastal regions have advantages of fishery and accessibility to international traffic. Similarly, border regions, regions that are near an international airport or a big city, especially those near an international route (land, sea, air), or regions that have cultural and natural attractions can use their geographic advantages.

**Unequal investment in infrastructure**
Investment in infrastructure in favorable regions (plains, urban areas) and economically advantaged regions (rich natural resources, fertile land) is relatively inexpensive but highly effective. Therefore, these regions are given priority in the development of infrastructure. Once again, the unequal investment in infrastructure widens the economic gap between localities.

Table 7.8 Poverty in Vietnam, by region, 2004

<table>
<thead>
<tr>
<th>Region</th>
<th>Percent of population below the food poverty line</th>
<th>Human poverty index (HPI)</th>
<th>Gap between 20 percent richest and 20 percent poorest</th>
<th>Income per capita of 20 percent poorest (US$ PPP)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Red River delta</td>
<td>4.59</td>
<td>8.4</td>
<td>7.0</td>
<td>164</td>
</tr>
<tr>
<td>Southeast</td>
<td>1.82</td>
<td>9.6</td>
<td>8.7</td>
<td>233</td>
</tr>
<tr>
<td>Mekong River delta</td>
<td>5.22</td>
<td>20.0</td>
<td>6.7</td>
<td>159</td>
</tr>
<tr>
<td>North central coast</td>
<td>12.24</td>
<td>15.8</td>
<td>6.0</td>
<td>114</td>
</tr>
<tr>
<td>South central coast</td>
<td>7.58</td>
<td>13.8</td>
<td>6.5</td>
<td>141</td>
</tr>
<tr>
<td>Northeast</td>
<td>9.35</td>
<td>18.6</td>
<td>7.0</td>
<td>124</td>
</tr>
<tr>
<td>Northwest</td>
<td>21.81</td>
<td>32.7</td>
<td>6.4</td>
<td>95</td>
</tr>
<tr>
<td>Central highlands</td>
<td>12.30</td>
<td>20.5</td>
<td>7.6</td>
<td>119</td>
</tr>
<tr>
<td>Vietnam</td>
<td>6.92</td>
<td>15.1</td>
<td>8.3</td>
<td>142</td>
</tr>
</tbody>
</table>

Source: GSO (2006c).

Figure 7.8 Inequality in Vietnam

Source: Based GSO (2000).
infrastructure and economic disparities. The people in the most developed regions (the southeast) have the best access to infrastructure and services. In contrast, the people in the most isolated areas (northeast, northwest, central highlands) have the worst access.

**Economic structure**

Seemingly, the localities with a low share of agriculture and a high share of industry in GDP enjoy a higher growth rate (see figure 7.9 and table 7.11). The regions with a high share of industry can create high export value and make a large contribution to the state and national budgets. A special case is the northeastern region. While many provinces in the highlands have underdeveloped economies and conditions that are not conducive to the development of industry, Quang Ninh province located on the eastern border has a significant gateway to China, a deepwater port; the Ha Long World Heritage site; and the biggest coal mine in the country. Hence, the industry and economy of this province are well developed, raising the average value of the region.

**Macro policies**

Apart from the natural characteristics of regions, state policies also result in economic disparities. These policies seek to promote growth and create favorable conditions for advantaged sectors, regions, and groups by offering incentives and according them priority in accessing resources. One example is trade protection policy, which treats commodities differently depending on the sector (see table 7.12).

The following are some other macro policies with the same impact:

- In some periods, the domestic currency was kept at an inflated value. This exchange rate policy favored industrial products with low competitiveness, while it disfavored export-oriented industries such as rice, coffee, cashews, and rubber.
- For a long time, the terms of trade were disadvantageous for agricultural products. The price of agricultural products
often rises more slowly than the price of inputs (fertilizers, chemicals, gasoline, machines) as well as the price of consumer goods and services for farmers (medicine, health care, education).

- One of the most controversial policies is compensation for the transfer of agricultural land to industrial, urban land. Normally, the price paid to farmers for land is different than the price paid by enterprises and landowners who will convert it to industrial or urban use. This situation benefits enterprises implementing industrial and urban development projects and creates an opportunity for speculation, placing farmers at a disadvantage.

There are many other examples of incentives for urban development, such as infrastructure investment, high-quality service, price stabilization, intellectual attraction to cities and industrial zones, and many examples of unfavorable policies for farmers, such as prohibiting the use of outdated vehicles in rural industry and restricting the use of unofficial services (which are performed mostly by migrants from rural areas).

**Investment orientation**
Although agriculture is creating jobs and income for the majority of the population and contributes 22–23 percent of total GDP, in recent years the portion of total

---

**Table 7.11 Structure of GDP and economic development in Vietnam, by region, 2006**

<table>
<thead>
<tr>
<th>Region</th>
<th>Share of service in GDP</th>
<th>Share of industry in GDP</th>
<th>Contribution to total GDP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Red River delta</td>
<td>44.43</td>
<td>40.32</td>
<td>19.56</td>
</tr>
<tr>
<td>Southeast</td>
<td>30.62</td>
<td>63.95</td>
<td>38.73</td>
</tr>
<tr>
<td>Mekong River delta</td>
<td>28.41</td>
<td>31.30</td>
<td>20.53</td>
</tr>
<tr>
<td>Central north</td>
<td>36.57</td>
<td>32.27</td>
<td>5.90</td>
</tr>
<tr>
<td>South central coast</td>
<td>38.55</td>
<td>37.81</td>
<td>5.95</td>
</tr>
<tr>
<td>Northeast</td>
<td>36.34</td>
<td>36.89</td>
<td>5.29</td>
</tr>
<tr>
<td>West east</td>
<td>35.99</td>
<td>21.84</td>
<td>1.12</td>
</tr>
<tr>
<td>Central highlands</td>
<td>28.21</td>
<td>24.85</td>
<td>2.92</td>
</tr>
<tr>
<td>Vietnam</td>
<td>38.07</td>
<td>41.56</td>
<td>100</td>
</tr>
</tbody>
</table>

**Source:** Provincial Statistics Offices (2008).

**Table 7.12 Effective rate of protection in Vietnam, by sector, 1997–2003**

<table>
<thead>
<tr>
<th>Sector</th>
<th>1997</th>
<th>2001</th>
<th>2003</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agriculture</td>
<td>7.74</td>
<td>7.43</td>
<td>12.52</td>
</tr>
<tr>
<td>Manufacturing</td>
<td>121.47</td>
<td>95.97</td>
<td>43.94</td>
</tr>
<tr>
<td>Mining</td>
<td>6.05</td>
<td>16.39</td>
<td>-0.03</td>
</tr>
<tr>
<td>Average</td>
<td>59.54</td>
<td>54.1</td>
<td>26.23</td>
</tr>
</tbody>
</table>

**Source:** Athukorala (2005).
investment in agriculture has been low (see figure 7.10). Public expenditure for agriculture only accounts for 5–6 percent of the government budget, equivalent to 3–6 percent of total agricultural production, and 1–1.5 percent of total GDP. As a result, the development of infrastructure and many public services (animal health, plant protection, information, research, and technical transfer) have not kept pace with the demand, especially in rural areas.

The proportion of agricultural investment in total social investment decreased from 7.1 percent in 1996–99 to 6.4 percent in 2000–03. Private investment in agriculture and in rural areas only makes up 13–14 percent of private investment in general. Despite the role of foreign investment in the economy overall, the share of foreign investment in agriculture is low, at only 3–4 percent. As a result, the socioeconomic gaps between the rural and urban areas and between agriculture and industry are inevitable.

**Recommendations**

Although they are not serious yet, economic disparities are increasing in Vietnam. The disparity is not only in space and growth rates but also in accessibility of resources and services, not only in the economy but also in culture, society, and the environment.

The cause of this situation includes both market mechanisms that direct resources to highly profitable fields and areas and public policies that focus attention and resources on industry, services, and urban areas in an effort to accelerate economic growth and development.

The solutions to this complicated problem should begin with research on a theory of sustainable development. All strategies and policies should be formulated to ensure this objective. In principle, key linkages in the economy should be improved as follows:

- Link production, processing, business, and consumption (value chain, commodity chain) so that stakeholders can communicate with one another throughout the process from production to consumption through associations, economic contracts, and community commitment and so that commodity associations can provide science and technology, market information, credit, extension services, and food safety. Such linkages are needed to allow the sharing of profit and risk and allow production households to participate more in the value chain, raising their income and reducing their risks.
• Link the rural and urban areas by removing barriers to the migration of rural laborers to urban areas and create a favorable environment in rural areas to attract investment, develop small and medium enterprises (SMEs), upgrade services and infrastructure, and improve education. Build a system of satellite cities and industrial zones to decentralize urban areas and attract industry to rural areas.

• Link key labor-supplying areas with urban areas and industry so that workers can return home after work and urban dwellers can enjoy life in rural areas. Give priority to spillover industries that mobilize rural laborers in industry and the service sector in urban, industrial zones. This would help to create jobs, raise income, and improve living standards for rural people.

• Link regions by mobilizing private and public capital to build infrastructure, especially key traffic axes among regions, focusing on difficult regions such as mountainous, remote areas and minority ethnic areas and giving priority to agriculture and rural development to ensure equality between favorable and unfavorable areas for industrial development.

• Deal with the issue of an aging rural population by gradually setting up a system of social safety nets and transferring this system from the household level to the community level and the state.

• Apply incentives for ethnic groups not favored by natural and social conditions. At the same time, preserve ethnic cultural, economic, and social values and encourage the community to manage its own life and development and not depend passively on the state and outsiders.

• Build key development corridors (roads, railways) to link the localities within a region, connect foreign localities in Cambodia, Lao, and Yun Nan, China, for example, to the sea through Vietnamese territory, develop key deepwater ports in the north, the center, and the south, and build international airports linking Vietnam to international ports and airlines.

• Attract foreign investment to develop science, technology, and management; promote trade liberalization; and enter integration commitments.

• Through the market, media, civil society, education, and scientific and technological research, give all social classes, including vulnerable groups, the opportunity to participate in the national economic development process, to join and benefit from globalization, and to raise their voice, self-defense capacity, and economic, political, and social position.

Socioeconomic disparity is an inevitable consequence of fair market competition. However, in the current context of higher growth and untenable solutions, such as destroying the environment now and reproducing it later or pauperizing farmers and mobilizing them as unskilled labor in industry, disparities are leading directly to ecological imbalance and social crisis. Therefore, solving the problem of disparity is as crucial as pursuing economic growth.

Notes
Dr. Dang Kim Son is director general of the Institute of Policy and Strategy for Agriculture and Rural Development in the Vietnam Ministry of Agriculture and Rural Development.

1. According to the official poverty line set by the Vietnamese government.


3. The rural labor force is the number of people in rural areas who are more than 15 years old and are involved in economic activities. It does not include people who are unemployed.

References


With its 13,000 islands, Indonesia is the world’s largest archipelagic state and one of the most spatially diverse nations on earth in its resource endowments, population settlements, location of economic activity, ecology, and ethnicity. There are about 350 identified ethnic groups. In the early 2000s, per capita regional product in the richest province, East Kalimantan, was around 16 times that in the poorest, Maluku. The range of poverty incidence was from 3.4 percent of the population in Jakarta to 42 percent in Papua.

The country’s regional development patterns are therefore of great analytical and policy interest. Indonesia is formally a unitary state, but all national governments have had to deal with major regional development challenges. The country’s international boundaries have changed twice since independence, with the formal entry of Papua (then Irian) in 1969 and the entry and later exit of East Timor in 1976 and 1999, respectively. Subnational boundaries have changed frequently.

While national economic fortunes and policies explain much of the local development outcomes, regional responses to international and domestic events inevitably vary. Four examples briefly illustrate this proposition.

First, the 1970s oil boom disproportionately benefited the country’s four resource-rich provinces, even though much of the windfall gains accrued to the central government and oil companies. Second, the major policy reforms of the 1980s resulted in rapid, export-oriented industrialization, mainly concentrated on Java and Bali, which in turn boosted the economic fortunes of these islands. Third, the economic crisis of 1997–98 particularly affected construction of the modern sector, finance, and import-substituting manufacturing sectors, and, because these are mainly located on Java, this region experienced the sharpest decline in economic activity. Fourth, the decentralization program has transferred considerable financial resources and administrative authority from the central government to the second-level tiers of government (kabupaten and kota) and, in the process, is likely to alter Indonesia’s economic geography significantly.

While much has been written on various aspects of regional development in Indonesia, there are two reasons to revisit the issue. First, it has only been possible to measure accurately and quantify regional trends since the mid-1970s. Development dynamics are a long-term phenomenon, involving decades rather than years, and we are only now in a position to analyze Indonesia’s regional economic, social, and demographic development over a period of 30 years.

The second motivation has to do with the renaissance of regional economics and science. Traditionally regarded as inhabiting the backwaters of the profession, “new economic geography has come of age” in the words of Neary (2001). This has arisen principally owing to the intellectual fusion between international trade and geography articulated by Krugman (1991).

A key insight from this literature concerns the interaction between the international
As countries remove regulatory impediments to the cross-border flow of goods, services, capital, technology, and people, those regions most connected to the global economy—by dint of location, infrastructure, and enabling institutions—are likely to grow the most quickly. In cases where domestic infrastructure lags or there are regulatory barriers to domestic commerce, these internationally oriented regions may become in effect enclaves, more connected to the global economy than to the hinterland.

As a corollary, to the extent that national economic policies—openness, macroeconomic management, and so forth—are tending to converge around the world, local governance and institutions are likely to become increasingly important determinants of regional development outcomes. In the search for markets and mobile factors, for example, Jakarta is competing with both Surabaya and Shanghai, albeit in different dimensions.

This paper draws on this rapidly expanding literature and the rich Indonesian regional database to address the following issues, each of which constitutes a section of the paper. First, we provide an overview of Indonesia's changing regional economic geography, examining how the location of economic activity and provincial economic rankings have changed since the 1970s. Next, we investigate patterns of regional economic growth and structural change, examining regional growth dynamics, followed by the interrelationships among growth, structural change, and demographic dynamics. Next we examine convergence and inequality, both in terms of the "four-quadrants" story of initial incomes and subsequent growth and the various measures of convergence. These results are compared with Indonesia's provincial social indicators. We also discuss conflict at the regional level and assess various explanatory hypotheses. In a final section, we summarize our main findings.

To address these issues, we have assembled a large regional database from various series of Indonesia's Central Board of Statistics (Badan Pusat Statistik). These data are discussed in detail in the relevant sections, but we note here two general points. First, the analysis is conducted at the provincial level and is based on a standard set of 26 provinces. These are the 27 provinces that existed for most of the Soeharto era, excluding the special case of East Timor. Since 2000, there has been considerable fragmentation (pemekaran) of provincial boundaries, and so it is necessary to adjust the published data back to the pre-2000 provincial boundaries.¹

The second general point to note is that, reflecting data constraints, our story commences in the 1970s, the period when reliable regional socioeconomic data became available (see Arndt 1973). In the case of demographic and related data, the starting point is the 1971 population census, while the regional accounts effectively commence in 1975.

**Economic geography**

As is well known in the Indonesian context, there are two relevant measures of regional economic activity and three indicators of economic welfare. There is no "true" measure of economic activity and welfare, as each one measures a different concept. We therefore present and examine the three series.

The activity measures are regional gross domestic product (GDP) and regional GDP excluding mining, in particular oil and gas. The latter measure is frequently employed in Indonesia owing to the presence of extractive activities, which significantly affect measured local economic activity but have much less effect on local economic and social welfare. This difference between the two series arises because a large proportion of the returns to extractive activities accrue to extra-provincial entities, principally the central government and foreign and domestically owned mining companies. With the introduction of decentralization measures in January 2001, regions now receive a higher proportion of mining revenue, and thus the differences between the welfare measures might be expected to narrow gradually over time (Resosudarmo and Vidyattama 2007).

In principle, the output of any "enclave" activity might be deducted from regional GDP to provide a better indication of local economic activity and welfare. In practice, the choice is between oil and gas, on the one hand, and mining, on the other. Other
resource-based activities, notably forestry, are substantially more labor intensive and therefore have larger local employment and income spin-offs. Some mining activities are also quite labor intensive (for example, small-scale gold mining) and perhaps do not need to be deducted from regional GDP. In practice, the distinction is inevitably somewhat arbitrary.

In this paper, we employ regional GDP and regional non-mining GDP. The latter is selected for two reasons. First, the non-mining series is available for a longer period of time (since 1975) than the non-oil and gas series (since 1983). Second, the difference between the non-mining and non-oil and gas series is not large, as oil and gas are the major component of Indonesian mining output, accounting for 68 percent of mining value added in 2004. The only regional exception—that is, a very large non-oil and gas mining sector—is Papua (Manning and Rumbiak 1989).

In addition to total and non-mining regional GDP, there are estimates of household consumption expenditure (CE) per capita. The latter are available for a shorter time period, since 1983. They are particularly useful for computing poverty estimates. They are not a superior indicator of economic welfare—by definition they exclude household saving and government consumption and saving—but they do provide an additional dimension. This series would be expected to correlate more closely with non-mining regional GDP.

We present the regional accounts data at three points in time, 1975 (1983 for the CE data), 1990, and 2004. These correspond to important time periods in Indonesia’s recent economic history. These are, respectively, the early years of the oil boom, the year in which the major post-oil boom policy reforms were introduced, and the year in which national income per capita returned to pre-crisis levels.

**Major concentrations of Economic activity**

It is convenient initially to divide the country into five major island groupings: Java-Bali, Sumatra, Kalimantan, Sulawesi, and “eastern Indonesia.” Java dominates Indonesia’s economy, contributing 61, 66, and 67 percent of the country’s total GDP, non-mining GDP, and household expenditure, respectively, in 2004 (see table 8.1). Sumatra comes next, with 22, 20, and 20 percent. Kalimantan has 9, 8, and 5 percent, Sulawesi has 4 percent on all measures, and the eastern provinces have around 3 percent on all measures. We examine the factors underlying these regional dynamics in the following section.

Over time and regardless of the measure used, there has been a clear shift of economic activity toward Java-Bali and, in particular, the national capital Jakarta. Jakarta generated one-sixth of Indonesian GDP in 2004, double that of 1975. Its share of non-mining GDP also has increased significantly, though not as fast. It accounts for virtually all of the increase in the Java-Bali share of GDP and more than 100 percent of the increase in non-mining GDP. That is, the Java-Bali share excluding Jakarta is stable for the total regional GDP series, while declining slightly for the other two series. In fact, the increase in Jakarta’s share is understated, as some of its growth has spilled over the border to West Java, the only other province in the group with an increased share of GDP. The three big Java provinces—these two and East Java—account for half of Indonesia’s GDP and a slightly higher share of its non-mining GDP.

Sumatra’s share of non-mining GDP and household expenditure has been stable at 20–21 percent. Its share of GDP has been declining, owing to the falling share of oil and gas in the national economy and reflected in the declining shares of the island’s main producers, Riau and Aceh. The two largest economies have been Riau with mining included and North Sumatra with mining excluded. Riau is a particularly unusual regional economy, with a large oil enclave, a cash crop economy, a relatively wealthy capital city, and a strong export-oriented manufacturing and service economy in the islands adjacent to Singapore. Thus, although its share of national GDP has declined since 1975 owing to the oil effects, its share of national non-mining GDP (and household expenditure) has more than doubled since 1990, the fastest increase in the country for this period.

Of note is the fact that the three southern provinces of Sumatra—South Sumatra,
West Sumatra, and Lampung—have been slipping. In 2004 their share of non-mining GDP was about two-thirds of that in 1975. Evidently, their proximity to stronger economies to their south and north has not had a growth spillover effect. Lampung, in particular, was seen as a solution to Java’s alleged problems of over-population and poverty, but since the 1970s its economic performance has lagged behind that of Java.

The largest and most dynamic regional economy in Kalimantan is East Kalimantan, with its large oil and gas resources. In fact, it has experienced “twin booms” in the words of Pangestu (1989), from both hydrocarbons and timber. Downstream industrial processing has provided a further boost, while since 2001 the decentralization program has enriched kabupaten Kutai Kartanegara, which has the nation’s highest regional GDP per capita. Both regional GDP series are misleading indicators of the region’s living standards, as indicated by the much lower share of household expenditure compared to their shares of regional GDP with and without mining. Nevertheless, the latter is growing quickly, rising 50 percent as a proportion of the national total since 1990.

The share of the eight eastern provinces in the national economy is gradually declining. This generalization applies to the largest regional economy in the east, South Sulawesi, and its traditionally most prosperous region, North Sulawesi. The share of Maluku, the site of the country’s most serious religious conflict, is now less

Table 8.1 Shares of regional GDP with and without mining and household consumption expenditure in Indonesia, by province, various years, 1975–2004

<table>
<thead>
<tr>
<th>Province</th>
<th>Regional GDP</th>
<th>Non-mining regional GDP</th>
<th>CE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sumatra</td>
<td>32.2</td>
<td>24.9</td>
<td>22.2</td>
</tr>
<tr>
<td>Aceh</td>
<td>1.6</td>
<td>3.8</td>
<td>2.2</td>
</tr>
<tr>
<td>North Sumatra</td>
<td>5.7</td>
<td>5.7</td>
<td>5.4</td>
</tr>
<tr>
<td>West Sumatra</td>
<td>1.8</td>
<td>1.8</td>
<td>1.7</td>
</tr>
<tr>
<td>Riau</td>
<td>15.1</td>
<td>6.5</td>
<td>6.8</td>
</tr>
<tr>
<td>Jambi</td>
<td>0.8</td>
<td>0.7</td>
<td>0.8</td>
</tr>
<tr>
<td>South Sumatra</td>
<td>4.8</td>
<td>4.2</td>
<td>3.3</td>
</tr>
<tr>
<td>Bengkulu</td>
<td>0.3</td>
<td>0.4</td>
<td>0.4</td>
</tr>
<tr>
<td>Lampung</td>
<td>1.9</td>
<td>1.7</td>
<td>1.6</td>
</tr>
<tr>
<td>Java-Bali</td>
<td>51.5</td>
<td>58.6</td>
<td>61.0</td>
</tr>
<tr>
<td>Jakarta</td>
<td>8.7</td>
<td>12.1</td>
<td>17.1</td>
</tr>
<tr>
<td>West Java</td>
<td>14.5</td>
<td>16.8</td>
<td>17.2</td>
</tr>
<tr>
<td>Central Java</td>
<td>9.9</td>
<td>11.5</td>
<td>8.8</td>
</tr>
<tr>
<td>Yogyakarta</td>
<td>1.2</td>
<td>1.0</td>
<td>1.0</td>
</tr>
<tr>
<td>East Java</td>
<td>15.8</td>
<td>15.5</td>
<td>15.5</td>
</tr>
<tr>
<td>Bali</td>
<td>1.3</td>
<td>1.6</td>
<td>1.3</td>
</tr>
<tr>
<td>Java-Bali without Jakarta</td>
<td>42.8</td>
<td>46.4</td>
<td>43.8</td>
</tr>
<tr>
<td>Kalimantan</td>
<td>7.1</td>
<td>9.1</td>
<td>9.3</td>
</tr>
<tr>
<td>West Kalimantan</td>
<td>1.4</td>
<td>1.5</td>
<td>1.3</td>
</tr>
<tr>
<td>Central Kalimantan</td>
<td>0.5</td>
<td>0.7</td>
<td>0.8</td>
</tr>
<tr>
<td>South Kalimantan</td>
<td>1.0</td>
<td>1.2</td>
<td>1.2</td>
</tr>
<tr>
<td>East Kalimantan</td>
<td>4.1</td>
<td>5.7</td>
<td>6.0</td>
</tr>
<tr>
<td>Sulawesi</td>
<td>5.0</td>
<td>4.1</td>
<td>4.2</td>
</tr>
<tr>
<td>North Sulawesi</td>
<td>1.3</td>
<td>0.8</td>
<td>0.8</td>
</tr>
<tr>
<td>Central Sulawesi</td>
<td>0.4</td>
<td>0.5</td>
<td>0.7</td>
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<tr>
<td>South Sulawesi</td>
<td>3.0</td>
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<td>2.2</td>
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<td>Southeast Sulawesi</td>
<td>0.3</td>
<td>0.4</td>
<td>0.5</td>
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<tr>
<td>Eastern Indonesia</td>
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<td>3.3</td>
</tr>
<tr>
<td>West Nusa Tenggara</td>
<td>0.8</td>
<td>0.7</td>
<td>1.0</td>
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<td>East Nusa Tenggara</td>
<td>0.8</td>
<td>0.6</td>
<td>0.6</td>
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<tr>
<td>Maluku</td>
<td>0.9</td>
<td>0.8</td>
<td>0.3</td>
</tr>
<tr>
<td>Papua</td>
<td>1.8</td>
<td>1.2</td>
<td>1.4</td>
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<tr>
<td>Indonesia (current Rp trillion)</td>
<td>12</td>
<td>188</td>
<td>2,203</td>
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</table>

Source: Central Board of Statistics (various years).
Note: All numbers are in percentages. Based on current prices.
than one-third of the 1975 figure. The only exceptions to this picture of declining shares are the two small Sulawesi provinces (which were boosted by in-migration), West Nusa Tenggara (which recently experienced a major expansion in mining) and Papua (in the case of household expenditure since 1990). The latter reflects the combined effects of the mining boom and special government programs.3

**Provincial economic rankings**

We examine these rankings with reference to the three measures discussed above. All data are normalized around the national average of 100. There are large interprovincial income and welfare differences and evidence of both continuity and change in these rankings (see table 8.2). In 2004, the gap between the richest and poorest provinces was very large, depending on which series is used. The ratio of the richest to poorest was 15.9 for regional GDP per capita (East Kalimantan:Maluku), 14.7 for non-mining regional GDP per capita (Jakarta:Maluku), and 11.3 for household expenditure (Jakarta:West Nusa Tenggara).

The first three columns indicate how the inclusion of mining inflates the estimated regional GDP per capita for the resource-rich regions, especially in the earlier years. For example, in the case of Riau,

Table 8.2. Regional GDP with and without mining and household consumption expenditure per capita in Indonesia, by province, various years, 1975–2004

<table>
<thead>
<tr>
<th>Province</th>
<th>Regional GDP per capita</th>
<th>Non-mining regional GDP per capita</th>
<th>PCE</th>
</tr>
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<tr>
<td>Sumatra</td>
<td>177.0</td>
<td>121.7</td>
<td>103.1</td>
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<td>93.3</td>
<td>200.7</td>
<td>114.5</td>
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<td>North Sumatra</td>
<td>101.9</td>
<td>99.6</td>
<td>92.2</td>
</tr>
<tr>
<td>West Sumatra</td>
<td>79.1</td>
<td>78.3</td>
<td>81.6</td>
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<td>1,061.5</td>
<td>352.0</td>
<td>245.2</td>
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<td>87.1</td>
<td>65.5</td>
<td>67.0</td>
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<td>118.5</td>
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<td>64.6</td>
<td>49.0</td>
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<td>72.8</td>
<td>50.8</td>
<td>48.4</td>
</tr>
<tr>
<td>Java-Bali</td>
<td>79.4</td>
<td>94.9</td>
<td>103.3</td>
</tr>
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<td>Jakarta</td>
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<td>262.9</td>
<td>419.1</td>
</tr>
<tr>
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<td>84.9</td>
<td>85.9</td>
</tr>
<tr>
<td>Central Java</td>
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<td>Yogyakarta</td>
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<td>85.1</td>
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<td>83.4</td>
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<tr>
<td>Java-Bali without Jakarta</td>
<td>70.5</td>
<td>81.3</td>
<td>78.8</td>
</tr>
<tr>
<td>Kalimantan</td>
<td>159.2</td>
<td>178.4</td>
<td>159.8</td>
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<tr>
<td>West Kalimantan</td>
<td>84.2</td>
<td>80.3</td>
<td>65.8</td>
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<td>83.9</td>
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<td>30.5</td>
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<td>Maluku</td>
<td>91.9</td>
<td>76.6</td>
<td>29.0</td>
</tr>
<tr>
<td>Papua</td>
<td>226.8</td>
<td>126.8</td>
<td>123.5</td>
</tr>
<tr>
<td>Indonesia (current Rp thousands)</td>
<td>91</td>
<td>1,051</td>
<td>10,421</td>
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</table>

Source: Central Board of Statistics (various years).
Note: All provincial numbers are relative to Indonesia, which is set to 100. Based on current prices.
regional GDP per capita was seven times higher than non-mining regional GDP in 1975. By 2004, these effects were much smaller. The three series were about 37 percent higher in Aceh, 52 percent in Riau (and also in West Nusa Tenggara, owing to its recent mining expansion), 63 percent in East Kalimantan, and almost double in Papua. In the first and last of these provinces, non-mining regional GDP had fallen below the national average.

We therefore develop our main story around the non-mining series, which excludes the enclave mining effects. We identify what may be termed consistently “wealthy” and “poor” regions, those close to the national average, and those that have experienced a significant change in relative incomes.

**Consistently wealthy.** There are two really wealthy provinces, Jakarta and East Kalimantan. Jakarta is by far the richest province as measured by non-mining regional GDP per capita, at about four times the national average and double that of the next richest province. It has been getting relatively richer, especially since 1990. This is notwithstanding, first, the 1980s liberalizations, which reduced the regulatory powers of the capital; second, the decentralization of 2001, which transferred resources and funds to the regions; and third, the 1997–98 crisis, which affected it more severely than any other province apart from West Java.4 However, it also recovered more quickly than most provinces. In spite of its role as the national capital, the public sector is one of the smallest in the country.

East Kalimantan’s per capita non-mining regional GDP has consistently been at least three times the national average, indicating that its economic wealth extends well beyond the mining enclaves. However, its household expenditure suggests that community living standards are much closer to the national average. About 60 percent of East Kalimantan’s non-mining regional GDP comes from oil- and gas-processing industries. These are relatively capital-intensive activities, and much of the return on these investments accrues to entities outside the province.

A third province, Riau, is generally well above the national averages. Its fortunes declined sharply during the 1980s in the wake of the fading oil boom, resulting in its income and expenditures being close to the national average. However, as noted, strong growth in the islands close to Singapore, combined with export-oriented cash crops on the mainland, resulted in it being the third-richest province in 2004 according to both series.

**Consistently nonpoor.** A second group of provinces may be termed consistently well-off, with non-mining regional GDP per capita at least 85 percent of the national average. This includes the traditionally strongest agricultural exporter, North Sumatra; the frontier province of Central Kalimantan (initially driven by timber, but with cash crops now the major agricultural activity); the country’s two major industrial provinces, West and East Java (the latter’s ranking rising appreciably); the major tourist region, Bali;5 and West Sumatra (where both agriculture and a range of services are important). Aceh would have belonged in this group until recently, but the protracted conflict (at least until 2005) has resulted in sharply lower living standards.

**Very poor.** At the other extreme are the poor provinces, with a ratio of about half the national average or less. They are all located in eastern Indonesia. The two Nusa Tenggara provinces are consistently poor and evidently slipping further behind, falling from just over half the national average in both series to 35–40 percent. Maluku, which has experienced the most serious conflict since 1998, has fallen sharply, from above the national average (in non-mining regional GDP per capita) to one-third of it. Southeast Sulawesi, the poorest province on this island, is about half the national figure in all series.

**Slipping behind.** A number of provinces have slipped significantly in their rankings in both the non-mining regional GDP and expenditure series. These are mainly traditional agricultural exporters that have not been able to capitalize on their initial advantages. Examples include South Sumatra,6 Jambi, Bengkulu (all in Sumatra), West and South Kalimantan, North and South Sulawesi, and resource-rich
Papua (although its household expenditure has risen). It is notable that Central Java and Yogyakarta have slipped according to both series, although not as much as the others in this group. The latter case is puzzling given its traditional importance as a major center of higher education. This is such a heterogeneous group of provinces as to render hazardous any attempt to find a common set of explanations. Perhaps the most important observation is that they generally lack a major, internationally oriented engine of growth. We return to this issue shortly.

These interprovincial rankings shed much light on Indonesian regional dynamics. In the first three decades of Indonesian independence, Java was regarded as the country’s most serious development challenge, with the island “asphyxiating for want of land,” in the words of Keyfitz (1965: 503). By contrast, in spite of their poorer human and physical infrastructure, the resource-rich regions in the Outer Islands were considered to have less poverty and better development prospects. However, a different picture emerged in the 1980s. The major economic policy reforms increased the relative profitability of export-oriented manufacturing and related higher-value services, which are located mainly on Java-Bali. Declining commodity prices adversely affected many off-Java regions. Thus Sumatra’s ranking on all three series declined significantly. It was overtaken by Java-Bali by 1990 and was below the national average for both series in 1990 and 2004. A particularly notable decline is Lampung, historically seen as the solution to Java’s “population problem.” In 2004 its income and expenditures were less than half those of Java-Bali in all three series.

Kalimantan displays above-average income but below-average expenditure, owing to the distributional effects of the natural resource sectors. The eight provinces of eastern Indonesia are both poor and slipping further behind, with the partial exception of Papua’s enclaves.

**Regional economic growth and change**

We now examine provincial economic growth rates on a per capita basis over the same periods and for the same series. Java-Bali in general was the fastest-growing region, followed by Sulawesi (see table 8.3). Sumatra was pulled down by the oil sector. In the case of growth in non-mining regional GDP per capita, there is the same relatively even pattern of growth across island groupings: Java-Bali was the only major region to grow (slightly) faster than the national figure of 4.6 percent. Kalimantan and Sulawesi were just below it, followed by Sumatra and by eastern Indonesia, 0.9 percentage points below the average. The growth rates of household expenditure are similarly quite even.

It is not easy to identify obvious groupings and characteristics of provinces based on growth rates. The fastest growth rates (in regional GDP per capita) over the period of 1976–2004 occurred in Bali, West Nusa Tenggara, West Sumatra, Jakarta, Central Java, and North Sulawesi. The slowest rates were recorded in Riau, Papua, South Sumatra, Maluku, East Kalimantan, and Jambi. Thus the fast growers included both small and large provinces, “central” and remote locations, and areas with initially high and low per capita incomes. The only common element appears to be the absence of a major resource sector, whereas this is a feature of all but one of the slow growers.

For a more detailed examination, we focus on the non-mining regional GDP per capita series, which is arguably the most accurate indicator of provincial economic performance. The fastest-growing provincial economy by a significant margin (1.1 percentage point over number two) was Bali. Also in the high-growth group (at least 5 percent) are Southeast Sulawesi, Jakarta, and West Sumatra. A further four provinces are just above the average: North Sumatra, West and Central Java, and North Sulawesi. Conversely, a number of provinces grew at a rate at least a percentage point slower than the national average. These are Papua and Maluku in the east and Riau, Jambi, and South Sumatra in Sumatra. The remaining 13 provinces grew close to, but slower than, the national average.

The story differs for the shorter (and not directly comparable) household consumption expenditure per capita (PCE) series. The fastest-growing provinces from 1984 to 2004 were East Java, North Sulawesi, East Nusa Tenggara,
West Sumatra, and Central Java. The slowest growth was recorded in Yogyakarta, Southeast Sulawesi, Riau, Bali, and Bengkulu.

The story also differs by subperiods. Aceh grew very fast over the period 1976–90, as its gas production came on stream, but very slowly since 1990 in an era of (mostly) lower energy prices and conflict that increasingly affected economic activity. Similarly, East Kalimantan’s growth slowed in the second period as a result of lower energy prices and slower timber exploitation. In fact, Kalimantan experienced the greatest deceleration in growth among the major island groupings, mainly owing to these factors, principally the former. Bali also slowed from its exceptionally rapid growth, but was still above average after 1990.

By contrast, some provinces that grew slower than the national average in the first period recorded above-average rates in the second. This appears to be especially the case for a number of export-oriented economies, which benefited from the 1980s reforms and which weathered the economic crisis better than other regions. Examples include the predominantly agricultural producers, North, West, and South Sumatra (the latter the only province to grow faster in the second period than in the first), Lampung, all of Sulawesi except the Southeast, and the industrial province of West Java.

Although in aggregate growing more slowly than the national average, the four eastern provinces experienced mixed fortunes. Maluku, as noted, was severely affected by the post-crisis conflict. East Nusa Tenggara grew a percentage point faster than the national average in the second period, and the West grew at about the average. Papua’s growth was dependent on commodity prices, but its household expenditure grew at almost the national rate.

Table 8.3  Annual growth rates of regional GDP with and without mining and household consumption expenditure per capita in Indonesia, by province, 1976–2004

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
<th></th>
<th></th>
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</thead>
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<td>Sumatra</td>
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<td>2.2</td>
<td>1.6</td>
<td>4.7</td>
<td>3.2</td>
<td>4.0</td>
<td>2.6</td>
<td>3.7</td>
<td>3.3</td>
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<tr>
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<td>4.0</td>
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<td>3.3</td>
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<td>3.8</td>
<td>4.9</td>
<td>1.8</td>
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<td>3.3</td>
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</tr>
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<tr>
<td>Southeast Sulawesi</td>
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<td>3.7</td>
<td>3.4</td>
<td>4.5</td>
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<td>3.7</td>
<td>2.7</td>
<td>4.1</td>
<td>3.6</td>
</tr>
<tr>
<td>East Nusa Tenggara</td>
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<td>4.5</td>
<td>4.8</td>
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<td>4.5</td>
<td>3.0</td>
<td>5.0</td>
<td>4.3</td>
</tr>
<tr>
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<td>0.3</td>
<td>2.8</td>
<td>2.3</td>
<td>2.5</td>
<td>2.4</td>
</tr>
<tr>
<td>Papua</td>
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<td>1.6</td>
<td>2.7</td>
<td>2.6</td>
<td>2.6</td>
<td>1.5</td>
<td>3.7</td>
<td>2.9</td>
</tr>
<tr>
<td>Indonesia</td>
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<td>3.0</td>
<td>3.9</td>
<td>6.0</td>
<td>2.1</td>
<td>4.6</td>
<td>3.4</td>
<td>3.5</td>
<td>3.7</td>
</tr>
</tbody>
</table>

Source: Central Board of Statistics (various years).
Note: All numbers are in percentages. Based on 1993 prices.
There are several cases of provinces growing faster than the national average but slipping in the relative income rankings. For example, North Sulawesi grew faster than the Indonesian (non-mining) average during 1976–2004, but its relative regional GDP per capita fell very sharply, from 109 to 60. East Nusa Tenggara grew at the national average, but its income fell from 52 percent of the national average to just 33 percent. There are also converse cases, such as Riau, where non-mining per capita growth was less than half the national average, but its relative income rose. These are presumably the result of local terms of trade effects—that is, of local economies specializing in the production of goods and services whose prices have risen faster or slower than the general price level (or specifically the national accounts deflator). This is confirmed, for example, in the case of North Sulawesi: using constant rather than current prices, its per capita income ranking rose considerably.

There are no obvious correlates among the fast growers. The explanations for Jakarta and Bali are relatively straightforward—the seat of government, global connections, and high-value services and industry in the former and the tourism success story and resultant spillovers in the latter. In West and Central Java, export-oriented industrialization, especially in West Java from the mid-1980s, and the earlier agricultural successes, especially in Central Java, were important. North Sumatra has a strong agricultural base and was traditionally the most industrial province outside Java.

West Sumatra and North Sulawesi had traditionally strong agricultural bases and quite good education records. But both are somewhat distant from the main centers of commerce, and neither has had a “booming sector.” West Sumatra’s service sector growth is probably connected to high levels of inward remittances, as a result of its long history of mainly male out-migration (merantau). In the case of North Sulawesi, tourism, shipping, and agroprocessing (mainly based on coconuts and fisheries) have all done quite well. More recently, its tolerance of diverse religions and ethnicities has reportedly attracted investment from neighboring conflict-prone regions.8

Are these differences in regional growth amenable to quantitative explanation? As a growing literature has argued, the growth literature can be productively employed, in a modified form (Barro and Sala-I-Martin 1991). That is, openness can be redefined to mean “connected” (to the global economy); institutions clearly do differ among regions in many countries; and factor and product markets in developing countries are often poorly integrated.

The international evidence suggests, first, that regions which are the most connected to the global economy (in the sense of location, infrastructure, and trade regime) are likely to grow more quickly, as is the case of Jakarta, Bali, and in recent times Riau (at least the islands adjacent to Singapore). These are arguably the regions most connected to the global economy, in terms of facilitating physical infrastructure, trade in goods and services, and the movement of people.

A second factor is clustering and increasing returns to scale, as forward and backward linkages develop and spill over from growth centers. The best example in the Indonesian context is probably the rapid industrialization in West Java since 1980 around the periphery of Jakarta. This region has now become the industrial heartland of Indonesia.

The evidence regarding regional institutions and governance is mixed and incomplete. We lack reliable long-term estimates of any “quality” variables, and in any case the provinces have enjoyed significant political authority only since the decentralization of 2001, while local-level democracy has arrived even more recently. There is some anecdotal evidence to suggest that the higher-growth regions have been quite well governed.

The indifferent record of the resource-rich provinces is suggestive of a Sachs and Warner (2001) “resource curse” at work. Two of the four provinces have experienced very serious conflict, and most of the resource wealth (at least until 2001) accrued to entities outside the province. However, there is sufficient diversity within this group to caution against sweeping generalizations. Two of the provinces, East Kalimantan and Riau, have become increasingly prosperous.
Structure of regional economy

Indonesia was a predominantly agrarian economy in the mid-1970s. Reflecting this, agriculture was more than one-third of regional GDP in 21 out of the 26 provinces in 1975. In 10 it was at least half. By 2004, only 8 were above this threshold. Thus, consistent with the well-known hypothesis linking economic growth and structural change, there has been a rapid shift out of agriculture. The provinces that have been slow to make this transition either are among the poorest in the country (Maluku, Southeast and Central Sulawesi, East Nusa Tenggara) or have a very strong comparative advantage in agriculture (Central Kalimantan, Jambi) or a combination of both (Lampung, Bengkulu).

Industrialization is the flip side of the coin: no province had a share of manufacturing in regional GDP in excess of 20 percent in 1975. By 2004, seven provinces registered shares greater than 20 percent: the three big Java provinces dominated, particularly West Java with 43 percent. Off Java, the higher shares are found in Riau, owing principally to Singapore industrial spillover, the two Sumatran provinces with large agricultural or industrial processing sectors (North and South Sumatra), and East Kalimantan with its timber processing and oil-related fertilizer and heavy industries. There has been only one significant case of “deindustrialization,” in Jakarta, where the manufacturing share is a little over half the 1985 figure, as factories have migrated across the border to West Java–Banten.

There has also been a general increase in the services sector share. In 1975 there were just two provinces in which services contributed at least half of regional GDP. By 2004, five provinces were in this group, and several more were close to it. Only resource-rich Riau, Papua, and East Kalimantan recorded a share below 25 percent of GDP. A high or increased share of the services sector occurred in a variety of development contexts. Land-scarce Jakarta has always had the highest service sector share, as the seat of national government, the provider of high-value commercial services, and the national transport and communication hub. There are high shares in Bali and Yogyakarta, reflecting their status as leading tourism and education centers, respectively. The share is also high in West Sumatra, reflecting the traditional importance of remittances. But the share is also high in poorer, more remote regions, including Maluku, East Nusa Tenggara, and North Sulawesi. For the poorer regions, the explanation has more to do with a relatively large government sector, as fiscal transfers have been weighted in their favor. Higher transport shares in remote regions are also a factor.

Theory predicts that there is a positive association between economic growth and the speed of structural change. We test this by calculating a simple index of structural change among the agriculture, non-mining industry, and service sectors for each province. The estimates and growth of non-mining regional GDP per capita are plotted in figure 8.1.

There appears to be quite a weak correlation between growth and structural change. The fastest structural change has occurred in a diverse group of provinces: East Kalimantan (reflecting the resource boom and spillovers), West Java (rising industrialization), Riau (resource boom plus Singapore-related industrialization), Maluku, Bali (tourism growth), and Central Java. Structural change has been relatively slow in many of the agricultural provinces (Kalimantan, Sulawesi, and Sumatra), reflecting the slow movement out of this sector in many of them. It is surprisingly low in Jakarta, presumably because the classification is too aggregated to pick up many of the new service sector activities.

Demographic dynamics

We are interested to know how closely Indonesia’s regional demographics correlate with these economic changes. The country’s demographics reflect the interplay of four main factors: highly uneven “initial conditions” (in the pattern of spatial settlements); the uneven location of opportunities for employment, economic advancement, and education, which in turn triggers migration; official migration policy (a factor especially in the period of 1970–85); and the speed of the demographic transition toward low fertility and mortality.
Table 8.4 highlights these patterns over the period 1971–2000. First, the population is heavily concentrated on Java-Bali, though becoming less so, especially outside Jakarta–West Java. Sumatra and Kalimantan have been gaining most of the declining Java-Bali population share, while the share of Sulawesi and Eastern Indonesia (excluding Papua) has been constant over the three decades.

Provincial population growth is a combination of natural increase and net migration. No recent decomposition of these two elements is available, and thus low population growth could be the result of a very rapid decline in fertility, continuing high mortality, or out-migration. These factors have very different economic and demographic implications. However, the percentage of the population born outside the province gives a reasonably accurate indication of the extent of in-migration (see table 8.5).

The major magnets are those provinces that offer opportunities for socioeconomic advancement. Thus they tend to be the richer ones or the frontier regions. Jakarta is quintessentially a migrant city, as it always has been (Castles 1989), with by far the highest proportion. There are also very high shares in resource-rich, frontier East and Central Kalimantan, almost all provinces in the southern part of Sumatra (proximity to Java and employment opportunities), Central and Southeast Sulawesi, and Papua.10 Yogyakarta, a major education center, has the highest figure for Java-Bali outside Jakarta.

Regional inequality and convergence
We first extend this analysis with reference to the “four-quadrant” story relating initial (that is, 1975) levels of regional GDP per capita to income growth per capita over the period of 1976–2004 (see figure 8.2, panel A). In 1975 only 4 provinces had above-average income: East Kalimantan, Jakarta, Papua, and Riau. Subsequently, only Jakarta grew at above the national average. Conversely, of the 22 provinces with below-average income in 1975, only 5—Jambi, South Sumatra, Yogyakarta, Central Kalimantan, and Maluku—grew at a slower rate than the national average. Thus most provinces were in either the “above-average growth and below-average income” category or the converse, suggesting that interprovincial inequality was declining over this period. Many were very close to the national average growth rate. We shortly test this formally with reference to convergence estimates.

When mining is excluded, the story changes somewhat (figure 8.2, panel B). Two of the seven provinces with above-average non-mining regional GDP in 1975 also registered above-average growth in 1976–2004. These were Jakarta and East Kalimantan. Reassuring from the point of view of interregional equity, although there are seven provinces in the below-average income and slow-growth quadrant for the non-mining regional GDP series, all but one is close to one or other of the national averages. The one exception is the special and recent case of Maluku. In the case of the expenditure series, six provinces are in the bottom-left quadrant—that is, they are poor and apparently slipping behind: Bengkulu, Yogyakarta, West Kalimantan, Maluku, Central Sulawesi, and Southeast Sulawesi (see figure 8.2, panel C). Here, too, most of these are very close to one or the other national average. The latter three are farthest inside the quadrant and therefore are regions of concern from the point of view of regional equity.
We now examine the evidence on inequality and convergence, with reference to the two usual measures, absolute $\beta$ convergence, that is whether poorer provinces are catching up to richer ones, and $\sigma$ convergence, an overall measure of inequality. Furthermore, there are two types of $\beta$ convergence, absolute and conditional. The former refers to the absence of any of the control variables presumed likely to influence convergence. In this paper we focus just on this concept, because an analysis of conditional convergence entails a much larger and more complex exercise.

Furthermore, growth theory predicts that absolute convergence is more likely to apply across regions than among countries, principally because there are fewer barriers to mobility in the former and less variation in policies and institutions. However, much depends on center-region policies, particularly concerning fiscal arrangements (Sala-I-Martin 1996).

$\beta$ convergence is a necessary, but not a sufficient, condition to achieve $\sigma$ convergence. That is, the presence of poorer regions catching up to richer ones is necessary for aggregate inequality to decline. But catch-up does not guarantee reduced inequality. For example, the catch-up process may involve the once poorer provinces overtaking the once richer ones; if the margin between

### Table 8.4 Social and demographic indicators in Indonesia, by province, 1971 and 2000

<table>
<thead>
<tr>
<th>Province</th>
<th>Infant mortality</th>
<th>Average schooling</th>
<th>Poverty</th>
<th>Population (millions)</th>
<th>Annual growth in population (percent)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sumatra</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aceh</td>
<td>143</td>
<td>40</td>
<td>2.3</td>
<td>6.0</td>
<td>14.3</td>
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<tr>
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<td>44</td>
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<td>22.6</td>
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<tr>
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<td>5.6</td>
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<tr>
<td>Riau</td>
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<td>6.0</td>
<td>29.1</td>
</tr>
<tr>
<td>Jambi</td>
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<tr>
<td>South Sumatra</td>
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<td>53</td>
<td>1.9</td>
<td>5.3</td>
<td>34.1</td>
</tr>
<tr>
<td>Bengkulu</td>
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<td>53</td>
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<td>5.5</td>
<td>16.7</td>
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<td>Lampung</td>
<td>146</td>
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<td>1.6</td>
<td>5.1</td>
<td>54.5</td>
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<td>Java-Bali</td>
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<td></td>
<td></td>
</tr>
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<td>Jakarta</td>
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<td>8.4</td>
<td>13.7</td>
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<td>19.4</td>
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<td>37.9</td>
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<td>Yogjakarta</td>
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<tr>
<td>East Java</td>
<td>120</td>
<td>48</td>
<td>1.6</td>
<td>5.1</td>
<td>29.1</td>
</tr>
<tr>
<td>Bali</td>
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<td>36</td>
<td>1.4</td>
<td>5.9</td>
<td>34.4</td>
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<td>Kalimantan</td>
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<td>West Kalimantan</td>
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<td>1.1</td>
<td>4.3</td>
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<tr>
<td>Central Kalimantan</td>
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<td>70</td>
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<tr>
<td>East Kalimantan</td>
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<td>2.0</td>
<td>6.3</td>
<td>37.7</td>
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<tr>
<td>Sulawesi</td>
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<td>26.7</td>
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<tr>
<td>Central Sulawesi</td>
<td>150</td>
<td>66</td>
<td>2.4</td>
<td>5.3</td>
<td>45.7</td>
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<tr>
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<td>1.9</td>
<td>4.9</td>
<td>24.7</td>
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<tr>
<td>Southeast Sulawesi</td>
<td>167</td>
<td>53</td>
<td>1.4</td>
<td>4.9</td>
<td>29.1</td>
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<tr>
<td>Eastern Indonesia</td>
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</tr>
<tr>
<td>West Nusa Tenggara</td>
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<td>89</td>
<td>1.0</td>
<td>3.9</td>
<td>53.8</td>
</tr>
<tr>
<td>East Nusa Tenggara</td>
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<td>57</td>
<td>1.9</td>
<td>4.0</td>
<td>52.9</td>
</tr>
<tr>
<td>Maluku</td>
<td>143</td>
<td>66</td>
<td>2.7</td>
<td>5.6</td>
<td>31.7</td>
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<tr>
<td>Papua</td>
<td>86</td>
<td>57</td>
<td>4.2</td>
<td>5.3</td>
<td>27.2</td>
</tr>
<tr>
<td>Indonesia</td>
<td>145</td>
<td>47</td>
<td>1.9</td>
<td>5.4</td>
<td>29.5</td>
</tr>
<tr>
<td>Coefficient of variation</td>
<td>0.184</td>
<td>0.262</td>
<td>0.357</td>
<td>0.164</td>
<td>0.362</td>
</tr>
</tbody>
</table>

Source: Central Board of Statistics (various years).

Note: Infant mortality rate is defined as the number of deaths of infants (one year of age or younger) per 1,000 live births. Average schooling year is the average schooling year among those over 10 years old. Poverty is the percentage of poor people defined by the Central Board of Statistics in the province.

a. Urban areas only.
them remains the same, $\beta$ convergence has occurred, but there is no $\sigma$ convergence.

We report here estimates of provincial growth rates relative to initial (that is, 1975) incomes, that is, whether absolute $\beta$ convergence is present (see table 8.6). For regional GDP per capita, we find a $\beta$ coefficient of 1.5 percent for the period since 1975, suggesting that the observed disparity would halve over 46 years. The results are statistically very significant.

However, these findings are sensitive to the period of analysis, as they are heavily influenced by the very high incomes of the resource-rich provinces in 1975 and the declining relativities as the oil and gas sector has become less important. For example, for the years 1975–81, coinciding with the oil boom, the absolute $\beta$ convergence was even higher (2.0 percent) and significant at 5 percent. In fact, excluding mining, the absolute $\beta$ convergence for the whole period falls to 0.4 percent, and it is insignificant. In the case of household consumption, available only since 1983, the coefficient is also low, 0.2 percent, and statistically insignificant.

The pace of $\beta$ convergence varies significantly across development periods. It was quite rapid (2 percent) during the oil boom, 1975–81, with the coefficient significant at 5 percent. This is to be expected, with the oil-rich provinces such as Riau and East Kalimantan having high initial income but slower growth over the period. Moreover,
Figure 8.2 Initial regional GDP with and without mining and household consumption expenditure per capita vs. growth in Indonesia, by province, 1975–2004

Panel A: Regional GDP per capita

Panel B: Non-mining regional GDP per capita

Panel C: Household consumption expenditure per capita

Source: Authors’ calculations.

Note: Blk is Bengkulu. C.Kal is Central Kalimantan. C.Sul is Central Sulawesi. E.Jav is East Java. E.Kal is East Kalimantan. Jkt is Jakarta. Jmb is Jambi. Lmp is Lampung. Mlk is Maluku. N.Sum is North Sumatra. S.Sum is South Sumatra. W.Jav is West Java. W.Kal is West Kalimantan. W.N.T is West Nusa Tenggara. Ygkt is Yogyakarta.
central government grants to the regions became increasingly important toward the end of this period.

The process of convergence accelerated still further in the wake of the oil boom, with a coefficient of 2.8 percent for 1981–86, reflecting the impact of the major policy reforms. It was also positive, though slower, for the other series. As the export-oriented reforms took hold, the speed of convergence slowed, to 1.7 percent for the period of 1986–92, and further still during the 1990s, to just 1 percent. During the crisis period, no significant convergence occurred. This may appear surprising, given the widely held presumption that this event particularly affected the country’s richer regions, such as Jakarta. However, it needs to be remembered that some poorer regions were very badly affected by post-crisis conflicts (for example, Maluku) and that some strong agricultural exporters off Java capitalized on the sharp depreciation of the exchange rate.

For $\sigma$ convergence, measured as coefficients of variation, the estimates are similarly highly sensitive to whether the mining sector is included (see figure 8.3). With mining, inequality is high and variable during the oil boom period. It then declines significantly, and more or less continuously, until the crisis period, after which it slightly increases again. The coefficients for non-mining regional GDP and household expenditure are initially much lower, less than half the value of the regional GDP series. They remain fairly stable during the 1980s reform period, but both begin to rise after the crisis, again only slightly. By 2004, reflecting the declining share of the mining sector, the two regional GDP series had almost converged.

Additional insights are obtained by decomposing the variations in provincial income by sector. The results of this analysis are not shown here, but the broad summary is as follows. Overall, and as would be expected, regional inequality in agricultural and services output is much lower than that of mining and manufacturing. Regional inequality in mining is, of course, the highest, owing to the uneven spatial distribution of major mineral deposits. The inequality for the aggregate industrial sector (that is, mining, manufacturing, construction, and utilities) has therefore always been high, although it fell for most of the period, reflecting mainly the declining share of mining since the late 1970s. Regional inequality in agricultural output rose for most of the period, but this sector’s share of GDP fell rapidly, hence the increase had little overall impact. By contrast, inequality in services declined, and this sector’s share rose.

### Table 8.6 Absolute convergence

<table>
<thead>
<tr>
<th>Time period and proxy of income</th>
<th>Absolute convergence ($-\beta$)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Regional GDP per capita</strong></td>
<td></td>
</tr>
<tr>
<td>1975–2002</td>
<td>0.015***</td>
</tr>
<tr>
<td>1975–81</td>
<td>0.020**</td>
</tr>
<tr>
<td>1981–86</td>
<td>0.028***</td>
</tr>
<tr>
<td>1986–92</td>
<td>0.017***</td>
</tr>
<tr>
<td>1992–97</td>
<td>0.010*</td>
</tr>
<tr>
<td>1997–2002</td>
<td>0.007</td>
</tr>
<tr>
<td><strong>Non-mining regional GDP per capita</strong></td>
<td></td>
</tr>
<tr>
<td>1975–2002</td>
<td>0.004</td>
</tr>
<tr>
<td>1975–81</td>
<td>0.010</td>
</tr>
<tr>
<td>1981–86</td>
<td>–0.001</td>
</tr>
<tr>
<td>1986–92</td>
<td>0.008</td>
</tr>
<tr>
<td>1997–2002</td>
<td>0.003</td>
</tr>
<tr>
<td>1997–2002</td>
<td>0.001</td>
</tr>
<tr>
<td><strong>Expenditure per capita</strong></td>
<td></td>
</tr>
<tr>
<td>1983–2002</td>
<td>0.002</td>
</tr>
<tr>
<td>1983–86</td>
<td>0.017**</td>
</tr>
<tr>
<td>1986–92</td>
<td>0.007</td>
</tr>
<tr>
<td>1992–97</td>
<td>–0.018</td>
</tr>
<tr>
<td>1997–2002</td>
<td>0.018</td>
</tr>
</tbody>
</table>

Source: Authors’ calculations.

*** Significant at 1 percent.

** Significant at 5 percent.

* Significant at 10 percent.

### Figure 8.3 Provincial income inequality in Indonesia, 1975–2003

![Graph showing provincial income inequality in Indonesia from 1975 to 2003.](source: Authors’ calculations.)

Note: All numbers are calculated at 1993 prices.
**Social indicators**

We then ask how the economic and social indicators correlate with one another. Table 8.4 provides a summary picture. We include here a health indicator (infant mortality), an education indicator (average years of schooling), and the percentage of the population below the poverty line. The first two are based on the Population Censuses of 1971 and 2000, while the poverty estimates are available only from 1984.

Two general points deserve emphasis. First, there are dramatic improvements in the social indicators: by 2000, infant mortality was just a third of the 1971 rate, while average years of schooling had risen almost threefold. Moreover, these improvements have been experienced practically throughout the country. Although the rankings have not changed significantly, in all but one case infant mortality rates have at least halved, and years of schooling have doubled. The one exception is Papua, for which the early data series are incomplete. For the shorter time series of the poverty estimates, also, there is broad-based decline. Here too, Papua goes against the trend, partly owing to weaknesses in the data, but also reflecting the unequal nature of Papua’s development. Aceh is the only other province where poverty increased, owing to the effects of the prolonged conflict.

Second, coefficients of variation (CVs) are low, but there is no clear trend. The health and education CVs are very low, well below those of the regional accounts series. They reflect the fact that, as with intercountry comparisons, interprovincial social inequalities are lower than economic inequality. The poverty CV is higher, which is to be expected because it is generated from the consumption expenditure estimates. There is a slight increase in the poverty and health CVs and a fall in the education CVs. These trends are to be expected and indicate, in particular, the government’s emphasis on universal mass primary and lower secondary education since the 1970s.

There are now several estimates of the human development index (HDI) for Indonesian provinces (UNDP 2004). They are not presented here, but they show the expected positive relationship between non-mining regional GDP per capita and HDI, albeit with much clustering close to the averages. Jakarta stands out, with the highest ranking on both measures, while the Nusa Tenggara and Papua are among the lowest. There are several provinces with below-average income per capita but above-average HDI. The two major cases are North Sulawesi and Yogyakarta, both with traditionally strong educational achievement. There are no cases of above-average (non-mining) regional GDP per capita but below-average HDI. This suggests that the resource-rich provinces (with the possible exceptions of Papua and Aceh) have been reasonably successful at translating the benefits of the resource booms into improved social indicators. One qualification that needs to be attached to these conclusions is that all of the provincial HDIs prepared thus far include an income or expenditure variable, typically with a weight of one-third, thus limiting their value as an independent check on economic and social correlates.

**Social conflict**

Particularly since the fall of the Soeharto regime, several regions have experienced episodes of severe social conflicts that have significantly interrupted their development progress. The most serious incidents have occurred in Aceh, West and Central Kalimantan, Central Sulawesi, Maluku, and Papua.

Only as an indicative exercise, we present a number of variables hypothesized to be likely explanations of interprovincial variations in conflict. A number of these are interrelated, and therefore any quantitative approach would need to deal with the problem of multicollinearity.

The first indicator is the volatility of provincial growth rates, defined as the coefficient of variation through a certain period of time (table 8.5). Its inclusion is based on the premise that higher variations in growth rates will lead to heightened insecurity and possibly conflict. These are shown in columns 1–3 for each of the three series. As would be expected, the resource-rich regions experience more volatile growth, with the CVs of Aceh, Riau, East Kalimantan, Maluku, and Papua at least double, and the CV of Papua four times, the national average. The high
figures for Aceh and Papua lend prima facie support to the hypothesis.

However, the direction of causality is unclear. For example, Maluku was peaceful and experienced fairly stable growth until the onset of serious conflict in 1998. In other words, this was a case of conflict causing the volatility of growth, rather than the converse. A similar observation applies to some extent in the case of Central Kalimantan.

The second indicator is the share of natural resources in regional GDP (table 8.1). This is a subnational variant of the "natural resource curse": a large natural resource sector will result in a more volatile income stream (that is, the first factor) and also possibly exacerbate conflict over the allocation of natural resource rents. In 2004 mining generated more than one-third of regional GDP in three of the resource-rich provinces and more than one-quarter in the fourth, Aceh. High shares are also evident in West Nusa Tenggara (of very recent origins), South Sumatra, and South Kalimantan. Severe and protracted conflict has occurred in two of these provinces, Aceh and Papua, again lending prima facie support to this hypothesis. Nevertheless, the other resource-rich regions have been relatively peaceful, while serious conflict has occurred where mining shares are low, for example, Maluku, Central Kalimantan, and Southeast Sulawesi. Hence, the presence of mining enclaves per se is an insufficient explanation for conflict.

A third variable relates to ethnic fragmentation, data that we include on the grounds that greater ethnic diversity is alleged by some to hinder the development of local cohesion and trust and to heighten the potential for conflict. We lack precise estimates of ethnic diversity at the provincial level in Indonesia, but a good proxy for it is religious belief, especially as the latter has been a source of tension in some of Indonesia’s most serious conflicts, such as in Poso (Central Sulawesi) and Maluku. A convenient proxy for religious diversity is the percentage share of the largest religion in each province, with the hypothesis being that the lower the share, the greater the possibility of conflict.

There does not appear to be a clear relationship between the incidence of conflict and religious diversity. There are cases of an apparently strong association, such as in Maluku and East Nusa Tenggara. Yet there are more examples where the converse applies. Aceh has one of the highest majority-religion shares and serious conflict. North Sulawesi is at the opposite end of the spectrum, with the highest religious diversity and little conflict. North Sumatra and some of the Kalimantan provinces are religiously mixed but have low recorded conflict (but note caveats). There are also instances of little religious diversity but considerable conflict, such as West Nusa Tenggara.

Papua is a special case in this context. There are two main sources of spatial inequality, which together explain the perception that the benefits of growth have been enjoyed primarily by immigrant communities. The first is the urban-rural divide. Much of this was fueled by the growth of the provincial capital, Jayapura, the center of the rapid expansion of the mainly non-Papuan civil service and major development projects. These growing centers also attracted many migrants from other provinces in search of business opportunities. Poverty in the urban areas was quite low in 2004, around 8 percent. By contrast, in rural areas, where the majority of Papuans reside, poverty was still around 50 percent. The second major source is the huge Freeport mine, whose impact is confined mainly to Timika.

Fourth, the percentage of the population born outside the province indicates the extent of settler arrivals. It too is suggestive of the possibility of conflict, as in-migrants compete for jobs and access to land and sometimes introduce customs at variance with local traditions (for example, concerning gender relations, diet, and so forth). Obviously, this variable is highly correlated with the share of the natural resource sector. As would be expected, a high presence of migrants is found in Jakarta, the resource-rich regions, remote “frontier” regions, and areas formerly designated by the central government as transmigration sites.

Here too the evidence for this variable is mixed. There are examples where conflict and in-migration are significantly correlated, such as Papua, Southeast Sulawesi, Central Kalimantan, and Jakarta. Yet, there
are also cases of large migrant communities generally living in harmony (some of the Sumatran provinces and Yogyakarta), while some of the most serious conflict has occurred in regions with below-average in-migration, such as Aceh and Maluku.

Finally, it might be expected that intraprovincial inequality in income and expenditures would predispose a province to conflict. That is, all things being equal, high-inequality provinces are more likely to experience conflict. We include estimates of provincial expenditure inequality for 1984 (the first year they were available) and 2002 to examine this proposition. Predictably, above-average inequality is found in the resource-rich provinces, except Aceh. Papua particularly stands out. There is also high inequality in the two most urbanized provinces of Java: Jakarta and Yogyakarta. With the exception of Papua, all the high-inequality provinces have been quite peaceful. By contrast, inequality is generally below average in areas of major conflict, such as Maluku and Central Sulawesi. Therefore, inequality per se does not appear to be a major explanatory factor.

This discussion highlights the fact that the magnitude and determinants of local conflict are complex, interrelated, and not easily amenable to quantitative explanation. The quality of local leadership is a key factor and thought to be one of the reasons why one of the most religiously diverse provinces, North Sulawesi, has been largely free of conflict. In the case of Aceh, one of the most conflict-prone provinces, the conflict has been principally between the central government and the very strong local identity, which, when mismanaged, has spawned a separatist movement. It required a terrible natural disaster (the December 2004 tsunami), presidential leadership, and a local capacity to negotiate to reach the 2005 peace settlement. Similarly, the protracted conflict in Papua reflects its complex history and a troubled record of central government and military intervention.

**Conclusions**

Our major conclusions include the following.

First, there continues to be great diversity in economic and social outcomes, but growth and social progress have been remarkably even. There has been no significant change in the concentration of economic activity across the major island groupings. As with all the economic variables, this conclusion is somewhat sensitive to whether or not the mining sector is included. Excluding mining, Java’s share has risen, mainly at the expense of Sumatra.

More generally, economic activity has continued to cluster around some key regional economies. Java has remained dominant, along with Bali, Sumatra, and Kalimantan, as compared to the eastern region (although Sulawesi has gone from below-average to above-average growth over the two periods). Moreover, Greater Jakarta has assumed ever greater prominence in the nation’s key economic agglomeration.

Nevertheless, the poorest regions, located mainly in eastern Indonesia, have generally performed about as well as the national average. There is no case of a province with consistently poor performance for decades, in the sense of being well below the national average growth rate, let alone with protracted periods of negative growth.

Second, as a corollary, regional disparities are either high and declining or moderate and stable, depending on which series is used. The former conclusion is based on the with-mining series. However, these provide a misleading indicator of local-level welfare and should be interpreted with caution. The other two series—that is, non-mining regional GDP and household consumption expenditure per capita—suggest no significant change in inequality or catch-up during both the 1980s reforms and the crisis periods. Over the entire period, there was no convergence in non-mining regional GDP per capita, while household expenditure per capita showed weak convergence.

It is also notable that the policy reform period of 1984–96 produced an even record of provincial economic performance, as compared to the mining boom, crisis, and post-crisis periods, when major exogenous events had uneven subnational impacts.

Third, while there have been strong performers—notably, Bali, Jakarta, and occasionally East Kalimantan and Riau—the group of top performers has been quite
diverse, as to location, size, and socio-economic characteristics. In general, the better-performing regions are typically those that are the most connected to the global economy. In this respect, Jakarta stands out as a special case, growing richer than the rest of the country over time.

Although two of the strongest performers are resource-rich regions, there is no clear natural resource story, in that the performance of this group of provinces has varied considerably. The impact of enclave-style development has also varied among them, with the most challenging being the special case of Papua. Moreover, it is evident that conflict is particularly harmful to economic development, as illustrated in the case of Maluku since 1997 and to a lesser extent Aceh.

Future research in this area might focus on two areas. The first is an examination of the impact of decentralization on regional dynamics. This will need to be a longer-term project because, as illustrated by the experience in the Philippines and elsewhere, it will take at least a decade to discern impacts. Second, the fragmentation (pemekaran) of administrative boundaries is greatly complicating longitudinal analysis. This paper has consolidated the current 34 provinces back to 26, to facilitate comparisons over time. Even this process is a laborious one. It is currently not possible to draw inferences at the kabupaten level, the administrative unit to which authority and resources have been decentralized, because the process of boundary changes has proceeded much further. However, it may be possible to develop such a database with the cooperation of Indonesia’s Central Board of Statistics. With a finer level of disaggregation, it would be possible to examine the development of regional clusters in more detail, because these invariably straddle provincial boundaries. It may also be the case that our main conclusions, of no major change in inter-regional inequality and no major dropouts (apart from Maluku in recent years), would have to be modified.

Notes
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1. Thus, for example, West Java refers to the existing provinces of West Java and Banten, North Sulawesi to North Sulawesi and Gorontalo, and so on.

2. The revenues of all kabupaten and kota governments in the province have increased by at least 300 percent since the 2001 decentralization.

3. In 2002, following the introduction of special autonomy measures, the budget of the Papuan provincial government was three times that of 1999–2000 in nominal terms.

4. In 1997–98, the economies of Jakarta and West Java contracted by about 50 percent more than the economy as a whole. This was explained mainly by the effects in finance, construction, and import-substituting manufacturing, all disproportionately important in these two provinces (Akita and Alisjahbana 2002).

5. But note that Bali’s position has slipped significantly since the 1990s, mainly due to the downturn in international tourism following the terrorist incidents.

6. After having one of the highest per capita incomes in the country, this province has slipped more than most in this group. Part of the explanation is that it was one of the first oil-refining centers in the country, with Pertamina’s Musi plant. However, this large sector of its economy has grown slowly since the 1970s, and, unlike Riau, new growth engines have yet to emerge, apart from palm oil.

7. The very high growth rates of small provinces like Southeast Sulawesi in the earlier period need to be interpreted with great caution. The statistical infrastructure was still rudimentary, and the transition from subsistence to a monetary economy may have inflated measured growth rates.

8. For an economic survey of the province since the crisis, see Sondakh and Jones (2003), which extends their earlier work on this province in Hill (1989).

9. See also Jones and Hull (1997).

10. The special case of Lampung deserves note. It was traditionally designated as a major transmigrant-recipient region and in 1971 had by far the highest share of migrants outside
Jakarta (Bakir and Humaidi 1989). However, its slower growth, combined with the emergence of other more attractive destinations and the lower cost of movement, meant that by 2000 it had slipped to seventh ranking in terms of the proportion born outside the province.

11. See also the work by Garcia Garcia and Soelistianingsih (1998).

12. The high share of mining in West Nusa Tenggara is of recent origins and dates from the establishment of the sometimes controversial Newmont copper and gold mine on Sumbawa. The share of mining in the province’s GDP rose from 4 percent in 1999 to 28 percent in 2000.

References


Urbanization and industrial agglomeration are two fundamental characteristics in the transition of countries toward greater levels of development. Both have to do with the concept of concentration, the former with regard to the concentration of people and the latter with regard to the concentration of economic activity. While the concept of “urban” is broad and requires that a district’s population also has access to a basket of basic services, a necessary first condition is that the district scores above a benchmark of population density. Concentration of production (or economic density) is driven by agglomeration economies, which result from a self-reinforcing interaction among (a) increasing returns at the plant level, leading producers to concentrate; (b) transportation costs, leading the concentration to occur close to large markets; and (c) factor mobility, making large markets even larger as producers and labor relocate to them (Krugman 2000). Concentration of production and consumption generates benefits but also costs resulting from congestion and increased interregional disparity. Governments intervene in these market-led levels of urbanization and agglomeration by promoting deconcentration through legislation and regulations as well as through economic policy making in the fiscal and monetary arenas. Fiscal decentralization has been, perhaps, the most widespread and profound type of deconcentration of the government structure in developing countries over the past two decades. Decentralization promotes fiscal structures that aim to provide local governments with adequate incentives for development and to ensure a healthy degree of equalization across local governments by addressing vertical and horizontal imbalances.

Despite the natural association among the concepts of fiscal decentralization, urbanization, and industrial agglomeration, there is scant understanding of how these issues interrelate with one another and with other geographic dimensions. Two questions are of particular importance: What is the expected effect of fiscal decentralization on patterns of urbanization and industrial concentration in developing countries? What is the expected effect of deconcentration on regional economic growth through its impact on the patterns of urban and industrial concentration? The second question is more important for policy making and flows naturally from the first.

This study focuses on Indonesia, a large middle-income country economically and demographically concentrated on the island of Java, but experiencing strong decentralization since 2001. It addresses these questions from a spatial economics point of view, by examining the ways in which the spatial distribution of districts affects their economic development. In particular, regarding urbanization, it investigates whether distance between a leading and a lagging district has an effect on the migration of citizens toward the larger district. Second, it explores whether public expenditures in a district would generate further in-migration to leading regions (or lesser out-migration
from lagging regions). Finally, based on the role of the spatial characteristics examined, this study speculates on the likely results of dispersing leading regions geographically. In regard to economic concentration, this study examines first whether the spatial distribution of districts is increasingly driven by agglomeration economies in industries at the two-digit level (where employment growth is used as the measure of growth).\(^1\) Second, it examines whether a district’s public expenditures on infrastructure or business development programs are correlated with industrial growth and, if so, whether decentralization can lead to lower industrial concentration. Third, it examines whether decentralizing public expenditures can promote development by improving efficiency through intergovernmental competition. It concludes by discussing the likely implications of policies such as fiscal decentralization for regional economic growth and for policy making.

The rest of the chapter proceeds as follows. First, it presents an overview of the patterns and trends of urbanization in Indonesia, examining the patterns and trends of natural urban population growth across “1 million plus” cities, urban fringes, and peripheries, the determinants of interdistrict net migration, and the magnitude of urban growth due to reclassification. This is followed by a discussion of the dynamics and geographic patterns of agglomeration economies that tests the existence of urbanization and localization economies and examines the patterns of spatial interdependence in regional employment growth. It then examines the role of government policy making and intervention by examining the impact of public expenditures at the subnational level on industrial concentration and intergovernmental competition for mobile factors of production. A final section concludes.

**Decentralization of expenditures, urban-to-rural migration, and urban density in congested regions**

From a demographic perspective, urbanization is typically measured by the urban population’s proportion of the total population.\(^2\) The distinction between urban and rural areas has declined in most regions due to a large pattern of temporary, seasonal, and weekly commuting of rural residents to urban or periurban regions, where they work in the informal sector, transportation, and minor trade. Moreover, small and medium cities are simultaneously urban and rural, with farming activities in close proximity to modern buildings and housing. This pattern, which has been referred to as *kotadesasi*—*kota* (city) and *desa* (village)—in Indonesian, is a common characteristic of urbanization in Indonesia (Firman 1997; Firman, Kombaitan, and Pradono 2007; Hugo 1975, 1997; McGee 1992) and in other Asian countries (Hugo 2003b; Lin 1994).

Indonesia’s urbanization rate has increased significantly over the past decades, from 14.6 percent in 1960 to 42.7 percent in 2006 (see table 9.1). Urbanization in Indonesia results largely from natural population growth: Indonesia has doubled in population since the 1960s (from 94 million in 1960 to 218 million in 2005) and remains the fourth most populous nation on earth (BPS 1960, 2005b).\(^3\) However, the annual exponential population growth rate has declined sharply from 2.34 percent during the period of 1971–80 to 1.61 percent during the period of 2000–05. The decrease in the population growth rate is, at least partially, a result of the increasing tendency to postpone marriage, growing awareness and effective use of modern contraceptives, and unsatisfactory record in reducing mortality. Urban population growth reached its peak in the 1980s, accompanied by a significantly lower rate of growth of the rural population. While the absolute percentage of urban population increased in the 1990s, the growth rate of the urban population declined, as did that of the rural population.

The pattern of rapid urbanization in Indonesia is in line with the average of other countries in the East Asia and Pacific region, but lower than the average of lower middle-income countries generally (a category in which it falls according to gross domestic product [GDP] per capita). Although the direction of causality is difficult to determine, urbanization is highly correlated with a country’s level of socioeconomic
development. In this regard, a review of East Asian economies estimates that the elasticity of economic growth to urbanization is about 2.71 (Iimi 2005). Whether larger populations (and larger markets) generate economic activity or mobile capital is driven to larger labor markets (and so lower wages), retaining a region’s population by preventing out-migration seems to be desirable if the goal is to promote economic development.

The implications of rapid urbanization for development are particular to the underlying driving factors. When urban growth is caused by natural population growth and rural-to-urban migration, it leads to higher levels of urban density. In contrast, urban growth caused by reclassification reflects a lateral extension of the urban limits due to changes in the labor market structure of previously rural villages toward nonagricultural jobs or the origination of new industrial areas. According to ESCAP–UN (1993) and Firman (2004), natural population growth accounted for only around 35 percent of urban population growth from 1980 to 1985, whereas the remaining 65 percent resulted from migration and reclassification (lateral extension). Gardiner (1997) asserts that the proportion of urban growth due to natural population growth, reclassification of rural regions as urban, and net rural-to-urban migration over the period of 1980–90 was 35, 30, and 35, respectively. As Gardiner and Oey–Gardiner (1991) report, the number of villages that changed from rural desas to urban areas almost doubled from 1980 to 1990. This distribution—roughly one-third for each factor—remained constant over the 1990–2000 period. World Bank (2003) estimates that 30–35 percent of urban growth in the 1990s was due to reclassification of rural to urban areas. Yet urban growth due to lateral extension increased further in 2000, as 7 percent of Indonesia’s more than 65,000 villages were recoded from rural to urban. As much as 48 percent of urban population growth between 1999 and 2000 was due to reclassification (BPS various years).

### Distance and factor mobility

The concentration of population in a few metropolitan areas has gone beyond the capacity of current factor markets and infrastructure facilities, and so it generates congestion costs. Rural-to-urban migration can affect urban growth in positive or negative ways, depending on the degree to which population flows are monitored and whether they are planned in ways that promote an adequate distribution of urban centers and minimize congestion costs. Urbanization is not necessarily accompanied by economic growth, and in fact concentration of urbanization (in the form of urban primacy) can generate negative growth (Ades and Glaeser 1995; Williamson 1965). Natural population growth in rural areas transforms rural regions into small urban centers or hinterlands that do not share the main characteristics of large metropolitan regions and often digress to slums, characterized by the absence of infrastructure and sanitation services, such as electricity, tap water, sewerage, and housing, and the presence of air and water pollution, crime, and heavy traffic (Iimi 2005).

### Table 9.1 Urban and rural population and population growth rate in Indonesia, 1960–2005

<table>
<thead>
<tr>
<th>Year</th>
<th>Population (thousands)</th>
<th>Urbanization rate</th>
<th>Annual exponential rate of growtha</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Urban</td>
<td>Rural</td>
<td>Urban</td>
<td>Rural</td>
</tr>
<tr>
<td>1960</td>
<td>—</td>
<td>—</td>
<td>14.6</td>
<td>—</td>
</tr>
<tr>
<td>1971</td>
<td>20,568</td>
<td>99,712</td>
<td>17.1</td>
<td>—</td>
</tr>
<tr>
<td>1980</td>
<td>32,845</td>
<td>113,930</td>
<td>22.4</td>
<td>4.68</td>
</tr>
<tr>
<td>1990</td>
<td>55,433</td>
<td>123,811</td>
<td>30.9</td>
<td>5.23</td>
</tr>
<tr>
<td>1995</td>
<td>71,657</td>
<td>123,143</td>
<td>36.8</td>
<td>5.13</td>
</tr>
<tr>
<td>2000</td>
<td>85,380</td>
<td>115,361</td>
<td>42.4</td>
<td>4.47</td>
</tr>
<tr>
<td>2005</td>
<td>92,919</td>
<td>124,452</td>
<td>42.7</td>
<td>1.69</td>
</tr>
</tbody>
</table>

Source: Author’s calculations based on BPS (2005a, 2005b).

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a. The exponential formula is \( r = \ln(P_0 / P_1) * (100 / t) \).


The figures for population growth differ from official government projections for 2005, as they are based on actual data as opposed to projections.
In 2005, 32 million Indonesians (14 percent of the total population) lived outside their district of origin. The pattern of lifetime net migration in Indonesia reveals that large areas in Java and Bali, the eastern and southern regions in Sulawesi, and some landlocked districts in Sumatra lost the most population (see figure 9.1). Strong dynamics of population mobility are led by the attraction that regions with higher levels of urbanization exert on regions with lower levels of urbanization. Urban gravity, resulting from opposing centrifugal and centripetal forces, decreases with distance. Centrifugal forces lead districts proximate to districts with a higher level of urbanization to benefit from their neighbor’s economic growth, due to the deconcentration of population and employment. This usually reflects congestion in the leading region and the propensity of firms to take advantage of the lower costs of labor and land in the suburbs. Centripetal forces lead rural residences to migrate to urban centers in search of better access to employment and services.

While population growth in large cities (1 million plus population) is lower than the national average, there is a strong pattern of migration, mostly from rural districts to districts with higher levels of urbanization. What might seem to be a contradiction—high levels of in-migration and slow population growth—is explained by a significant proportion of large districts’ own population that is driven to the peripheries mainly by the costs of congestion. Results from an econometric estimation of the determinants of net migration across districts shed light on the dynamic between pull forces (urban gravity) from districts with a higher level of urbanization and push forces from areas with a lower level of urbanization (see the annex for descriptive statistics and variable definitions).

On average, one rural district located in a peripheral area (that is, one standard deviation above the average distance to a higher-tier urban neighbor and one standard deviation below the average level of urbanization) is expected to have net out-migration that is as much as 21 percent higher than the average district: 5 percent due to distance-sensitive pull and 16 percent due to push from its own urbanization. As expected, the effect of distance is nonlinear. Districts close to the average level of urbanization and situated within a given radius (125 kilometers) of a district with a higher level of urbanization experience negative net migration. This circle of “urban gravity” is larger (with a radius of 200 kilometers) for districts with significantly lower levels of urbanization (one standard deviation below the average). This suggests that the neighbor’s pull is reinforced by an additional push from the district of

![Figure 9.1 Net migration of population in Indonesia, by districts, 2005](image)

*Source: Author’s calculations based on net migration (in-migration minus out-migration) data from the Supas (BPS 2005b).*
origin. On the contrary, districts within 125 to 600 kilometers of a larger neighbor tend to gain population.

Figure 9.2 presents a simulation of expected net migration patterns at increasing levels of distance between a district and its nearest neighbor at a higher tier of urbanization. Urban-gravity pull decays as distance between two districts increases until net migration reaches a positive maximum. Distances to the nearest higher-tier neighbor beyond 600 kilometers, which could be considered the limit after which a district falls into the category of “very remote area,” are associated again with negative values of net migration. Suburbanization determines that, within the highest level of urbanization, fringes gain instead of lose population due to congestion costs and high-quality amenities and housing in suburban enclaves. This is reflected in the negative value of the coefficient for an interaction term defined as the product of the variable for distance to the nearest higher-tier urban neighbor and a dummy variable for fringe areas of “1 million plus cities” (see table 9.2, column 3).

One of the clearest examples of congestion costs experienced by districts at the highest level of urbanization is that of Medan and Jakarta metropolitan area, illustrated in figure 9.3. While the results of the migration model predict that cities closer to larger cities lose population (attracted by their strong urban gravity), the results reverse at the highest level (as shown by the negative sign on the fringe interaction term in table 9.2). That is,

![Figure 9.2 Simulation: Urban gravity at alternative distances and levels of urbanization](source: Author's calculations.)

Table 9.2 Determinants of districts' net migration

<table>
<thead>
<tr>
<th>Explanatory variable</th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Distance to higher-tier-urbanization neighbor (gravity pull)</td>
<td>0.153*</td>
<td>0.443***</td>
<td>0.090</td>
</tr>
<tr>
<td>Distance to higher-tier districts squared</td>
<td>-0.001**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Incremental distance to urban level four</td>
<td>0.07</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Incremental distance to urban level five</td>
<td>0.1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Urbanization</td>
<td>103.35</td>
<td>-182.76**</td>
<td>102.9***</td>
</tr>
<tr>
<td>Urbanization square</td>
<td>293.15***</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dummy “1 million plus” cities</td>
<td>-46.6**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fringe * Distance to higher-tier-urbanization neighbor</td>
<td>-4.1 e-3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Constant</td>
<td>47.80</td>
<td>-22.38</td>
<td>-36.5**</td>
</tr>
<tr>
<td>Number of observations</td>
<td>371</td>
<td>371</td>
<td>371</td>
</tr>
<tr>
<td>R²</td>
<td>0.07</td>
<td>0.11</td>
<td>0.10</td>
</tr>
</tbody>
</table>

Note: Numbers in parentheses are t-statistics.

*** Significance at the 1 percent level.
** Significance at the 5 percent level.
* Significance at the 10 percent level.
fringe areas around the district of Central Jakarta, consisting of the remaining districts of province DKI Jakarta (East, West, North, and South Jakarta) and the districts of Bogor, Tangerang, Depok, and Bekasi (abbreviated usually as BOTADEBEK), experienced significant positive net migration (gained population) instead of losing population, while the district of Central Jakarta itself experienced negative net migration (−330,000).\(^5\) Negative net migration in Jakarta metropolitan area reflects a push out of villages due to congestion, as the city attracts population from throughout Indonesia.\(^6\) Similar cases of congestion can be seen in the city of Medan (province of Sumatra Utara) and the district of Bandung (which is now the largest district, with a population of 4.05 million) and in 8 out of 10 of the districts with a population greater than 2 million.\(^7\)

**Migration and regional fiscal structure**

An examination of per capita public expenditures after controlling for the forces of urban gravity suggests that public expenditures on social services and infrastructure have an effect on household migration.\(^8\) Public expenditures are expressed as the log of the ratio of a four-year average of nominal expenditures to total nonmigrant population.\(^9\) Table 9.3 presents the results of three models aimed at estimating the effects of public expenditures on net lifetime migration.\(^10\) These specifications include the following regressors: exogenous fiscal variables from the district of origin, which measure the fiscal push (or analogous fiscal pull from the district of origin when its level of expenditure is high enough to keep its population from leaving); one variable accounting for the urban-gravity pull from larger urban centers (defined as the distance to the nearest district in a higher quintile of urbanization); and a group of exogenous geographic variables. The group of geographic variables includes dummies for the main island, a dummy for isolated islands, and a variable for landlocked districts. Model 1 presents a linear regression, whereas models 2 and 3 explore further the spatial interdependence of net migration patterns by means of a spatial lag of the dependent variable and spatial error estimations.\(^11\) Furthermore, all sectoral public expenditure variables are highly correlated with one another, and so they have not been used simultaneously in the same specification, but rather in independent equations.

Results from these estimations suggest that per capita public expenditures on

---

*Figure 9.3 Out-migration from large metropolitan districts to the fringes in Indonesia*

[Map showing population net migration from various districts to fringes in Indonesia. Source: Author’s calculations based on data in the Supas (BPS 2005b).]
increasing subnational revenues, on average, because of a reduction in fuel subsidies), increase in national fiscal space (mainly in subnational resources resulted from an... in 2006. This substantial increase called a second “big bang” of fiscal decentralization in Indonesia, given what has been discussed above. The growth in subnational revenues is of particular importance to Indonesia, given what has been called a second “big bang” of fiscal decentralization in 2006. This substantial increase in subnational resources resulted from an increase in national fiscal space (mainly because of a reduction in fuel subsidies), increasing subnational revenues, on average, by as much as 55 percent from 2005 to 2007. If those resources are channeled toward services and infrastructure, decentralization is likely to have a large effect on the pattern of urbanization by minimizing the push effect and encouraging a more homogeneous pattern of urban development.

### Alternative policy interventions to reduce urban concentration

An examination of population at an initial point in time and subsequent growth at the district level confirms the existence of a tendency for population to converge (deconcentrate), although at a very slow pace (see table 9.4). The change in the pattern of urban concentration can also be seen by categorizing cities by quintile in terms of their population size and computing the percentage that each quintile represents of the total population. The 20 percent of smallest

### Table 9.3 Population dynamics: public expenditures and net migration in Indonesia

<table>
<thead>
<tr>
<th>Variable</th>
<th>Ordinary least squares</th>
<th>Spatial lag</th>
<th>Spatial error model</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Education</td>
<td>Health</td>
<td>Infrastructure</td>
</tr>
<tr>
<td>Distance to district of highest-tier urbanization (gravity pull)</td>
<td>0.07</td>
<td>0.07</td>
<td>0.07</td>
</tr>
<tr>
<td></td>
<td>(4.91)</td>
<td>(4.97)</td>
<td>(5.00)</td>
</tr>
<tr>
<td>Log sectoral expenditures(^a)</td>
<td>1.61</td>
<td>2.52</td>
<td>3.31</td>
</tr>
<tr>
<td></td>
<td>(2.13)</td>
<td>(3.33)</td>
<td>(3.31)</td>
</tr>
<tr>
<td>Isolated</td>
<td>−6.53</td>
<td>−7.01</td>
<td>−5.59</td>
</tr>
<tr>
<td></td>
<td>(−0.98)</td>
<td>(−1.06)</td>
<td>(−0.83)</td>
</tr>
<tr>
<td>Landlocked</td>
<td>−10.71</td>
<td>−10.80</td>
<td>−10.38</td>
</tr>
<tr>
<td></td>
<td>(−3.42)</td>
<td>(−3.45)</td>
<td>(−3.47)</td>
</tr>
<tr>
<td>Island Sumatra</td>
<td>13.01</td>
<td>12.82</td>
<td>11.45</td>
</tr>
<tr>
<td></td>
<td>(3.30)</td>
<td>(3.29)</td>
<td>(2.89)</td>
</tr>
<tr>
<td>Island Kalimantan</td>
<td>15.11</td>
<td>13.89</td>
<td>12.31</td>
</tr>
<tr>
<td></td>
<td>(3.17)</td>
<td>(2.93)</td>
<td>(2.81)</td>
</tr>
<tr>
<td>Island Sulawesi</td>
<td>−2.84</td>
<td>−3.28</td>
<td>−3.44</td>
</tr>
<tr>
<td></td>
<td>(−0.74)</td>
<td>(−0.85)</td>
<td>(−0.91)</td>
</tr>
<tr>
<td>Island Nusa Tenggara and Maluku</td>
<td>−7.62</td>
<td>−8.51</td>
<td>−9.42</td>
</tr>
<tr>
<td></td>
<td>(−1.85)</td>
<td>(−2.04)</td>
<td>(−2.24)</td>
</tr>
<tr>
<td>Island Papua</td>
<td>−0.83</td>
<td>−3.79</td>
<td>−6.73</td>
</tr>
<tr>
<td></td>
<td>(−0.18)</td>
<td>(−0.48)</td>
<td>(−0.85)</td>
</tr>
<tr>
<td>Constant</td>
<td>−19.52</td>
<td>−25.97</td>
<td>−35.23</td>
</tr>
<tr>
<td></td>
<td>(−2.09)</td>
<td>(−3.33)</td>
<td>(−3.35)</td>
</tr>
<tr>
<td>(p) (spatial-lag coefficient)</td>
<td>0.57</td>
<td>0.56</td>
<td>0.53</td>
</tr>
<tr>
<td></td>
<td>(4.99)</td>
<td>(4.89)</td>
<td>(4.53)</td>
</tr>
<tr>
<td>(\lambda) (spatial autoregressive parameter)</td>
<td>0.77</td>
<td>0.76</td>
<td>0.74</td>
</tr>
<tr>
<td>(R^2) and square correlation(^b)</td>
<td>0.23</td>
<td>0.24</td>
<td>0.28</td>
</tr>
<tr>
<td>Number of observations</td>
<td>354</td>
<td>354</td>
<td>354</td>
</tr>
</tbody>
</table>

Source: Author’s calculations.

Note: Numbers in parentheses are \(t\)-statistics.

a. Four-year average.

b. Squared correlation is reported instead of \(R^2\) in models 2 and 3. All spatial lag and spatial error regression models were computed by maximum likelihood using STATA ml routine modules (see Pisati 2001).
districts increased from only 2.8 percent of the population in 1983 to 11 percent in 2005. On the contrary, districts forming the 20 percent of largest districts decreased from 49 to 44 percent over the same period. An alternative natural aggregate level of observation is the six largest islands of the country (see table 9.5). Population distribution in Indonesia, at the island level, remained almost constant over the last two decades, with 60 percent of the total population on the island of Java and in Bali and 20 percent on the island of Sumatra. The maximum-to-minimum ratio at the island and provincial level decreased slightly, suggesting that regions with the lowest population have been catching up with regions with the most population (converging). The same figure increased at the district level, at least partially, as a result of the proliferation of new districts, which have some of the smallest populations.

Overpopulation and the high degree of population concentration in inner Indonesia (as opposed to the outer islands) have been widely regarded as among the most pressing problems facing the nation since the 1970s. As a result, a government resettlement program, denominated Transmigrasi, which was initiated as early as 1904, was strengthened by the late 1970s and mid-1980s under the New Order government (during the periods of the Repelita: five-year economic development plans III and IV; see table 9.6). These programs aimed to intervene in the patterns of population growth and to reduce concentration by resettling the landless population from areas with high population density to those with low population density. The number of families relocated decreased markedly after 1980 due to a decline in available resources; at that time, the government devised a program to encourage “voluntary” migration of people who would receive none or only partial funding. As a result, the second half of the 1980s was characterized by a large increase in the number of spontaneous (swarkasa) transmigrants. These reached approximately 500,000 families, twice the number of sponsored families. In all, between 1969 and 2000, approximately 1 million families—or 6.2 million people—were moved from Java-Bali to the outer islands, in particular Sumatra.

Similar types of government-financed resettlement programs were also practiced in several other countries in Southeast Asia, including Malaysia, the Philippines, Thailand, and Vietnam (Leinbach 1989). It is widely believed that the success of those programs, as well as that of Indonesia’s Transmigrasi program, was, at best, mixed and controversial, because of problems including inadequate income levels, improper

### Table 9.4 Population convergence

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
</tr>
</thead>
<tbody>
<tr>
<td>Log population 1983</td>
<td>-0.107</td>
</tr>
<tr>
<td>Constant</td>
<td>1.71</td>
</tr>
</tbody>
</table>

Source: Author’s calculations.

Note: Numbers in parentheses are t-statistics. Numbers in square brackets are t-statistics corrected for spatial correlation (error model).

### Table 9.5 Distribution of population in Indonesia, by district, province, and island, 1983 and 2005

<table>
<thead>
<tr>
<th>Indicator</th>
<th>District level (thousand)</th>
<th>Provincial level (million)</th>
<th>Island level (million)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>531.7</td>
<td>496.7</td>
<td>4.7</td>
</tr>
<tr>
<td>Standard deviation</td>
<td>464.5</td>
<td>571.8</td>
<td>7.6</td>
</tr>
<tr>
<td>Minimum</td>
<td>14.0</td>
<td>12.7</td>
<td>0.32</td>
</tr>
<tr>
<td>Maximum</td>
<td>291.9</td>
<td>4,102</td>
<td>31.1</td>
</tr>
<tr>
<td>Share maximum (percent)</td>
<td>1.9</td>
<td>1.9</td>
<td>20.2</td>
</tr>
<tr>
<td>Ratio of maximum to minimum</td>
<td>201</td>
<td>322</td>
<td>96</td>
</tr>
<tr>
<td>Number of observations</td>
<td>281</td>
<td>444</td>
<td>31</td>
</tr>
</tbody>
</table>

Source: Computed based on information in the Susenas (BPS various years).

### Table 9.6 Number of people relocated under Indonesia’s transmigration program

<table>
<thead>
<tr>
<th>Period</th>
<th>Number of target families</th>
<th>Number of families actually moved</th>
<th>Number of people actually moved</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-Repelita period, 1950–69</td>
<td>—</td>
<td>100</td>
<td>500</td>
</tr>
<tr>
<td>Repelita perioda</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I: 1969–74</td>
<td>39</td>
<td>37</td>
<td>174</td>
</tr>
<tr>
<td>II: 1974–79</td>
<td>250</td>
<td>118</td>
<td>544</td>
</tr>
<tr>
<td>III: 1979–84</td>
<td>500</td>
<td>535</td>
<td>2,470</td>
</tr>
<tr>
<td>IV: 1984–89</td>
<td>750</td>
<td>230</td>
<td>1,082</td>
</tr>
<tr>
<td>V: 1989–94</td>
<td>550</td>
<td>119b</td>
<td>—</td>
</tr>
<tr>
<td>VI: 1994–99</td>
<td>600</td>
<td>300</td>
<td>1,500</td>
</tr>
<tr>
<td>VII: 1999–2000</td>
<td>16</td>
<td>40</td>
<td>22</td>
</tr>
<tr>
<td>Total</td>
<td>2,705</td>
<td>1,024</td>
<td>6,271</td>
</tr>
</tbody>
</table>

Source: Sri Adhiati and Bobsien (2001).

b. Not available.
c. Approximation: equal to one-fifth of the target number of families, as stated by Hugo (1997).
Spatial considerations on decentralization and economies of concentration in Indonesia

Site selection, poor matching of settlement models to the specific sites, environmental deterioration, difficulties of adjustment, land conflicts, and financing (Fearnside 1997; Hugo 2003a). As highlighted by Hugo (1997), however, the transmigration program was not the largest component of a substantial spontaneous migration from Java to the outer islands. This is shown by significant and increasing figures for overall lifetime migration out of Java: 2.35 million in 1980 and 2.71 million in 1990. In all, the populations of Java and Bali are growing at a slower rate than those of the outer islands. In fact, the annual population growth rate in Java and Bali over the period 2000–05 (1.47 percent) was almost half that in the outer islands (2.86; see table 9.7). A more disaggregated categorization on the basis of the initial size of districts and their spatial location can be set to distinguish among districts with a population greater than 1 million (in 2000), fringe districts (defined as all neighboring districts of districts in the previous category), and districts in the periphery (defined as all districts that do not fall into either of the two previous categories). Three results stand out. First, peripheries and fringe districts are growing faster than “1 million plus cities,” with the former group experiencing the larger rate of growth. Second, outer islands are growing faster than Java and Bali. Third, within Java and Bali, “1 million plus cities” are still growing faster than the fringe and peripheries, whereas peripheral districts in the outer islands are growing significantly faster. The first and second points suggest a deconcentration of population, as both categories in which population was initially lower—peripheries and outer islands—are growing faster than those in which population was initially higher. The third point reveals that the dynamics of deconcentration are driven by growth in the outer islands and not in Java and Bali, where the trend of population growth exhibits further concentration.

Agglomeration economies

In Indonesia, economic activity is clearly becoming more concentrated in large cities. In 2004, 66 districts (15 percent of all districts) with populations larger than 1 million accounted for 51 percent of total GDP (excluding oil and gas). From this group of districts, those classified as cities or kotas (13 in total) contributed 26 percent, while “non-city districts” (53 in total) contributed 25 percent. Large districts generate about half of national GDP, but this does not necessarily reveal the existence of disparities in income per capita, as large districts also account for about half of the population of the country (49 percent). It is important to recognize that even largely populated districts in Indonesia have both urban and rural areas. In particular, as much as 35 percent of employment in large districts is agricultural. Disparities in productivity become more evident with a more detailed analysis of the patterns of sectoral employment (see table 9.8). In 2004, 45 percent of Indonesians worked in agriculture, which accounted for only 17 percent of national GDP (net of oil and gas). On average, residents of agricultural regions have lower income per capita than persons working in nonagricultural jobs, whether located in large cities or elsewhere. Moreover, the agricultural sector in Indonesia (together with wholesale and retail trade, hotels and restaurants, and construction) exhibits a low level of relative concentration, indicating that agricultural activity is spread somewhat evenly across

### Table 9.7 Population and annual population growth in Indonesia, 2000 and 2005

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>All areas</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Java and Bali</td>
<td>124.1</td>
<td>133.5</td>
<td>1.47</td>
</tr>
<tr>
<td>Outer islands</td>
<td>75.5</td>
<td>87.0</td>
<td>2.86</td>
</tr>
<tr>
<td>Indonesia</td>
<td>203.5</td>
<td>220.6</td>
<td>1.99</td>
</tr>
<tr>
<td>“1 million plus” cities</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Java and Bali</td>
<td>82.2</td>
<td>88.7</td>
<td>1.52</td>
</tr>
<tr>
<td>Outer islands</td>
<td>11.0</td>
<td>11.4</td>
<td>0.81</td>
</tr>
<tr>
<td>Indonesia</td>
<td>93.2</td>
<td>100.0</td>
<td>1.43</td>
</tr>
<tr>
<td>Fringe areas</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Java and Bali</td>
<td>27.3</td>
<td>29.1</td>
<td>1.33</td>
</tr>
<tr>
<td>Outer Islands</td>
<td>41.6</td>
<td>46.8</td>
<td>2.2</td>
</tr>
<tr>
<td>Indonesia</td>
<td>68.8</td>
<td>76.0</td>
<td>1.98</td>
</tr>
<tr>
<td>Periphery areas</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Java and Bali</td>
<td>14.6</td>
<td>15.7</td>
<td>1.42</td>
</tr>
<tr>
<td>Outer islands</td>
<td>22.9</td>
<td>28.8</td>
<td>3.52</td>
</tr>
<tr>
<td>Indonesia</td>
<td>37.5</td>
<td>44.5</td>
<td>3.41</td>
</tr>
</tbody>
</table>

Source: Author’s calculations based on data from BPS (2000, 2005a, 2005b).

a. The populations of all districts in 2005 are aggregated at 2000 boundaries.
Although there is widespread agreement that concentration generates economies in some industries, the large majority of these results refer to industries within the manufacturing sector. The manufacturing sector as a whole accounts for only 25 percent of GDP in Indonesia, which demonstrates the importance of observing the spatial interaction across two-digit classification sectors, including services and agriculture.

The dynamics of concentration (leading to further divergence or convergence) can be examined roughly by looking at changes in the index of relative concentration. The nonservice sectors have become more concentrated, while the service sectors have become less concentrated. This is reflected in an increase in the sectors of mining; agriculture; electricity, gas, and water; and manufacturing and in a decrease in all service sectors (sectors 6 to 9 in table 9.8). However, this indicator reflects an “average,” which can be biased by outlier observations and may not statistically represent the pattern of concentration in districts in Indonesia. Furthermore, the index of relative concentration provides a view of concentration by sector, but it does not shed light on the geographic patterns of distribution and does not take into account the space in which each municipality is located (Ruiz Valenzuela, Moreno-Serrano, and Vaya-Valcarce 2006). To examine the spatial dimension of economic development and concentration in further detail, the next sections present an econometric analysis of the (a) patterns of regional concentration by sectors, taking into account the strategic positioning of districts relative to neighbors in higher orders of the city hierarchy and (b) the magnitude and significance of agglomeration economies.

As outlined by the new economic geography literature (Fujita 1988; Fujita and Thisse 1996; Venables 1996), the decrease in transportation costs over time has enabled closer links between suppliers and customers and made it easier to ship agricultural goods to industrial and urban centers. At the extreme, if transportation costs and congestion costs are significantly low, regional economies can be expected to converge to form unique urban centers of production that benefit from increasing returns, that ship in inputs and agricultural goods, and that distribute products across the nation. Several studies document how improved technologies have led to a pattern of decreasing transportation and communication costs over time (Cairncross 1997; Glaeser and Kohlhase 2004). Although the net effects of lower transportation costs, which lead to concentration, reduce the costs of communication, and lead, in turn, to deconcentration, cannot be determined a priori, an implicit corollary of both of these hypotheses is that interjurisdictional distance would have a smaller effect on the structure of local economies.

### Table 9.8 Composition and concentration of employment, by sector

<table>
<thead>
<tr>
<th>Sector</th>
<th>Composition</th>
<th>Average percentage of regional GDP</th>
<th>Index of relative concentration (employment)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Agriculture, forestry, and fishery</td>
<td>48.3</td>
<td>45.0</td>
<td>0.1</td>
</tr>
<tr>
<td>2 Mining and quarrying</td>
<td>1.1</td>
<td>0.8</td>
<td>–0.6</td>
</tr>
<tr>
<td>3 Manufacturing industry</td>
<td>10.5</td>
<td>12.7</td>
<td>1.2</td>
</tr>
<tr>
<td>4 Electricity, gas, and water</td>
<td>0.4</td>
<td>0.2</td>
<td>–2.4</td>
</tr>
<tr>
<td>5 Construction</td>
<td>3.9</td>
<td>4.5</td>
<td>1.0</td>
</tr>
<tr>
<td>6 Wholesale or retail trade, restaurants, hotels</td>
<td>16.5</td>
<td>18.5</td>
<td>0.9</td>
</tr>
<tr>
<td>7 Transport, storage, and communications</td>
<td>3.6</td>
<td>5.8</td>
<td>2.5</td>
</tr>
<tr>
<td>8 Finance, insurance, real estate, and business</td>
<td>0.7</td>
<td>1.3</td>
<td>3.1</td>
</tr>
<tr>
<td>9 Public services</td>
<td>14.0</td>
<td>11.5</td>
<td>–0.4</td>
</tr>
</tbody>
</table>

Source: Employment figures are computed using data from the Susenas (BPS various years).

b. Excluding oil and gas manufacturing.
Homogeneous growth

Even if it is not possible to fit hundreds of millions of people into a very few regions due to congestion costs, concentrated growth can be expected to spill over across an entire region, except that growth spillovers fade off with distance. Arze del Granado and Sumell (2008) examine employment growth over a 10-year period in Indonesia and its relation to the spatial location of districts at different levels of the urban hierarchy. Employment growth in lower-tiered regions can be expected to be statistically lower if the regions are subject to a “distance penalty” due to fewer opportunities to commute, less access to urban amenities and high-ordered services, fewer opportunities to earn higher salaries, less access to lower-price goods (achieved in larger districts through economies of scale), and weaker trade links in general (Partridge and others 2008). In other words, by not accruing the benefits of agglomeration economies, distant districts may experience a loss in growth, or districts close to larger ones may benefit from growth spillovers. In addition, the magnitude of the distance penalty is likely to be positively associated with the distance between lower- and higher-tier regions. The positive economic value of distance to core centers of development could include higher congestion costs in the form of higher levels of crime, taxes, wages, land prices, traffic congestion, and environmental pollution (Glaeser 1997) or by the benefits of less competition from large urban centers—the new economic geography’s agglomeration shadows (Krugman 1991; Dobkins and Ioannides 2001). Arze del Granado and Sumell (2008) find that employment growth is larger in districts geographically proximate to a higher-order urban center. In particular, the incremental distance coefficients indicate that increasing the distance from a district to the nearest district of a higher tier by one standard deviation decreases its expected employment growth by 0.49 percent. This is a significant figure, considering that the mean annual employment growth of Indonesia’s districts is 1.1 percent. This result is consistent with the findings of Partridge and others (2006) based on U.S. data at the county level, which show that closer proximity to a nearby urban center has a positive effect on employment growth and that this effect is growing over time.

Where decentralization provides additional resources to lagging regions, as is the case in Indonesia (World Bank 2007), small and medium-size cities are likely to experience accelerated growth, increasing the scope for economic spillovers. The appropriateness of the fiscal structure in a decentralized country depends essentially on its geography. Hence the most direct effects of decentralization policy should be examined in terms of the potential benefits of deconcentrating economic activity across subnational territorial units. Decentralization entails the delegation of decision-making authority to a large number of subnational governments over resources previously allocated by the federal government. This is often coupled with larger amounts of public spending per capita at the subnational level in targeted sectors such as education and health (Arze del Granado, Martinez-Vazquez, and McNab 2005). A direct consequence would be the more homogeneous development of new centers of economic activity across the national territory as opposed to the complete centralization in one unique mega urban center. In turn, this implies a decrease in the average distance between lagging regions and the nearest leading region, which, as mentioned in the previous section, increases the scope for economic spillovers.

Urbanization and diversity

A wide array of empirical evidence suggests that regional economic growth is affected by agglomeration economies in the form of urbanization and localization economies. The former is usually proxied either by the overall size of a local economy or by an indicator of sectoral diversity, whereas the latter reflects sectoral gains from concentration of a specific industry. In a recent study of agglomeration economies in Indonesia over the period of 1994–2004, Arze del Granado and Sumell (2008) study the relationship of economic structure and growth, controlling for spatial characteristics such as distance to the nearest urban center and employment
growth in the surrounding regions (to correct for spatial autocorrelation). This study concludes that lagging regions seem to be catching up in terms of overall employment growth, led mainly by agriculture and mining. This is reflected in a negative coefficient on districts’ total employment and employment density in the initial year of the period examined. Having controlled for sectoral effects—both localization and diversity—employment density reflects the potential effect of the size of local markets, sometimes considered part of urbanization economies. It can also capture negative externalities such as pollution or high rents for land (see Combes 2000). Because of transportation cost savings and increasing returns, firms find it profitable to locate in large input and output centers. In addition, industries might benefit from knowledge spillovers across industries due to higher communication among people in cities or due to supply-demand linkages. Yet when markets are saturated with an excessive number of suppliers, output prices tend to fall and input prices tend to rise. In addition, an urban area’s capacity to absorb land-intensive industries, such as in agriculture and mining, is physically constrained. Therefore, these land-intensive industries seem to be less prone to achieving the benefits of agglomeration economies.

Arze del Granado and Sumell (2008) find evidence of a pattern counter to that expected from the presence of localization economies. That is, the coefficient of localization or specialization is statistically significant and negative in all sectors. The estimated localization elasticities range from −0.1 to −0.01 and are significantly larger for the service sector (from −0.1 to −0.04) than for the nonservice sectors, agriculture being the lowest (−0.01). These results suggest that employment in all sectors became distributed more equally across districts over the period of analysis, as opposed to a pattern of increased clustering of sectoral employment. Furthermore, these results are consistent with the theoretical conclusions of Jacobs (1969) and the empirical findings of Glaeser and others (1992), among others, which suggest that urbanization, and not localization, contributes to economic growth. Combes (2000), in a study covering 341 local areas in France from 1984–93, also finds negative specialization effects in sectors in which employment is growing at the national level. This would also be the case in Indonesia, where employment is growing in 7 out of 10 main sectors (exceptions being electricity, mining, and public services). Combes attributes this result to a pattern in which sectors “first develop in a few places and then develop across space.” Unlike results previously found in the United States and Europe, Combes’s findings can be explained partly by the fact that France has significantly lower levels of labor mobility. This is likely also the case in developing countries and, in particular, in Indonesia, which has a territory fragmented into more than 13,000 islands, with more than 700 living languages spoken across its regions (Gordon 2005). However, these results are based on a two-digit level of aggregation in which all manufacturing industries are aggregated into one sector, and so they do not shed light on the patterns of industries within the infrastructure sector.

Room for further decentralization and policy implications

It is too early to examine the full impact of decentralization in Indonesia, but it is still possible to infer some of its likely effects on local economic development based on an analysis of two additional dimensions: (a) the extent to which decentralized expenditures generate new centers of industrial activity and (b) the extent to which decentralized public expenditures can enhance efficiency by generating intergovernmental competition. Fiscal decentralization—perhaps the most widespread and profound type of transformation of the government structure in developing countries over the past two decades—has significantly transformed Indonesia since 2001 (Alm, Martinez-Vazquez, and Indrawati 2004; Bahl 1995; Fengler and Zaini 2006; Lewis 2005). Public policy at the subnational level can affect the migration of firms and individuals through the regulation of licensing, zoning, and the provision of various types
of subsidies, tax exemptions, industrial parks, and so forth. The regional allocation of subnational expenditures across sectors is just one of several factors that affect the mobility of production factors in a country, but an important one. The determinants of firm location have been widely examined in Indonesia (Deichman and others 2005; Kuncoro 1994; Kuncoro and Dowling 2007; see also Kuncoro in chapter 10 of this volume), and this topic is not considered further here. Instead, this section examines the effects of public expenditures on industrial concentration, defined as the percentage of manufacturing in total regional GDP. The theoretical justification for this type of empirical model is discussed in Chen, Jin, and Lu (2005) and Wen (2004). The main variables of interest in this section are public expenditures on infrastructure and on other sectors related to business development.21

There is no evidence that decentralization is generating new centers of industrial activity. In particular, decentralized expenditures over the period of 2001–04 are not statistically correlated with the level of industrial concentration in Indonesia.22 Results from a linear regression reveal a significant relation between the degree of industrial concentration and expenditures on infrastructure, yet these results lose their significance once a spatial lag is included in the model to correct for spatial autocorrelation. This indicates the existence of spatial correlation in the sense that other types of spatial characteristics might be leading to industrial clustering. It is still too early to find an effect from local public expenditures over the period examined, given that public investments may take several years to generate results.

An additional channel by which a decentralized government structure can enhance economic development is by increasing the efficiency of public spending. Yet districts in Indonesia seem to possess insufficient fiscal autonomy to generate efficiency gains from interregional competition. The current extent of competition can be examined in the form of spatial interdependence in discretionary public expenditures (largely expenditures other than personnel). If local governments compete for mobile labor and capital, the composition of their public expenditures should exhibit a systemic pattern of spatial interaction.25 Indonesia is among the most decentralized developing countries in the world, with a ratio of subnational to total expenditures of 40 percent (World Bank 2007). Yet, in 2004, as much as 48 percent of expenditures at the subnational level were de facto nondiscretionary.24 The current decentralized structure increased significantly the overall level of expenditures transferred from the central government that could be used, in principle, to attract mobile private investments. On the revenue side, the ability of a district to compete is almost nil, as most important taxes, such as property and income taxes, are administered by the central government and subsequently shared with provinces and districts, whereas the corporate income tax is still under the complete jurisdiction of the central government. The lack of subnational tax autonomy in Indonesia is reflected in the distribution of revenue by source, with own revenue sources accounting for as little as 8.8 percent of total revenues in 2005 (World Bank 2007).25

There is evidence that fiscal decentralization can increase interjurisdictional competition in developed countries, but there has been little research on these effects in the developing world. Arze del Granado, Martinez-Vazquez, and Simatupang (2008) examine the expenditure patterns of districts in Indonesia, finding evidence of spillover effects in expenditures on administration, but failing to find a similar effect in expenditures on other sectors.26 This is of particular interest, as expenditures in the government sector account for the largest share of subnational expenditures in Indonesia. The estimated spatial elasticity for subnational administrative services is almost twice as large as that for discretionary total expenditures. Some sort of an imitation effect, and not necessarily of the good kind, appears to occur among Indonesia’s local districts: spending by neighboring districts on local buildings, cars, and so on leads to imitation by other districts. On the contrary, Arze del Granado, Martinez-Vazquez, and Simatupang (2008) find evidence of the existence of yardstick competition (spatial interaction on the quality of services). This is of particular significance because accountability
mechanisms in decentralized developing countries may be reinforced through the presence of interjurisdictional competition in terms of local government performance.

The constraints on the expenditures of subnational governments are now weakening as the amount of intergovernmental transfers from the central government is increasing. Hence greater autonomy on the expenditure side may be generating stronger intergovernmental competition across districts, but this will only be shown when new budgetary data become available in the coming years.

**Conclusions**

This chapter suggests that gravity forces from districts in higher tiers of the urban hierarchy pull population from nearby districts in lower ranks of the hierarchy. This pattern reverses for districts at the highest levels of urbanization, which repel population toward their fringe areas due to the costs of congestion. Higher urbanization rates do not imply greater urban concentration. The level of urban concentration in existing urban areas does not increase as a result of the reclassification of regions from rural to urban, as this is a lateral extension of the urban boundaries. On the contrary, rural-to-urban household migration does lead to higher urban concentration. An examination of rural-to-urban migration patterns in relation to urbanization reveals that a district’s own level of urbanization and level of public expenditures on social services and infrastructure determine its migration gravity. The higher these levels, the lower the outflow of population toward larger districts. If a district’s own migration gravity is sufficiently weak, residents are pushed outward toward districts with better services or employment opportunities. Fiscal decentralization could serve to curtail rural-to-urban migration, whether this is desired or not, to the extent that decentralization increases per capita spending in sectors such as infrastructure and health services. Moreover, anecdotal evidence on the Transmigrasi program suggests that explicit policy interventions that resettle population can cause several secondary problems.

In relation to the effects of government intervention on industrial concentration, the results of an empirical model on the determinants of industrial concentration do not support the existence of a significant relation between industrial concentration and public spending on infrastructure or on “business development.” This result is in line with studies finding that, while natural advantages and production externalities affect the location decisions of firms, the effects of government intervention on location patterns, through investments on infrastructure in lagging regions, are not effective (Deichman and others 2005). Wells and Allen (2001) find that special tax incentives and tax holidays aimed at developing local industry are not likely to develop sustainable growth, as these incentives attract mostly footloose industries that leave soon after the policy is over.

Whether further concentration in Indonesia is desirable or not is a topic that requires further debate. The benefits of deconcentration in reducing congestion costs and regional disparities should be weighed against the potential losses it could generate from agglomeration economies. Results from the examination of employment growth across two-digit sectors reveal that higher concentration of overall economic activity—as measured by employment density—does not generate productive externalities in most sectors, including manufacturing (embracing all industries as a whole) and, in fact, is correlated with lower rates of growth in total employment. These results suggest that economic growth is positively associated with sectoral diversity (urbanization) and negatively associated with sectoral concentration (localization) at the two-digit level of aggregation. These results do not pertain to the dynamics of growth in industries within the manufacturing sector, which could be benefiting from economies of localization or urbanization. Likewise, these results should not be interpreted as suggesting that Indonesia has reached an intrinsic stage of excessive concentration leading to congestion costs. On the contrary, it is more likely that Indonesia has not yet received the benefits that other more developed
countries have accrued from agglomeration economies and that further efforts should be directed to improving the productive environment in ways conducive to achieving these benefits. Deconcentrating policies such as fiscal decentralization, discussed in relation to agglomeration economies, are likely to enhance growth in nonmanufacturing sectors, to strengthen industries that have settled in leading regions outside Java, and to further develop some industries across the country that do not exhibit strong gains from agglomeration (see Deichman and others 2005; Kuncoro in chapter 10 of this volume; Kuncoro and Dowling 2007 for a review of agglomeration economies by industry in Indonesia). The potential gains from developing nonmanufacturing sectors should not be taken lightly, particularly considering that nonmanufacturing sectors account for 75 percent of Indonesian GDP.

Distance matters, and so does the homogeneous distribution of economic activity. This chapter finds that employment growth is inversely related to the distance between a district and its nearest higher-order urban center. The more disperse leading regions (districts of higher urban hierarchies), the lower the average distance from lower- to higher-ranked districts and, in turn, the higher the expected level of overall employment growth. This suggests that fiscal decentralization, as far as it relates to the spatial distribution of growth and growth spillovers, could generate more homogeneous levels of growth across the country. However, these results do not lead to conclusions on whether more homogeneous levels of growth at the subnational level translate into higher levels of national economic growth, which is a topic worthy of further research.

Notes
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1. Most studies in the literature focus on the dynamics of sectors within the manufacturing sector, whereas this study explores the intersectoral dynamics between two-digit sectors, including agriculture, services, and manufacturing.

2. The Indonesian Bureau of Statistics (BPS) defines a locality as “urban” if it satisfies three conditions: (a) a population density of 5,000 people or more per square kilometer, (b) 25 percent or less of the households working in the agricultural sector, and (c) eight or more types of urban infrastructure and facilities. These facilities include a primary school or equivalent, a cinema, a hospital, a maternity hospital or mother-child hospital, a primary health care center or clinic, a road that can be used by three- or four-wheel motorized vehicles, a telephone or post office agency, a market with buildings or a shopping center, a bank, a factory, a restaurant, public electricity, and a party-equipment rental service (Firman 1997).

3. Data from Supas 2005 were complemented with data from the Aceh Census post-tsunami (BPS 2005a, 2005b).

4. Figures for net migration (in-migration minus out-migration) and urbanization are drawn from the Intercensal Population Survey (Supas) for 2005, which allows the identification of important patterns of interdistrict rural-urban migration, yet does not allow the study of intradistrict migration from rural to urban areas (BPS 2005b). Migration patterns are examined in the economics literature by “gravity models” that consider the characteristics of origin and destination districts as well the distance (“friction”) between them (Sen and Smith 1995).

5. After a pronounced increase from 100,000 in 1900 to approximately 9.1 million in 1995 (Han and Basuki 2001), Jakarta’s population decreased to 8.4 million in 2000, as recorded by the census, but increased again to 8.82 in 2005 (BPS 2005b).

6. According to the Supas, in 2005 only 68 percent of the city’s population was born in the city (BPS 2005b).

7. These districts are Cianjur, Cirebon, Garut, Jember, Malang, Medan, Sukabumi, and Tasikmalaya, with the district of Tangerang and city of Surabaya being the exceptions.

8. Expenditures on services such as education and health, police, and parks and recreation
tend to improve the welfare of most individuals, and so they can be expected to increase the likelihood of a district being chosen as a migrant’s destination. Infrastructure expenditures can be expected to be positively correlated with net migration as the development of infrastructure enhances the productivity of existing firms in several ways (for one, by decreasing transportation costs) and attracts additional firms to the region, which in turn increases employment opportunities and wages.

9. This is because net migration is clearly correlated with total population in a district, and so any “per capita” measure would be endogenous to the model.

10. The 2005 Supas provides data on lifetime migration, which are used here to construct the dependent variable. Lifetime migration is defined by where individuals were born and where they currently live. This is suboptimal, as migration that occurred before the fiscal period being observed may distort the results. Yet data on 5-year migration are only available every 10 years, the next one being in 2010, and fiscal data at the subnational levels are available only since 2001.

11. This is important given that the units of observation are likely subject to spatial correlation, as migration is without doubt defined by geographic proximity.

12. This is inconsistent with other studies, which have found that in-migration is positively associated with education expenditures, but not with health expenditures (Clark and Hunter 1998; Conway and Houtenville 1998). The common argument suggests that some segments of the population, such as the elderly, do not benefit directly from education and that higher expenditures on education may be associated purely with higher local taxes. Yet the association between taxes and expenditures is weak in Indonesia, which raises a question regarding the true reason for this relation.

13. This is revealed by a negative correlation between initial population and population growth (or population convergence).

14. All cities (regardless of their population) account for 43 percent of GDP.

15. This index varies between 0 and 1 and measures, for each sector, the aggregate difference between a district’s share of total employment in that specific industry and the district’s share of employment in total national employment. A value of 0 denotes the absence of regional concentration (for example, the share of a district’s employment in a specific industry is the same as its share of employment in total national employment).

16. Congestion costs in the form of higher wages and land prices tend to disperse manufacturing activities to less-congested regions.

17. Districts are categorized into one of five tiers based on their degree of urbanization. See the annex for details on the definition of the urban-tier categories and also of the control variables used in this study.

18. This refers to a negative-effect “penalty,” as this is the sign found in their empirical analysis. A positive distance effect could be interpreted as a “distance benefit” for more regions distant to urban centers, as they benefit from lower competition with their larger neighbors (Partridge and others 2006).

19. The coefficient for distance against total employment as the dependent variable is negative and statistically significant, indicating that an additional kilometer of distance between a district and a higher-tier urban center decreases the district’s employment growth by −0.002 percent.

20. None of the remaining sectors has a significant elasticity for initial levels of employment density, whereas all sectors experienced positive intersectoral effects from diversity (the coexistence of various sectors in a given locality benefiting from supply and demand linkages).

21. Infrastructure expenditures are defined as regional development, housing, and settlement sector; water resources, irrigation, and transportation sector; telecommunication subsector; energy subsector of mining and energy sector (World Bank 2007).

22. Reverse causality could lead to inconsistent estimates of the coefficients. Yet this estimation initially sought to find the mean of the dependent variable conditional on the potentially endogenous variable, abstracting from the sign of causality. The resulting coefficients of interest are not statistically significant, and thus no further estimations with instruments were deemed necessary.


24. To identify the presence of expenditure spillovers, it is necessary to assume that subnational governments have discretion regarding how to spend their resources. This assumption is not always met in developing decentralized countries. In the case of Indonesia, despite the devolution of public spending in 2001 a large portion of the General Allocation Fund (Dana Alokasi Umum) is used to cover the full amount
of the district’s civil service wage bill, while the central government has retained the authority to manage the subnational civil service. In practice, district governments have circumvented this by hiring contractual employees to cover additional needs in different sectors. Unfortunately, the current budget classification does not allow the separation of those expenditures from civil servants salaries. To test the predictions of the expenditure spillover model, discretionary expenditures are separated from nondiscretionary expenditures at the subnational level. Nondiscretionary expenditures are defined as capital expenditures plus routine expenditures other than for personnel (goods and materials, operations and maintenance, other routine expenditures, and others).

25. In turn, taxes on hotels and restaurants account for 75 percent of own-source revenues.

26. The lack of statistical significance of the coefficients for the remaining sectors is not surprising, as many of the studies conducted in other countries have failed to find a spatial interdependence on expenditure estimations based on distance weight matrices (Case, Rosen, and Hines 1993). These authors do not find evidence of the presence of tax competition.

27. The lack of evidence of production externalities in manufacturing suggests only that there is no evidence of production externalities at this level of aggregation. Studies of industries within the manufacturing sector find effects of agglomeration economies in determined industries (Deichman and others 2005; Kuncoro in chapter 10 of this volume).

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Definition of the variables and estimation results

This annex provides details regarding the definition of variables and econometric model specifications. Further details and descriptive statistics are available from the author upon request.

Definition of the variables

Results reported here are drawn from a minimum least squares regression. The variables and their sources are defined as follows.

Net migration is the number (thousands) of lifetime in-migrants minus out-migrants from the Intercensal Population Survey (Supas) for 2005 (BPS 2005b). Net out-migration is used instead of an "allocation rate" (net migration as a percentage of the total number of out-migrants from the place of origin), as recent studies prove that using "allocation rates" as dependent variables is valid only with a very narrow interpretation when origin variables are included in the model (Cushing 1989).

Urbanization is the district’s urban population as a percentage of total population from the Supas (BPS 2005b).

Incremental distances are computed following a methodology similar to the one used by Partridge and others (2006). The variable minimum distance to urban center is the distance from a district to a district at a higher tier of urbanization. The tiers are defined by quintiles relative to the percentage of urban population in the district. The location of districts is not necessarily sequential, so a district in the top quintile could be the closest district to one in the bottom quintile. In this case, all variables of incremental distance to levels three, four, and five would be 0. Yet if a district in the bottom quintile is closest to a district in the second quintile, the incremental distances three, four, and four would record the "additional" distance needed to reach a district at those levels. For example, if a district in category one is 50 kilometers from a category-two district and 110 kilometers from a category-three district, the incremental distance to category three would be 60 kilometers. Incremental distances are computed based on geographic coordinates exported from MapInfo. Incremental distance three was dropped because it did not have enough observations.1

1 million plus cities is a dummy variable with a value of 1 for districts with population greater than 1 million in 2005 and 0 otherwise, based on population data from the Supas 2005 (BPS 2005b).

Fringes areas is a dummy variable with a value of 1 for all districts adjacent to a "1 million plus city" and 0 otherwise.

Estimation results

Specialization or localization is defined as \( S = \frac{\text{emp}_{d}}{\text{emp}_{a}} \) where \( \text{emp}_{d} \) is employment in sector \( s \) in districts \( d \), and \( \text{emp}_{a} \) is total national employment in sector \( s \). Employment density is \( E = \frac{\text{emp}_{d}}{\text{a}} \), where employment in district \( d \) in time \( t \) = 1994, and \( a \) is district of area. This variable is a proxy for the size of local markets, which are quasi-proportional to the size of the local economy. Diversity, defined as \( \text{div}_{s,d} = 1/ \sum_{s} (\text{emp}_{s,d} / (\text{emp}_{s,d} \text{emp}_{a,d}))^{1/2} \), is the inverse of a Herfindahl index. This variable reaches a maximum when all sectors except the sector being studied have the same size in district \( d \) (see Combes 2000; Henderson, Kuncoro, and Turner 1995). Nearest urban (distma) and incremental distances (inchigherma) are in line with the incremental distances described earlier, but the definitions are slightly different. Each district is categorized either as "mainly" urban or as rural, based on both the total population and the population density of the district. Urban districts are then categorized into tiers according to total population. That is, districts can be categorized as either rural or as one of three categories of urban (with category three being the largest). Specifically, a district is classified as urban if it has a population greater than 100,000 and a population density greater than 100. The reason for using both population and population density in categorizing districts is that several geographically large districts have a substantial, but sparse, total population without a significant urban center. If the population is above 100,000 but below 400,000 with a population density above 100 or if the population is above 400,000 with a density below 100, it is a category-one urban district; if the population is between 400,000 and 700,000 with a density above 100, it is a category-two district; and if the population is above 700,000, it is a category-three district. The categories are based on 1994 population figures. All districts with a population above 500,000 have a population density above 100. Of the 286 districts included in the analysis, 133 qualify as urban: 18 in category three, 4 in category two, and 74 in category one.

For rural districts, estimations include the distance to the center of the nearest urban district regardless of category and incremental distance to the center of the nearest higher-category district. For urban districts, the distance to the nearest urban district equals 0, but other values are assigned to incremental distances of the nearest higher-category district. All category-three urban districts have a value of 0 for both nearest urban district and incremental distances. However, a category-one urban district that is 20 kilometers away from the nearest category-two district and 50 kilometers away from the nearest category-three district will have a value of 0 to the nearest urban district, an incremental value of 20 to the nearest category-two district, and an incremental value of 30 to the nearest category-three district. As a final example, assume that a rural district is 40 kilometers from the nearest category-one district, 80 kilometers from the nearest category-two district, and 60 kilometers from the nearest category-three district. If the distance to the nearest urban area equals 40, then the incremental values to the nearest category-two and category-three districts would equal 0 and 20, respectively.

The specification is estimated as follows:

\[
y_{d,s} = \alpha + \beta_{1} L + \beta_{2} E + \beta_{3} \text{Dist} + \beta_{4} \text{InePop} + \beta_{5} G + \beta_{6} \text{PopCat} + \eta_{d,s},
\]

where \( y_{d,s} \) is employment growth in district \( d \) and sector \( s \), \( D \) is diversity, \( L \) is specialization or localization, \( E \) is employment density, \( \text{Dist} \) is distance to nearest urban center, and \( \text{InePop} \) is incremental population to category-four and category-five districts, \( G \) is a matrix of geographic and ethno-linguistic variables (including landlocked, island district, remote district, ethno-linguistic fractionalization, longitude, latitude, and regional dummies for Sumatra, Kalimantan, Sulawesi, Nusa Tenggara and Maluku, and Papua), \( \text{PopCat} 2 \ldots \text{PopCat} 5 \) are dummies for population categories, and \( \eta \) is the error term. \( \beta \) is an autoregressive parameter, which takes the form of a mixed regressive spatial autoregressive process.
corresponding to the following spatial regression model: $Y = \rho W Y + X \beta + \mu$. See Arze del Granado and Sumell (2008) for further details and a complete set of results.

The specification is estimated as follows:

$$Y_i = \rho \sum_{j \neq i} w_{ij} y_j + \beta_1 E + \beta_2 I + \beta_3 S + \beta_4 \text{Geog} + u_{,i}, \quad (A.2)$$

where $Y_i$ is district’s $i$ share of manufacturing in total regional GDP (as a proxy for regional industrial concentration), $\rho$ and $\beta_1 - \beta_4$ are parameters to be estimated, $w_{ij}$ are weights defined according to a predefined criteria of neighborliness (district with a centroid within a band of five digitizing units, using spawmat in Stata software), $y_j$ are expenditures of district $j$’s neighboring districts, and $E$, $I$, $S$, and $\text{Geog}$ are explanatory variables corresponding, respectively, to public expenditures (infrastructure and expenditures in industry and business development sectors), relative income per capita, average years of schooling, and a set of district $i$’s geographic characteristics, including the inverse distance to the closest port, landlocked, isolated island, and main island dummies.

Two more specifications (which include a spatial lag of the dependent variable) are computed by maximum likelihood using STATA ml routine modules developed by M. Pisati (see Pisati 2001). The full set of results is available upon request.

**Note**

1. By definition, the incremental distance to the third quintile (incremental distance three) is 0 for all districts in quintiles four and five. In addition, for districts in the second quintile, the minimum distance to larger urban center variable is actually the distance to the nearest third quintile, and so values for the incremental distance to the third quintile are also 0.
Spatial agglomeration, firm productivity, and government policies in Indonesia: concentration and deconcentration in the manufacturing sector

Ari Kuncoro

This chapter focuses on two of the three central themes of World Development Report 2009, namely, spatial concentration (density) and industrial decentralization (distance). Spatial centralization of resources and spatial concentration of economic activities in a few of the largest metropolitan areas are issues facing many developing countries. Concentration will bring spatial disparities between leading and lagging regions, widening gaps in living standards and welfare, and negative externalities associated with very large urban areas, such as congestion, crime, and pollution. From the standpoint of economic efficiency, of course, there are benefits from such concentration or agglomeration.\(^1\)

The challenge is to minimize the unintended negative effects. One solution is regional or territorial development within countries, which means encouraging the development of alternative centers in lagging regions.

Using series of firm-level data for Indonesian manufacturing, this chapter illustrates how the concentration took place as the economy was becoming more developed and how public policies could mitigate the problem by mixing infrastructure development in lagging regions with private incentives to encourage industries to concentrate in smaller cities in lagging regions. The government has made it possible for manufacturing firms to locate in outlying locations by building and improving roads in rural areas. The goal is to decentralize jobs to small cities and thus ease the pressure on large cities. During the 1980s and 1990s, efforts to decentralize manufacturing firms to outlying locations in Java were relatively successful mainly because localization forces were stronger than urbanization forces. The forces of decentralization pushed toward deconcentration, while local agglomeration and specialization encouraged industries to reconcentrate in smaller, medium-size cities. In the following sections, this chapter presents empirical evidence to explain why this was the case.

Evolution of the manufacturing industry’s spatial configuration in Java

The concentration of economic activity in a few places is a common phenomenon. While the concentration of economic activity (and the concomitant economic efficiency) is itself desirable, the large spatial disparities in welfare associated with this process are mostly unwelcome. Manufacturing activities in Indonesia offer good examples of this process. In the Indonesian context, manufacturing, especially its labor-intensive branches, is instrumental in alleviating poverty. It provides millions of people with
more rewarding off-farm jobs and, at the same time, relieves pressure on agricultural wages. But the concentration of manufacturing in a few places in Java also attracts people to cities, putting severe pressure on overburdened urban infrastructure.

As in other countries, the Indonesian government has been eager to stem this tide by improving infrastructure, particularly roads, in the hinterland (Albala-Bertrand and Mamatzakis 2004). The social capital program, called INPRES, was created to improve infrastructure in the countryside. By investing in road infrastructure, the government made it possible for manufacturing firms to locate in outlying locations. In effect, the government attempted to move jobs to rural cities to ease the pressure on large cities. This chapter examines whether this policy was indeed successful in deconcentrating manufacturing out of old central locations.

For the purpose of comparison, all districts in Java are divided into high income per capita versus low income per capita regions (see table 10.1). As part of the Dutch colonial legacy, Jakarta (the capital city) and Surabaya (the capital of East Java province) were among the few places where manufacturing firms were originally concentrated (see figure 10.1). Naturally, the supporting service sectors, such as banking and trade, also agglomerated in those high-income regions.

Table 10.2 calculates the income gap between the national capital—Jakarta—and other cities and regions. Only Surabaya has been able to catch up with Jakarta, while others either have maintained the same gap (BOTABEK or Bogor, Tangerang, and Bekasi) or have fallen behind (low-income districts in lagging regions).

In terms of value added, the high concentration of manufacturing in regions with low income per capita is rather deceiving, because it is shared by about 83 (out of 97) districts, which occupy about 90 percent of the land area in Java (see table 10.3). Manufacturing firms in low-income regions are typically in food processing, mostly traditional food products. From 1986 to 2003, Jakarta lost its dominance as creator of value added, as its share of manufacturing gross domestic product (GDP) dropped to 19.3 percent in 2003. In the meantime, its neighboring districts, BOTABEK, increased their share to 23.9 percent. Evidently, some deconcentration took place, albeit relatively close to the old center. Surabaya showed some gains, while low-income regions suffered a loss of 6 percentage points.

Table 10.4 illustrates the role of the manufacturing sector in the local economy. The huge drop in the share of manufacturing in GDP in Jakarta reflects more than the movement from manufacturing to the service sector. The soaring costs of land, tighter environmental regulations, and worsening congestion have made it increasingly uneconomical for manufacturing to locate in Jakarta. The next-door neighbors of BOTABEK are the most logical sites. Using money from the oil boom of the 1970s, the government has made a conscious effort to improve road infrastructure in Java. Indeed, in contrast to Algeria, Ecuador, Nigeria, and Venezuela, Indonesia is the only oil-rich country in which agricultural output has expanded during an oil boom (Gelb and others 1988). Although, from the infrastructure point of view, it was possible to relocate farther away from Jakarta, the choice of BOTABEK—about 60 kilometers from Jakarta—suggests that the national capital still acted as a magnet, drawing firms to locate in close proximity to it.

Why did the deconcentration happen so close to Jakarta rather than farther inland, for example, in Bandung, West Java, which is about 180 kilometers to the southeast of Jakarta? Infrastructure apparently was not the main reason. Indeed, road infrastructure in Java, which connects the industrial agglomerations of Jakarta and Surabaya

<table>
<thead>
<tr>
<th>Table 10.1</th>
<th>Comparison of high-income per capita and low-income per capita regions in Java, select years, 1986–2003</th>
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</thead>
<tbody>
<tr>
<td>Region</td>
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<td></td>
<td>1986</td>
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<td></td>
</tr>
<tr>
<td>Jakarta</td>
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</tr>
<tr>
<td>BOTABEK</td>
<td>0.4</td>
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<td>Lamongan, Gresik, Sidoarjo</td>
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</tr>
<tr>
<td>Surabaya</td>
<td>0.8</td>
</tr>
<tr>
<td>Low income per capita regions</td>
<td>0.5</td>
</tr>
</tbody>
</table>

Source: Calculated from the regional income data of the Central Statistical Agency.
to the hinterland, improved a lot between 1986 and 1990 (see table 10.5). The share of villages with paved roads in districts other than Jakarta, including those in low-income regions, increased significantly during this period. In this respect, Henderson and Kuncoro (1996), using the Java sample, suggest that, in 1986–90, centralization of the licensing regime in Jakarta was one factor drawing firms to central locations.

**Choice of firm location**

This section examines firm-level decisions regarding location in the manufacturing sector. Conceptually, a firm will choose a location in which it believes it can earn the highest profit.

The trend of spatial concentration or deconcentration is presented in tables 10.6 and 10.7. Based on share of all firms as a simple measure of concentration, it appears that the trend among all industries between 1990 and 2003 was toward deconcentration (table 10.6). Despite a period of slight reconcentration between 1980 and 1990 as the nation underwent liberalization, the number of firms in Jakarta as a share of all firms dropped from 19 percent in 1980 to 11.5 percent in 2003. As expected, BOTABEK increased its share from only 5 percent in 1980 to 12.4 percent in 1990. Low-income regions, after experiencing a drop from 63.7 percent in 1980 to 57.4 percent in 1990, regained much of the loss in 2003, returning almost to the level in 1980. So from the firm-level standpoint, the deconcentration was of firms moving to lower-income regions.
This would have been almost impossible if the central and local governments had not improved infrastructure in Java, particularly roads (table 10.5).

At the outset, hinterland locations had difficulty attracting industries, despite government policies encouraging decentralization, such as the creation of industrial zones in outlying regions. Many industrial zones remained largely empty until the mid-1990s. Later on, after the second wave of economic liberalization in the mid-1990s, some deconcentration to areas farther from Jakarta did take place. Only after congestion and wage and price increases began to erode their competitiveness did firms start to fill in new locations adjacent to the original metropolitan areas of Jakarta, BOTABEK, and Greater Surabaya.5

At the industry level, the picture is more interesting. In terms of number of firms, as the economy was liberalized in the mid-1980s, textile firms began to concentrate in Jakarta and BOTABEK at the expense of low-income regions, particularly the old center of textiles in Bandung, West Java. But in 1995 this trend was reversed and continued until well after the economic crisis of the late 1990s. For machinery, the deconcentration took place mainly from Jakarta to the neighboring districts of BOTABEK and not much elsewhere. So, in effect, BOTABEK became a new center of agglomeration for machinery.

In the case of chemicals, low-income regions enjoyed significant gains, increasing their share of firms from 30.4 percent in 1980 to 45.7 percent in 2003. Tighter environmental regulations in urban areas may continue to force firms to relocate in less-regulated districts in low-income regions. However, this does not necessarily mean the recentration of industry, because these firms are shared by 83 districts. But new industrial agglomerations evidently are emerging in low-income regions, contributing to the increasing share of firms in these regions.

The nonmetallic industry has experienced deconcentration, mainly to low-income districts. The share of firms in lagging districts increased significantly, from 64.9 percent in 1980 to 83.5 percent in 2003, at the expense of Jakarta and BOTABEK. Districts in Gresik, Lamongan, and Sidoarjo enjoyed gains in other industries, but they were less significant than in the nonmetallic industry. Although less pronounced, the same picture can be observed for wood. Finally, there was little change in the concentration of food processing. There was movement between Jakarta and BOTABEK, but little movement elsewhere.

Table 10.7 presents the concentration of employment as a consequence of firm-level choice of location. As expected, the general picture resembles the concentration of firms in table 10.6. For machinery and nonmetallic minerals (including cement), where scale is important, the concentration of employment and any change associated with it is more pronounced than the concentration of firms in Jakarta and BOTABEK.

The movement of population
Industry concentration is measured by a normalized Hirschman-Herfindahl index. For each industry, the normalization controls for changes in industry concentration brought about by changes in population concentration over time. For industry \( j \) at time \( t \), the concentration is given by:

\[
g_j(t) = \sum_{i=1}^{I} \left[ \frac{E_{ij}(t)}{E_j} - \frac{P_{ij}(t)}{P(t)} \right]^2,
\]

where \( E_{ij}(t) \) is national employment in industry \( j \) at time \( t \), \( P(t) \) is national population

<table>
<thead>
<tr>
<th>Region</th>
<th>1986</th>
<th>1995</th>
<th>2001</th>
<th>2003</th>
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<td>0.33</td>
</tr>
<tr>
<td>Surabaya</td>
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<td>0.35</td>
<td>0.34</td>
<td>0.34</td>
</tr>
<tr>
<td>Low-income per capita regions</td>
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<td>0.21</td>
<td>0.19</td>
</tr>
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</table>

Source: Calculated from the regional income data of the Central Statistical Agency.

<table>
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<th>2000</th>
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<td>0.99</td>
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<td>0.62</td>
<td>0.69</td>
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</tbody>
</table>

Source: Calculated from the village potential data of the Central Statistical Agency.
at time $t$, and $i$ is the total number of geographic units. The minimum value of $g_j(t)$ is 0; that is, when all locations’ share of industrial employment is exactly the same as their share of population.6

The results are presented in tables 10.8 and 10.9. For simpler categorization, Jakarta is combined with BOTABEK to become JABOTABEK, while Greater Surabaya combines the city of Surabaya itself with the industrial districts of Lamongan, Gresik, and Sidoarjo. The Hirschman-Herfindahl concentration index for all industries confirms that overall manufacturing industries were more concentrated in 2003 than in 1990, which means that industrial concentration tends to deviate from where the population resides. In the booming period between 1990 and 1995, food and textiles became more concentrated, while other industries showed the opposite trend. Wood, chemicals, and machinery were highly concentrated in the beginning of the period, but afterward became significantly less concentrated.

For some industries, the 1998 economic crisis brought an abrupt change in the trend of deconcentration. Wood, chemicals, nonmetallic minerals, and machinery became more concentrated after the crisis. This reconcentration, however, was not a result of the influx of new firms; rather it was caused by the decline in the number of firms in outlying districts. This trend resumed in the post-crisis period of 2001–03. For all industries, the index increased from 3.1 percent (chemicals) to 35.1 percent (machinery),

<p>| Table 10.6 Concentration of manufacturing firms in Java, select years, 1980–2003 |
|-------------------------------|---------|---------|---------|---------|---------|---------|---------|---------|</p>
<table>
<thead>
<tr>
<th>Region and year</th>
<th>Food</th>
<th>Textiles</th>
<th>Wood</th>
<th>Paper</th>
<th>Chemicals</th>
<th>Nonmetals</th>
<th>Machinery</th>
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</table>

Source: Calculated from the Central Statistical Agency, Manufacturing Annual Survey (various years).
a significant increase in just over two years (see table 10.9). This suggests that, for those particular industries, the spatial distribution of firms and population deviated from each other. This can be attributed to the movement of new firms to central locations, but this is highly unlikely in the post-crisis atmosphere. It is possible that outlying districts in Java experienced more firm death or exit than central locations. It is also possible that population or workers moved to "cheaper" districts adjacent to JABOTABEK and Greater Surabaya and spent more time commuting to their workplace. Actually,
there was a slight decrease in the share of population living in both central areas, from 23.6 percent in 1995 (using intercensal data for 1995) to 22.9 percent in 2000 (using the 2000 population census).

What is interesting is that the concentration of all industries fell 11.5 percent between 2001 and 2003 (table 10.9). The category “all industries” includes paper, printing and publishing, and “other” categories. Taking into account all industries in all districts, the deviation between industrial and population concentration is not great, compared with the situation in which just a single individual industry is considered.

The puzzling question pertaining to the post-crisis increase in industrial concentration is resolved by figures presented in table 10.10. In the pre-crisis era, between 1990 and 1997, each year the stock of firms grew 4 percent for JABOTABEK and Greater Surabaya and 4.6 percent for the whole of Java. This implies that some deconcentration did take place. But in the post-crisis era, these figures turned negative: –2.6 and –2.4 percent, respectively. Evidently, there was more firm death in the two central locations than in remote districts. But these central locations had a far larger stock of firms to begin with and thus could sustain higher losses, while outlying areas had a meager initial stock of firms, leaving them with almost nothing if only a very few firms disappeared.

**Empirical methodology: externalities and firm decentralization**

For government policies to succeed, it is important to understand the behavior of firms with respect to choice of location, particularly their behavior related to agglomeration externalities (Henderson and Kuncoro 1996; Mitra 1999).

Firm productivity is closely linked to overall changes in employment and productivity. Firms have the potential to capture efficiency gains from learning by doing as well as from increasing returns to scale due to specialization and mechanization (Romer 1990).

In the Indonesian context, one important question is which type of externalities is actually stronger. Whatever the form, externalities have important implications for urban development. If externalities are in the form of localization—which in dynamic form are often called Marshall-Arrow-Romer (MAR) externalities—smaller cities are more likely to specialize in just one industry or in closely connected industries. Spatially, this means that standardized manufacturing activities tend to locate disproportionately in smaller, specialized cities. Thus policies to decentralize industries from their historical agglomerations are more likely to succeed.
Spatial agglomeration, firm productivity, and government policies in Indonesia

However, if the externalities happen to be urban in nature, an industry needs to find a location in a large, diverse urban environment. Such industries are more likely to be found in large urban areas.

A related question is whether externalities are mainly static or dynamic. If externalities are dynamic, past industrial development in cities will affect present productivity, because, over time, a particular location accumulates a large body of knowledge. The paradox for industrial location is that firms become more static—tied to a particular industrial agglomeration—and less willing to move to cities where historically a particular industry has never existed and where there is no built-up stock of knowledge. This section examines whether the pattern of concentration or deconcentration across industries in Java is consistent with the estimated externalities.7

The approach is to relate firm productivity as a function of local industry inputs and the external environment generating spillovers (Henderson, Lee, and Lee 2001). The equation for assessing local externalities is based on the firm production function with constant returns to scale technology. In the intensive form, the firm technology is represented by:

\[ x_{ij}(t) = A[S_{ij}(t), f[k_{ij}(t)], \quad (10.2) \]

where \( x_{ij}(t) \) is real value added per worker in firm \( h \) in city \( i \), in industry \( j \), and in time \( t \), and \( k_{ij}(t) \) is real capital per worker. The function \( f(.) \) represents firm technology based on the original—extensive form—production function \( F(.) = f(.)L_{ij}(t) \), where \( L_{ij}(t) \) is the number of workers.8 To obtain the real value added, the nominal value added is divided by the wholesale price index at the appropriate three-digit industrial code for the relevant years. Firms’ capital is constructed from the estimated market value of machinery and building. To convert this into real terms, the nominal values are deflated by the wholesale import price of machinery (including electrical machinery). \( S_{ij} \) represents the shift in the production function, which also includes measures of spillover externalities, time and industry dummies, and firms’ characteristics that supposedly affect productivity, such as legal and ownership status (foreign direct investment or domestic investment).9

Localization (MAR) externalities are measured by total employment in the same industry in the same district. This measure is meant to capture interaction among firms within a district. Urbanization externalities are measured by a diversity index. For district \( i \), for example, the index of diversity is:

\[ g'_i(t) = \sum_{j=1}^{J} \left[ \frac{E_{ij}(t)}{E(t)} - \frac{E_{ij}(t)}{E(t)} \right]^2, \quad (10.3) \]

where \( E(t) \) is total national manufacturing employment and \( E_{ij}(t) \) is total national employment in industry \( j \). Meanwhile, \( E_i \) and \( E_{ij} \) are the corresponding local magnitudes. The measure of urbanization economies \( g'_i(t) \) has a minimum value of 0, where within a district, each industry’s share of local manufacturing employment is exactly the same as its share nationally, so the district is completely unspecialized because its industrial composition merely copies that of the nation. At the other end, the maximum value of \( g'_i(t) \) approaches 2 for a district completely specialized in one industry, while at the same time national employment is concentrated in another industry. The higher is \( g'_i(t) \), the less diverse and the more specialized is the district.

In estimating equation 10.2, we use a log-linear form of technology and assume city, time, and individual fixed effects. We also introduce firm characteristics such as legal status, firm ownership, and age to control for the shift in production function due to individual effects. The estimating equation is:

\[ \ln[x_{ij}(t)] = \alpha_j + \beta_j \ln[k_{ij}(t)] + \delta_j \ln[E_{ij}(t)] + \gamma g'_i(t) + \rho_j(t) + \eta_{ij} + \mu_j + \epsilon_{ij}. \quad (10.4) \]

The equation is estimated at the level of industry \( j \). Localization externalities are represented by the district’s employment in the same industry, \( E_{ij} \). Urbanization economies are represented by the \( g'_i \) index in the linear form.
For industry \( j \), the error term comprises four components; time fixed effects, \( \rho_j(t) \), which can be used to infer productivity gains; district fixed effects, \( \mu_{ij} \); individual firm fixed effects, \( \eta_{hij} \); and contemporaneous errors, \( \varepsilon_{hij} \), which are assumed to be i.i.d. Exploiting the nature of the data, in order to capture time fixed effects, we introduce time dummies for the relevant year of manufacturing survey. District dummies are introduced to capture district fixed effects. District fixed effects capture time-invariant aspects, which are perhaps unique to that particular location, such as resource endowment, climate, urban layout, and internal infrastructure.10

**Results**

Table 10.11 shows the results for textiles, a category that includes textiles, garments, leather, and footwear. The coefficient of the same-industry employment is positive and highly significant, reflecting strong localization economies. For the period before the crisis, the coefficient for urbanization is positive but insignificant. In the crisis period, the coefficient is positive and significant. It turns negative and significant in the post-crisis period, which means that firms located in more diverse environments have higher productivity. Because the sign of the coefficient of same-industry employment is always consistent, the forces of localization are stronger than the forces of urbanization. So textiles are more likely to be found in more specialized, smaller cities.

Chemicals encompass smaller subgroups of industries such as basic and industrial chemicals, petroleum refinery and products, and rubber and plastic products. The results for chemicals are presented in table 10.12. The coefficient of same-industry employment is significant before and after the economic crisis, but not in between. The evidence for the dominance of localization forces is quite strong, because the urbanization coefficient is never significant.

Table 10.13 reveals the results for nonmetallic minerals, a group consisting of glass products, ceramics, clay, cement, and other nonmetallic minerals such as marble and granite. Unlike textiles and chemicals, the evidence supporting localization is very weak or nonexistent, and the coefficients for the entire period are never significantly positive. The coefficients turn negative and significant after the economic crisis, which implies that firms go to where the presence of the particular industry is weak. The coefficient for urbanization is also weak: none of them is significant in three periods of analysis. So the category of nonmetallic minerals exhibits no clear pattern either in localization or in urbanization.

Table 10.14 shows the results for machinery. Unlike nonmetallic minerals, this industry consists of more uniform products, ranging from metallic products, nonelectrical

---

**Table 10.11 Externality and productivity in Java: textiles, garments, leather, and footwear, 1990–2003**

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Log of capital per labor</td>
<td>0.21**</td>
<td>0.27**</td>
<td>0.15**</td>
</tr>
<tr>
<td></td>
<td>(9.67)</td>
<td>(10.34)</td>
<td>(6.47)</td>
</tr>
<tr>
<td>Log of same-industry employment (localization)</td>
<td>0.13**</td>
<td>0.03</td>
<td>0.19**</td>
</tr>
<tr>
<td></td>
<td>(4.67)</td>
<td>(0.33)</td>
<td>(13.39)</td>
</tr>
<tr>
<td>Index of districts’ diversity (urbanization)</td>
<td>0.67</td>
<td>9.04**</td>
<td>–0.70**</td>
</tr>
<tr>
<td></td>
<td>(1.58)</td>
<td>(3.67)</td>
<td>(4.20)</td>
</tr>
<tr>
<td>Year dummies</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>District dummies</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Firm characteristics</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Constant</td>
<td>–0.35</td>
<td>–0.74</td>
<td>0.80**</td>
</tr>
<tr>
<td></td>
<td>(1.21)</td>
<td>(0.55)</td>
<td>(4.03)</td>
</tr>
<tr>
<td>Number of observations</td>
<td>18,807</td>
<td>7,768</td>
<td>7,539</td>
</tr>
<tr>
<td>( R^2 )</td>
<td>0.34</td>
<td>0.41</td>
<td>0.33</td>
</tr>
</tbody>
</table>

Source: Author’s calculations.

Note: Numbers in the parentheses are \( t \)-statistics with robust standard errors.

** Significant at 5 percent.
* Significant at 10 percent.
Table 10.12  Externality and productivity in Java: chemicals, 1990–2003

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Log of capital per labor</td>
<td>0.32**</td>
<td>0.22**</td>
<td>0.23**</td>
</tr>
<tr>
<td>(19.11)</td>
<td>(9.58)</td>
<td>(10.68)</td>
<td></td>
</tr>
<tr>
<td>Log of same-industry employment (localization)</td>
<td>0.22**</td>
<td>0.05</td>
<td>0.16**</td>
</tr>
<tr>
<td>(3.05)</td>
<td>(0.35)</td>
<td>(2.01)</td>
<td></td>
</tr>
<tr>
<td>Index of districts' diversity (urbanization)</td>
<td>1.17</td>
<td>0.05</td>
<td>−1.52</td>
</tr>
<tr>
<td>(1.48)</td>
<td>(0.35)</td>
<td>(1.18)</td>
<td></td>
</tr>
<tr>
<td>Year dummies</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>District dummies</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Firm characteristics</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Constant</td>
<td>−0.52</td>
<td>1.37</td>
<td>0.71</td>
</tr>
<tr>
<td>(1.46)</td>
<td>(1.57)</td>
<td>(1.31)</td>
<td></td>
</tr>
<tr>
<td>Number of observations</td>
<td>8,642</td>
<td>5,144</td>
<td>3,464</td>
</tr>
<tr>
<td>$R^2$</td>
<td>0.35</td>
<td>0.41</td>
<td>0.27</td>
</tr>
</tbody>
</table>

Source: Author’s calculations.

Note: Numbers in parentheses are t-statistics with robust standard errors.

** Significant at 5 percent.

* Significant at 10 percent.

Table 10.13  Externality and productivity in Java: nonmetallic minerals, 1990–2003

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Log of capital per labor</td>
<td>0.28**</td>
<td>0.32**</td>
<td>0.21**</td>
</tr>
<tr>
<td>(14.01)</td>
<td>(5.93)</td>
<td>(5.81)</td>
<td></td>
</tr>
<tr>
<td>Log of same-industry employment (localization)</td>
<td>−0.17*</td>
<td>0.11</td>
<td>−0.26**</td>
</tr>
<tr>
<td>(1.67)</td>
<td>(1.17)</td>
<td>(2.19)</td>
<td></td>
</tr>
<tr>
<td>Index of districts' diversity (urbanization)</td>
<td>0.19</td>
<td>1.20</td>
<td>2.26**</td>
</tr>
<tr>
<td>(1.04)</td>
<td>(0.68)</td>
<td>(6.17)</td>
<td></td>
</tr>
<tr>
<td>Year dummies</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>District dummies</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Firm characteristics</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Constant</td>
<td>1.07</td>
<td>−1.0</td>
<td>2.56</td>
</tr>
<tr>
<td>(1.36)</td>
<td>(−0.09)</td>
<td>(3.07)</td>
<td></td>
</tr>
<tr>
<td>Number of observations</td>
<td>6,958</td>
<td>3,975</td>
<td>3,121</td>
</tr>
<tr>
<td>$R^2$</td>
<td>0.54</td>
<td>0.43</td>
<td>0.72</td>
</tr>
</tbody>
</table>

Source: Author’s calculations.

Note: Numbers in parentheses are t-statistics with robust standard errors.

** Significant at 5 percent.

* Significant at 10 percent.

Table 10.14  Externality and productivity in Java: machinery, 1990–2003

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Log of capital per labor</td>
<td>0.26**</td>
<td>0.29**</td>
<td>0.17**</td>
</tr>
<tr>
<td>(17.10)</td>
<td>(10.61)</td>
<td>(9.69)</td>
<td></td>
</tr>
<tr>
<td>Log of same-industry employment (localization)</td>
<td>0.10</td>
<td>0.31</td>
<td>0.24**</td>
</tr>
<tr>
<td>(0.98)</td>
<td>(1.27)</td>
<td>(5.66)</td>
<td></td>
</tr>
<tr>
<td>Index of districts' diversity (urbanization)</td>
<td>−65.52*</td>
<td>0.13</td>
<td>156.76**</td>
</tr>
<tr>
<td>(1.82)</td>
<td>(0.07)</td>
<td>(12.69)</td>
<td></td>
</tr>
<tr>
<td>Year dummies</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>District dummies</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Firm characteristics</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Constant</td>
<td>1.07</td>
<td>−1.39</td>
<td>−0.36</td>
</tr>
<tr>
<td>(1.36)</td>
<td>(−0.75)</td>
<td>(1.08)</td>
<td></td>
</tr>
<tr>
<td>Number of observations</td>
<td>8,151</td>
<td>3,996</td>
<td>3,675</td>
</tr>
<tr>
<td>$R^2$</td>
<td>0.30</td>
<td>0.32</td>
<td>0.31</td>
</tr>
</tbody>
</table>

Source: Author’s calculations.

Note: Numbers in parentheses are t-statistics with robust standard errors.

** Significant at 5 percent.

* Significant at 10 percent.
machinery, electrical machinery, transportation, and scientific equipment. The forces of localization and urbanization are clearly nonexistent before and during the economic crisis. The coefficient of the same industry, though positive, is very weak statistically. The same also applies to the urbanization variable or the diversity index. Only later in the post-crisis years does the coefficient of the industry, along with the diversity index, become positive, which means that the previous districts in which the industry is found become even more specialized in the production of machinery.

Previously it was said that if an industry exhibits dynamic externalities, the past industrial environment in that particular location will affect the present-day productivity. Consequently, firms are reluctant to move to locations with no prior history of that particular industry. This makes it difficult for industries to deconcentrate from prime locations to the hinterlands. To address this concern, we estimate the dynamic version of equation 10.3. For this, employment in the industry and the diversity index are replaced by their relevant past value with a lag of five years. The model is tested for the 1990–95 period, when there was no huge economic shock. The results are presented in table 10.15. The lag of the same-industry employment is positive and significant for textiles and chemicals, while none of the coefficients of the diversity index or urbanization is significant. The results mimic the static model. So, potentially, nonmetallic minerals and machinery may have a better chance than other industries of deconcentrating further to outlying locations.

**Conclusions**

As commonly observed in other countries, in Indonesia as the economy was liberalized, economic activities tended to become more concentrated in a few places, which brought unintended negative externalities associated with agglomeration. This chapter illustrates how public policies interacted with private incentives to mitigate this problem. After experiencing a period of concentration, these policies were able to mitigate the concentration trend and to bring about distance from the initial, historical agglomerations, enabling industries to reconcentrate in smaller, less expensive cities, including those in low-income or lagging regions in Java.

Based on empirical exercises conducted on Indonesia’s four most important industries, the chapter finds that this occurred because the nature of externalities and agglomerations favored industrial spillovers—that is, localization was stronger than urbanization effects. If externalities are in the form of localization, smaller cities are more likely to specialize in just one industry or in closely connected industries. However, if the externalities happen to be urban in nature, an industry will have to find a location in a diverse, large urban environment. The deconcentration process from Jakarta

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**Table 10.15 Test of dynamic externalities in Java, 1990–95**

<table>
<thead>
<tr>
<th>Explanatory variable</th>
<th>Textiles</th>
<th>Chemicals</th>
<th>Nonmetals</th>
<th>Machinery</th>
</tr>
</thead>
<tbody>
<tr>
<td>Log of capital per labor</td>
<td>0.21**</td>
<td>0.32**</td>
<td>0.29**</td>
<td>0.27**</td>
</tr>
<tr>
<td>Lag of log of same-industry employment</td>
<td>0.10**</td>
<td>0.10**</td>
<td>0.02</td>
<td>0.08</td>
</tr>
<tr>
<td>Lag of index of districts’ diversity</td>
<td>0.06</td>
<td>0.71</td>
<td>−0.28</td>
<td>−1.13</td>
</tr>
<tr>
<td>Year dummies</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>District dummies</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Firm characteristics</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Constant</td>
<td>0.28</td>
<td>−0.39</td>
<td>−0.18</td>
<td>0.36</td>
</tr>
<tr>
<td>Number of observations</td>
<td>18,836</td>
<td>8,480</td>
<td>6,818</td>
<td>7,980</td>
</tr>
<tr>
<td>$R^2$</td>
<td>0.34</td>
<td>0.35</td>
<td>0.54</td>
<td>0.30</td>
</tr>
</tbody>
</table>

Source: Author’s calculations.

Note: Numbers in parentheses are $t$-statistics with robust standard errors. ** Significant at 5 percent. * Significant at 10 percent.
Spatial agglomeration, firm productivity, and government policies in Indonesia

and BOTABEK is very apparent in non-metallic minerals and machinery industries, but it is less evident in textiles and chemicals, since their externalities are dynamic—that is, firms are less willing to move to locations without a prior history of the industry and hence no accumulated stock of knowledge.

Government policies were designed not to interfere with private incentives (that is, firms will always look for the most efficient sites in which to locate), but rather to complement them. Drawing from these lessons, the following measures could be implemented in the future:

- Improve our understanding of the behavior of firms in different industries, especially regarding their choice of location.
- Improve infrastructure in lagging regions. At the initial stage, the most effective policy is to improve or construct roads to cut the costs and time of traveling between factory sites and markets or ports. Although, at the outset, the relocating firm or new entrants may only be willing to move within close proximity of the old center, given enough time, they will gradually fill up sites farther away, as the initial ones become more congested.
- Decentralize the national licensing regime to local governments. This would allow firms, especially those that are the most reliant on the centralized bureaucracy for financing, export-import licenses, and other aspects of business, to locate closer to the national capital. Responding to this, in 1999 the legislature passed the Decentralization Law, which was subsequently enacted in 2001. Greater autonomy is delegated to around 400 districts in many areas, including in the fields of public works, health, education, agriculture, industry, trade, and environment. It is true a lot of problems have emerged since the launching of decentralization, such as the proliferation of new local taxes and local government corruption. However, these should be viewed as transitory problems, as the economy is moving to a new equilibrium.
- Construct basic infrastructure, such as village halls, schools, health centers, and markets. Such infrastructure is very important because it provides the basic services that the local population needs and wants, reducing the incentives to migrate (permanently) to cities and easing the pressures on urban areas. By locating in nonurban areas, firms can also meet their need for workers with various skill levels and keep jobs in local areas.

Notes

Ari Kuncoro is a research associate at the Institute of Economic and Social Research, University of Indonesia.

1. One important benefit of agglomeration is that firms can learn from each other, creating a synergy that collectively boosts their average productivity. In this regard, there are two types of “positive” externalities. First is localization, in which firms learn about local inputs, output markets, and technological conditions in the same industry. Alternatively, firms learn from all firms in a city, where the diversity of local industries enhances the environment for local information. This type of externality is called urbanization or, in the dynamic context, Jacobs externalities (Jacobs 1969).

2. Not only roads but also village infrastructure, such as village halls, schools, health centers, and markets, were constructed in rural areas.

3. We use PODES (village potential) from various years to construct road indicators.

4. The influence was strongest for incorporated firms that were most reliant on the centralized bureaucracy of financing, export licenses, and other aspects of business. The economic liberalization in the mid-1980s gave firms better access to government and other centralized services; to take advantage of these opportunities firms had to centralize in close proximity to Jakarta because the bureaucratic process was centralized and communication was poor.

5. For example, Krawang and Cikarang in western Java, Kabupaten Semarang and Magelang in the Semarang-Yogyakarta corridor in central Java, and Pasuruan, Jombang, Mojokerto, and Lamongan in eastern Java (see figure 1). But they did not locate exclusively in industrial zones. Batam Island was not taken into account because it had special regulations regarding industry exclusively for export.

6. This happens when there is total deconcentration of industries in which employment in local industry is a fixed fraction of the local population in all cities. At the other end of the spectrum, when \( g(t) \) approaches its maximum value of 2, an industry is totally concentrated in...
one location, for example, at location \( k \), such that \( E_k(t)/E(t) = 1 \), when population share is miniscule, or \( P_k(t)/P(t) \rightarrow 0 \), when population is concentrated in another location.

7. We focus on four industries: textiles, chemicals, nonmetallic minerals, and machinery. A study on manufacturing location in Indonesia looks at spatial concentration in Java, where about 80 percent of manufacturing firms are located. Another consideration is that the location's choice model is probably more applicable to Java because infrastructure, the quality of labor, and other amenities located in the outer islands are not really comparable to those in Java.

8. The reason for choosing value added instead of output is that the former is less susceptible to the extent of outsourcing and the use of same-industry intermediate inputs. At the aggregate level, this could overstate the true net industry output with magnitudes that vary by the diversity and size of the district, potentially biasing the estimate of true urbanization externalities.

9. In the empirical formulation, agglomeration effects are modeled as external to the firm. Hence we can assume a constant return to scale (CRS) technology for firms so the output can be written in terms of output per labor or productivity. This can be easily modeled as the impact of agglomeration on firm productivity. There is no contradiction between the use of CRS with increasing returns to economic scale: 100 firms can agglomerate in one location to create externalities, which is obviously different than when one CRS firm locates alone in a location with no externality, because nobody else is around.

10. To control for firm fixed effects, we employ several important firm characteristics available in the manufacturing survey, such as foreign direct investment (FDI) versus other investment, the share of capital equity ownership belonging to various entities such as the central government, local governments, private domestic investors, and foreign investors, and legal status.

References


Economic growth in the Philippines has been quite anemic, barely exceeding the population growth rate, which has continued to expand rapidly at 2.3 percent a year for most of the past 25 years. It has quickened in the present decade, but questions linger regarding its sustainability. Even at the present pace (per capita gross domestic product [GDP] growth of 3–5 percent a year in 2004–07), one can hardly argue that the Philippines has come close to the growth trajectories of its neighbors. It is thus not surprising that serious students of Philippine development contend that shifting the economy to a higher growth path—and keeping it there for the long term—should be first and foremost on the development agenda.

The country’s similarly disappointing performance in poverty reduction simply mirrors its growth performance. This is not unexpected. Every country that has chalked up significant achievements in poverty reduction and human development has also done quite well in securing long-term economic growth. This correlation is not unexpected: economic growth is an essential condition for the generation of resources needed to sustain investments in health, education, infrastructure, and good governance (law enforcement, regulation), among others.

Yet, more than a few observers of the Philippine economy contend that the poor performance in economic growth and poverty reduction has to do partly with the large disparities in access to infrastructure and social services across regions and island groups and between urban and rural areas. A widely held view, for example, is that development efforts have favored Luzon, particularly the national capital region, Metro Manila, and discriminated against the Visayas and, especially, Mindanao (see figure 11.1). Proponents of this view say that this development pattern has led to substantial spatial differences in access to economic opportunities, in rates of poverty reduction, and in the incidence of armed conflict. Indeed, economic activity has been highly uneven and concentrated particularly in Metro Manila. Together with the two adjacent regions, Metro Manila produces about 55 percent of the country’s GDP. Socioeconomic indicators also vary significantly across regions (and even across provinces within a region). The headcount poverty estimate for the two poorest regions is more than 10 times that for the national capital. The Philippine Human Development Report 2005 shows that measures of deprivation, such as disparities in access to reliable water supply, electricity, and especially education, predict well the occurrence of armed encounters (HDN 2005).

To be sure, spatial economic disparities need not be growth-reducing if these arise from efficiencies associated with agglomeration. Given scale economies and factor mobility, as well as scarcity of investment funds, the spatial concentration of economic activities leading to differential patterns of growth across regions or areas of the country may in fact be inevitable and even desirable from an overall economic growth perspective. However, to prevent unreasonable spatial disparities in welfare during the development process, the priority should be to improve the
market links between the leading and lagging regions through greater factor mobility, particularly labor mobility. Improving access to social services, particularly education and health, in lagging regions should also be part of the development agenda.

The Philippines is ideally suited to a study of regional dynamics and development policy. With a population nearing 90 million people, the country is highly diverse in its geography, ecology, natural resource endowments, economy, ethnicity, and culture.
Comprising 7,100 islands, it is the second-largest archipelagic state in the world, after Indonesia. It is estimated to have 110 ethnic groups and 170 spoken languages.

This chapter provides an overview of spatial development dynamics in the Philippines in the past 25 years. Spatial development is seen in the context of the country’s 16 regions and 77 provinces. Because the grouping of the country’s provinces into regions is based on considerations beyond economics, the spatial development story that emerges from the analysis of provincial data differs from that of regional data. Specifically, the chapter is organized as follows. It first discusses the dimensions and patterns of spatial (regional, provincial, urban-rural) diversity. Diversity is seen in terms of economic performance, economic and spatial attributes (such as infrastructure development, agrarian structure, location), and various indicators of social development outcomes (health status, literacy). The chapter then uses econometric techniques to explain the differences in income growth and poverty reduction. The analysis makes use of an updated provincial panel database covering 1985 and every three years thereafter, which the authors have built over the years. Although the regions have longer data, covering years before 1985, data comparability over time is a major problem owing to numerous changes in the grouping of provinces into regions. Finally, the chapter highlights the policy lessons and implications of the study for regional development and poverty reduction.

### Regional development patterns

Manila dominates the Philippine economy, with the National Capital Region (NCR) generating a little more than one-third of the country’s GDP in recent years (see table 11.1). With the two regions surrounding it—Central Luzon and Southern Tagalog—this central zone produces about 55 percent of the country’s GDP. The island of Luzon, on which they are located, contributes almost two-thirds of the national economy, making it by far the largest of the three major island groupings. Luzon’s economy has also grown marginally faster than the national economy since the 1970s, resulting in a gradual rise in its national share.

| Table 11.1 Regional growth and structure in the Philippines, by region, 1975–2005 |
|----------------------------------|-----------------|-----------------|-----------------|-----------------|
| Average growth of regional GDP (1985 prices) |         |         |         |         |
| Philippines                       | 2.5     | 2.5     | 4.3     | 3.4     |
| Luzon                             | 2.6     | 2.8     | 4.3     | 3.6     |
| NCR                               | 2.4     | 2.8     | 4.9     | 3.7     |
| Central Luzon and South Tagalog   | 2.6     | 3.1     | 3.6     | 3.4     |
| Other Luzon                       | 3.0     | 2.3     | 4.3     | 3.4     |
| Visayas                           | 2.4     | 2.1     | 4.4     | 3.4     |
| Central Visayas                   | 2.7     | 2.6     | 5.1     | 3.9     |
| Other Visayas                     | 2.3     | 1.7     | 3.9     | 3.1     |
| Mindanao                          | 2.2     | 1.7     | 3.8     | 2.8     |
| Share of national GDP             |         |         |         |         |
| Luzon                             | 62.6    | 64.8    | 65.7    | 64.4    |
| NCR                               | 28.8    | 31.6    | 30.7    | 29.9    |
| Central Luzon and South Tagalog   | 23.3    | 23.2    | 24.7    | 24.3    |
| Other Luzon                       | 10.5    | 10.0    | 10.3    | 10.1    |
| Visayas                           | 16.7    | 16.3    | 16.3    | 16.3    |
| Central Visayas                   | 6.4     | 6.5     | 6.9     | 6.5     |
| Other Visayas                     | 10.3    | 9.8     | 9.4     | 9.8     |
| Mindanao                          | 20.8    | 19.0    | 18.0    | 19.3    |
| Share of total population         |         |         |         |         |
| Luzon                             | 54.3    | 55.1    | 56.0    | 55.1    |
| NCR                               | 12.3    | 13.2    | 13.0    | 12.8    |
| Central Luzon and South Tagalog   | 22.8    | 23.9    | 26.0    | 24.2    |
| Other Luzon                       | 19.2    | 18.0    | 17.1    | 18.1    |
| Visayas                           | 23.2    | 21.4    | 20.3    | 21.7    |
| Central Visayas                   | 7.9     | 7.5     | 7.5     | 7.6     |
| Other Visayas                     | 15.3    | 13.9    | 12.8    | 14.0    |
| Mindanao                          | 22.5    | 23.5    | 23.7    | 23.2    |

Table 11.2: Key economic indicators in the Philippines, by region, 1988 and 2003

<table>
<thead>
<tr>
<th>Region</th>
<th>Per capita regional GDP (Philippines, 1988 =100)</th>
<th>Agriculture</th>
<th>Industry</th>
<th>Services</th>
<th>Regional GDP growth rates, 1988–2005</th>
</tr>
</thead>
<tbody>
<tr>
<td>Philippines</td>
<td>100.0</td>
<td>126.5</td>
<td>23.2</td>
<td>14.5</td>
<td>34.8</td>
</tr>
<tr>
<td>NCR</td>
<td>232.6</td>
<td>318.7</td>
<td>0.0</td>
<td>0.0</td>
<td>45.5</td>
</tr>
<tr>
<td>CAR</td>
<td>98.7</td>
<td>159.8</td>
<td>20.4</td>
<td>9.7</td>
<td>56.4</td>
</tr>
<tr>
<td>Ilocos</td>
<td>50.6</td>
<td>68.9</td>
<td>42.5</td>
<td>34.9</td>
<td>15.9</td>
</tr>
<tr>
<td>Cagayan Valley</td>
<td>53.0</td>
<td>68.2</td>
<td>52.5</td>
<td>41.2</td>
<td>13.7</td>
</tr>
<tr>
<td>Central Luzon</td>
<td>94.0</td>
<td>99.3</td>
<td>22.6</td>
<td>18.6</td>
<td>39.3</td>
</tr>
<tr>
<td>Southern Tagalog</td>
<td>114.0</td>
<td>123.7</td>
<td>29.0</td>
<td>20.7</td>
<td>40.6</td>
</tr>
<tr>
<td>Bicol</td>
<td>42.7</td>
<td>59.1</td>
<td>41.3</td>
<td>19.7</td>
<td>18.6</td>
</tr>
<tr>
<td>Western Visayas</td>
<td>76.8</td>
<td>114.4</td>
<td>33.4</td>
<td>20.3</td>
<td>27.1</td>
</tr>
<tr>
<td>Central Visayas</td>
<td>86.5</td>
<td>120.5</td>
<td>14.5</td>
<td>8.8</td>
<td>36.4</td>
</tr>
<tr>
<td>Eastern Visayas</td>
<td>47.8</td>
<td>59.5</td>
<td>35.3</td>
<td>27.6</td>
<td>33.1</td>
</tr>
<tr>
<td>Western Mindanao</td>
<td>64.8</td>
<td>90.6</td>
<td>46.8</td>
<td>37.8</td>
<td>21.0</td>
</tr>
<tr>
<td>Northern Mindanao</td>
<td>104.4</td>
<td>132.2</td>
<td>48.0</td>
<td>27.2</td>
<td>20.4</td>
</tr>
<tr>
<td>Southern Mindanao</td>
<td>101.3</td>
<td>123.9</td>
<td>42.0</td>
<td>23.3</td>
<td>24.4</td>
</tr>
<tr>
<td>Central Mindanao</td>
<td>67.6</td>
<td>102.3</td>
<td>41.6</td>
<td>38.4</td>
<td>38.3</td>
</tr>
<tr>
<td>ARMM</td>
<td>70.4</td>
<td>90.6</td>
<td>57.2</td>
<td>51.0</td>
<td>13.8</td>
</tr>
<tr>
<td>Caraga</td>
<td>82.2</td>
<td>59.7</td>
<td>33.3</td>
<td>33.5</td>
<td>36.2</td>
</tr>
</tbody>
</table>

Sources: Authors’ calculations based on NSCB, National Income Accounts (various years); NSO, Family Income and Expenditure Surveys (various years).

Note: Average per capita GDP for the Philippines in 1988 was P 50,242 (in 2005 prices). Regional GDP shares and growth rates are averages for three adjoining years (that is, the 1988 figure is the average for 1987–89, while the 2005 figure is the average for 2004–06). Regions are defined consistently across years. Provincial income shares from the household survey data are used.

Figure 11.2: Regional growth versus initial regional income

Source: Authors’ calculations based on NSCB, National Income Accounts (various years); NSO, Family Income and Expenditure Surveys (various years).

Note: Regions are consistently defined across the period.

Mindanao (ARMM) has to be grouped separately owing to its extremely low income—less than half that of the poor grouping and less than one-quarter the national average.

The last column of table 11.2 shows average annual growth of regional GDP between 1985 and 2005. Most of the poor regions, including ARMM, grew more slowly than the national average of 3.6 percent. At the other end of the range, the richest region, the NCR, grew at about the same pace as the national average. Figure 11.2 investigates the relationship between regional growth rates and (initial year) average income. The top right-hand quadrant (quadrant I) represents regions with above-average growth and income; quadrant II represents regions with below-average growth and above-average income; quadrant III represents regions with below-average growth and income; and quadrant IV represents regions with above-average growth and below-average income. In general, the more heavily quadrants II and IV are populated, the more likely are regional differentials to be narrowing. In fact, the majority of regions are in these two quadrants: 2 in quadrant II and 8 in quadrant IV, out of a total of 16. However, the clustering of regions close to the national average growth and the fact that the NCR and ARMM are such outliers caution against drawing too robust a conclusion.

We formally test for the presence of convergence by estimating a standard regional growth equation, to determine whether incomes are converging to the mean over
The evidence is mixed, and the results are sensitive to the selection of administrative boundaries. That is, as shown below, the provincial data indicate convergence, whereas the regional data do not. One plausible explanation for these mixed results is that a number of administrative regions contain groups of provinces with a wide range of per capita income. We return to the provincial data later in the chapter to explore further the determinants of local income growth.

Social indicators
Table 11.3 shows indicators of poverty, inequality, the human development index (HDI), life expectancy, and literacy by region and between two periods. These indicators generally correlate quite closely, although there are some deviations. For instance, regional mean income is highly correlated with poverty incidence (the Spearman correlation coefficient is 0.78), the HDI (0.85), and functional literacy (0.75). But it is weakly correlated with the Gini ratio (0.20) and primary enrollment (0.39). As expected, the correlation between the HDI and poverty is also high (0.85), but not the correlation between the HDI and the Gini ratio (0.05).

As expected given the regions’ very diverse records of growth (see the last column in table 11.2), poverty indicators vary considerably across regions. However, Metro Manila consistently has the lowest poverty, while Bicol, Western Mindanao, and the Visayas, have the highest. In 2003 the poverty incidence in Bicol and Western Mindanao was roughly 10 times higher than in Metro Manila. Some significant re-rankings also occurred: ARMM became the poorest region in 2003, after being the third-least-poor region (out of 16 regions) in 1988. Even more significant is the differential evolution of poverty over time. In 2 regions, Western Mindanao and ARMM, poverty was higher in 2003 than in 1988. This increase also shows up in measures reflecting human development deprivation, particularly in the areas of health and education (HDN 2005). Toward the close of the 1990s, these two regions, particularly ARMM, were at the center of violent confrontations between the military and armed dissidents.

The Philippines is a high-inequality country compared with most of Asia, with all but one of its regions (Central Luzon) registering a Gini ratio of at least 40 in 2003. Income inequality is particularly high in most of the Visayas as well as in Mindanao—ARMM being a notable exception—owing to the highly inequitable distribution of

### Table 11.3 Social indicators in the Philippines, by region, 1988 and 2003

<table>
<thead>
<tr>
<th>Region</th>
<th>Poverty Incidence</th>
<th>Percent of total</th>
<th>Income Gini ratio</th>
<th>Life expectancy at birth</th>
<th>Adult functional literacy rate</th>
<th>Primary and secondary enrollment rate</th>
<th>Human development index</th>
</tr>
</thead>
<tbody>
<tr>
<td>Philippines</td>
<td>34.4</td>
<td>26.0</td>
<td>100.0</td>
<td>44.0</td>
<td>64.4</td>
<td>68.3</td>
<td>73.5</td>
</tr>
<tr>
<td>NCR</td>
<td>9.5</td>
<td>4.9</td>
<td>3.8</td>
<td>44.2</td>
<td>66.4</td>
<td>70.0</td>
<td>90.0</td>
</tr>
<tr>
<td>CAR</td>
<td>39.1</td>
<td>15.3</td>
<td>2.2</td>
<td>37.2</td>
<td>60.5</td>
<td>66.2</td>
<td>82.9</td>
</tr>
<tr>
<td>Ilocos</td>
<td>25.5</td>
<td>16.9</td>
<td>4.3</td>
<td>38.1</td>
<td>65.4</td>
<td>69.5</td>
<td>71.9</td>
</tr>
<tr>
<td>Cagayan Valley</td>
<td>39.2</td>
<td>26.2</td>
<td>4.4</td>
<td>40.5</td>
<td>62.5</td>
<td>67.0</td>
<td>71.8</td>
</tr>
<tr>
<td>Central Luzon</td>
<td>15.3</td>
<td>13.6</td>
<td>4.4</td>
<td>39.6</td>
<td>67.2</td>
<td>70.9</td>
<td>82.1</td>
</tr>
<tr>
<td>Southern Tagalog</td>
<td>31.7</td>
<td>20.8</td>
<td>11.1</td>
<td>41.3</td>
<td>65.4</td>
<td>68.9</td>
<td>75.9</td>
</tr>
<tr>
<td>Bicol</td>
<td>60.9</td>
<td>45.7</td>
<td>12.8</td>
<td>41.1</td>
<td>63.0</td>
<td>68.6</td>
<td>75.7</td>
</tr>
<tr>
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<td>34.4</td>
<td>26.7</td>
<td>9.2</td>
<td>42.2</td>
<td>63.8</td>
<td>68.3</td>
<td>66.0</td>
</tr>
<tr>
<td>Central Visayas</td>
<td>55.2</td>
<td>36.6</td>
<td>12.0</td>
<td>44.5</td>
<td>66.1</td>
<td>70.7</td>
<td>68.2</td>
</tr>
<tr>
<td>Eastern Visayas</td>
<td>53.7</td>
<td>45.0</td>
<td>8.6</td>
<td>39.4</td>
<td>59.8</td>
<td>65.6</td>
<td>60.4</td>
</tr>
<tr>
<td>Western Mindanao</td>
<td>47.6</td>
<td>49.7</td>
<td>5.8</td>
<td>45.3</td>
<td>61.4</td>
<td>66.3</td>
<td>62.7</td>
</tr>
<tr>
<td>Northern Mindanao</td>
<td>44.9</td>
<td>29.8</td>
<td>4.9</td>
<td>48.8</td>
<td>62.4</td>
<td>68.6</td>
<td>75.5</td>
</tr>
<tr>
<td>Southern Mindanao</td>
<td>46.5</td>
<td>26.8</td>
<td>8.8</td>
<td>41.6</td>
<td>63.2</td>
<td>68.8</td>
<td>68.7</td>
</tr>
<tr>
<td>Central Mindanao</td>
<td>35.8</td>
<td>34.1</td>
<td>3.2</td>
<td>40.8</td>
<td>61.2</td>
<td>66.5</td>
<td>61.0</td>
</tr>
<tr>
<td>ARMM</td>
<td>23.4</td>
<td>63.4</td>
<td>2.0</td>
<td>34.3</td>
<td>52.0</td>
<td>54.2</td>
<td>55.2</td>
</tr>
<tr>
<td>Caraga</td>
<td>30.1</td>
<td>36.9</td>
<td>2.5</td>
<td>37.8</td>
<td>60.2</td>
<td>64.8</td>
<td>75.2</td>
</tr>
</tbody>
</table>

Sources: Authors’ calculations based on NSO, Family and Income Expenditure Survey; NSO, Functional Literacy, Education, and Mass Media Survey; HDN (various years).  
— Not available.
physical assets, particularly land, and the mix of economic activities (mining, plantation agriculture) in these regions.

These high-inequality regions have, for example, land Gini ratios of close to 60 percent, while the comparable figures for most of Luzon (excluding Bicol) are close to, or below, 50 percent. As Balisacan (2003) has shown, it is the inequality within regions—not the inequality between regions—that accounts for more than 80 percent of the national variation in household income. He further shows that high-inequality regions tend to have low steady-state growth rates compared to their lower-inequality counterparts. Moreover, his analysis of the data covering the past two decades indicates that changes in poverty incidence (as well as in other measures of income poverty) are attributable largely to changes in overall per capita income within regions, rather than to changes in income or asset inequality within or between regions.

Population, labor, and migration

Philippine demographics more or less reflect economic patterns. A little more than half of the nation’s population lives in Luzon, whose share of population has been rising gradually since the 1970s (table 11.1). The remaining 45 percent of the population is divided fairly evenly between the Visayas and Mindanao. Within Luzon, Manila and the two surrounding regions dominate, with a gradually rising share in the range 35–40 percent of the population.

These patterns reflect the interplay of regional fertility differentials and migration. Historically, the major migration flows were into the national capital and its surrounds and into the frontier regions, principally Mindanao (Pernia and others 1983). Since 1980, the dominant migration stream has been into the two regions surrounding Manila, especially Southern Tagalog (see table 11.4). Only two other regions have had (modest) net immigration: the region of Central Visayas, with its capital the relatively prosperous second city of Cebu, and the resource-rich region of Northern Mindanao. Thus relative income differentials, together with employment and education opportunities, drive these patterns. In spite of decentralization, and the dismantling of the centralizing bias in favor of the capital region, it remains the dominant destination of migrant flows. In other words, migration continues to be, de facto, a key instrument of regional adjustment, including the well-known phenomenon of migration out of poverty. Regional labor markets

### Table 11.4 Population and intraregional migration in the Philippines, by region, 2000

<table>
<thead>
<tr>
<th>Region</th>
<th>Total population (thousands)</th>
<th>Population density (people per square kilometer)</th>
<th>Average annual growth rate (percent)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>1980–90</td>
</tr>
<tr>
<td>Philippines</td>
<td>76,504</td>
<td>255</td>
<td>2.3</td>
</tr>
<tr>
<td>NCR</td>
<td>9,933</td>
<td>16,091</td>
<td>2.9</td>
</tr>
<tr>
<td>CAR</td>
<td>1,365</td>
<td>70</td>
<td>2.3</td>
</tr>
<tr>
<td>Ilocos</td>
<td>4,200</td>
<td>318</td>
<td>2.0</td>
</tr>
<tr>
<td>Cagayan Valley</td>
<td>2,813</td>
<td>90</td>
<td>2.0</td>
</tr>
<tr>
<td>Central Luzon</td>
<td>8,031</td>
<td>437</td>
<td>2.6</td>
</tr>
<tr>
<td>South Tagalog</td>
<td>11,794</td>
<td>239</td>
<td>3.0</td>
</tr>
<tr>
<td>Bicol</td>
<td>4,687</td>
<td>258</td>
<td>1.2</td>
</tr>
<tr>
<td>Western Visayas</td>
<td>6,211</td>
<td>301</td>
<td>1.8</td>
</tr>
<tr>
<td>Central Visayas</td>
<td>5,707</td>
<td>359</td>
<td>1.9</td>
</tr>
<tr>
<td>Eastern Visayas</td>
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<tr>
<td>Western Mindanao</td>
<td>3,091</td>
<td>181</td>
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<tr>
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<tr>
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<td>144</td>
<td>3.3</td>
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<td>2,412</td>
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<td>3.0</td>
</tr>
<tr>
<td>Caraga</td>
<td>2,095</td>
<td>98</td>
<td>2.5</td>
</tr>
</tbody>
</table>

Source: Authors’ calculations based on NSO, Census of Population and Housing (1990, 2000).

— Not available.

Note: Calculations are based on intracountry migration.

a. Net migrants, defined as in-migrants less out-migrants, per 1,000 population in 2000.
have also been liberalized gradually. The setting of minimum wages has been decentralized, and some regions, mainly poorer ones, are beginning to compete for employment by offering more flexible labor market regulations (Sicat 2003).

**Infrastructure and integration**

Infrastructure is the glue that unifies the national economy, and it is in many respects the single most important instrument of regional policy. It enables people and goods to move quickly and efficiently around a country. The composition of this infrastructure also matters. For example, efficient connections to the global economy alongside the poorer provision of domestic networks—an increasingly accurate characterization of the situation in the Philippines—will result in a series of internationally oriented enclaves of economic activity weakly integrated to the hinterland.

Effective infrastructure provision requires competent governance. First, many infrastructure projects entail long gestation periods and therefore require predictable financing and policies. Second, a number of sectors have “natural monopoly” characteristics (for example, power generation, land-line telecommunications, major trunk roads, international airports), which in turn prescribe a role for government as regulator, though not necessarily as provider. Third, following a decentralization program, there will be many players in the industry, including several tiers of government, the state-owned providers, and some foreign firms, as well as a number of regulatory agencies. There are therefore major coordination issues.

Indicators of Philippine infrastructure generally follow per capita income rankings, with the better-off regions having the capacity (and political influence) to fund better-quality physical facilities. This is illustrated in the standard indicators of road density, access to water, irrigation, electricity, and telephone density (see table 11.5).

Manila and its two surrounding regions clearly register above-average physical infrastructure indicators in most respects. Outside this central region, the picture is more variable. One notable feature is that Mindanao does not emerge as a particularly infrastructure-deficient region by Philippine standards, reflecting the region’s high-priority status with both the government and the donor community.

### Table 11.5 Infrastructure indicators in the Philippines, by region, 1988 and 2004 or 2005

<table>
<thead>
<tr>
<th>Region</th>
<th>Road density (kilometers per square kilometer)</th>
<th>Access to potable water (percent of households)</th>
<th>Access to electricity (percent of households)</th>
<th>Telephone line density (per 100 households)</th>
<th>Irrigation serviced (percent)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Philippines</td>
<td>0.27</td>
<td>0.78</td>
<td>71.9</td>
<td>80.1</td>
<td>59.9</td>
</tr>
<tr>
<td>NCR</td>
<td>4.29</td>
<td>15.55</td>
<td>92.0</td>
<td>85.7</td>
<td>97.6</td>
</tr>
<tr>
<td>CAR</td>
<td>0.12</td>
<td>0.33</td>
<td>66.2</td>
<td>76.2</td>
<td>51.7</td>
</tr>
<tr>
<td>Ilocos</td>
<td>0.53</td>
<td>1.12</td>
<td>83.9</td>
<td>89.5</td>
<td>70.0</td>
</tr>
<tr>
<td>Cagayan Valley</td>
<td>0.14</td>
<td>0.43</td>
<td>80.2</td>
<td>87.9</td>
<td>61.3</td>
</tr>
<tr>
<td>Central Luzon</td>
<td>0.61</td>
<td>0.94</td>
<td>96.0</td>
<td>96.2</td>
<td>83.4</td>
</tr>
<tr>
<td>Southern Tagalog</td>
<td>0.28</td>
<td>0.62</td>
<td>78.1</td>
<td>84.5</td>
<td>63.8</td>
</tr>
<tr>
<td>Bicol</td>
<td>0.14</td>
<td>0.44</td>
<td>60.9</td>
<td>74.2</td>
<td>40.7</td>
</tr>
<tr>
<td>Western Visayas</td>
<td>0.35</td>
<td>0.77</td>
<td>54.4</td>
<td>73.4</td>
<td>43.5</td>
</tr>
<tr>
<td>Central Visayas</td>
<td>0.36</td>
<td>1.42</td>
<td>57.6</td>
<td>74.8</td>
<td>43.6</td>
</tr>
<tr>
<td>Eastern Visayas</td>
<td>0.37</td>
<td>0.75</td>
<td>60.9</td>
<td>79.5</td>
<td>33.2</td>
</tr>
<tr>
<td>Western Mindanao</td>
<td>0.10</td>
<td>1.11</td>
<td>40.8</td>
<td>59.7</td>
<td>43.4</td>
</tr>
<tr>
<td>Northern Mindanao</td>
<td>0.23</td>
<td>0.63</td>
<td>66.2</td>
<td>79.8</td>
<td>56.3</td>
</tr>
<tr>
<td>Southern Mindanao</td>
<td>0.12</td>
<td>0.32</td>
<td>73.6</td>
<td>69.9</td>
<td>52.1</td>
</tr>
<tr>
<td>Central Mindanao</td>
<td>0.12</td>
<td>0.56</td>
<td>69.7</td>
<td>74.3</td>
<td>46.6</td>
</tr>
<tr>
<td>ARMM</td>
<td>0.13</td>
<td>0.34</td>
<td>22.9</td>
<td>40.9</td>
<td>20.2</td>
</tr>
<tr>
<td>Caraga</td>
<td>0.15</td>
<td>0.36</td>
<td>77.7</td>
<td>79.7</td>
<td>61.1</td>
</tr>
</tbody>
</table>

Sources:
Authors’ calculations based on data from the Department of Public Works and Highways; NSO, Annual Poverty Indicators Survey (various years); NSO, Family Income and Expenditure Survey (various years); NSCB, Philippine Statistical Yearbook (various years).

— Not available.

a. Road density is adjusted for quality (concrete equivalent).
b. Irrigation serviced refers to the ratio of total irrigated area to potential irrigable area.
The Philippine infrastructure report card is deficient in key respects (Llanto 2007), and this appears to be holding back the process of efficient regional economic integration. In a recent Global Competitiveness Report, the country’s infrastructure performance was ranked 71 out of 131 countries in 2007–08 (World Economic Forum 2007). The country is underinvesting in infrastructure: its ratio of infrastructure investment to GDP is about half the East Asian average.

There are three interrelated problems. First, the country has chronic fiscal constraints, as a result of past fiscal crises and the continuing poor revenue performance of the national government. Fiscal constraints have a particularly adverse effect on infrastructure, because capital works invariably are the first to be cut in budget-pruning exercises. Second, the overall regulatory framework lacks cohesion, coordination among national agencies and among the various tiers of government, and clear division of responsibilities. About 30 national agencies are involved in infrastructure decision making. Third, national-level decision makers appear unable or unwilling to deliver the long-term policy predictability and guarantees that major private (and especially foreign) providers require, resulting in potential suppliers factoring in very large risk premiums. Corruption and political patronage are associated with the award of large infrastructure projects in many countries. But large infrastructure investments appear to be unusually politicized in the Philippines, with several key projects over the past decade remaining incomplete.

The picture varies considerably by subsector. There have been some positive achievements. For example, domestic shipping, civil aviation, and cellular telecommunications services were effectively deregulated during the 1990s. Roads are perhaps the weakest link, and here coordination failures are serious. The two major national agencies with responsibilities for roads—the Department of Public Works and Highways and the Toll Regulatory Board—do not coordinate their activities effectively. There also appears to be a “missing middle” in the road network. The national government assumes responsibility for the major trunk network. Although local governments have limited infrastructure budgets, they are responsive to local constituencies demanding farm-to-market roads. Reflecting the division of political power, secondary roads connecting the national and local road networks suffer from continued neglect and constitute the major weak link.

Is the Philippines becoming a more spatially integrated economy over time? In figure 11.3, we test for this by presenting estimates of coefficients of variation for provincial prices during 1985–2003. Two sets of price indexes are shown, one consisting of a basket of food and nonfood items (“all commodities”) and the other consisting of food items only. Ideally, the spatial comparison should involve only tradable goods. Arguably, food is highly tradable; hence the latter price index can be regarded as a reasonable measure for comparing the regional prices of tradable goods. As figure 11.3 shows, the two indexes exhibit the same pattern: the coefficients of variation tend to rise in the second half of the 1980s through early 2000s, suggesting that impulses for domestic integration have been muted by widening regional price variations in recent years. This pattern is an outcome partly of evolving disparities in infrastructure development and institutional arrangements and partly of deregulatory reforms in transport and related services.

Figure 11.3 Variation in provincial prices, 1985–2003

Source: Balisacan (2001), updated to 2003 using the consumer price indexes in NSCB, Philippine Statistical Yearbook (various years).

Note: Figures pertain to coefficients of variation of cost-of-living indexes for a basket of goods and services.
Determinants of local growth and poverty reduction

In this section, we use subnational panel data to explore the determinants of income growth and poverty reduction. The units of observation are provinces, which show remarkable diversity in terms of economic performance and poverty reduction. The units and variables are consistently defined, both across space and over time. The historical and institutional contexts are largely similar across these units (same legal system, same political administration). Moreover, the major sources of heterogeneity—that is, technologies, tastes—are likely to be less severe for these data than for cross-country data. Hence, the estimation problems concerning cross-country data are likely to be less serious for the subnational panel data set.

The long-term relationship between Philippine poverty and income growth is evident in data on the country’s 77 provinces. This is shown in figure 11.4, which plots the change in poverty incidence between 1985 and 2003 and the corresponding percentage change in real family income per capita, adjusted for provincial cost-of-living differences.9 Clearly, as in cross-country data on growth and poverty, the pace of poverty reduction at the provincial level is closely linked to local economic performance. However, there are significant departures from the fitted line (that is, provinces not conforming to the “average pattern”), suggesting that factors other than the local economic growth rate are influencing the evolution of poverty.

One set of such factors may have to do with the relatively large variation in access to infrastructure and social services across regions, island groups, and provinces. As noted earlier, a widely held view is that development efforts have favored Luzon and discriminated against the Visayas and, especially, Mindanao. Proponents of this view say that this development pattern has led to substantial spatial differences in access to economic opportunities, in rates of poverty reduction, and in incidence of armed conflict.

Adopting the growth framework developed by Barro and Sala-i-Martin (2004), Balisacan (2007) traces the quantitative significance of the channels by which income growth, together with a host of other factors, influences poverty reduction. In his model, these other factors affect the speed of poverty reduction either directly by changing the distribution of a given economic pie (hereafter referred to as the redistribution channel) or indirectly by expanding the economic pie for each person in society (hereafter referred to as the growth channel). These factors can be grouped into two types:

- **Initial economic and institutional conditions (in or around 1988),** which include initial mean provincial per capita income, initial distribution of per capita income, initial stock of human capital, political “dynasty” (as a proxy for political competitiveness), and ethno-linguistic fragmentation and

- **Time-varying policy variables (difference during 1988–2003),** which include the simple adult literacy rate, agricultural terms of trade (as a proxy for economic incentives), access to infrastructure (represented by electricity and good-quality road), and implementation of the Comprehensive Agrarian Reform Program (CARP).

The income growth regression is specified as in the standard Barro and Sala-i-Martin framework. The poverty reduction regression adds the income growth rate variable to the set of explanatory variables associated with the rate of poverty reduction. This amounts to estimating the income growth...
and poverty reduction equations simultaneously using the three-stage least squares estimation technique. Only variables that are significant in the reduced-form estimates of the growth and poverty reduction equations are retained. The regression results are summarized in table 11.6. The annex to this chapter shows the complete list of variables, including descriptive statistics.

The magnitude of the coefficient estimate for initial income implies that (conditional) convergence of provincial incomes occurs at a rate of 2.2 percent a year. There is thus a growth premium for late starters; that is, provinces that have initially lower mean incomes tend to grow faster. The estimate is, however, much lower than the figure of 9 percent a year given by Balisacan and Fuwa (2004). The present estimate is comparable to estimates of regional income convergence for Europe, Japan, and the United States, which cluster around 2 percent a year (Barro and Sala-i-Martin 2004). At this rate of convergence (2.2 percent), it would take 31 years to halve the gap between the initial and the steady-state incomes. Compared to a similar estimate for China’s 30 provinces and municipalities of 1 percent a year on average during 1960–2000 (Song 2007), the estimate for the Philippines is quite high.

Among the initial conditions, the level of human capital stock (as proxied by the child mortality rate) is found to be statistically significant at conventional levels. This finding of a positive association between growth performance and human capital is consistent with most other studies on determinants of income growth. The magnitude of the coefficient, however, is comparatively small. An increase of 10 percent in the mortality rate relative to the mean for all provinces (84.7 in 1988) would reduce the rate of provincial income growth by 0.2 percentage points a year. Put differently, if the mortality rate in the province with the highest mortality rate (Western Samar) were to fall to the average level for all provinces—that is, from 121.1 to 84.7 or by 30 percent (annex)—the income growth rate for that province would increase by 0.7 percentage points a year, all other things remaining equal.

All the time-varying policy variables are significant and have the expected signs. In conformity with theory and most cross-country regressions, improvements in literacy and access to infrastructure (electricity and roads) have a positive effect on income growth. The magnitude of those effects, however, is surprisingly small. In the case of literacy, even a 20 percent improvement in the overall provincial average increase of 3.8 percentage points a year (annex) would see income growth increasing by only 0.05 percentage points. This limited gain from an improvement in the simple literacy rate can be attributed to the relatively high rate for the provinces as a group (91.4 percent in 2003). This average, however, conceals the large variation that exists across provinces. For provinces that are well below the national average, an improvement in the literacy rate to, say, the national average could have a major impact on local income growth. For example, if the province with the lowest literacy rate in 2003 (Tawi-Tawi, at 63.3 percent) were to achieve the average

| Table 11.6  Determinants of local growth and poverty reduction in the Philippines |
|------------------------------------------|-------------------|-------------------|
| Explanatory variable                    | Mean income growth | Rate of poverty reduction* |
| Mean income growth                      | −1.30161**        | (−5.18)           |
| Change in literacy                      | 0.00066**         | −0.00077          |
| Change in electricity                   | 0.00031**         | (2.81)            |
| Change in road density                  | 0.04649**         | −0.07067**        |
| Change in CARP                          | 0.03211**         | 0.00748           |
| Change in agricultural terms of trade   | 0.01346**         | (3.55)            |
| Initial per capita income (log)         | −0.02106**        | (−3.29)           |
| Initial mortality                       | −0.00019*         | 0.00035*          |
| Landlock                                | 0.00754**         | 0.00615           |
| Initial Gini ratio                      | 0.000006**        | (3.02)            |
| Initial Gini ratio squared              | −0.00012**        | (−2.98)           |
| Constant                                | 0.06261           | −0.01666          |
| R²                                      | 0.62850           | 0.64880           |
| Sample size                             | 71                | 71                |

Source: Balisacan (2007).
Note: The estimation procedure used is three-stage least squares regression. Figures in parentheses are t-ratios. Other variables included in the estimation but not significant in both the growth and poverty regressions are not shown.

a. The poverty measure used is headcount, defined as the proportion of the population deemed poor. The dependent variable is the average annual rate of headcount reduction between 1988 and 2003 so that a negative coefficient for a variable implies that the variable has a positive effect on poverty reduction.

** Significantly at 5 percent level.
* Significant at 10 percent level.
rate for all provinces (91.4 percent), the income growth rate of that province would increase by 1.8 percentage points a year, all other things remaining the same.

Increments in land reform implementation (CARP) have a positive and significant effect on the mean income growth rate. A 25 percent increase in the pace of CARP implementation (that is, an increase in the average change for all provinces from 80 percent to 100 percent, thereby effectively completing implementation) would raise the income growth rate by 0.6 percentage points a year. This is a significant result considering that land reform is often seen as a policy tool mainly for achieving noneconomic objectives. The result suggests that addressing access to productive assets would improve efficiency, thereby raising the economy’s subsequent income growth rates, as argued cogently by Bourguignon (2004).

The policy variables and the variables representing initial conditions, except those pertaining to human capital and infrastructure, are found mainly to exert an indirect effect on poverty reduction through their effect on overall income growth. For infrastructure, particularly transport, and, to some extent, initial human capital, both direct and indirect effects are operative and, taken together, have a positive impact on the pace of poverty reduction. Particularly remarkable is the lack of direct response of poverty to CARP. Considering that the agrarian reform program is touted as an equity tool, this result is not only surprising but also inconsistent with earlier findings. This is not to say that CARP has no effect on the poor. It has, but its effect is mainly through the income growth channel. Taken together, the regression results show very limited direct effects of recent policies and institutions on the speed of poverty reduction; their effects get transmitted indirectly to poverty reduction, mainly through overall income growth.

Another interesting observation from the above study, as well as other studies using the same provincial data (for example, Balisacan and Fuwa 2004), concerns the extent to which poverty responds to overall income, after accounting for the influences of other factors noted above. This response can be aptly summarized by what is referred to as “growth elasticity” of poverty reduction. This elasticity clusters around 1.3: a 10 percent increase in the income growth rate increases the poverty reduction rate by roughly 13 percent. These estimates are much lower than those reported for other developing countries. For example, using parameter estimates of inequality distribution for each country, Cline (2004) obtains growth elasticities of 2.9 for China, 3.0 for Indonesia, and 3.5 for Thailand. Ravallion (2001) obtained a growth elasticity of 2.5 for 47 developing countries, based on a bivariate regression of the proportionate changes in their poverty rate and mean income. A similar bivariate regression of the data used in this chapter gives an elasticity of 1.5. Hence, by all these indications, the growth elasticity in the Philippines has been quite muted by international standards.

Clearly, the very low income growth achieved in recent years is a key factor in the country’s sluggish rate of poverty reduction. Still, even this modest level of income growth could have delivered more poverty reduction than what would have been realized if the growth elasticity in the Philippines had come close to that in neighboring countries.

The finding that policy levers often identified as tools for achieving equity objectives—human capital and asset reform through CARP—have rather weak discernible direct effects on poverty reduction is quite disturbing. Their effects are felt mostly indirectly through the income growth process. In other words, even programs supposedly targeted at poverty, such as CARP, have been largely neutral from an income distribution viewpoint. One interpretation of this result is that the implementation of such programs has been poorly targeted. Indeed, the country’s record in administering direct antipoverty programs, such as food, credit, and housing subsidy programs, has been quite disappointing (Balisacan and Edillon 2005). These programs have had high leakages to the nonpoor, been administratively costly to implement, and encouraged unintended rent-seeking processes.

Conclusions
The very high spatial disparity in economic performance and social development in
the Philippines is quite remarkable. This chapter has shown that, indeed, poverty has a strongly spatial dimension, with some regions and provinces far more multidimensionally deprived than others. Some areas of the country have human development outcomes comparable with those found in more economically advanced countries; for example, Metro Manila’s HDI for 2003 is comparable with that of Thailand, and the province of Rizal’s HDI is comparable with that of Ukraine. Sadly, many other areas have outcomes comparable with those of the poorest countries of the world; for example, the ARMM provinces have HDI scores comparable with those of Ghana, Myanmar, and Sudan. In recent years some regions have done quite well in attaining high per capita income growth and poverty reduction, but others have experienced falls in their average per capita income and an increase in poverty.

The Philippines is significantly under-investing in infrastructure, particularly in transport and electricity, owing to continual fiscal crises and an unattractive commercial climate for long-term private investors. This not only reduces overall efficiency (growth) but also limits domestic mobility of factors, goods, and people, hindering the full participation of lagging regions from the growth process in leading regions or urban centers. The high cost of mobility, especially that of labor, creates spatial disparities in welfare levels.

The government’s allocation of scarce infrastructure funds has had implications for regional development patterns. Following the dismantling of the old import substitution growth regime, the new driver of spatial development patterns has been the location decisions of export zones. In this context, the Philippine government (and donors) has been more inclined to invest in internationally oriented infrastructure (ports, harbors, and associated facilities) than in domestic transport networks and corridors. The effect has been to reinforce the internationally connected enclaves at the expense of a denser set of domestic connections, a factor exacerbated by the regulatory barriers erected between firms inside and outside the export zones.

Spending priority should be accorded as well to social services, especially health and education, in lagging regions. Reversing the significant decline in education and health spending in recent years is expected to unlock the potential of human capital as a “deep determinant” of income growth and poverty reduction. However, given the fiscal bind, the targeting of public spending must be improved so that poorer individuals, especially in lagging areas, would receive proportionately more opportunities for publicly funded social services. Unfortunately, the country’s record in administering direct antipoverty programs, such as agrarian reform and food, credit, and housing subsidy programs, has been quite disappointing. These programs have had high leakages to the nonpoor, been administratively costly to implement, and encouraged unintended rent-seeking processes. Clearly, investing in good governance has to be part of the overall reform agenda.

Notes

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1. The fragmentation of administrative boundaries complicates the task of regional development analysis over time. For the purposes of consistency, throughout this chapter we use the 1997 classification, which groups the provinces into 16 regions, unless otherwise specified. Currently (that is, in 2007), the number of regions is 17, following the division of Region IV (Southern Tagalog) into 2 regions.

2. These are the Cordillera Administrative Region (CAR) and Northern Mindanao.

3. This region is also the major source of the estimated 8 million Filipinos residing abroad. Their remittances, estimated to be equivalent to almost 50 percent of merchandise exports, are the third largest in the developing world (Burgess and Haksar 2005).

4. As a corollary, there is a tendency to rely on donor agencies to supply infrastructure, resulting in an investment strategy that is short term in orientation and poorly integrated.

5. In the case of telecommunications, for example, Salazar’s (2006) comparative study shows that the Philippines moved more quickly
than several of its neighbors, particularly Malaysia.

Moreover, while the expenditure of local governments as a percentage of GDP has doubled since decentralization, their infrastructure budgets have not expanded commensurately.

Available regional price indexes for the 1980s and beyond are not strictly comparable owing to the marked changes in the composition of regions over time. Moreover, the available data do not capture price variation across regions, because each region has a price index value of 100 for the base year.

Details of the construction of the price indexes are shown in Balisacan (2001).

Poverty estimates are those used in Balisacan (2007). These are not comparable with official data released by the National Statistical Coordination Board.

Apart from the longer period covered by the present study, Balisacan and Fuwa’s results pertain to the convergence of per capita provincial mean expenditures, not incomes. Moreover, the end year in Balisacan and Fuwa’s study is 1997, marking the start of the Asian financial crisis.

Cline’s estimate for the Philippines is 2.2. While higher than the other estimates quoted here, it is still low by Asian standards.

References


———. Various years. Family Income and Expenditure Survey. Manila: NSO.


### Determinants of growth and poverty reduction in the Philippines: descriptive statistics

<table>
<thead>
<tr>
<th>Variable</th>
<th>Description</th>
<th>Mean</th>
<th>Standard deviation</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Headcount 1988</td>
<td>Proportion of the population deemed poor, 1988</td>
<td>0.394</td>
<td>0.175</td>
<td>0.075</td>
<td>0.852</td>
</tr>
<tr>
<td>Headcount 2003</td>
<td>Proportion of the population deemed poor, 2003</td>
<td>0.321</td>
<td>0.176</td>
<td>0.044</td>
<td>0.984</td>
</tr>
<tr>
<td>Average income growth rate</td>
<td>Average annual growth rate of per capita income, 1988–2003</td>
<td>0.012</td>
<td>0.016</td>
<td>–0.030</td>
<td>0.049</td>
</tr>
<tr>
<td>Average headcount growth rate</td>
<td>Average annual rate of change in poverty incidence, 1988–2003</td>
<td>–0.008</td>
<td>0.032</td>
<td>–0.0568</td>
<td>0.115</td>
</tr>
<tr>
<td>Gini squared 1988</td>
<td></td>
<td>1,153.988</td>
<td>339.961</td>
<td>449.016</td>
<td>1,868.833</td>
</tr>
<tr>
<td>Dynasty</td>
<td>Proportion of provincial officials related by blood or affinity</td>
<td>0.140</td>
<td>0.246</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Ethnic fragmentation 1988</td>
<td>Herfindahl index</td>
<td>0.579</td>
<td>0.190</td>
<td>0.287</td>
<td>0.884</td>
</tr>
<tr>
<td>Mortality</td>
<td>Mortality rate per 1,000 children ages 0–5 years, 1988</td>
<td>84.688</td>
<td>14.847</td>
<td>55.920</td>
<td>121.120</td>
</tr>
<tr>
<td>Landlock</td>
<td>Dummy variable (1 if a landlocked province, 0 otherwise)</td>
<td>0.203</td>
<td>0.405</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Change in literacy</td>
<td>Change in simple literacy rate, 1988–2003</td>
<td>3.847</td>
<td>5.288</td>
<td>–8.960</td>
<td>16.0000</td>
</tr>
<tr>
<td>Change in road density</td>
<td>Change in (concrete-equivalent) road density, 1988–2003</td>
<td>0.123</td>
<td>0.286</td>
<td>–0.076</td>
<td>2.466</td>
</tr>
<tr>
<td>Change in CARP</td>
<td>Change in CARP accomplishment, 1988–2003</td>
<td>0.802</td>
<td>0.144</td>
<td>0.263</td>
<td>1.000</td>
</tr>
<tr>
<td>Change in agricultural terms of trade</td>
<td>Change in agricultural terms of trade, 1988–2003</td>
<td>–0.004</td>
<td>0.186</td>
<td>–0.310</td>
<td>0.460</td>
</tr>
</tbody>
</table>

Source: Balisacan (2007).
Note: The last two columns show the provinces with the lowest and highest scores, respectively.
Thailand’s economy, measured by gross domestic product (GDP) at market prices in 2006, was about B 7.8 trillion and had been growing at a rate of 6 percent a year for more than 25 years. After experiencing a deep economic crisis in 1997, with a drastic decline in real output of approximately 10 percent in 1998, Thailand took five years to recover completely, achieving a post-crisis growth rate (1999–2005) of about 5 percent a year.

The structure of the Thai economy began to change in the early 1980s, during which the Thai government promoted industrialization and shifted the policy emphasis from import substitution to export promotion. Accordingly, the manufacturing sector took over a large area of agricultural land, which reduced the proportion of agriculture in GDP from 23 percent in 1980 to 13 percent in 2005 and increased the proportion of industry from 27 to 38 percent. Services remain the largest sector, contributing half of the country’s GDP in 2005 (see table 12.1).

Together with satisfactory economic growth, per capita GDP has increased over time, with the only exception being during the economic crisis (see figure 12.1). In 2005 Thailand’s GDP per capita was about B 60,000 a year, which is equivalent to approximately B 164 a day, a level just above the minimum wage rate.

As this impressive economic growth was taking place, the proportion of people living below the poverty line declined from 38 percent in 1990 to 17 percent in 1996 (see figure 12.2). During the economic crisis, poverty increased, approaching 21 percent in 2000. After the crisis, the figure resumed its downward trend and ultimately stabilized at 9.6 percent in 2007.

Despite the decline in absolute poverty, the income gap between the richest and the poorest has been worsening. From 1990–2006, the ratio of the richest to the poorest income quintiles (Q5/Q1) increased from 13.3 to 15.9, indicating a wider income gap between the rich and the poor. Yet that ratio declined during two periods: 1992–98 and 2000–04. According to Siamwalla and Jitsuchon (2007), the earlier decline occurred as a result of growth-promoting policies, while the later decline occurred as a result of policy packages implemented by the Thaksin cabinet, which sought to stimulate domestic demand without offering incentives for businesses to improve productivity. This explains why Thailand is facing a deteriorating situation, as shown by the bounce in 2006 of the Q5/Q1 ratio to 15.9, soon after the packages were removed.

The Thai economy is growing and developing satisfactorily, but there is a question regarding whether these benefits are distributed evenly to different areas of the country. This paper attempts to outline the existence and evolution of spatial disparities and their relationship with economic development and to delineate the factors that create such spatial differentials, including both market-driven and government-directed influences. Special emphasis is placed on urban-rural as well as regional differences, with a particular attempt to determine whether growth-promoting policies as well as public finances...
have alleviated or aggravated spatial disparities in Thailand.

**Growth and spatial disparities**

A quick observation of the income disparity between urban and rural areas in 2004 shows that the urban population in Thailand earned approximately 2.2 times what those living in rural areas earned. The figure shows a satisfactory decline from 1994, when the disparity was 2.56 (see table 12.2). Intraregional differences in income between the 20 percent richest and the 20 percent poorest, however, can be as large as 1,000 in Bangkok and as low as 3 in the northeast. This suggests that richer areas can be subject to wider gaps in income distribution than poorer areas.

Bangkok, the capital of Thailand, and its vicinities play a significant role in creating jobs and produce as much as half of the country’s GDP (see figure 12.3). Greater Bangkok has the smallest proportion of people defined as poor, while the northeastern region has the highest (see figure 12.4).

Greater Bangkok generates per capita income about 2.6 times that of the country average and about 8 times that of the northeastern region, where the majority of the poor are located. Yet income convergence is evident in the central and eastern regions, which are catching up with Bangkok (see figure 12.5). They had accelerating growth rates of 12.1 and 13.5 percent a year, respectively, in the early 1990s and kept growing at an impressive rate afterward, finally outpacing the country’s average rate of growth and becoming second, after Bangkok, in contributing to Thailand’s output (see table 12.3).
Table 12.2 Urban-rural income gap in Thailand measured by per capita income, 1994–2004

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Urban income per capita</td>
<td>3,868</td>
<td>5,220</td>
<td>5,657</td>
<td>5,772</td>
<td>6,394</td>
<td>6,885</td>
</tr>
<tr>
<td>Rate of change (percent)</td>
<td>n.a.</td>
<td>34.96</td>
<td>8.36</td>
<td>2.02</td>
<td>10.78</td>
<td>7.68</td>
</tr>
<tr>
<td>Rural income per capita</td>
<td>1,510</td>
<td>2,007</td>
<td>2,343</td>
<td>2,300</td>
<td>2,680</td>
<td>3,130</td>
</tr>
<tr>
<td>Rate of change (percent)</td>
<td>n.a.</td>
<td>32.92</td>
<td>16.78</td>
<td>−1.85</td>
<td>16.53</td>
<td>16.80</td>
</tr>
<tr>
<td>Urban income times rural income</td>
<td>2.56</td>
<td>2.60</td>
<td>2.41</td>
<td>2.51</td>
<td>2.39</td>
<td>2.20</td>
</tr>
<tr>
<td>Thailand income per capita</td>
<td>n.a.</td>
<td>34.35</td>
<td>12.67</td>
<td>0.50</td>
<td>14.68</td>
<td>11.99</td>
</tr>
</tbody>
</table>

Source: Data from National Statistical Office, computed by the NESDB. n.a. Not applicable.

For the past 15 years, they have enjoyed an increase in per capita income, attaining a level 2.17 times the country average in 2005. The central region, whose per capita income was 88 percent of the country average in 1990, now has per capita income that is approximately 1.5 times the country average. While both regions are successfully narrowing the gap with Bangkok, other regions—western, southern, northern, and northeastern—are growing relatively slowly. As a result, they are maintaining their low levels of income, which are 75, 72, 48, and 31 percent, respectively, of the country average.

Explaining spatial disparities

Different levels of income and growth can be achieved partly by income-generating activities that are inherently different in each region (see figure 12.6). In terms of economic structure, Bangkok’s major activities are service related. Other regions, like the central and eastern areas, have benefited from a variety of growth-promoting policies, including industrialization, globalization, and the creation of export-promotion zones, which are eligible to undertake a significant structural transformation in economic activities, meaning essentially a shift to manufacturing. Improved infrastructure and a lot of incentives attract both local and multinational firms, encouraging them to establish production sites and eventually allowing the area to enjoy agglomeration economies as well as government support in several forms. In the central region, the manufacturing sector constituted only one-tenth of economic activity in 1980, but this...
had increased to about 60 percent in 2005. The pattern of structural shift in the eastern region is similar to that in the central area: the manufacturing sector has replaced the agriculture and service sectors.

As a result, both the central and eastern regions have become a magnet for labor from other low-income, lagging areas, including the western, southern, northern, and northeastern regions. The northeastern region, in particular, has long housed the poorest of the country, as reflected in its high poverty rates. Its regional GDP was only about 30 percent of the country average. The southern region’s economic structure is quite distinct from that of other regions, with the agriculture sector relatively more relevant than manufacturing. Households generate income mainly from agriculture and services based largely on natural resources, including rubber plantations and tourism. Its ability to catch up with other regions is generally weak.

Several studies attribute the success of the catching-up process in Thailand to a number of growth policies that have promoted industrialization, globalization, and urban-based development (see, for example, Krongkaew 1996; Siamwalla and Jitsuchon 2007). However, Ikemoto and Limskul (1987) and Tinakorn (1995), among many others, assess the impact of such growth-promoting policies on income distribution.

Table 12.3 Per capita regional GDP in Thailand, 1990–2005

<table>
<thead>
<tr>
<th>Region</th>
<th>Per capita regional GDP (Thailand = 100)</th>
<th>Regional GDP growth rate (percent a year)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bangkok and vicinities</td>
<td>310.9</td>
<td>280.8</td>
</tr>
<tr>
<td>Eastern</td>
<td>147.7</td>
<td>185.0</td>
</tr>
<tr>
<td>Central</td>
<td>87.6</td>
<td>120.4</td>
</tr>
<tr>
<td>Western</td>
<td>75.6</td>
<td>74.9</td>
</tr>
<tr>
<td>Southern</td>
<td>66.8</td>
<td>72.0</td>
</tr>
<tr>
<td>Northern</td>
<td>50.0</td>
<td>50.1</td>
</tr>
<tr>
<td>Northeastern</td>
<td>33.7</td>
<td>33.3</td>
</tr>
</tbody>
</table>

| Thailand          | GDP per capita (baht) | 56,113.8 | 76,931.6 | 94,345.8 | n.a. | n.a. | n.a. |
|                   | Growth rate (percent) | 8.6       | 0.4       | 5.1      |

Sources: Data from NESDB and author’s calculations.

n.a. Not applicable.
and conclude that they tend to deteriorate equality. According to a survey by Siriprachai, Wisaweisuan, and Srisuchart (2004), industrialization policy did not lead to permanent job creation and thus resulted in long-term inequality, and the export promotion policy helped to reduce absolute poverty but widened income distribution.

The regional Gini index, constructed based on income earned by population living in 76 provinces over seven regions in Thailand, exhibited a continual upward trend between 1981 and 1997, rising from 0.13 to 0.24 (see figure 12.7). This indicates that the income gap widened even as economic growth accelerated. Thanks to the economic crisis in 1997, Thailand’s regional Gini index fell sharply to 0.1560. In 2005 the figure stayed at 0.1683, which was higher than the figure in 1980.

However, an assessment of income distribution based on the Gini coefficient of
consumption spending between 1988 and 2006 shows an improvement in equality (see table 12.4). Yet the level of Gini was still as high as 0.4148 in 2006, which, according to Siamwalla and Jitsuchon (2007), is similar to the level in Latin American countries such as Argentina and Mexico. Gini coefficients at the regional level improved everywhere, except in the northern and northeastern regions and in rural areas. These areas are experiencing greater intraregional disparities, with Gini coefficients of 0.4048, 0.3948, and 0.3882, respectively, in 2006.

As asserted earlier, globalization and industrialization are engines of growth. Thailand has a close relationship with international economies in terms of both trade and investment, as indicated by an increase in the degree of openness: from 90 percent of GDP in 1995 to 149 percent of GDP in 2005 (see table 12.5). Thailand also enjoys an influx of capital, which generates greater employment and migration of labor into the export sector. Although it is impossible to establish a concrete relationship between greater connectivity to the global market and a lower Gini coefficient, in the manufacturing sector, machinery and manufactured goods together share about 70 percent of total export values, and machinery, fuel, and lubricants together share about 57 percent of total import values.

Israngkura (2000) employs a social accounting matrix to evaluate the impact of free trade areas on income distribution and concludes that export-led growth via globalization and greater intensity of regionalism, particularly in the form of a free trade area, results in deteriorating income distribution in Thailand. In particular, nonagricultural sectors earn triple the income earned by the agricultural sector (B 154,774 and B 57,010, respectively). More important, inequality is higher in the nonagricultural sector, which has a Gini coefficient of 54.41, compared with the nonagricultural sector, which has a Gini coefficient of only 17.78.

According to Israngkura (2000), the worst scenario would occur in the presence of financial liberalization that brings about growth in the service sector. In this regard, Wattanakuljarus (2007) studies the tourism sector to assess the impact of growth on income distribution and finds that for every 10 percent increase in tourism, 3.72 percent in additional income will accrue to nonagricultural labor and 2.53 percent in additional income will accrue to agricultural labor.
In terms of capital account, Thailand is a net recipient of foreign direct investment (FDI), with net flows amounting to $383$ billion (see table 12.6). FDI grew rapidly, at 71 percent a year, between 1985 and 1990, as a result of the government’s industrialization policy and several export promotion measures. Thailand experienced only one period of continuous decline in FDI—between 1990 and 1995, a period in which financial liberalization created an influx of short-term capital and portfolio investment that replaced a large proportion of FDI. Since then, FDI has increased steadily, growing, on average, 22 percent a year.

A great deal of FDI in the manufacturing sector has intensified the imbalance between agricultural development and industrialization, exacerbating the uneven distribution of income. The need to raise income in the agricultural sector has received far less government attention. For several decades, the policy has been to raise income in rural areas through measures such as price supports. This approach has not succeeded in raising agricultural income. As Siamwalla and Jitsuchon (2007) argue, agricultural development policy that improves productivity and promotes competitiveness is preferable because it helps to protect the Thai agricultural sector from the adverse impacts of agricultural liberalization in the years to come.

### Attempts to alleviate the problem

The government’s approach to alleviating regional disparities is contained in the official National Economic and Social Development Plans (see table 12.7). The first one was launched in 1963, with major emphasis on investment in infrastructure throughout the country. A large proportion of the government budget was spent on the construction of roads, telecommunications, and other public works projects. The second plan, launched in 1971, emphasized improvement of rural infrastructure and development of human resources. The third plan, launched in 1980, focused on improving the living standards of the rural poor and expanding access to education and health services. The fourth plan, launched in 1986, emphasized the importance of human resource development and environmental sustainability. The fifth plan, launched in 1996, emphasized the importance of social inclusion and environmental sustainability.

### Table 12.4 Gini coefficient of consumption spending in Thailand, by region, 1988–2006

<table>
<thead>
<tr>
<th>Year</th>
<th>Thailand</th>
<th>Bangkok</th>
<th>Central</th>
<th>North</th>
<th>Northeast</th>
<th>South</th>
<th>Urban</th>
<th>Rural</th>
</tr>
</thead>
<tbody>
<tr>
<td>1988</td>
<td>0.4387</td>
<td>0.3627</td>
<td>0.3767</td>
<td>0.3952</td>
<td>0.3877</td>
<td>0.3773</td>
<td>0.4058</td>
<td>0.3787</td>
</tr>
<tr>
<td>1990</td>
<td>0.4433</td>
<td>0.3845</td>
<td>0.3864</td>
<td>0.4111</td>
<td>0.3916</td>
<td>0.3611</td>
<td>0.4173</td>
<td>0.3856</td>
</tr>
<tr>
<td>1992</td>
<td>0.4500</td>
<td>0.3926</td>
<td>0.3717</td>
<td>0.3898</td>
<td>0.3960</td>
<td>0.3739</td>
<td>0.4239</td>
<td>0.3839</td>
</tr>
<tr>
<td>1994</td>
<td>0.4377</td>
<td>0.3641</td>
<td>0.3732</td>
<td>0.3983</td>
<td>0.3909</td>
<td>0.3983</td>
<td>0.4085</td>
<td>0.3811</td>
</tr>
<tr>
<td>1996</td>
<td>0.4313</td>
<td>0.3484</td>
<td>0.3597</td>
<td>0.3871</td>
<td>0.3785</td>
<td>0.3742</td>
<td>0.4104</td>
<td>0.3592</td>
</tr>
<tr>
<td>1998</td>
<td>0.4092</td>
<td>0.3261</td>
<td>0.3354</td>
<td>0.3583</td>
<td>0.3428</td>
<td>0.3612</td>
<td>0.3784</td>
<td>0.3489</td>
</tr>
<tr>
<td>2000</td>
<td>0.4283</td>
<td>0.3289</td>
<td>0.3657</td>
<td>0.3745</td>
<td>0.3517</td>
<td>0.3742</td>
<td>0.3951</td>
<td>0.3594</td>
</tr>
<tr>
<td>2002</td>
<td>0.4179</td>
<td>0.3650</td>
<td>0.3539</td>
<td>0.3819</td>
<td>0.3559</td>
<td>0.3661</td>
<td>0.3939</td>
<td>0.3552</td>
</tr>
<tr>
<td>2004</td>
<td>0.4255</td>
<td>0.3585</td>
<td>0.3647</td>
<td>0.4062</td>
<td>0.3760</td>
<td>0.3871</td>
<td>0.3956</td>
<td>0.3838</td>
</tr>
<tr>
<td>2006</td>
<td>0.4183</td>
<td>0.3584</td>
<td>0.3589</td>
<td>0.4048</td>
<td>0.3908</td>
<td>0.3740</td>
<td>0.3897</td>
<td>0.3882</td>
</tr>
</tbody>
</table>

**Source:** Community Economic Development and Income Distribution Office (CEDIO).

### Table 12.5 Openness and income distribution in Thailand, 1995–2005

<table>
<thead>
<tr>
<th>Year</th>
<th>Trade value (percent of GDP)</th>
<th>Ginia</th>
<th>GDP per capita (Baht)</th>
<th>Change in openness (percent)b</th>
</tr>
</thead>
<tbody>
<tr>
<td>1995</td>
<td>90.4</td>
<td>0.2191</td>
<td>70,474</td>
<td>n.a.</td>
</tr>
<tr>
<td>1996</td>
<td>84.8</td>
<td>0.2227</td>
<td>76,847</td>
<td>9.0</td>
</tr>
<tr>
<td>1997</td>
<td>94.6</td>
<td>0.2299</td>
<td>78,053</td>
<td>1.6</td>
</tr>
<tr>
<td>1998</td>
<td>101.9</td>
<td>0.1560</td>
<td>75,594</td>
<td>−3.2</td>
</tr>
<tr>
<td>1999</td>
<td>104.0</td>
<td>0.1686</td>
<td>75,026</td>
<td>−0.8</td>
</tr>
<tr>
<td>2000</td>
<td>124.9</td>
<td>0.1697</td>
<td>79,098</td>
<td>5.4</td>
</tr>
<tr>
<td>2001</td>
<td>125.1</td>
<td>0.1732</td>
<td>81,915</td>
<td>3.6</td>
</tr>
<tr>
<td>2002</td>
<td>122.0</td>
<td>0.1693</td>
<td>88,322</td>
<td>5.4</td>
</tr>
<tr>
<td>2003</td>
<td>124.3</td>
<td>0.1664</td>
<td>92,860</td>
<td>7.7</td>
</tr>
<tr>
<td>2004</td>
<td>136.4</td>
<td>0.1682</td>
<td>101,092</td>
<td>8.7</td>
</tr>
<tr>
<td>2005</td>
<td>148.8</td>
<td>0.1683</td>
<td>109,440</td>
<td>9.1</td>
</tr>
</tbody>
</table>

**Source:** Bank of Thailand.

**n.a.** Not applicable.

a. Based on the regional Gini index in Fu (2004).

b. Degree of openness is measured by the ratio of trade value to GDP.
Spatial disparities in Thailand: does government policy aggravate or alleviate the problem?

Table 12.6  Net inflows of foreign direct investment in Thailand, 1970–2006

<table>
<thead>
<tr>
<th>Year</th>
<th>FDI (baht billion)</th>
<th>Five-year growth (percent a year)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1975</td>
<td>1.7</td>
<td>14.4</td>
</tr>
<tr>
<td>1980</td>
<td>3.9</td>
<td>17.3</td>
</tr>
<tr>
<td>1985</td>
<td>4.4</td>
<td>2.6</td>
</tr>
<tr>
<td>1990</td>
<td>64.7</td>
<td>71.2</td>
</tr>
<tr>
<td>1995</td>
<td>50.0</td>
<td>-5.07</td>
</tr>
<tr>
<td>2000</td>
<td>115.3</td>
<td>18.2</td>
</tr>
<tr>
<td>2005</td>
<td>262.6</td>
<td>17.9</td>
</tr>
<tr>
<td>2006</td>
<td>382.9</td>
<td>45.8</td>
</tr>
</tbody>
</table>

Source: Bank of Thailand.

Table 12.7  Major emphasis of national economic and development plans in Thailand

<table>
<thead>
<tr>
<th>Plan</th>
<th>Period</th>
<th>Major emphasis</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1963–66</td>
<td>Investment in infrastructure</td>
</tr>
<tr>
<td>2</td>
<td>1967–71</td>
<td>Sectoral development</td>
</tr>
<tr>
<td>3</td>
<td>1972–76</td>
<td>Job promotion</td>
</tr>
<tr>
<td>4</td>
<td>1977–81</td>
<td>Alleviating poverty and reducing income</td>
</tr>
<tr>
<td></td>
<td></td>
<td>distribution</td>
</tr>
<tr>
<td>5</td>
<td>1982–86</td>
<td>Balanced development</td>
</tr>
<tr>
<td>6</td>
<td>1987–91</td>
<td>Productivity-based development</td>
</tr>
<tr>
<td>7</td>
<td>1992–96</td>
<td>Decentralization of public authorities</td>
</tr>
<tr>
<td>8</td>
<td>1997–2001</td>
<td>Focus on human resources</td>
</tr>
<tr>
<td>9</td>
<td>2002–06</td>
<td>A self-sufficient economy</td>
</tr>
<tr>
<td>10</td>
<td>2007–11</td>
<td>Green and happiness society</td>
</tr>
</tbody>
</table>

Sources: NESDB, author’s compilation.

of roads, railways, and several facilities that support growth of the industrial sector; a negligible amount was spent on research and development in the agricultural sector.

At the end of the first plan, rural-urban differences became evident, which led the government to attempt to reduce the income gap. The success of this effort is mixed. The government succeeded in reducing the income gap from 2.56 times in 1994 to 2.20 in 2004, but it was unable to address rural-urban differences in income. As shown in table 12.2, monthly per capita income in urban areas increased from B 3,868 in 1994 to B 6,885 in 2004, while that in rural areas increased from B 1,510 in 1994 to B 3,130 in 2004.

In urban areas in 2004, the top 20 percent of income earners earned 80 times the earnings of the bottom 20 percent (see table 12.8). This difference was even higher in 1994, when the top 20 percent earned 110 times the earnings of the bottom 20 percent. In rural areas, the income gap has remained narrow, with the top 20 percent of income earners earning approximately four times the earnings of the bottom 20 percent throughout the decade.

The disparity may be observed not only across regions, but also within regions: the richer the area, the wider the income gap. Bangkok has the highest per capita income and the widest income gap. The northeastern region has the lowest per capita income and the smallest income gap. Based on an analysis of the ratio of the richest to the poorest income quintiles (Q5/Q1), the top 20 percent income group in Bangkok earned 986 times what the bottom 20 percent earned in 2004. The figure was especially high in 1994, when the gap was larger than 2,000 times. The northeastern region is the poorest in the country and has relatively even distribution of income, with the Q5/Q1 ratio being only about two to three times.

The fourth National Economic and Social Development Plan (1977–81) gave high priority to alleviating poverty and reducing income inequalities. The issue was again addressed in the seventh plan, which sought to decentralize development. However, the plan was poorly implemented, especially in the regional context, as only a limited amount of infrastructure was made available to the regions and rural areas (Dixon 1999).

The problems persist, owing in part to the uneven spatial distribution of the public budget. The most recent figures for 2003–06 indicate that more than 50 percent of the government budget was spent in Greater Bangkok (see figure 12.8). As Greater Bangkok continues to grow, the budget inequality deepens even further. In 2006 the government budget spent within Bangkok and its vicinities grew at 14.8 percent, followed by the northeastern and the southern regions, which grew at 9.9 and 1.9 percent, respectively. The northeastern region received the second-highest proportion of the budget, about 13 percent, but the sum was still far lower than the amount going to Bangkok and its vicinities. In fiscal 2006 Bangkok received B 123,057 per capita of government spending, while the northeastern region received only B 8,448. The following regions receive a share of the
Table 12.8 Ratio of Q5 to Q1 in Thailand, by region, 1994–2004

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Bangkok</td>
<td>2,263.94</td>
<td>2,890.00</td>
<td>1,991.56</td>
<td>4,499.84</td>
<td>1,409.69</td>
<td>985.95</td>
</tr>
<tr>
<td>Central</td>
<td>36.30</td>
<td>33.81</td>
<td>31.81</td>
<td>53.34</td>
<td>38.49</td>
<td>37.73</td>
</tr>
<tr>
<td>North</td>
<td>8.31</td>
<td>8.44</td>
<td>8.42</td>
<td>6.82</td>
<td>6.00</td>
<td>5.90</td>
</tr>
<tr>
<td>Northeast</td>
<td>3.15</td>
<td>3.14</td>
<td>3.16</td>
<td>3.13</td>
<td>3.49</td>
<td>2.92</td>
</tr>
<tr>
<td>South</td>
<td>11.18</td>
<td>10.45</td>
<td>9.61</td>
<td>12.14</td>
<td>10.52</td>
<td>11.91</td>
</tr>
<tr>
<td>Thailand</td>
<td>14.07</td>
<td>13.52</td>
<td>13.06</td>
<td>11.03</td>
<td>91.40</td>
<td>89.18</td>
</tr>
<tr>
<td>Urban</td>
<td>110.45</td>
<td>110.68</td>
<td>100.69</td>
<td>121.14</td>
<td>105.2</td>
<td>91.18</td>
</tr>
<tr>
<td>Rural</td>
<td>4.52</td>
<td>4.19</td>
<td>4.45</td>
<td>4.89</td>
<td>4.47</td>
<td>4.48</td>
</tr>
</tbody>
</table>

Source: NESDB.

Note: Q1 = 20 percent lowest-income group; Q5 = 20 percent highest-income group.

The uneven distribution of government budget across regions may be attributed to spatial disparities in Thailand, despite the absence of empirical evidence that fiscal policies over the past five decades brought about a narrowing or a widening of spatial disparities. Excluding Greater Bangkok, the northeastern region received the greatest share of the public budget for water development, education, and general support for local institutions (see figure 12.9), but its level of income remained low. The central region received the greatest share of public budget for infrastructure for economic development, and its per capita income rose, approximating that of Bangkok. Recently, the public budget for infrastructure for economic development was diverted to the northeastern region, suggesting that the government views infrastructure as a means of promoting growth and decentralization.

The uneven distribution of public finance results in the “poor” being poor not only in terms of income but also in terms of access to basic services required for improving their quality of life, developing their skills, and raising their productivity. Table 12.9 presents the spatial distribution of health care and education resources by region, revealing once again the concentration of productive resources in Greater Bangkok. For example, 41 percent of doctors, 26 percent of pharmacists, 30 percent of nurses, and 31 percent of dentists are working in Bangkok and its vicinities. Government spending per capita on health care was B 8,484 in Bangkok and merely B 763 in the northeastern region. Even if the scarcity of medical services does not necessarily lead to low productivity, differences in life expectancy do lead to differences in earning capacity. It is not clear whether greater availability of resources would lead to higher income. For example, per capita income in the central region is relatively high, but the proportion of health care resources is relatively small. This may be explained by the region’s proximity to Bangkok and its vicinities.

Education also contributes to inequalities. In general, higher education successfully reduces the proportion of the population living in poverty (see table 12.10). However, Sianwalla and Jitsuchon (2007) argue that higher education will not take people away from poverty even in the medium to long term, because the quality of education rather than the proportion of the population who

Figure 12.8 Allocation of the government budget in Thailand, by region, 2003–06

Source: Comptroller–General’s Department, Ministry of Finance.
Spatial disparities in Thailand: does government policy aggravate or alleviate the problem?

are educated is what raises productivity and the ability to earn income.

In this regard, Tangkitwanit and Manusboonpoempoon (2007) evaluate the impact of the income-contingency loan for education (ICL) on income distribution at the national, not the regional, level. They find that more loans are allocated to the lower-income population at both the high school and the university levels, which successfully distributes income to lower-income groups. However, when investigating the relative
effectiveness of the policy by education level, a more satisfactory outcome may be found at the high school than at the university level. This is true largely because the ICL is a tool for facilitating education, not investing in human capital, and the poor generally have limited access to a university-level education.

Conclusions
The spatial disparities in Thailand that are outlined in this paper reveal a decline in absolute poverty, as indicated by the proportion of the population who are poor, and the persistence of an income gap not only across but also within regions. For the past 50 years, various policies have sought to tackle the problem of income distribution at the national level, but not at the regional level. There is no clear evidence that spatial disparities are less severe now than before; nevertheless, some of the regional policies that successfully raised income in the area targeted also seem to have created gaps among regions. A balance is needed between agricultural development and industrialization. The allocation of government spending needs to be assessed critically, because many provinces are allocated less than 1 percent of the total budget, which will not lead to a narrowing of regional disparities. Rather, centralized policy is likely to remain ineffective. Further study is needed in areas such as regional job creation and its relation to the income-generating process and the linkage between government finance and the regional Gini index, to inform a complete and comprehensive policy on regional disparities in Thailand.

Notes
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1. Thailand’s currency is the baht.
2. “Recovery,” according to Siamwalla and others (2006: 4), is defined as the year in which economic growth started to outpace average growth during 1980–96, not including the year with economic shocks, and in which real national income bounced back to the same level as the pre-crisis figure.
3. This calculation is based on the alternative methodology of Fu (2004) for estimating the Gini index, which takes into account the relative importance of regions as follows:

\[
\text{GINI} = \frac{1}{2n^2 \mu} \sum_{j=1}^{n} \sum_{k=1}^{n_j} n_j n_k \left| \frac{y_j}{\mu} - \frac{y_k}{\mu} \right|
\]

where \( n \) is the total population, \( \mu \) is the average income equal to total income divided by total population, \( j \) is the number of regions, \( k \) is the number of provinces, \( n_j \) and \( n_k \) are the population in region \( j \) and province \( k \), respectively; and \( y_j \) and \( y_k \) are income per capita in region \( j \) and province \( k \), respectively.

4. These figures need to be interpreted with caution, as a number of areas could transform themselves from rural to urban.

5. Commenced on January 16, 1996. As of 2005, the maximum annual loan varies by education level; that is, B 55,440 for high school; B 62,500 for vocational study; B 70,240 for higher vocational study; B 127,000 for sciences and health-related undergraduate studies; and B 100,000 for other undergraduate studies.

References


Much has been made of China’s impressive growth as well as its distributional and environmental consequences. But with 1.3 billion people spread unevenly across 31 ecologically diverse provinces and municipalities, China is perhaps the best example of how a country has reshaped its economic geography to reverse half a century of economic decline. This chapter provides an overview by drawing on chapters in this volume that deal in depth with particular aspects and on other related studies.

**China’s historic and geographic legacy**

China’s geography has been fundamental in shaping 5,000 years of social and economic history and has been a defining factor in influencing China’s pattern of population settlement (see figure 13.1). Although by global standards its land mass is large, the population is concentrated in the more fertile central plains and valleys of the Yangtze and Yellow rivers and along the urbanized coastal areas. The western region, comprising 12 provinces with large tracts of uninhabitable mountainous terrain and deserts, is isolated, sparsely populated, and thus less suited to commercial activities. The central region, with 8 provinces, has large concentrations of population along major river basins and accounts for a substantial portion of agricultural production. Finally, the coastal region, with 11 provinces, has traditionally been China’s industrial and commercial heartland and is historically linked to the outside world through trade and labor migration.

Geographic factors determined that regional development in China would be uneven long before the post-1980s reform era. The potential for disparities to emerge, however, was less visible because of the low level of development after the postwar period of central planning (1950–80). To encourage more balanced growth, investment was directed to inland provinces and the northeast, rather than based on regional comparative advantages. China’s unique hukou residency restrictions also limited the potential for both rural to urban and interprovincial migration and prevented cities from getting too large. As elaborated by Yao in chapter 14, these location-specific industrial policies took place in the midst of altering periods of economic and fiscal centralization and decentralization. These shifts were motivated by the adverse consequences of the Great Leap Forward and the Cultural Revolution, which pushed senior policy makers either to tighten or to liberalize their grip on the local authorities.

By 1980, three decades after liberation, China was still a desperately poor agrarian economy, although by international standards it was an exceptionally egalitarian society. With these facts in mind, Deng Xiaoping launched a series of reforms that, in opening the country to the outside world, foreshadowed the basic tenets underpinning the new economic geography and trade theories that were only just becoming prominent in the literature. During the ensuing reform era, preferential policies were sequenced to work with rather than against differences
in natural endowments and comparative advantages; in the process, they fundamentally reshaped China’s economic geography.

The story of China during the past quarter century revolves around a series of pragmatic and at times trial-and-error reforms that made use of the country’s natural advantages, unleashing the pent-up energies of the nation. These policies had three distinct consequences: (1) they reshaped the spatial dimensions of development both in terms of regional concentration and the dynamism of urban and rural areas; (2) they broke the gridlock in the mobility of factors and goods both internally across provinces and between urban and rural areas and externally between China and the rest of the world; but (3) they also set in motion forces that increased disparities across regions and provinces and between as well as within urban and rural areas. In the process, China emerged as an exceptionally competitive, growth-oriented economy, having dealt successfully with the three “Ds”: realizing the benefits of agglomeration economies through a higher density of economic activities in its major urban centers, overcoming the distance factor by making a concerted effort to improve regional transportation and communications infrastructure, and eliminating internal and external divisions to promote national market integration and China’s participation in the global economy.

This chapter begins by presenting a synopsis of how the government’s reform policies managed to reorient growth dynamics to tap China’s comparative advantages as influenced by its economic geography. It then explores more deeply several of the key spatial and policy factors that have shaped these growth and distributional trends: agglomeration benefits, fiscal policies, investment in transport services, and the migration cum urbanization process, before assessing the distribution and equity
implications. Finally, this chapter explores the implications of these issues for future policies and trends in inequality.

Accelerating growth: coordinating structural, incentive, and fiscal policies

With the advent of economic reforms in the late 1970s, the past quarter century has seen a period of unprecedented growth, coupled with equally sharp increases in income and regional disparities. Gross domestic product (GDP) growth averaged nearly 10 percent a year, lifting half a billion people out of poverty. The record of rapid growth and increasing inequality, however, was marked by periods of considerable variation (see figure 13.2). The major factors underpinning this growth have been well analyzed. Growth increased sharply in the first half of the 1980s as households became part of the agrarian economy, along with communes and state farms, as a result of the new “household responsibility system.” By simply de-collectivizing production and allowing farmers to sell their surplus on the market, rural per capita incomes tripled during the 1978–84 period, contributing to a surge in the GDP growth rate to more than 15 percent by the mid-1980s. By the second half of the 1980s, the momentum from these reforms had petered out, while the full benefits from the emergence of rural-based “township-and-village enterprises” and the restructuring of state-owned enterprises in urban areas were still to be felt. Nevertheless, these enterprise-related reforms spurred the movement from farm-based to off-farm labor activities and sowed the seeds of rapid urbanization.

This urbanization process was integral to the process of industrial agglomeration in China and influenced by the uniqueness of the transition from a planned to a market economy. The transition was supported initially by an agenda of dual-track reform—an “open-door policy” that strengthened the investment climate along the coastal provinces before going national and waves of fiscal decentralization and recentralization that initially favored more experimentation among certain coastal provinces but is now trying to deal with the disparities and expenditure needs of a highly decentralized intergovernmental fiscal system.

As discussed by Chen and Lu in chapter 15, the open-door policy began with the establishment of the first special economic zones (SEZs) in 1980 in four cities in Guangdong and Fujian provinces (figure 13.1). This initiated a process that generated urban-based agglomeration benefits but also triggered wider regional disparities. The preferential status of SEZs was soon rolled...
out to 14 other coastal cities in 1984, to the three deltas in 1985, to Hainan in 1988, to Pudong in Shanghai in 1990, and then gradually to 11 border cities and eventually to all capitals of the inland provinces and autonomous regions during the 1990s. These SEZs were the precursor to a more broad-based improvement in China’s investment climate and laid the foundations for a ratcheting up of investment rates.

In the early 1990s, Deng Xiaoping’s famous southern tour gave a strong boost to the open-door policy and conferred formal status on the “gradient development model” (see Yao in chapter 14). This approach, which considered coastal, central, and western regions as three ladders of economic growth starting from the coast, gave the coastal region large benefits as the first movers of reforms. This was supported by a strategy of “big inputs, big exports,” which was centered in the coastal region and sought to stimulate processing trade and attract foreign direct investment (FDI). Foreign trade and investment provided the coast not only with capital but also with advanced technology and management, which enhanced productivity. In 1990, when only coastal provinces were open to foreign investors, more than 92 percent of FDI accrued to the coast. (Despite more regionally neutral incentive policies, by 2005, the coastal region still accounted for more than 90 percent of total exports and imports and received 85 percent of a much larger volume of FDI.) With the first-nature advantages of geographic location supported by favorable second-nature policy advantages, the coastal region took off economically.

These industrial reforms were complemented by additional agrarian reforms, notably the overhaul of China’s food-grain marketing system in the mid-1990s, which increased farm-gate prices and led to another surge in rural incomes. Together these reforms pushed GDP growth rates well into the double digits during the first half of the 1990s. The growing divergence between growth of coastal and inland provinces widened, however, and only in the last several years has there been some evidence of convergence (figure 13.2). (In chapter 18, Yueng and Shen provide a comprehensive discussion of the emergence during this period of the three major commercial regions centered on Guangzhou, Shanghai, and Beijing.)

Although growth moderated in the late 1990s due to the Asian financial crisis, an ambitious public investment program coupled with accession to the World Trade Organization (WTO) led to the rapid expansion of exports, which has kept GDP growth above 10 percent in recent years. Further liberalization of the agrarian economy was largely connected with WTO trade-related reforms, which eliminated any remaining pricing biases against agriculture and encouraged a shift to more profitable crops in line with China’s comparative advantages (Huang and others 2007). This was subsequently reinforced by a whole-scale reduction in agricultural taxes and fees that lifted agrarian incomes and moderated regional disparities in the new millennium.

Spatial factors and government policies: growth and equity implications

China’s success in building a more competitive economy over the past several decades can be viewed from various perspectives, but overall its success can be interpreted as the consequence of having initiated a major agglomeration process that boosted the productivity of Chinese enterprises (supported by policies that revived agricultural productivity). As elaborated in chapter 16 by He and summarized here, in the aftermath of the open-door policies and selective fiscal incentives, the triple forces of marketization, globalization, and decentralization jointly drove the spatial transformation of the industrial sector.

In 1980 the most agglomerated industries were state owned and capital intensive, with the majority of the dispersed industries being resource based. By allowing market signals and globalization to play a more important role, economic reforms gave birth to centripetal forces that encouraged competitive industries, especially those with an export orientation, to locate along the coast. Coastal cities have not only first-nature comparative advantages in factor endowments but also second-nature advantages
as first-movers in attracting and retaining domestic and foreign resources.

Meanwhile, as decentralization of responsibilities encouraged provincial authorities to protect their local industries, inefficiencies and duplicative industrial structures also emerged. This was motivated in part by a desire to protect local revenues and jobs, but over time it undermined the achievement of productivity gains for the overall economy as a result of geographic and economic specialization. As reforms deepened, however, interactions between centripetal and centrifugal forces gradually reshaped the spatial structure of activities. Differences increased between the productivity of agglomerated competitive industries and that of dispersed resource-based, heavy industries.

Gradually, a process of rapid urbanization and specialization evolved in the coastal areas. Several factors supported this process. First, national market integration facilitated labor and capital mobility, while cross-provincial commodity exchanges encouraged industrial development in line with locational advantages. This process allowed Chinese companies to exploit economies of scale (as discussed by Chen and Lu in chapter 15 and by He in chapter 16). Second, external market integration, as part of globalization, encouraged more dynamic activities to concentrate in the coastal region, which, in turn, generated agglomeration effects. As the coastal cities became more linked to the global economy, the benefits became obvious, as exemplified by rapid employment creation, competitive pressures on enterprises to restructure, and a much improved domestic and external financial position. (Yeung and Shen describe the contrasting experiences in chapter 18.) This provided the basis for broad-based political support for WTO membership and trade liberalization more generally. The remarkable changes in the degree of openness of the economy are evident in the increase in the ratio of trade to GDP from 10 percent in 1978 to nearly 70 percent in 2006. Much of the trade liberalization took place over the past decade, as reflected in the decline in trade-weighted statutory tariffs from 40 percent in 1992 to an estimated 7 percent after WTO accession (Bhattasali, Li, and Martin 2004). Third, as labor markets became more flexible, wages began to reflect differences in quality, and skill premiums rose sharply.

As market integration deepened, provincial industrial structures gradually became more diversified, but by the late 1990s, the agglomeration process began to take hold, with the effect of nurturing more specialization. As He discusses in chapter 16, the relationship between regional specialization and per capita GDP is U shaped. Driven by market forces, both the very poor and very rich regions are now more specialized, with the more service-oriented or higher-technology industries concentrated in the coastal urban areas. Moreover, as analyzed by Bai and Lin in chapter 17, differences in returns to capital across provinces have decreased over time although returns remain greater in the coast than in the west. This lends support to the view that the agglomeration process has not become wasteful over time; rather, market forces have been encouraging the more efficient allocation of resources.

Today, many agglomerated industries are globalized, with more diversified ownership structures, while the dispersed industries either are oriented to the domestic market or are strategic industries. Heavily protected or state-controlled industries remain relatively dispersed due to the strong local pressures to retain profits (and associated fiscal revenues) within provincial boundaries. Industries with less local protection and government intervention typically are more exposed to external competition. Eventually, as agglomeration effects have taken hold, these industries have become more regionally specialized as well as more productive.

**Role of fiscal policies**

These open-door policies were also supported by shifting decentralization and recentralization of fiscal policies. Although far from meeting the needs of a modern economy, these actions provided Guangdong and Fujian and then other coastal provinces with stronger revenue incentives to experiment with reforms and thereby improve their investment climate. But the system also encouraged fiscal disparities.
to widen between the relatively better-off coastal provinces and the poorer inland areas. Only with the 1994 tax reforms was the fiscal system restructured to begin tackling distributional concerns.

Before 1980, China’s fiscal system was characterized by centralized revenue collection and fiscal transfers, which created few, if any, incentives to develop the local economy. Under this system, subnational governments were highly dependent on the central government and had limited fiscal autonomy (Ma and Norregaard 1998). From 1980 to 1993, China adopted the fiscal contracting system, which decentralized tax administration. Subnational governments, with relatively large discretionary powers to grant tax privileges, had strong incentives to retain fiscal revenues and develop their localities by imposing the lowest taxes possible on enterprises to compete with other regions. As a result, the ratio of total government revenue to GDP declined, as did central government revenues relative to total government revenues. The ratio of total government revenues to GDP declined from 26 percent in 1980 to 16 percent in 1989, and to 12 percent in 1993 (see figure 13.3). The ratio of total government expenditure to GDP declined accordingly.

The fiscal capacity of local governments closely mirrored the availability of resources. To keep resources within their control, local governments avoided sharing their revenues with the central government. The ratio of central government revenues to total government revenues declined from 55 percent in 1980 to 31 percent in 1989 and to 22 percent in 1993. Fiscal devolution, on the one hand, contributed to rapid economic growth by effectively enhancing the incentives of local governments; on the other hand, it limited the central government’s ability to use tax and expenditure policy instruments to narrow regional fiscal disparities and support the delivery of basic public services in poor localities. At this stage in China’s transition from a centrally managed to a market economy, the priority was more to revive growth than to deal with distributional concerns. In the aftermath, the more advantageous revenue-sharing arrangements contributed to the rapid growth of the two provinces on the frontier of open-door policies, namely, Fujian and Guangdong. This was reinforced by incentives favoring the allocation of public investment projects to provinces with a greater financing capacity. As a result, the share of public capital expenditures going to the coastal provinces rose from about 50 percent in the mid-1980s to nearly 65 percent by the mid-1990s.

With the major tax reform of 1994, this discretion-based revenue-sharing system was replaced with a more rule-based fiscal assignment system, allowing the central authorities to reassert themselves more actively and to use fiscal policy for redistribution

Figure 13.3 Ratio of total government revenue and expenditure to GDP in China, 1980–2005

Source: National Bureau of Statistics of China (various years).
The reform package brought China’s intergovernmental fiscal system much closer to international practice and paved the way for a turnaround in the ratio of government revenues to GDP in the second half of the 1990s (figure 13.3). To mitigate possible resistance from the provinces, the central government made certain concessions, including tax rebates in favor of the richer provinces, and only gradually changed the tax-sharing arrangements between the central and subnational governments.

Before the reforms, the share of central government expenditures was roughly in line with its share of revenues (see figure 13.4). After the reform, the share of central government revenues to total government revenues rose sharply, more than doubling from about 22 percent in 1993 to 56 percent in 1994 and hovering around 50 percent in recent years. The share of central government expenditures to total government expenditures remained at about 30 percent.

The centralization of the fiscal system strengthened the central government’s capacity to redistribute in favor of poorer inland provinces. After a decade of decline under the fiscal contracting system, the share of total fixed-asset investment that went to the inland region versus the coastal region increased gradually from the mid-1990s onward (see figure 13.5).

The ratio of local government expenditures to regional GDP rose over time under the tax-sharing system, especially in the inland region in the late 1990s to early 2000s, when the “Go West” policy was implemented (see figure 13.6). By 2005, the ratio of fiscal revenues in the eastern, central, and western parts of China was 60:23:17, while the ratio of their expenditures was 46:29:25, which suggests that overall the fiscal system has had some redistributive effects (Lou 2008).

Figure 13.6 shows that total central transfers range widely across provinces in aggregate terms as well as in per capita terms, but there appears to be some preference in favor of inland provinces. Generally, the larger the size of the provincial economy, the larger the central transfer; however, in per capita terms, the level of transfer is relatively greater, the poorer the province, especially if it is inland (see figure 13.7).

At the provincial level, a higher GDP per capita is associated with a lower ratio of central transfers to subnational government expenditures (see figure 13.8). Central transfers play a more important role in inland provinces, especially in the more remote and poorer ones, as their subnational administrative units are more dependent on intergovernmental support. In 2004 the ratio of central transfers to subnational government expenditures was, on average, about 40 percent for coastal provinces, but almost 70 percent for inland provinces. This suggests that central transfers have helped to reduce disparities in fiscal capacity across regions (see also chapter 15 by Chen and Lu).
However, fiscal disparities across regions, as measured by per capita social expenditures, continue to be large. Wealthier provinces, as measured by GDP per capita, tend to have a higher level of local government expenditures per capita. This positive relationship has remained virtually unchanged over the years. In 2005 GDP per capita of the richest province, Zhejiang, was about 5.5 times that of the poorest province, Guizhou; and subnational government expenditures per capita of the former were about 1.85 times those of the latter. Disparities in public spending contribute to disparities in social outcomes across regions and between rural and urban areas. Although the differences in subnational government expenditures on education and health care across regions have been decreasing in recent years, per capita expenditures in the coastal region are still more than 1.5 times those of inland regions (see figure 13.9). For example, in 2005 the national average per capita expenditure on public health was Y 78; major cities like Beijing spend several multiples of the average. But worth noting is that some of the poorest provinces like Tibet and Qinghai spend well above the average, largely because of the higher costs of serving a sparsely distributed population. Furthermore, budgets are set at the county level and are based largely on county government revenues. Local governments in the poorest parts of China, which face the toughest public health challenges, spend the least on public health. In 2003 the maternal mortality rate was 73 per 10,000 live births in the poorest fifth of the population covered by China’s maternal and child health surveillance system and 17 per 10,000 live births in the richest fifth (Wagstaff and Lindelow 2008).

Although revenue collections have been gradually recentralized, expenditure assignments in China continue to be exceptionally decentralized. The mismatch between expenditures and revenue assignments has led to major financing gaps, as responsibilities cascade from the center to the provinces and then down through several layers to the local level. Subnational governments have a wide array of economic responsibilities in addition to the delivery of social services, including basic health care, education, and social security schemes. Such a mismatch of risk pooling and resource redistribution leads not only to deadweight efficiency loss but also to uneven provision of public services. As fiscal transfers from the upper levels are often inadequate, local governments largely rely on their own devices to finance and deliver public services. Due to tighter fiscal constraints, many local governments, especially those in rural inland areas, which often suffer from significant resource shortfalls, have to provide more limited public services, while charging higher user fees.

In sum, although revenues have grown substantially in recent years and the fiscal
system has now taken on a redistributive role, the impact on the provision of more equitable access to public services is still modest, in part because of the way expenditure assignments are pushed down to the local level without the provision of commensurate funding and in part because of the structure of revenue sharing. These consequences are more significant in the poorer inland provinces and partially explain why urban-rural disparities are greater there relative to the coastal areas.

**Overcoming the distance factor: expanding transport services**

China's experience illustrates the importance of spatial factors in development. There is a significant correlation between the distance of inland provinces to the major commercial centers along the coast and the level of economic development. This is illustrated by the growth rates of per capita income, which decline with distance from the east coast. As seen in figure 13.10 (panel A),
in the early years of the reform period (1979–87), growth was less dependent on location, as measured by the relatively flat line showing the relationship between GDP per capita growth rates and the “adjusted distance” of a province from the coast. This is because the “balanced growth” strategy in the earlier years partially offset any locational advantages, with the consequence that growth rates tended to equalize across provinces, but at a lower level. With the onset of reforms and globalization during the 1988–95 period, locational advantages became more important; the closer provinces were to the coast, the faster they grew, with the effect illustrated by a more steeply sloped line in figure 13.10 (panel A). Given the nature of the growth process in the reform period, a typical coastal province benefited from the compound effect of a reduction in the adjusted distance and the presence of market-oriented policies that capture the benefits of location. While a typical inland province benefited from the same reduction in adjusted distance, the disadvantages of remote location in the reform era had a negative effect on its growth potential. However, the adverse impact of distance...
on growth was mitigated over time as China expanded its transport services. With the massive transport investment programs initiated in the 1990s, the distance factor became less of a barrier during the third period from 1996 onward (figure 13.10, panel B), making it possible for the growth rates of the inner provinces to move a bit closer to those along the coast, as shown in the line becoming slightly flatter. This may be one of the reasons why the gap in growth rates between the inland and coastal provinces has narrowed in recent years.

Part of China’s success story is therefore due to sustained improvements in transportation and communication networks, which mitigated some of the disadvantages associated with distance. In the process, this allowed competitive forces to reshape interprovincial industrial structures more in line with evolving comparative advantages. These investments also contributed to globalization pressures by reducing the costs of transport and logistics as a percentage of the final price of traded goods, which helped to link production to both domestic and global markets. Internal divisions in the form of provincial boundaries have traditionally inhibited the integration of national markets, as evidenced by abnormally large differences in product prices and wages across provinces before the mid-1990s. Due largely to massive investments in transport infrastructure in the 1990s, internal transport and logistics costs have fallen significantly, and interprovincial prices and wage rates have begun to converge. In the early 1990s, emphasis was placed on development of the coastal provinces and on upgrading of logistics services to improve connectivity with the outside world. After 2000, increasing priority was given to infrastructure investments in the western and central regions, as exemplified by a 45 percent expansion in highway mileage from 1999 to 2004, compared with a 30 percent expansion in the eastern region (Li and Xu 2007). Over the past decade, completion of the 44,000-kilometer national highway system along with improvements in 400,000 kilometers of local and township roads connected almost all of China’s major regional centers. This was supplemented by huge investments in the railway network, ports, and inland waterways. All together, China has been spending more than 5 percent of GDP on transport investments annually, amounting to more than US$100 billion in 2006 (of which about a third was on the expressway network). This is roughly double the amount spent in comparable countries.

As seen in figure 13.11, highway expansion was initially concentrated in the three core economic centers in the eastern region (Pearl River delta, Shanghai, and Beijing-Tianjin), spreading inward over time, following the need to move finished products and people. These patterns reinforced the fiscal and investment-related policy reforms, which favored growth along the coast and helped to promote agglomeration effects arising from unification of the national market.

The pattern of development for the railway sector has been different, driven largely
by the need to move bulk commodities like coal from resource-intensive regions in the northeast (see figure 13.12). Thus railway development was initially concentrated in the northeast, spreading first into the central provinces and then to the coastal areas. Investment in railways has lagged investment in the highway system. In particular, connections between the north and south for passenger and processed goods have not kept up with demand. Consequently, the rail system is overloaded, carrying 25 percent of the world’s railway traffic on just 6 percent of its track length, but capacity is expanding rapidly in line with an ambitious investment program laid out for the coming decade.

Evaluations of the rates of return on highway projects over the past decade show that the majority cluster in the 15–25 percent range. There is now enough evidence to support the view that transport investments have been fundamental in linking regional markets. Only in the last few years has it been possible to drive by expressway from Beijing to Hong Kong (China) and from Shanghai to Xinjiang. Within the eastern provinces, transporters now have optional routes, which are important for long-distance transport of high-value freight, thus allowing distributors to hold smaller inventories and respond more quickly to changing market tastes. Wal-Mart now has a single major distribution center in Guangdong for supplying stores throughout China, a practice that would not have been possible a decade ago.

Improved connectivity has increased efficiency and facilitated greater industrial specialization through agglomeration economies. Reduced transport costs between inland cities and coastal mega cities and seaports—and from there to overseas markets—have promoted development of inland firms in two ways: through lower costs of inputs delivered by inland factories and higher net revenue from sales to external markets. The result is greater access to both national and external markets, creating more competition and eroding existing local monopolies. Both skilled and semiskilled labor is increasingly able to move from the interior to the coast and back in line with shifting economic activity, resulting in greater economies of scale and rewards to innovation.

These transport investments are part of a broader strategy to reduce logistics costs driven, in part, by the competitive pressures of globalization and the key role that China now plays in regional supply chains. Factors that influence logistics costs range from customs procedures, transport infrastructure, security, and regulations. China has made impressive progress over the past few decades. According to rankings on the logistics performance index (World Bank 2007b), China ranks 30 globally among 150 countries, but 1 among lower-middle-income countries. However, there is still potential for improvement, as measured by estimates that logistics costs amount to 18 percent of GDP in China compared with 10 percent in the United States (‘‘China’s Infrastructure
Toward a more urbanized economy and implications for labor mobility

China’s urbanization process accelerated when the introduction of township-and-village enterprises drew workers out of farm production and facilitated migration. Over time, this spawned a large population of migrant labor, which now totals an estimated 140 million, heavily concentrated in the major commercial centers along the coast: Pearl River delta (Guangzhou and Shenzhen), Yangtze River delta (Shanghai), and Bohai Bay area (Beijing-Tianjin). See figure 13.13. However, rural migrants often can only find jobs not wanted by urban residents, characterized by long working hours, poor pay, and inferior working conditions. As reforms deepened, administrative constraints on labor mobility were progressively alleviated in the mid-1980s. Although access to housing, health services, and education for children remained unequal for migrants without urban residency status (hukou), they became less prohibitive over time.

For many migrants economic security is typically linked to their rural hukou in their home province, which, in the absence of formal land markets, provides the right to use agricultural land. A fully functioning land market, which would allow existing landowners to sell or lease use rights to others and migrate to the city if they found employment opportunities to be sufficiently attractive and durable, is still absent in China. In the absence of more formal land use markets in rural areas, the equally contentious and politically sensitive issue of granting residency rights to migrant labor in the cities is difficult to resolve. However, as addressed in many studies, perhaps the most effective instrument for dealing with rural-urban disparities would be to reform the hukou system and give migrant workers better access to social services and equal employment rights. But understandably, elements of the system have helped China to avoid some of the worst features of urban slums typical of many Asian cities. Thus the issue is really about how to manage better rather than halt rural-urban migration to moderate social tensions while providing more equitable access to employment and social services.

A quarter century after the reforms began, China’s urbanization rate, including migrant labor, has more than doubled and is now about 50 percent. The urbanization rate of Guangdong province now exceeds 60 percent compared with about 35 percent in most western provinces. At the current stage of development in metropolitan areas, positive agglomeration effects dominate negative congestion effects, although China’s cities face severe environmental challenges and urban transport systems need to be improved. Contrary to popular perceptions, in relation to its population and land mass,
China’s major cities are too small rather than too large. Building new “secondary” towns on the edge of existing cities may be effective, but only if there is a strong demographic and economic rationale for doing so. Fragmentation in large cities (agricultural or vacant land within the contiguously built-up city), resulting from a typical multiple-ring spatial format of city development, has unnecessarily increased infrastructure costs by creating less densely utilized enclaves and increasing the costs of urban transport and other social services. More efficient urban planning that would infill “leapfrogged” areas will be an important issue as urban population growth continues to accelerate.
Dealing with emerging disparities: spatial and welfare aspects

Income inequality in China, as measured by various indicators, has risen rapidly in the past quarter century: between coastal and inland regions, within provinces, as well as across and within rural and urban areas. The dynamics of spatial divergence across subnational areas have taken the form of a “race to the top.” Disparities are not the result of stagnant income growth among certain segments of society or regions but rather the consequence of unusually high and sustained growth in coastal and urban areas. As the biggest gains have gone to the leading commercial centers, the income gap between the coastal and inland provinces as well as between urban and rural areas has steadily widened.

As one indicator, the Gini coefficient has risen from around 30 to 45 over the past 25 years (see figure 13.14). Although regional disparity is widely considered as the key determinant in China, the rural-urban divide is the more important factor in shaping overall inequality. Changes in the Gini are closely associated with changes in the urban-to-rural income ratio and the coastal-to-inland per capita GDP ratio.

Shifts in the urban-to-rural income ratio as well as the Gini are largely explained by performance of the rural economy. Over the past two and half decades, agricultural production increased by around 4 percent a year; by international standards this is quite impressive. Yields for the major food grains, for example, are already quite high in China compared with other countries; in fact, they are similar to or higher than those in the United States and Japan and much higher than in Argentina, Canada, and Thailand (Yusuf and Nabeshima 2008). Given technological constraints and the cost implications of increasing crop yields in a land- and water-scarce economy, it is hard to see how agricultural growth could have been rapid enough to prevent rising urban-rural income ratios, because urban income growth rates have, at times, approached double digits. Thus experience suggests that inequality would be more effectively addressed by promoting off-farm income opportunities in rural areas. This is evidenced by the higher share of off-farm income in the coastal areas compared with the inner provinces and the extent to which this has lowered urban-rural income disparities in the former.

The challenge in reducing inequality, however, is that, as impressive as growth in rural incomes has been, it is still much lower than growth in urban incomes. As a result, trend lines for indicators of disparity either level off or reverse during periods of sharply rising rural incomes, notably in the early 1980s with the household responsibility reforms, in the mid-1990s with agrarian

![Figure 13.14 Income inequality in China, 1978–2004](source: Authors’ calculations based on data from Ravallion and Chen (2004)).
marketing reforms, and more recently with the reduction in rural-based taxes and the increase in commodity prices. For example, the urban-to-rural income ratio fell from 2.5 in 1980 to 1.8 by the mid-1980s and then rose to 2.8 by the mid-1990s. It then fell again to 2.5 in the late 1990s, before rising sharply and leveling off at the current ratio of 3.1 (World Bank 2007b, forthcoming; also see chapter 14 by Yao).

Regional factors do matter, however, because the larger urban-rural differences in the western provinces can be seen as structural: in those areas, ecological conditions militate against higher agricultural productivity and lower urbanization rates. Moreover, more isolated settlement patterns raise the costs of providing public services to rural inhabitants. Per capita GDP in the coastal region is now more than twice that in the inland region. As documented in many studies, the coastal provinces have smaller urban-rural income gaps than the inland provinces, with differences within rural and urban areas in the poorer regions being particularly pronounced (World Bank 2007a). In 2006 the ratio of urban to rural per capita income for the three richest provinces was about 2.5 times, while the ratio for the three poorest provinces was about 4.5. A large part of the inequality between regions is associated with the differences between their rural areas and is related to the uneven degree of urbanization across provinces. Thus equalizing mean incomes between rural areas and urban areas would have a larger impact on reducing overall inequality than equalizing mean incomes across regions (World Bank forthcoming). Both rural income levels and urbanization rates are lower in inland provinces than in coastal provinces. In 2005 rural per capita incomes were 70 percent higher and urbanization rates were 65 percent higher in the coastal region than in the western region. As urban incomes are, on average, two to three times rural incomes, the higher income levels in coastal areas are due largely to their more urbanized labor force.

Within provinces, inequality within rural and urban areas has accounted for a larger share of total inequality over time. Before the reform era, the extent of urban and rural inequality was contained by the guaranteed employment and flat remuneration system among urban enterprises and the comprehensive social welfare role provided by the communal farming system in rural areas. When marketization and structural transformation deepened, individual circumstances gradually played a more important role in determining income, including the high premium accorded to education. This suggests that increasing income inequality is, to some extent, a consequence of the stage of China’s development: the growth process unleashed competitive pressures and created incentives for investment in skills enhancement.

There is also a regional dimension to the evolution of inequality. Among the coastal provinces, the poorest groups in rural areas have experienced phenomenal growth in their incomes, while among inland provinces rural households have not experienced as significant an increase. Meanwhile, the incomes of the wealthier groups in urban areas—both the coastal and inland regions—have been rising the most rapidly (see figure 13.15). Overall, in both urban and rural areas, the growth rate of income has been higher in coastal than in inland provinces.

The divergence in growth rates between coastal and inland provinces peaked between the mid-1980s and 1990s, but there seems to be some convergence in recent years, especially in the western region, as the growth rates of many of the poorer provinces increased more rapidly (see table 13.1). This is also noted by Yao in chapter 14 and by Li and Xu (2007). These encouraging trends may be due to recent regional policies, but they are also an affirmation that globalization forces, embodied by WTO accession, have not worsened the rural-urban divide. Accompanied by labor market reforms, the forces of globalization actually narrowed the differences between international and domestic market prices for agricultural products and eliminated domestic policy distortions between farm prices and market prices. In doing so, the terms of trade improved in favor of agricultural products, and rural-urban inequality declined (Huang and others 2007).

It might be too early, however, to attribute this convergence to the impact of various regional development policies—“Go West”
in 1999, “Revive the Northeast” in 2003, and “Central China Rising” in 2005—that targeted rebalancing regional growth (see chapter 14 by Yao). By remediing market failures and some of the earlier biases in spatial policies, these programs probably did help to address some of the issues underpinning regional disparities. In focusing on ecological restoration and infrastructure improvements in the west, restructuring static industrial and institutional systems in the northeast, and developing intermodal connectivity facilities in the central region, these efforts can be an effective means to develop the comparative geographic and economic advantages of the various regions. However, arguments for a more aggressive investment-led strategy to raise agricultural productivity to levels comparable to those in the industrial and services sectors, and thus to moderate rural-urban disparities, should be pursued cautiously, given differences in regional endowments and considerations of cost-effectiveness.

Judged by social indicators, China’s performance has been favorable, with achievements exceeding what would be predicted in relation to income levels. China’s human development index (HDI) has risen continuously over the past quarter century to 0.78, placing the country 81 in 2005 among 177 countries (UNDP 2007). China’s primary school net enrollment rate of 97 percent and life expectancy of 72.5 years are higher today than the average of lower-middle-income countries.

However, as discussed earlier, disparities in social indicators among regions and between rural and urban areas are large. As of 2000, 2.5 percent of the urban population between 15 and 64 years of age received no education, while the proportion in rural areas was more than three times as high, at 8.7 percent. Child and maternal mortality rates are twice as high in rural areas as in cities. Moreover, social disparities between urban and rural areas appear to be greater in the poorer provinces, particularly in the west. For example, the urban-rural disparity in life expectancy is less than 3.5 years in the eastern region, but more than 8 years in the western region. Over the past decade, given the increased attention to regional differences, especially in the poorer western provinces, interregional gaps at the primary educational levels have narrowed. However, urban-rural disparities in health conditions may have widened since the late 1990s due to the persistence of urban-rural income inequality and slow development of rural health care insurance systems. This issue has drawn increased attention from policymakers, with indications that more support will be brought to bear in the near future. This reinforces the point made earlier: the
persistence of such disparities in welfare indicators illustrates how much further the distributional aspects of fiscal policies need to go to moderate trends.

**Looking to the future**

Recent trends suggest a gradual convergence in growth rates between the coastal provinces and the interior. But the advantages of location will likely persist even if narrowed, with agglomeration effects continuing to favor the larger and more globalized urban areas along the east coast. What, then, should be the course of future policies, given public pressures to deal with increasing disparities?

Both theory and experience indicate that government initiatives should not try to “balance the location of productive capacity” across regions. However, a strategy to “moderate differences in economic welfare” between the coastal and inner provinces and between rural and urban areas would involve a three-prong approach that builds on China’s past success by (1) strengthening the distributional aspects of the fiscal system so that regional and rural-urban differences in access to social services are reduced and allocations of investment projects are less constrained by the financing capacity at the poorer subprovincial levels; (2) eliminating jurisdictional barriers that inhibit mobility of labor, financial resources, and goods, while strengthening infrastructure and logistics links so that the regions and rural-urban areas are better connected; and (3) encouraging complementary regional development policies that recognize and build on the uniqueness of geographic and inherited economic differences rather than working against them.

The government’s policies have been generally consistent with this agenda, although progress on some aspects could be accelerated and others refined given political pressures (see chapter 15 by Chen and Lu and chapter 14 by Yao). The distributional impact of the fiscal system in transferring resources from richer to poorer provinces and between urban and rural areas has been so buoyant in recent years. Although the bias favoring infrastructure needs in the coastal provinces has been reversed, interior regions remain less well served in relation to the needs of the population. Protectionist provincial regulations that discourage interregional movement of goods, finance, and services and encourage duplicative industrial structures have lessened as national markets have become more unified, but many inefficiencies persist. Regionally differentiated policies should continue to recognize that the priority for the western region is defined by its fragile ecological conditions and the need to strengthen its base of human capital to prepare for the voluntary migration of labor to better employment opportunities. For the northeast, the priority is to encourage more aggressive restructuring of enterprises, create supportive social protection systems, and tap the region’s natural agriculture-based advantages. For the central region, the priority is to strengthen intermodal transport links and logistics services, as commercial activities inevitably shift inward to serve major population centers and growth becomes more domestically driven.

In the future, however, China’s evolving economic structure is likely to favor a more balanced pattern of investment in transport infrastructure. Investment in one province will increasingly have spillover effects on other provinces (see chapter 17 by Bai and Lin; Luo 2005). In addition, as China’s growth becomes driven relatively more by growth in domestic consumption and services and less by external demand, highway investment in the central provinces will exert both a push and a pull effect on adjacent western and eastern provinces, and this may produce the best overall net economic effect (Luo 2004). In addition, while a relatively complete transport network has developed along the coastal areas, many of the western and some of the central provinces lack high-grade highway connections to each other and to the major eastern cities. Over the coming decades, the regional pattern of investment priorities is likely to involve a combination of the following: (1) eastern provinces: expand capacity where the volume of traffic warrants; (2) central provinces: complete network connectivity; and (3) western provinces: improve accessibility through a balanced investment program of expressways and lower classes of roads (World Bank 2007a).
Positive externalities within and across sectors have further intensified the concentration of activities. As the most developed coastal metropolitan areas move up the ladder into higher value-added services and high-technology industries, dispersion of labor-intensive activities remains limited within the coastal region (Catin, Luo, and Van Huffel 2005). Only a few industries have relocated to adjacent inland provinces, and some are attractive candidates, if there are no major agglomeration economies in being along the coast and if access to domestic consumer centers and lower cost structures become more important. Thus reducing local protective barriers and encouraging more regional integration will help to strengthen the spillover effects from the coast to the rest of the country, which are necessary to facilitate continued gains in productivity.

The disadvantages of being located in the remote interior may not always be a problem, and, ironically, globalization may well be a significant factor in expanding trade to Central Asia and Europe through the old silk route via the relatively poorer western provinces of Gansu and Xinjiang. Similarly, there is a noticeable increase in trade flows going into Southeast Asia via Guangxi and Yunnan due in part to the promotional efforts to integrate the Greater Mekong region (see chapter 6 by Rigg and Wittayapak). In fact, growth in exports along these border areas is expanding more rapidly than anywhere else, albeit from a relatively low base.

Pressures will also be high to address widening urban-rural disparities. Improving connectivity and encouraging spillover effects that provide more wage-based rural employment is the most attractive option. While designing policy reforms for rural and urban areas is often seen as separate exercises, sustainable institutional solutions may emerge from thinking about the problem in a more spatially neutral framework. For example, social welfare schemes that segregate rural and urban populations tend to accentuate differences and hamper financial sustainability.

Perhaps the major challenge, however, is managing the pace and nature of reforms in China’s hukou system, which are closely linked to policies governing rural and urban land use rights. No other measure is likely to have as significant an impact as liberalizing internal migration from rural to urban areas and from disadvantaged inland regions to the more dynamic commercial centers along the coast as well as the newly emerging inland commercial centers such as Chongqing and Wuhan.

The government’s policies have been generally consistent with this agenda, placing renewed emphasis on improving welfare in rural areas and dealing with the environmental concerns from rapid urbanization. Taken together, such initiatives will promote the agglomeration benefits from higher density, help to minimize the distance factor that impedes more efficient location of economic activity, and take down the divisions that limit factor mobility and discourage sustainable development outcomes. As discussed below, over time, location-specific disparities, as measured by social welfare indicators, will become less pronounced.

**Likely trends in inequality**

The key question facing policy makers is whether China can maintain rapid growth in a way that moderates existing inequalities. This is all the more important given the concern of the senior leadership for fostering a more “harmonious society,” which is a major objective of the current Five-Year Plan. Thus how will the above policies affect distribution of income across income groups and space? The links between growth and equity are complex. Sustained growth is likely to uplift the incomes of everyone—urban and rural, rich and poor—as has been the case thus far. But as impressive as this progress has been, it does not necessarily lead to a more equitable distribution of income. As noted, over the past quarter century, the Gini has been closely associated with movements in the ratio of urban-to-rural incomes and coastal-to-inland GDP per capita. Small differences in annual growth rates can lead to wide gaps over time. Take urban and rural income growth as an example. A 1 percent difference in the annual growth rate (4 percent for rural and 5 percent for urban)
compounded over 24 years will result in an increase in the urban-to-rural income ratio from 2.5 times to 3.2 times. If one ignores the fluctuations over time, that is roughly the change in the urban-to-rural income ratio during the period of 1980–2004.

In the future, inequality will very likely continue to rise. The reason, as observed by Kuznets in his seminal work, National Income and Its Composition (Kuznets 1941), is that, as a country develops and the population moves from lower-productivity agriculture to higher-productivity urban centers, this leads to a lengthy period of rising overall inequality as the share of the higher-paid urban workers increases relative to the less well-off rural population (Bourguignon 2008). But over time, as the rural population diminishes with migration, inequality begins to decline as the vast majority of the population becomes engaged in urban-based activities.

At this stage in China’s development, for the foreseeable future growth in productivity will remain higher in the industrial and service sectors than in agriculture due to specialization and agglomeration effects. China’s GDP growth rates, however, will likely decline somewhat from recent levels to a more sustainable 8–9 percent over the coming decade or two. The recent shift in the terms of trade between the industrial and primary sectors will reverse itself at some point or become a neutral factor in affecting intersectoral incomes. As a consequence, the urban-to-rural income ratio will feed into rising overall inequality as measured by the Gini. With appropriate policies, however, a plausible scenario could begin to reverse this trend:

- As a large continental economy (similar to the United States), domestic demand will eventually play a more dominant role than trade as China develops. Industries, starting probably with those that are more “footloose” and geared to the domestic market, may choose to locate more inland to optimize their cost-profit structure and better respond to consumers in the major population centers in the central provinces. Once the economic mass in inland areas reaches a critical threshold, centripetal and centrifugal forces may work in favor of the emerging new economic centers and eventually lead to a narrowing of inland-coastal differences.
- Current policies that emphasize a more balanced approach in building a “more harmonious society” may redistribute resources in favor of more social services for less-developed areas and poorer segments of the population. Implementation of appropriate fiscal and regional policies will influence the emergence of new economic centers, but in ways consistent with shifting comparative advantages and market forces.
- Migration will become a powerful force in shaping development and influencing distribution. Movement of labor, typically from rural to urban and inland to coastal areas, contributes to overall income growth. On the one hand, it provides coastal and urban areas with a flexible labor supply at reasonable costs; on the other hand, it augments the availability of land and other resources for those staying in rural farming areas, while generating higher incomes for migrants (Zhu and Luo 2008). Although the impact of migration on lowering the urban-to-rural income ratio may be uncertain—because this depends on the combined effects on migrants and non-migrants in sending areas and residents in receiving areas—migration is likely to reduce coastal-inland inequality by accelerating urbanization and increasing overall productivity.

How long will it take before the forces that moderate income inequality begin to make a difference? As the percentage of the population working in more productive jobs in urban areas becomes large enough, at some point the pattern of income divergence and inequality will have peaked and the Gini will begin trending downward. These processes take decades and perhaps even a generation to become significant if the experiences of developed countries are to be taken as a guide. We project that with good policies—freer internal migration, more redistributive
fiscal policies, and continued infrastructure investments to improve connectivity—the Gini will continue to rise over the next decade, peaking at around 48, but then begin to decline before 2020. With less effective policies, the Gini will continue to increase to well over 50 and may then level off, but it will not begin to decline even by 2020 (see figure 13.16). Either way it is important to realize that growth and spatial factors have a very slow impact on distributional outcomes. This does not mean that social and economic progress is not being made. With appropriate policies, all segments of society are likely to better off in the coming years. How China handles this complex set of issues will have profound implications for shaping the location of future activity and for determining its impact on social disparities and growth.

Notes
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1. The municipalities of Beijing, Tianjin, and Shanghai are not included in this analysis given their special fiscal situations.

2. In almost all countries, per capita social expenditures are higher for richer areas than for poorer and in urban areas than in rural. These can be explained not only by differences in the availability of local financing but also by differences in price indexes. Thus a degree of inequality is normal, but in China’s case, the disparities are unusually large.

3. Adjusted distance is defined as the “traveling distance” between the province in question and the economic centers along the coast, adjusted by the level of development of the transport network. Transport investments “shorten” the economic distance between the two provinces by reducing transportation costs. See Luo (2001, 2004).

4. For a comprehensive discussion of transport investment and its impact on development in China, see World Bank (2007a), which is the source of much of this discussion.

5. Rural inequality continues to be higher than urban inequality, although the rate of increase in urban inequality is becoming more significant.

6. A recent study based on household survey data of eight Chinese provinces in 1989–2004 (Luo and Zhu 2008) suggests that the most important factor explaining overall inequality is the differential returns to schooling and sector of employment; the increase in returns to education explains two-thirds of changes in household income in urban areas and one-sixth in rural areas.

7. See He and Kuijs (2007), who show that, with a more labor-intensive, service-led pattern of urban growth, urban-rural inequality will decline in the decades ahead as more migration allows productivity of those left behind in agriculture to increase.

References


The political economy of government policies toward regional inequality in China

Yang Yao

With its vast territory and rich geographic, economic, and social diversity as well as fast-changing institutional setting, China offers a valuable case study on economic geography. In particular, China’s regional patterns of economic development in the last half century have been closely tied to government policies. This paper examines how government policies have shaped and reshaped China’s patterns of regional development and how these policies have been linked with growth as well as other considerations.

China was an unevenly developed country when the People’s Republic was established in 1949. Industries were concentrated in the Yangtze River delta, the northeast, and a limited number of industrial pockets in inland provinces. The planning era drastically changed this picture by deliberately setting up new factories in inland provinces and moving existing factories from the east coast and the northeast to inland provinces. After reform and the “open-door” policy were introduced in the late 1970s, this model of balanced development was abandoned and replaced with one of uneven development. Exemplifying this model was the opening up of the coastal region through the creation of “special economic zones” and “coastal open cities.” Concurrent with this opening up was deep fiscal decentralization, which provided local governments with incentives to pursue economic growth. To a large extent, this model integrated the Chinese economy into the world market and drove China’s rapid economic growth. Its downside is equally obvious: China’s regional disparity has been rising steadily. Public pressures to reverse the trend have been building since the mid-1990s and have led to two significant recent policies, “Go West” (xibu da kaifa) and “Reviving the Northeast” (zhengxing dongbei), both aiming to achieve a more balanced model of regional development.

After reviewing some key facts about regional disparities, this paper seeks to answer the following questions: Why did the Chinese government choose the uneven development model in the 1980s? To what extent can the resulting policies be rationalized on the grounds of economic geography? To what extent were they successful? What factors—geography or government preferential policies—are more capable of explaining the superb record of growth of the coastal provinces? What factors, in addition to geography and the uneven development model, exacerbated China’s regional disparities? What are the prospects of the recent government policies aiming to achieve more balanced development? Are there any alternative ways to reduce regional disparities? And, if yes, what are they? These are difficult questions to answer. This paper does not seek to conclude the debate; rather, it tries to provide a basis for further discussion.

Regional disparities in China

Many studies have examined China’s regional disparities. This section gathers key second-hand statistics from the literature to provide a broad picture of regional disparities since the founding of the People’s Republic of China.
Convergence and divergence in historical perspective

Démurger and others (2002) provide a comprehensive study of China’s regional income inequality in the period of 1952–98. Figure 14.1 summarizes their results of σ-convergence among Chinese provinces based on the coefficient of variation (CV) of per capita GDP. The figure shows two sets of results, one with the municipalities of Beijing, Shanghai, and Tianjin and one without them. Because these three municipalities have much higher income than the other provinces, their inclusion results in much higher CVs. Both sets of results, however, follow the same pattern. Three periods of increased divergence are evident, all characterized by decentralization. The first one was in the Great Leap Forward period, the second was in the Cultural Revolution period, and the third started in the early 1980s and continues today. There were also three notable periods of declining divergence, all of which were associated with centralization or measures to correct the decentralization that preceded them. The first period (1952–56) was China’s First Five-Year Plan period, in which the central government controlled most of the government investment. The second period (1960–65) featured a great famine and subsequent economic adjustments and recentralization. The third period (1976–82) followed the Cultural Revolution and witnessed many measures to reverse the decline of the national economy.

Before the third period of increasing divergence began in the early 1980s, there was no clear trend of divergence and, except for the Great Leap Forward period, the CVs were relatively low when the three big cities are excluded from the calculation. In contrast, there has been a steady trend of divergence since the early 1980s.

Figure 14.2 extends the two series of data to the period of 1999–2006. An interesting finding is that the trend of divergence stopped for both series, and the one with all the provinces even exhibited a weak trend of convergence, indicating that the three large municipalities were growing more slowly than other provinces in this time period. The Go West policy was initiated in 1999. Was it a coincidence that income divergence began to stabilize after this policy was implemented? This is an important question to which the paper returns later.

Consistent with this pattern of σ-convergence, β-convergence, or the (unconditional) convergence of growth rates, had distinct features in the three periods of time. Figure 14.3, also adopted from Démurger and others (2002), presents evidence for 1952–78. A strong trend of divergence clearly existed in that period; that is, provinces with higher...
initial per capita gross domestic product (GDP) tended to grow faster throughout the planning period. This result was obtained even when the Chinese government deliberately tried to spread industry evenly in the country. There were two significant waves of allocation and reallocation of industry to the inland areas. One was in the First Five-Year Plan period, when many of the major projects—notably the 156 projects aided by the Soviet Union—were allocated to inland provinces. The other was the 1960s, when new investment was concentrated in the so-called third front, and many factories were reallocated from coastal to inland provinces. The evidence in figure 14.3 shows that high-income provinces, mostly those on the east coast and in the northeast, continued to grow faster than the rest of the country, despite these two large-scale government efforts, indicating the strength of economic and geographic forces.

Figures 14.4 and 14.5 present evidence for the periods of 1978–98 and 1999–2006, respectively. Although neither period shows a sign of convergence, the trend of divergence is not as strong as shown in the data for 1952–78. It is even less evident in the more recent period of 1999–2006, a result that is consistent with the stabilized and even declining income disparities shown for this period in figure 2.

If we group the Chinese provinces into the three conventionally defined regions—coastal, central, and western—we can even see growth rates in the central and western regions catching up with growth rates in the coastal region. Table 14.1 shows the data. In the period of 1978–98, the average growth rate of the central and western regions was 81 and 77 percent, respectively, of that of the coastal region. However, in 1999–2006, the central region caught up with the coastal region, and the western region substantially narrowed its gap to only 7.7 percent of the coastal region’s growth rate. In recent years, there have been complaints that the central region has been neglected by the central government and is sinking into a valley in China’s economic landscape. In 2006 these complaints led the government to call for development of the central region. However, the data provided in table 14.1 show that the
central region has not been sinking; instead, it has accelerated its catch-up with the coastal region and has widened its distance from the western region (the growth rate of the western region was 95 percent of the growth rate of the central region in 1978–98, but fell to 91 percent in 1999–2006).

This analysis is simple but shows that China’s regional disparities have passed through a dynamic and complicated process. The bottom line is that the divergence of growth rates was not as serious in the reform era as in the planning era. The planning era had smaller degrees of income disparities only because the level of income was low to begin with. The continuing divergence of income growth rates had already begun to set the stage for the divergence of the level of income, which finally showed up in the reform period. The diverging growth rates in the planning era were not likely to be a consequence of government policies, though. Rather, the establishment of the People’s Republic provided a relatively stable economic environment (with little political turmoil), which enabled the advanced regions to unleash their growth potential (Perkins 2005). Economic reform and the open-door policy, viewed from a historical perspective, are not the likely causes of the growing regional disparities in the last quarter century. The signs of both the σ-convergence and (unconditional) β-convergence, especially among China’s three regions since 1999, are encouraging. The question is the extent to which positive signs can be attributed to government policies, especially the Go West campaign, which aims to reduce regional disparities. It is also possible that the Chinese economy was not ready to converge until the late 1990s. Empirical research finds that there exists a hurdle for convergence to happen both internationally (Durlauf and Johnson 1995) and domestically (Peng, Wang, and Wu 2007). Perhaps China was only able to overcome that hurdle in the late 1990s.

Regional or urban-rural divide?

The urban-rural divide has been much more serious than the regional divide in China. In 2006 per capita urban disposable income was 3.14 times per capita rural net income, the highest in the world. This large gap is not a new phenomenon; it was already 2.78 times when China embarked on its reform and open-door policy in 1978. Except for a brief decline to 1.8 times in the early half of the 1980s due to institutional reforms implemented in the countryside and another period of smaller declines in the early 1990s due to higher agricultural prices, the gap has been growing for the past 30 some years.

The most significant regional regularity about the urban-rural divide is that higher-income provinces have lower urban-rural income gaps. Figure 14.6 shows the relationship between per capita GDP and the urban-rural divide for Chinese provinces in 1999 and 2006. Beijing, Shanghai, and Tianjin are excluded because their urbanization rates are very high. There clearly exists an inverse relationship between per capita GDP and the urban-rural income gap. This should be obvious even to a casual observer traveling on Chinese highways. In coastal regions, modern houses dot the densely populated countryside along any highway; in western regions, a 20-minute drive out of any major city encounters sheer poverty.

Table 14.2 provides a sharp contrast between the three richest provinces (Guangdong, Jiangsu, and Zhejiang) and the three poorest provinces (Gansu, Guizhou, and Yunnan) for 2006. Per capita GDP of the three richest provinces was 3.62 times that of the three poorest provinces. However, per capita urban disposable income of the three richest provinces was only 1.72 times that of the three poorest. In contrast, per capita rural net income of the three richest provinces was 2.86 times that of the three poorest. The urban-rural income gap was 2.65 times for the three richest provinces, but 4.41 times for the three poorest provinces.

<table>
<thead>
<tr>
<th>Year and indicator</th>
<th>1978–98</th>
<th>1999–2006</th>
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<tbody>
<tr>
<td>Average growth rate</td>
<td>9.4</td>
<td>10.1</td>
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<tr>
<td>Central and western as a percent of coastal</td>
<td>7.6</td>
<td>10.3</td>
</tr>
<tr>
<td>Average growth rate</td>
<td>7.2</td>
<td>9.3</td>
</tr>
<tr>
<td>Central and western as a percent of coastal</td>
<td>77.0</td>
<td>92.3</td>
</tr>
</tbody>
</table>

Table 14.3 presents a rough estimation for the share of the urban-rural divide in the regional divide using data for 2005. It presents two sets of data: one actual and the other simulated. The simulation assumes that the central and western regions had the coastal region’s urban-rural income ratio and recalculates rural income leaving urban income unchanged. Using the ratio of urban population as the weight, this yields the simulated average income for the central and western regions. Table 14.3 shows that the income gap between the coastal and the central region would decline from the actual 1.8 times to 1.68 times, a drop of 6.8 percent, and the gap between the coastal and the western region would decline from the actual 2.22 times to 1.91 times, a drop of 13.8 percent.

A more precise estimation is provided by Gajwani, Kanbur, and Zhang (2006), who show that the urban-rural divide has played a much larger role than the regional divide in determining China’s interprovincial inequality. Using data from Table 14.1, Figure 14.7 shows the change in interprovincial inequality measured by the Gini coefficient and the general entropy (GE) index for the period 1952–2004. The two series parallel each other. Following a decline between the mid-1970s and early 1980s, both the Gini and the GE increased dramatically during the last quarter century. However, the urban-rural divide by and large has been the dominant factor in determining interprovincial inequality (see Figure 14.8). The contribution of the coastal-inland divide was minimal before the reform started but has increased substantially since then, except for a brief decline in the early 1990s. In the meantime, the contribution of the urban-rural divide decreased. However, its contribution remained at 72 percent in 2004, while the contribution of the coastal-inland divide was only 11 percent.

In summary, the larger urban-rural divide in inland provinces is an important, if not a decisive, factor in the regional divide. This is not to deny the significance of the regional divide; rather, the real gap exists between the coast and the interior—that is, between the countryside of the two regions.
Government policies to raise rural income in inland provinces are likely to have a large impact on lowering regional inequality.

**The path to the uneven development model**

The model of uneven development was adopted after 1978 in a conscious pursuit of economic growth. This started with establishment of the “growth consensus,” which was based on the painful lessons learned in the Chinese encounters with the Western powers, the socialist world’s lagging behind the capitalist world, and the destructive forces of the political movements in China’s history. The uneven development model was a deliberate choice based on market principles, notably those implied by economic geography. Central to the model is the priority given to the coast, characterized by several waves of preferential policies in the 1980s. This section reviews the formation of and rationale for the uneven development model and the various waves of preferential treatment given to the coast. The emphasis is on the alignment of government policies with economic geography and the tradeoff between the opening of the coast and the need to generate stable government revenues.

**The growth consensus**

Since the Opium War, several generations of Chinese leaders have sought to build a strong China. The painful lesson learned from China’s encounters with the Western powers in the 1800s was that, without economic power, China would be vulnerable to pressures. Unfortunately, economic growth was interrupted by civil wars and the Japanese invasion. The establishment of the People’s Republic gave China a chance to concentrate on economic growth, but the dream was shattered again and again by political movements, one wave higher than the other. Pragmatic leadership was restored with the ascension of Deng Xiaoping in the late 1970s, giving China a chance to pursue its century-long dream of economic prosperity. Fortunately, China did not miss this chance and was able to maintain an average growth rate of 9.7 percent for the next 30 some years. The growth consensus was firmly established and maintained throughout these years.

This consensus has its roots not only in history but also in contemporary thought. Socialism centered on state ownership was once thought to be the key to higher rates of economic growth, but the competition between the socialist and the capitalist worlds provided decisive evidence that this version of socialism could not outperform capitalism (Nee and Lian 1994). The fast growth of the four East Asian Tigers was a particularly painful fact for the Chinese leadership to swallow. Every piece of evidence showed that China had to introduce some elements of capitalism if it hoped to catch up economically with the developed nations. However, the introduction of capitalism
threatened the orthodox ideology of the Communist Party. To win support within the party, Deng Xiaoping initiated a nationwide debate at the end of 1978. The debate was not directed to the question of whether to have more markets; rather it was framed as a philosophical discussion about the sources of truth. This proved to be a wise political strategy, as it posed the question as a classic Marxist issue, preempting the objection of party conservatives to the debate. The conclusion of the debate was that there could be only one source of truth, which was practice, opening a door for experiments and change. These changes would ultimately transform China. The leadership at the time was convinced that embracing the market was the only way for China to grow economically. To preempt the conservatives’ rebuff, Deng Xiaoping set the tone with the following simple words: “Do not debate.”

Today, however, many in China are concerned that the growth consensus has been overdone. Indeed, inequality, social justice, and environmental problems are mounting issues in today’s China, and the growth model deserves a reexamination. However, it is worth keeping in mind that the growth consensus propelled the country on its remarkable path.

**Economic and political rationales for the uneven development model**

The uneven development model was a natural result of China’s decision to enter the market economy. The first steps entailed creating special economic zones (SEZs) in Shantao, Shenzhen, Xiamen, and Zhuhai, all located on the southern coast. The SEZs were designated “to experiment with the development of an outward-looking, market-oriented economic system and to serve the country as a ‘window’ and a ‘base’ along these lines” (Ge 1999: 49). That is, the uneven development model sought to experiment with a market-based system from the very start. Reinforcing this idea was the gradient theory (tīdū lìlùn) put forward in the early 1980s, which distinguished China’s three major regions (coastal, central, and western) as three ladders of economic growth. According to this theory, growth should start in the coastal region and gradually expand first to the central region and then to the western region (Wang and Hu 1999). This model was formally adopted by the government’s Seventh Five-Year Plan, which started in 1986 (State Council 1986). In the late 1980s, a more radical theory named “big inputs, big exports” (dàjìn dàchù) was put forward, which called for China’s coastal region to participate in the world market via processing trade. Those theories provided a strong case for the government to concentrate its investment in the coastal region. When put into practice, they were reinforced by fiscal decentralization, which gave provinces unprecedented fiscal autonomy. The result, as we all know, was rapid economic growth coupled with large regional disparities. But before discussing the consequences, let us step back and discuss the economic and political rationale behind the uneven development model.

The economic rationale has a lot to do with the geographic advantages of the coastal region: access to international markets, historical traits, cultural proxy to overseas Chinese communities, and the concentration of large cities.

In terms of the access to international markets, China’s coastal region has the advantage not only of transportation, but also of close proximity to Hong Kong, a dynamic and free-trade city second only to Tokyo in East Asia. For a long time, Hong Kong has been an important window for Chinese exports. Guangdong is the largest exporter in mainland China, accounting for 30 percent of China’s total exports, and 60 percent of its exports are routed through Hong Kong (Yang 2006). This means that 18 percent of the mainland’s exports are routed through Hong Kong (Yang 2006). This means that 18 percent of the mainland’s exports are routed through Hong Kong. In accordance, 60–70 percent of Hong Kong’s GDP is tied to exports from the mainland (Yao and others 2006). Since one of the major aims of the uneven development model is to experiment with a market-oriented system, learning from Hong Kong became a convenient route toward that goal. The influence of Hong Kong was the most evident in the initial stage of Shenzhen’s astonishing transformation from a fishing village to a major city with a large population of several million. Deng Xiaoping’s idea of creating an SEZ in
Shenzhen was intended to open a window for Hong Kong’s influence to slip gradually into the mainland. For the first quarter century of existence, Shenzhen lived up to Deng’s expectations and was a champion for economic reform, new ideas, and new forms of governance, although its advantages have diminished in recent years.

History matters a lot in the divergence of the Chinese provinces. The Chinese civilization started in the middle reach of the Yellow River in the Loess plateau and gradually moved east to the lower reach of the river in the Song dynasty. The invasion of the northern tribes forced the Song dynasty to move its capital to Hangzhou. The move was decisive, as it enabled China to move its economic center from the north to the more fertile south. The encounters with the Western powers in the 1800s added another advantage to the southern and eastern coasts: access to international markets through the treaty ports connecting China to the outside world. The most significant development was Shanghai’s emergence as the most dynamic city in the Far East. Since the early 1900s, Shanghai has been China’s economic powerhouse.

The cultural ties with overseas Chinese communities have been a valuable asset for development of the coast. The early wave of overseas Chinese came from a few regions in Fujian and Guangdong provinces. They brought back a large amount of investment in the early reform era. Indeed, until the late 1990s, half of China’s foreign direct investment (FDI) came from overseas Chinese. By the late 1990s, several other sources of investment became significant: the investment brought back by new emigrants from Zhejiang province, the investment brought by Singaporean businesses to Jiangsu province, and the investment brought by Taiwanese businesses to areas around Shanghai. Jiangsu’s becoming the second-largest exporter in China had a lot to do with this new wave of FDI.

Finally, the concentration of large cities enabled the coastal region to achieve economies of agglomeration. Empirical research finds evidence in China to support the claims of the new economic geography (for example, Chen and Wang 2007; Lu and Tao 2007).

The three large municipalities—Beijing, Shanghai, and Tianjin—are all located on the eastern coast; Guangzhou, the fourth-largest city in China today, is located on the southern coast; and Shenyang, the fifth-largest city, is close to the sea in the northeast. In fact, the Chinese economy is heavily concentrated in three regions centered on those big cities: the Pearl River delta, the Yangtze River delta, and the Bohai Bay area formed by Beijing, Shenyang, Tangshan, and Tianjin.

The political rationale was the need to achieve a balance between reform experiments and a stable flow of tax revenue. Reform experiments were politically risky, as failure risked a backlash from the conservatives. To make sure that the experiments were successful, the central government implemented a set of fiscal policies. On the one hand, it gave experimenting provinces preferential policies, which granted them more flexibility and helped them to attract FDI and other investments. On the other hand, through fiscal contracting, it provided them with strong fiscal incentives and gave the central government tight control over the nonexperimenting provinces. The next section is devoted to a discussion of the preferential policies. This section provides a review of the fiscal contracting system implemented in the 1980s.

The fiscal relationship between the central and local governments was not settled until the 1994 tax reform. Several rounds of centralization and decentralization occurred during the planning period. The fiscal contracting system was inspired by the model implemented in the decentralization period of 1959–67 (Wei 2000). Contracting was inspired by the success of the rural reform, which was famous for its village-household contracting of land. The central government negotiated different contracts with individual provinces, and no two contracts were identical. Generally, there were five types of contracts (Wei 2000):

- The first type of contract was offered to the two provinces on the frontier of the open-door policy, namely, Fujian and Guangdong. They had to hand in a fixed amount of revenue to the central government and were allowed to keep the

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- The first type of contract was offered to the two provinces on the frontier of the open-door policy, namely, Fujian and Guangdong. They had to hand in a fixed amount of revenue to the central government and were allowed to keep the...
rest for their own budget. Later, Fujian received a fixed amount of transfers from the central government each year.

- The second type of contract was offered to Jiangsu, which shared revenue with the central government according to a formula that was fixed for four years.

- The third type of contract was offered to 15 provinces, which received a fixed base payment and then shared a fixed percentage of revenue growth with the central government.

- The fourth, and most favorable, type of contract was for eight minority and border provinces, which received a fixed amount of transfers from the central government.

- The fifth type of contract was offered to the three large municipalities, Beijing, Shanghai, and Tianjin. These three cities retained the smallest proportion of revenue according to a formula that was adjusted every year.

These five types of contracts can be regrouped into two broader types, one with fixed payments to or subsidies from the central government and one with a marginal sharing mechanism. Almost all of the western provinces had fixed-payment contracts, with each receiving a fixed amount of subsidies from the central government. Fujian and Guangdong were the only two coastal provinces that had this type of contract. All of the other provinces or cities had sharing contracts. According to the tenancy theory, fixed-payment contracts provide relatively strong incentives to the contractor, while sharing contracts provide relatively weak incentives. The political goal here was for the two leading reform provinces—Fujian and Guangdong—to have a strong incentive to move forward, for the western provinces to balance their budgets (most of them had deficits), and for the rest of the provinces to contribute to the central budget in a progressive way.

The three large municipalities and Jiangsu were taxed the heaviest. Beijing’s retention rate was only 28.1 percent in 1980, although this was raised to 50 percent by 1988, where it remained until the 1994 tax reform. Tianjin started with 30.6 percent in 1980, and this was stabilized at 46.5 percent in 1988. Jiangsu’s retention rates were more stable, starting with 39 percent in 1980 and ending with 41 percent in 1988 (Wei 2000).

The case of Shanghai is especially interesting. In 1984 Shanghai contributed 5.6 percent to the national GDP and 9.6 percent to the gross value of national industrial output, while its population was barely more than 1 percent of the national total (Ge 1999). Because of its significance in the national economy, Shanghai had the worst contract with the central government. Its retention rate was merely 8.6 percent in 1980 and was only raised to 26 percent in 1985. Starting in 1988, Shanghai began to pay a fixed amount of Y 10.5 billion to the central government each year. For comparison, Guangdong’s highest fixed payment to the central government was Y 14.1 billion. Although it was made one of the 14 coastal open cities in 1984, Shanghai still got the most unfavorable deal with the central government. The contrast between Shanghai and Guangdong shows clearly that the central government was seeking to pursue reform while ensuring a continuous flow of tax revenues.

Roland and Verdier (2003) believe that one of the keys to China’s successful transition is the adoption of a “reform at the margin” approach, by which the state sector was left intact to provide revenues to the government, while the private sector was allowed to expand. The same logic applies to China’s uneven regional development strategy, which allowed a few frontrunner provinces to experiment and grow quickly, while holding back other provinces for the sake of tax revenues.

Preferential government policies and economic geography

The uneven development model was carried out by a series of preferential policies toward the coast. This started as a shift of central government investment away from inland provinces and toward coastal provinces through direct allocations and fiscal arrangements. This was followed by creation of the SEZs and coastal open cities, which institutionalized a set of preferential policies toward the coastal region. Finally, tax breaks for FDI benefited the coast, which...
was the largest recipient of FDI. However, it is not clear whether government policies or geography played a more important role in encouraging growth in the coastal region. In the 1990s, preferential government policies were extended to inland provinces. This gives us a chance to disentangle government policies from geography in determining regional variations in economic growth.

**Investment shifts and reduced interregional fiscal sharing**

The planning era witnessed the central government’s intentional shift of investment to inland provinces. In the reform period, there was a shift back to the coast and a decline in interregional fiscal transfers.

Changes in investment since the 1980s are shown in table 14.4, which compares four periods, 1953–78, 1979–91, 1993–98, and 1999–2005, by the share of the coastal, central, and western regions in the central government’s investment. While it was already the largest recipient of central government investment in the period of 1953–78, the coastal region became even more favorable in the initial reform period of 1979–91, receiving more than half of total central government investment, an increase of 14 percentage points over the earlier period. In contrast, the shares of both the central and western regions declined significantly, the central by 5.74 percentage points and the western by 8.26 percentage points. In terms of absolute value, the contrast is even starker. The investment received by the coastal region increased more than 200 percent, but that of the central and western regions increased only 89 and 55 percent, respectively. In 1979–91, the coastal region’s share was 1.9 and 2.9 times that of the central and western regions, respectively. The coastal region clearly dominated central government investment in the 1980s.

The share of the central and western regions increased slightly in the period of 1993–98, while the share of the coastal region declined. However, the trends were reversed in the subsequent period of 1999–2005. The share of the central region declined substantially, while the share of the western region remained almost unchanged. In the meantime, the coastal region recovered almost the entire share it had lost in the previous period. As a result, the distribution resembled that of the period of 1979–91.

Concurrent with the decline in equality in central government investment in the 1980s was the decline in fiscal sharing among the three regions. This is clearly shown in table 14.5, which presents the trends in fiscal transfers between 1953 and 2005. The coastal and central regions’ net contribution to the central government budget increased until 1976, but declined thereafter, until the 1993 tax reform reversed the trend. The reform significantly increased fiscal sharing among the three regions. By the period of 1999–2005, the contribution of the coastal region had recovered to close to the level of the period of 1976–80. Notably, the net gain of the central region became positive and reached almost the same level as that of the western region.

The coastal region’s dominance since the 1994 tax reform was more subtle. Fiscal decentralization in the 1980s was so deep that the central government’s share of tax revenues declined sharply from 25 percent in 1981 to 14 percent in 1994 (Wang and Hu 1999: fig. 6.7). The reform was intended to reverse this decline by strengthening the central government’s position. In the meantime, the government promised that poorer provinces would get more transfers through a predetermined formula based on provincial income and government revenues. While the first objective was obtained (currently,}

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Coastal</th>
<th>Central</th>
<th>Western</th>
</tr>
</thead>
<tbody>
<tr>
<td>1953–78</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Investment (billion yuan)</td>
<td>223.39</td>
<td>192.21</td>
<td>149.64</td>
</tr>
<tr>
<td>Percent of total</td>
<td>39.52</td>
<td>34.01</td>
<td>26.47</td>
</tr>
<tr>
<td>1979–91</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Investment (billion yuan)</td>
<td>686.28</td>
<td>362.42</td>
<td>233.83</td>
</tr>
<tr>
<td>Percent of total</td>
<td>53.52</td>
<td>28.26</td>
<td>18.22</td>
</tr>
<tr>
<td>Change over last period</td>
<td>14.00</td>
<td>−5.74</td>
<td>−8.26</td>
</tr>
<tr>
<td>1993–98</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Investment (billion yuan)</td>
<td>1,003.6</td>
<td>690.2</td>
<td>464.0</td>
</tr>
<tr>
<td>Percent of total</td>
<td>46.51</td>
<td>31.99</td>
<td>21.50</td>
</tr>
<tr>
<td>Change over last period</td>
<td>−7.01</td>
<td>3.72</td>
<td>3.28</td>
</tr>
<tr>
<td>1999–2005</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Investment (billion yuan)</td>
<td>4,696.7</td>
<td>2,255.1</td>
<td>1,820.4</td>
</tr>
<tr>
<td>Percent of total</td>
<td>52.94</td>
<td>25.42</td>
<td>21.65</td>
</tr>
<tr>
<td>Change over last period</td>
<td>6.43</td>
<td>−6.57</td>
<td>0.13</td>
</tr>
</tbody>
</table>

central government tax revenues are 60 percent of the national total), the second objective largely fell through. Instead, central government transfers have been relying largely on project financing. Provinces that need money from the central government must submit a proposal to the National Development and Reform Commission (NDRC) and the Ministry of Finance, among other central government agencies. Once a project is approved, NDRC and the Ministry of Finance require the province to match the central government’s contribution. This matching rule creates a field tilted in favor of coastal provinces, which are rich, and against inland provinces, which are much poorer. As a result, more central government revenues flow back to coastal provinces than to inland provinces.

**Government preferential policies**

Starting in 1980, China began to offer preferential policies to a few cities through various initiatives. In the 1980s, most of these initiatives only covered cities in the coastal region. After Deng Xiaoping’s visit to the south in 1992, inland provinces began to receive the benefits of opening up through the establishment of economic and technological development zones. The initiatives undertaken since 1980 include the following (Wang and Hu 1999):

- **Special economic zones.** Four SEZs were created in Shantou, Shenzhen, Xiamen, and Zhuhai in 1980. In 1988 Hainan Island was separated from Guangdong province and became the fifth SEZ. In 1992 Shanghai’s Pudong became the sixth SEZ.
- **Coastal open cities.** In 1984, 14 coastal cities were designated as coastal open cities, whose purpose was mainly to attract FDI through the establishment of economic and technological development zones (ETDZs).
- **Coastal economic open zones.** Between 1985 and 1988, five coastal economic open zones were created along the coast, covering all the major economic centers there.
- **Customs-free zones.** These were created between 1990 and 1993 along the coast.

In the 1990s economic opening spread to other regions through the creation of new open economic zones. These included major cities along the Yangtze River, border economic cooperation zones, capital cities of inland provinces and autonomous regions, ETDZs outside the coastal open cities, and bonded areas (see Démurger and others 2002). By the mid-1990s, opening finally spread to almost every corner of the country, and “zone fever” led to the establishment of numerous ETDZs and high-tech zones throughout the country. However, the number of ETDZs approved by the central government was limited. Even by the end of the 1990s, the distribution of special zones was tilted toward the coastal region (Démurger and others 2002).

These special zones received substantial preferential policy treatment, as summarized in table 14.6. These policies involved three types of preferential treatment: tax breaks, more freedom to approve FDI, and a larger retention rate of foreign exchange earnings. They provided substantial benefits to firms operating in the zones. This raises the question of whether the rapid development of the coastal region has been a result of economic forces including economic geography or a result of preferential government policies that arose because the zones were concentrated in the coastal region (Wang and Hu 1999). The next section turns to this question and tries to evaluate the roles played by government policies and geography in different periods since 1978.

### Table 14.5 Net transfers received from the central government, 1953–2005

<table>
<thead>
<tr>
<th>Time period</th>
<th>Coastal</th>
<th>Central</th>
<th>Western</th>
</tr>
</thead>
<tbody>
<tr>
<td>1953–57</td>
<td>-9.4</td>
<td>-1.4</td>
<td>7.6</td>
</tr>
<tr>
<td>1958–62</td>
<td>-15.6</td>
<td>-1.5</td>
<td>8.6</td>
</tr>
<tr>
<td>1963–65</td>
<td>-15.7</td>
<td>-4.2</td>
<td>9.1</td>
</tr>
<tr>
<td>1966–70</td>
<td>-20.2</td>
<td>-6.2</td>
<td>20.9</td>
</tr>
<tr>
<td>1971–75</td>
<td>-21.2</td>
<td>-4.1</td>
<td>15.2</td>
</tr>
<tr>
<td>1976–80</td>
<td>-20.5</td>
<td>-2.9</td>
<td>10.0</td>
</tr>
<tr>
<td>1981–85</td>
<td>-12.8</td>
<td>-1.2</td>
<td>12.2</td>
</tr>
<tr>
<td>1986–92</td>
<td>-4.0</td>
<td>-1.0</td>
<td>11.1</td>
</tr>
<tr>
<td>1984–98</td>
<td>-10.9</td>
<td>1.5</td>
<td>7.1</td>
</tr>
<tr>
<td>1999–2005</td>
<td>-17.8</td>
<td>10.1</td>
<td>11.4</td>
</tr>
</tbody>
</table>


a. Percentage of net transfers received from the central government in total central government budget. Net transfers equal transfers from the central government (including tax returns) minus taxes handed over from local governments to the center.
Policy versus geography

Démurger and others (2002) provide a comprehensive study of the factors determining China’s uneven economic development for the period of 1978–98. In particular, they examine the relative importance of preferential policies and geography in determining variations in growth across provinces. For that, they construct two variables, one measuring policy preferences and the other measuring geographic advantages. For the first, they create a preferential policy index, called Policy, based on the number of designated open zones in a province and the extent of preferential treatment they get. They then assign different weights to different zones according to the following rule:

- Weight = 3: SEZ or Shanghai Pudong New Area;
- Weight = 2: economic and technological development zone or border economic cooperation zone;
- Weight = 1: coastal open city, coastal economic open zone, open coastal belts, major city, bonded area, or capital city of an inland province or autonomous region; and
- Weight = 0: no open zone.

If a province (such as Guangdong) has one or more SEZs, it gets a score of 3 for its preferential policy index. That is, the value of the variable Policy does not increase when a province has more than one zone.

For geography, Démurger and her coauthors create a variable, Pop100cr, measuring a province’s ease in getting access to the sea. To be precise, it is “the proportion of the population distribution of a province in 1994 within 100 km [kilometers] of the coastline or ocean-navigable river[s], excluding the coastline above the winter extent of sea ice and the rivers that flow to this coastline” (Démurger and others 2002: 21). The correlation coefficient between Pop100cr and the average value of Policy in 1978–98 is 0.54. Therefore, the two variables have enough variations for us to disentangle the effects of geography and policy.

Using Pop100cr and the average scores of Policy for different periods and controlling initial per capita GDP, Démurger and her coauthors estimate separate growth equations for three periods: 1979–84, 1985–91, and 1992–98. The results are presented in the first three rows of table 14.7. The last row of the table presents results for the period 1999–2006. The Pop100cr variable is the same as in the first three regressions; Policy uses its values in 1998. Several relevant results emerge from the table.

First, there is no evidence for β-convergence among Chinese provinces. The coefficient for initial GDP is not statistically significant in any of the four periods.

Second, the role played by government policy has changed throughout the years. In the period 1985–91, the coefficient of Policy was significantly higher than in 1979–84. However, it became insignificant in 1992–98 and 1999–2006. That is, preferential
government policies were important in the 1980s, but not since the 1990s.

Third, the geography variable Pop100cr is statistically significant in the two expansionary periods of 1979–84 and 1992–98, but not in the less expansionary periods of 1985–91 and 1999–2006.4 The coastal region apparently has experienced more volatility than the other two regions: in expansionary periods, it moved ahead of the other two regions; in recessionary periods, it contracted more than the other two regions.

Fourth, the predictive power of the growth regression declines significantly for the period 1999–2006, with its $R^2$ decreasing to only 0.06. Neither geography nor government policy played a significant role in this period. This result is consistent with the data presented in table 14.1, which show that the growth rates of the central and western regions were catching up with the growth rate of the coastal regions in the period of 1999–2006. Some of this can be attributed to convergence, and some can be attributed to the diminishing role of government policies, but neither is significant enough to dominate.

In summary, we have the following two major conclusions. First, geography played a diverging role only in periods when the economy was on an expansionary track. This is a piece of evidence for the coastal region’s deeper integration into the world economy. Second, preferential government policies played a significantly diverging role in the 1980s but have since lost strength. This has been caused partly by the dispersion of preferential government policies to inland provinces in the 1990s. In 1991, the year before Deng Xiaoping’s visit to the south, the average score of Policy for the coastal region was 2.18, but the average score for the other two regions was 0.10. By 1998, however, the score had a small increase for the coastal region, reaching 2.36, but a large increase for the other two regions, reaching 1.50.

Recent government initiatives to reduce regional disparities

Beginning in the late 1990s, regional inequality caught the attention of the central government. This was partly related to the 1994 tax reform. One major consequence of the reform was to increase the central government’s share of government revenues. Less-developed provinces felt the pressure more than developed provinces because their budgets were smaller. The amount of formula-based revenue transfers did not increase to a level sufficient to counterbalance the inequality created. In the meantime, project-based revenue transfers worked against less-developed provinces. Less-developed provinces felt that they had been abandoned by the central government. The Go West policy, which was adopted in 1999, was an effort to respond to this sentiment. At the same time, the northeast, one of China’s old powerhouses, also experienced a sharp decline because of economic restructuring. Industries in the northeast were overwhelmingly state owned, resource based, and lacking new investment and research and development (R&D). In the new era of private economy and globalization, these industries lost their competitiveness and began an inevitable decline. A once glorious region became China’s backwater of stagnation and a source of social unrest. To revitalize the industrial bases in the northeast, the central government initiated the Reviving the Northeast program in 2003.

The central government set up a special office for each of the two programs, committed considerable amounts of financial resources, and offered them favorable policies. The positive responses from the central government, however, encouraged the central provinces to request preferential

Table 14.7 Policy versus geography: Regression results

<table>
<thead>
<tr>
<th>Period</th>
<th>Initial GDP</th>
<th>Pop100cr</th>
<th>Policy</th>
<th>$R^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>1979–84</td>
<td>−1.23</td>
<td>1.51</td>
<td>0.56</td>
<td>0.28</td>
</tr>
<tr>
<td>1985–91</td>
<td>−0.34</td>
<td>−0.64</td>
<td>1.19</td>
<td>0.38</td>
</tr>
<tr>
<td>1992–98</td>
<td>−0.60</td>
<td>2.42</td>
<td>0.99</td>
<td>0.71</td>
</tr>
<tr>
<td>1999–2006</td>
<td>0.52</td>
<td>0.51</td>
<td>−0.58</td>
<td>0.06</td>
</tr>
</tbody>
</table>


Note: The dependent variable is average growth rate (percent) of per capita GDP in each period. Regressions for 1979–84 are based on data for 30 provinces (Chongqing is excluded); regression for 1999–2006 is based on data for all 31 provinces. Initial GDP is the logarithm of per capita GDP of the year immediately before each period started. Numbers in parentheses are $t$-statistics for the estimates.
treatment. A theory of “the falling central” was developed, which believes that, while the east is forging ahead as a result of geographic and policy advantages and the west and the northeast are getting preferential policies and money from the central government, the central provinces (Anhui, Henan, Hubei, Hunan, Jiangxi, and Shanxi) do not get anything from the central government and thus are falling behind. The central provinces have used this argument to request support from the central government. In April 2006 the central government, in its tenth directive of 2006, pledged to give the central provinces more support and to set up an office in the NDRC to lead the efforts.

This section reviews these three initiatives and comments on their merits and shortcomings. In particular, it seeks to find the political economy logic behind the central government’s regional policies.

Go West
The main purpose of the Go West program is to support infrastructural construction and environmental protection. Between 2000 and 2005, 70 main construction projects were started, and the total amount of investment reached Y 1 trillion. More than one-third of the funds raised by long-term government bonds for construction were directed toward the western region during this period, and the percentage exceeded 40 percent from 2002 to 2005. About 220,000 kilometers of new roads were built in the region in the six years of 2000–05, among which 6,853 kilometers were highways. In addition, 5,000 kilometers of railways were built, and 10 airports were under construction. Among these projects, some, such as the Qinghai-Tibet Railway, West-East Power Transmission Project, and West-East Natural Gas Pipeline Project, have become national landmarks.

Environmental conservation is an important part of the Go West program. The “Land for Forest” and “Land for Grass” programs were introduced to restore the ecosystem. Under the Land for Forest program, 5.26 million hectares of cultivated land were converted to forest. In addition, about 16 million hectares of land suffering from water and soil losses were controlled, and 28 million hectares of land’s natural ecosystem were restored. New trees were planted on some 7.65 million hectares of wasteland. Under the Land for Grass program, 19.33 million hectares of grassland were restored.

The Land for Forest and Land for Grass programs displaced a large number of farmers from agriculture. The central government started various complementary programs to help displaced farmers find alternative employment. For the transitional period, displaced farmers were eligible for a subsidy of Y 20 for each mu (one-fifteenth of a hectare) of land converted back to forest. In 2007, the subsidy was raised to Y 105 in the south and Y 70 in the north (State Council 2007).

The Go West program also allocates money to support social development in the western region. Investment in education in this region amounted to Y 15 billion, and investment in public health services reached Y 8 billion in the six-year period of 2000–05.5

In addition to financial resources, the central government gives the western region a variety of preferential policies to attract FDI and domestic and foreign companies to construct infrastructure and environmentally friendly businesses. They include:6

- For domestic and foreign companies engaged in industries promoted by the central government, the rate of corporate income tax is 15 percent for a designated period of time.
- In minority autonomous regions, corporate income tax can be reduced or exempted after getting approval from the provincial government.
- For new companies in transportation, power supply, water conservation, postal services, and radio and television services, corporate income tax can be exempted or reduced for 3 years.
- In old revolutionary bases, minority regions, remote border areas, and poverty regions designated by the central government, corporate income tax can be exempted or reduced for 3 years, subject to government approval.
- For agricultural cash products covered by the Land for Forest and Land for Grass...
programs, the agricultural cash crop tax is exempted for 10 years.\textsuperscript{7}

- Road construction is exempted from land occupation tax subject to approval by the provincial government.
- For companies engaged in government-promoted industries, imported equipment for self use are exempted from tariffs and import value added tax.

Table 14.8 compares the western region and the country in some key economic and social indicators for the period of 2000–05. Road construction and telecommunications users grew faster in the western region than in the nation as a whole, reflecting the emphasis of the Go West program on infrastructural construction. In addition, the Land for Forest and the Land for Grass programs also paid off because the western region lost arable land and gained forest more quickly than the nation as a whole. In the same period of time, population in the western region declined 0.6 percent. This decline probably was a result of large-scale migration from the west to the east. Lastly, the western region’s growth rates for other indicators were comparable to those of the nation as a whole.

The Go West program seems to have fulfilled its primary goals of providing infrastructure, conserving the environment, and improving social development in the western region. While the last two achievements should be applauded in their own right, the first needs to be evaluated against the primary purpose—economic growth—it was meant to serve. In this regard, we do not have adequate data to provide a conclusive answer.

**Reviving the Northeast**

The Reviving the Northeast program seeks to revive the industrial potential of key cities and facilitate a smooth economic transition. The decline of the northeast as one of China’s powerhouses was a result of several concurrent factors.

The first was the declining efficiency of state ownership. The northeast lagged behind the rest of China in privatizing its state-owned enterprises (Garnaut and others 2005). This, in turn, was a result of its relative superiority before the mid-1990s. The performance of the region’s state-owned enterprises in the 1980s and early 1990s was relatively good, and people working for them enjoyed relatively high income. However, the emergence of the private economy in the southern and eastern parts of China since the mid-1990s has posed a serious challenge to the state-owned enterprises, resulting in declining profitability. In the eastern and southern parts of the country, privatization was relatively easy because a viable private sector was ready to absorb the redundant workers released from state-owned enterprises. In the northeast, however, the task was much harder because there were fewer employment opportunities outside the state sector. Therefore, having a

<table>
<thead>
<tr>
<th>Indicator</th>
<th>2000 Western</th>
<th>2005 Western</th>
<th>2000 National</th>
<th>2005 National</th>
<th>Growth rate\textsuperscript{b}</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population (million)</td>
<td>362</td>
<td>1,267</td>
<td>360</td>
<td>1,306</td>
<td>[–0.6] [3.1]</td>
</tr>
<tr>
<td>Arable land (million hectares)</td>
<td>4,846</td>
<td>12,824</td>
<td>4,503</td>
<td>12,208</td>
<td>[–7.1] [–4.8]</td>
</tr>
<tr>
<td>GDP (billion yuan)</td>
<td>1,665.5</td>
<td>9,720.9</td>
<td>3,349.3</td>
<td>19,779.9</td>
<td>11.3 [11.9]</td>
</tr>
<tr>
<td>Per capita GDP (yuan)</td>
<td>4,624</td>
<td>7,766</td>
<td>9,180</td>
<td>15,386</td>
<td>14.7 [14.7]</td>
</tr>
<tr>
<td>Railroads (kilometers)</td>
<td>22,109</td>
<td>58,656</td>
<td>27,594</td>
<td>75,438</td>
<td>[24.8] [28.6]</td>
</tr>
<tr>
<td>Paved roads (kilometers)</td>
<td>553,874</td>
<td>1,402,698</td>
<td>780,339</td>
<td>1,930,543</td>
<td>[40.9] [37.6]</td>
</tr>
<tr>
<td>Highways (kilometers)</td>
<td>3,677</td>
<td>16,314</td>
<td>30,530</td>
<td>41,005</td>
<td>22.4 [20.2]</td>
</tr>
<tr>
<td>Number of airports</td>
<td>58</td>
<td>121</td>
<td>166</td>
<td>142</td>
<td>[13.8] [17.4]</td>
</tr>
<tr>
<td>Landline phone subscribers (million)</td>
<td>2,525</td>
<td>14,463</td>
<td>7,030</td>
<td>35,045</td>
<td>21.8 [19.3]</td>
</tr>
<tr>
<td>Mobile phone subscribers (million)</td>
<td>1,382</td>
<td>8,453</td>
<td>8,012</td>
<td>39,341</td>
<td>42.1 [36.0]</td>
</tr>
<tr>
<td>Middle school students (million)</td>
<td>1,834</td>
<td>7,369</td>
<td>2,354</td>
<td>8,581</td>
<td>5.1 [3.1]</td>
</tr>
<tr>
<td>Hospital beds (thousand)</td>
<td>830</td>
<td>3,177</td>
<td>877</td>
<td>3,351</td>
<td>[5.7] [5.5]</td>
</tr>
</tbody>
</table>

Source: Statistical yearbooks of various provinces.

a. Figures for “western” are aggregated on all the provinces in the western region. For comparison purposes, figures for “national” are aggregated on all the provinces in the country. Growth rates are based on comparable prices. Other financial figures are based on current prices.

b. Most figures are annual growth rates, but those in square brackets are accumulative growth rates in 2000–05.
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strong state economy became a curse for the northeast.

The second factor was related to the northeast's industrial structure. Many cities in the region were dependent on a single resource such as coal or crude oil. The "resource curse" had real bite. Most cities were not prepared for the depletion of these resources. As a result, many cities suffered from massive unemployment in the mid-1990s. For example, Fuxin, a coal mining city, had an unemployment rate of 40 percent in the early 2000s (Garnaut and others 2005). Another deficiency of the industrial structure was that the economy was dependent on heavy manufacturing. This did not appear to be a problem when economic planning was in place and orders were secured, but it became increasingly problematic when the market became the primary tool of resource allocation. The dependence on heavy industry slowed the process of privatization in the northeast. The development in the east and south, especially the industrialization of their rural areas, was closely tied to their advantages in light industry. Private firms are mostly small and lack capital in their early years. They are more suitable to producing consumer goods than intermediate inputs. In the eastern and southern parts of the country, such firms benefited from technological spillovers from the existing state sector (Lin and Yao 2001). The dominance of heavy industry in the northeast prevented this kind of spillover from happening, retarding the process of privatization. In addition, state-owned enterprises in heavy industry are difficult to privatize because they are much larger in both capital stock and employment.

The third factor was related to the inferior technology in the northeast. This was actually tied to the first two factors. Because the profitability of the state-owned enterprises was declining and the industrial structure was inadequate, technological upgrading in the northeast has been very slow.

Notwithstanding these weaknesses, the northeast has rich stocks of human capital and technological know-how that, if used properly, could serve as the base for its revival. The Reviving the Northeast program acknowledges this potential. Large amounts of central government money have been invested in the program. According to the Office of the Leading Group for Reviving the Northeast Old Industrial Bases (2005), in 2004 alone the central government:

- Pledged Y 108.9 billion of government bonds for 297 projects in industrial structural adjustments and revitalization of old factories. By the end of 2004, Y 880 million had been disbursed;
- Provided Y 560 million to support the commercialization of key high-tech projects;
- Pledged Y 3.43 billion of government bonds for projects related to agriculture, forestry, and water conservation;
- Gave Y 5.31 billion to support the abolition of agricultural taxes;
- Arranged Y 2.02 billion for key road construction projects and Y 2.2 billion for rural road construction;
- Subsidized Y 1.82 billion to convert the old pension scheme to a new pension scheme;
- Provided Y 2.75 billion for the settlement of redundant workers in state-owned enterprises;
- Invested Y 4.05 billion in the rehabilitation of 15 coal mining areas; and
- Gave Y 1.3 billion to settle redundant workers in the petroleum industry.

The heavy investment has paid off in some respects, but it has not reversed the decline of the northeast in the national economy. An official report of the Office of the Leading Group for Reviving the Northeast Old Bases (2007) finds that the share of the three northeastern provinces (Helongjiang, Jilin, and Liaoning) in national GDP was 9.6, 9.3, 8.7, and 8.6 percent in 2003, 2004, 2005, and 2006, respectively. Their gap with Guangdong grew wider in these four years. In 2003 the sum of the three provinces' GDP was only 80.3 percent of Guangdong's GDP. The share declined further to 77.1, 76.6, and 58.3 in 2004, 2005, and 2006, respectively. The same report finds that the economy in the northeast is still dominated by state ownership. In 2006 state-owned and state-controlled enterprises contributed 35.7 percent of the total industrial value added in the
country, but 53, 63, and 86 percent in Liaoning, Jilin, and Helongjiang, respectively.

In addition, the industrial structure has not changed. The total profit of enterprises with an annual sales volume larger than Y 5 million was Y 191.1 billion for the three provinces. This is a remarkable increase of 22.5 percent over the year before, but still 8.5 percentage points shy of the national rate. Most important, 74.7 percent of the profit was contributed by central government–owned petroleum and natural gas companies. Indeed, except for a limited number of resource-based sectors such as petroleum, natural gas, steel, transportation equipment, power generation, and utility supply, other sectors were barely making money. The oil refinement and nuclear power sector, the largest sector in the northeast, lost Y 14.5 billion and Y 19.3 billion in 2005 and 2006, respectively.

Finally, the banking system is siphoning money out of the region, while the central government is pumping money into it. Since 2004, more than Y 10 million have been diverted by the banking system out of the region each year, and the total amount diverted during this period reached Y 858.1 billion by the end of 2006. The banking system diverts money out of the region because investments in other parts of the country can bring better returns than investments in the northeast. Thus the question of whether direct government investments can do better than private investments warrants serious consideration.

Central Rising program

The huge amounts of central money pledged to the west and the northeast were the envy of other provinces. The plea made by the central region was especially appealing politically. Although there is no evidence that the central region was failing (see table 14.1 for counter-evidence), there is a strong political case for the central government to provide support to provinces in the region. In April 2006, the Central Committee of the CCP and the State Council (2006) issued a joint directive to launch the zhongbu jueqi, or Central Rising program. This directive indicates nine areas for improvement: articulation of overall objectives and principles, promotion of the construction of the Socialist New Countryside, optimization and upgrading of industrial structures, enhancement of transportation advantages, promotion of the development of urban clusters and county economies, efforts to deepen the opening up, efforts to accelerate social development, promotion of sustainable development, and strengthening of the leadership. Although the details of the program have not been worked out, this program has a broader mandate than the other two programs, placing more weight on continuous development of the central region.

The political logic of regional development programs

The economic rationale for the three regional development programs varies, but the political case for all of them is strong.

The Go West program has lofty goals, but is a relatively modest program. It does not aim to narrow the gap between the west and the east; rather, it aims to restore the region’s ecological balance, preserve the environment, and build better infrastructure. This is a much-needed program because China’s western region is environmentally fragile and experiencing serious ecological challenges. It was named da-kai-fa—big development—for the sake of political viability. The true aims of the program are considered to be too conservative to receive support in the western provinces and too limited to soothe the dissenting voices opposed to enlarging the gaps between east and west.

In comparison, the Reviving the Northeast program is socially driven more than economically and environmentally motivated. While it is right to help the northeast in transforming its ailing industrial structure, the program tends to ignore the real impediments to growth in the northeast, which are rigid mind-set, poor incentive structure, and overwhelming state dominance of the economy. There is a danger that the influx of money from the central government will disguise the consequences of these impediments. To catch up, the northeast needs to adapt the reforms taken by the south and east coast. The central government should facilitate the transition in the northeast instead of trying to keep ailing
enterprises afloat. However, caution is needed in drawing attention to the weaknesses that have prevented the northeast from catching up with the coastal regions because doing so puts the blame on local governments. The Reviving the Northeast program is a benefit the central government gives the northeast to win local support.

Likewise, the Central Rising program is a response to regional pressures. The central government has already pledged money to some of the key areas for improvement. For example, Y 200 billion has been allocated to the Socialist New Countryside for each year of the Eleventh Five-Year Plan spanning from 2006 to 2010. While the spread of preferential treatment to regions other than the coast may narrow the gap between the coast and other regions, the gaps among the other regions are likely to remain and even expand. There is a “race to the bottom” effect in the competition for central government money, in which every province compares itself with the worst-performing province and is ready to ask for more central government support. The effects of preferential treatment then cancel each other out and may fail to rebalance regional development.

Alternative ways to address regional disparities

The previous section shows that other considerations are as prominent as economic considerations in reducing regional inequality in the three major government programs, although the Go West program is more practical than the other two. This section discusses some alternative ways to address regional disparities. It does not provide an exhaustive list of the alternatives; rather, it concentrates on three areas where policy changes could bring significant results. These three areas are migration and urbanization policy, fiscal policy, and investment policy.

Migration policy

China’s migration policy has long been criticized for its lack of efficiency as well as its violation of people’s basic economic rights. Since it was instituted soon after the great famine of 1959–62, the hukou, or resident registration, system has served as the major barrier preventing people from moving from the countryside to the city, from one village to another, and from one city to another. The fast growth of the coastal region since the early 1990s, however, has drawn a large number of migrants from the central and western regions. These migrants, now estimated at 140 million, have become an indispensable part of the growth of the coastal region. Yet it has taken more than 10 years, and sometimes political heat, for the government to acknowledge migrants’ rights to move freely about the country. The hukou system is still the major obstacle preventing migrants from settling freely in a place of their choosing. While most of the restrictions, such as no movement across county or city borders, and the benefits, such as free housing and food subsidies, associated with hukou have been reduced, hukou still holds significant implications in two important areas (Bhide and Yao 2007; Yao 2001).

The first area is providing more political representation to migrants in the recipient city. The right to political representation is important because it instills a sense of responsibility—not necessarily accountability—on the part of local government officials to include migrants in their calculations. Without hukou, migrants are often regarded as “outsiders” who only stay for short periods of time and whose welfare can rightly be ignored. For example, local urban residents can be qualified for dibao, the low-income maintenance program, but migrants cannot. Local governments need to worry about the employment of local residents, but not about the employment of migrants.

The second area is the education of migrant children. It used to be very expensive for migrants to send their children to local public schools, and migrants opted to set up their own schools. However, the schools faced constant harassment from local governments because they were not licensed. Starting in 2003, the situation began to improve. Fees charged on migrant students were lowered, and many migrant schools were licensed by the local governments. However, migrant students cannot take the college entrance exams in the
Recipient province because each province has a quota for college admission. This severely limits a migrant family’s future in the city. Migrants with children in high school have to return to their home province if they want their children to receive a higher education.

The restrictions put on migration are closely linked with China’s urbanization policy. While large urbanized areas are emerging along the east coast, the government is still averse to population concentration. Local governments of large cities all have population caps. For example, Beijing’s population is capped at 19 million by 2020, a target many experts believe will be exceeded.

Yet migration may be one of the most effective ways to neutralize regional disparities. In a simulation study, Whalley and Zhang (2004) find that eliminating hukou could lower regional income inequality. The intuition is a straightforward application of the law of one price: free movement of labor tends to equalize the wage rates in different regions. Although in reality the effect may not be as strong as the simulation predicts, allowing people of inland provinces to settle permanently in the coastal region would relieve some of the environmental stress widely observed in inland provinces.

The coastal provinces will certainly need to confront the problems caused by population concentration. But precisely because of concentration, many of those problems are easier to solve than when they happen in a dispersed area. For example, waste treatment is cheaper when the quantities are larger. Other issues can also be handled with proper urban design and government policies. Cities like Tokyo and New York provide good examples of big-city management for China.

Fiscal policy

China’s fiscal system provides incentives to local governments that exacerbate regional disparities. This happens through two mechanisms at the central and local levels, respectively.

At the central level, there is no properly designed and enforced revenue transfer scheme. There is a formula-based transfer scheme, but the money allocated to it is limited. Instead, the central government relies heavily on project-based transfers, which invariably favor rich provinces. As a result, investments by the central government often exacerbate regional inequality rather than narrow it. This seemingly unwise result has a sound political economy basis. The formula-based scheme does not allow the central government to provide selective favors to certain provinces or regions, whereas the project-based scheme gives the central government considerable discretion to exchange favors with select provinces. To the extent that they allocate money via projects, the programs that aim to narrow the regional gaps have the same logic.

At the provincial level, Zhang (2005) demonstrates forcefully that the current fiscal arrangements hurt poor provinces. As he puts it in the summary of his paper,

Regions initially endowed with a broader nonfarm tax base do not need to rely heavily on new and existing firms to finance public goods provision, which creates a healthy investment environment in support of nonfarm sector growth. In contrast, local governments in regions where agriculture is the major economic activity spend the majority of their resources on their own operating costs, leaving little for public investment. Because of the relatively high transaction costs associated with collecting taxes from the agricultural sector, local governments tend to levy the existing nonfarm sector heavily, thereby greatly inhibiting its growth. As a result, regional differences in economic structures and fiscal dependent burdens may translate into widening gaps in equality.

Table 14.9 shows that inland provinces tax their farmers more heavily than coastal provinces, although the overall tax burden is about the same level in all three regions. Since inland provinces have higher shares of agricultural GDP, the consequences of this skewed distribution of the tax burden cannot be underestimated.

In combination with inland provinces’ heavier tax burdens, extending the central government’s preferential tax policies to inland provinces would likely do more harm than good. These policies almost always promise to cut the corporate income tax. For existing firms, the corporate income tax is a 100 percent local tax; for new firms, it is split
evenly between the central and provincial governments. As provincial government officials like to say, “The central government invites the guests, but provinces end up paying the bill.” This is fine with rich provinces but becomes a burden for poor provinces that are financially constrained. Western provinces often opt not to extend preferential tax policies to enterprises, which invites the inevitable complaints from businesses (CPDF 2004).

A better approach to addressing regional disparities is to strengthen formula-based revenue transfers. Although this ties the central government’s hands, it also creates tangible benefits. One benefit is that it allows the central government to address regional disparities in a more equitable and less distortionary way. It is more equitable because poorer provinces automatically get more transfers from the central government; it is less distorting because it does not introduce selective incentives to the economy. Another benefit is that it preempts local governments’ demands for special favors, which makes the central government’s life easier.

However, the central government may not want to adopt this approach precisely because it ties its hands. As in other cases, political will is needed.

**Investment policy**

Even though the central government insists on project-based fiscal transfers, there are better ways to conduct projects. Zhang and Fan (2000) study the contributions of different public investments to reducing regional income inequality for the period of 1978–95. Table 14.10, adopted from table 14.6, reports their estimates for the marginal contribution of different public investments to regional inequality for the western, central, and eastern regions. All the investments in the coastal and central regions increase inequality, although the contribution of investments in the central region is minimal. All the investments in the western region reduce inequality. Investments in education and irrigation have very large effects on agricultural GDP; investments in education and telephones have very large effects on rural nonagricultural GDP; and investments in education and telephones have very large effects on total rural GDP. It is notewor-

### Table 14.9 Composite tax rates of inland and coastal regions

<table>
<thead>
<tr>
<th>Year and region</th>
<th>Per capita GDP (current yuan)</th>
<th>Agricultural tax rate (percent)</th>
<th>Overall tax burden (percent)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1994 National</td>
<td>3,849</td>
<td>2.14</td>
<td>10.55</td>
</tr>
<tr>
<td>Coastal region</td>
<td>5,262</td>
<td>2.16</td>
<td>10.53</td>
</tr>
<tr>
<td>Inland region</td>
<td>2,773</td>
<td>2.78</td>
<td>9.58</td>
</tr>
<tr>
<td>2000 National</td>
<td>7,077</td>
<td>2.33</td>
<td>12.62</td>
</tr>
<tr>
<td>Coastal region</td>
<td>10,578</td>
<td>1.61</td>
<td>11.40</td>
</tr>
<tr>
<td>Inland region</td>
<td>5,670</td>
<td>2.73</td>
<td>9.91</td>
</tr>
<tr>
<td>2005 National</td>
<td>14,002</td>
<td>0.25</td>
<td>16.67</td>
</tr>
<tr>
<td>Coastal region</td>
<td>21,426</td>
<td>0.16</td>
<td>14.81</td>
</tr>
<tr>
<td>Inland region</td>
<td>11,070</td>
<td>0.34</td>
<td>12.62</td>
</tr>
</tbody>
</table>

**Table 14.10 Marginal contribution of public investments to regional income inequality**

<table>
<thead>
<tr>
<th>Type of GDP and investment</th>
<th>Coastal</th>
<th>Central</th>
<th>Western</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agricultural GDP</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Roads</td>
<td>0.004</td>
<td>0.003</td>
<td>-0.005</td>
</tr>
<tr>
<td>Education</td>
<td>0.137</td>
<td>0.086</td>
<td>-0.221</td>
</tr>
<tr>
<td>Electricity</td>
<td>0.022</td>
<td>0.014</td>
<td>-0.033</td>
</tr>
<tr>
<td>Telephones</td>
<td>0.043</td>
<td>0.027</td>
<td>-0.088</td>
</tr>
<tr>
<td>Irrigation</td>
<td>0.127</td>
<td>0.080</td>
<td>-0.204</td>
</tr>
<tr>
<td>Agricultural R&amp;D</td>
<td>0.018</td>
<td>0.011</td>
<td>-0.027</td>
</tr>
<tr>
<td>Rural nonagricultural GDP</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Roads</td>
<td>0.033</td>
<td>0.002</td>
<td>-0.036</td>
</tr>
<tr>
<td>Education</td>
<td>0.251</td>
<td>0.018</td>
<td>-0.268</td>
</tr>
<tr>
<td>Electricity</td>
<td>0.064</td>
<td>0.004</td>
<td>-0.068</td>
</tr>
<tr>
<td>Telephones</td>
<td>0.129</td>
<td>0.009</td>
<td>-0.138</td>
</tr>
<tr>
<td>Total rural GDP</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Roads</td>
<td>0.018</td>
<td>0.009</td>
<td>-0.028</td>
</tr>
<tr>
<td>Education</td>
<td>0.185</td>
<td>0.093</td>
<td>-0.277</td>
</tr>
<tr>
<td>Electricity</td>
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<td>0.021</td>
<td>-0.062</td>
</tr>
<tr>
<td>Telephones</td>
<td>0.084</td>
<td>0.042</td>
<td>-0.125</td>
</tr>
<tr>
<td>Irrigation</td>
<td>0.052</td>
<td>0.026</td>
<td>-0.078</td>
</tr>
<tr>
<td>Agricultural R&amp;D</td>
<td>0.007</td>
<td>0.003</td>
<td>-0.010</td>
</tr>
</tbody>
</table>


Note: Inequality is measured by logarithmic variance of each type of GDP among the provinces. Figures are percentage changes of inequality as a result of a 1 percent increase in individual types of public investment.
inequality. A more detailed study is provided by Fan and Chan-Kang (2005), who find that high-quality roads do not help to reduce poverty, but that low-quality and rural roads have a significant effect. This result makes sense because poor people have few chances to use highways, and more rely on local roads for their production and commercial activities.

The results provided by Fan and Chan-Kang (2005), Fan, Zhang, and Zhang (2002), and Zhang and Fan (2000) may not be conclusive, but at least they show the merits of identifying better ways of investing public resources to reduce regional inequality. Chinese officials tend to conduct large-scale projects, such as building highways, and give lower priority to long-term investments, such as in education. The aforementioned studies have shown that a more balanced approach is needed.

Conclusions
This paper has reviewed regional income inequality in China and discussed the political economy behind China's uneven development model and its recent programs aiming to reduce regional inequality. These reforms have several facets. First, the uneven development model seeks to explore the geographic advantages offered by China's coastal region. Second, the Go West program aims to preserve the environment and improve economic and social infrastructure in the western region, but the Reviving the Northeast and the Central Rising programs are driven as much by non-economic as by economic considerations. Third, there are often more efficient approaches to addressing regional inequality, but they are less likely to be implemented precisely because government decisions are often driven by factors other than efficiency considerations.

The driving force behind Chinese central-regional politics is the “selective favor exchanges” by which the central government retains large discretionary power in distributing government revenues and the provincial governments bargain for favors and give regional support in return. But such decisions are not limited to China, although they may take a different form in other administrative systems.

Notes
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1. Construction of the third front started when China split from the Soviet Union and the Vietnam War began to escalate. The Chinese leadership sensed that a war was looming and believed that the country should be prepared for it. The country was then divided into three strategic fronts: the coast and border area was the first front; the hinterland was the third front; and between them was the second front (Wei 2000).

2. In an interesting paper, Banerjee, Duflo, and Qian (2005) find that the distance to the nearest treaty port still has predictive power for a county’s contemporary growth rates.

3. Before 1994, China had a dual-track system for its exchange rate regime. The central bank set an official exchange rate, and the Shanghai foreign exchange swap market generated a market exchange rate. Domestic firms had to buy foreign currencies if they imported inputs beyond the government plan. Therefore, a higher retention rate saved firms’ money that could be used to import inputs.

4. The period 1985–91 included 1989 and the slowdown years that followed; the period 1999–2006 included years of major deflation.

5. If not otherwise indicated, data used in this subsection all come from the Office of the Leading Group for Western Region Development (2006).


7. This policy lost its effect after the central government abolished all kinds of agricultural taxes in 2006.

8. Fan, Zhang, and Zhang (2002) provide another study for a longer period of time (1952–97) and obtain similar results.

References


Central Committee of the CCP (Communist Party of China) and the State Council. 2006.


In the past 30 years of reform and opening up, China has enjoyed unprecedented economic growth in the context of globalization, industrialization, and urbanization. When China became fully integrated into the global economy, this populous country joined the global production system, bringing not only vast, cheap, and high-quality labor but also great market demand. China’s integration has reshaped the global and, especially, the Asian industrial map. At the same time, China’s manufacturing industry has become concentrated along the east coast and urban areas. Industrial agglomeration has been beneficial for China’s economic growth, but it also has given rise to interregional and urban-rural disparities.

Because income disparities are disadvantageous for sustainable economic growth, China has been trying to balance interregional and urban-rural development by means of fiscal transfers. Despite the wisdom of the strategy, China’s government is unduly dependent on fiscal transfers to achieve interregional and urban-rural balanced development. Fiscal transfers alone cannot keep interregional and urban-rural gaps from expanding further. To achieve this, the Chinese government will have to adjust its policy measures to integrate the interregional market, promote the agglomeration of labor resources to coastal and urban areas, and direct more investment to human capital and infrastructure in lagging and rural areas.

In China, when considering the relationship between interregional, urban-rural balanced development and sustainable economic growth, we have to introduce a spatial perspective and take into account the role of the spatial agglomeration of economic activities. This chapter uses panel data at the provincial and city levels to describe industrial agglomeration in China. Generally speaking, cities achieve increasingly strong industrial agglomeration effects and scale economies. The chapter finds that industrial agglomeration in China is indeed accompanied by the widening of interregional and urban-rural gaps, which may exert a negative influence on economic growth and social harmony. To achieve balanced development while maintaining sustainable economic growth is a great challenge facing the Chinese government.

In the second part of this chapter, we present the trend of industrial agglomeration, use panel data at the provincial level to elaborate the interrelationships among industrial agglomeration, urbanization, and globalization, and use panel data at the city level to show the positive effects of scale on industrial growth. The third part shows the changes in interregional and urban-rural gaps as well as the negative influences of income disparity on economic and social development. The fourth part discusses the adjustment process of interregional and urban-rural development policy from a historical perspective and examines adjustments in fiscal transfers of the central government and their influence on regional development. The fifth section concludes.
Industrial agglomeration and city development

Traditional economic growth theory does not stress the importance of space, whereas new economic geography models consider the economies of scale brought about by the spatial agglomeration of economic activities to be an important driver of economic growth. As economic activities and population are increasingly concentrated in large cities, economic development will secure scale economies in at least three areas. The first is sharing. Producers can acquire extensive supplies of inputs from a wider scope of suppliers, which could reduce average production costs as the scale of production increases. At the same time, the sharing of inputs encourages suppliers to provide highly specialized products and services to meet the demand. The second is matching. In a large market, enterprises are more likely to employ workers with special skills, helping companies to meet specific market demands. Meanwhile, having many potential employers and employees in the same location makes it easier to match them efficiently. The third is learning. Spatial agglomeration can accelerate the spillover of knowledge and make it easier for employees and entrepreneurs to learn from one another (Gill and Kharas 2007).

Before China’s reform and opening up in 1978, many of China’s industries were located in inland areas as a result of a strategy of balancing regional economic development with military strategy. Since 1978, market forces have dominated economic development and industrial layout, with agglomeration occurring toward the east coast, especially the Yangtze River delta and the Pearl River delta. This provides an excellent case in which to examine the interplay of economic development, industrial agglomeration, and city development.

Industrial agglomeration in globalization and industrialization

Until the early years of reform and opening up in 1978, China’s industrial layout was geographically scattered:

- A few coastal and middle provinces accounted for a relatively small proportion—below 4 percent—of national industrial output.
- Three provinces in northeastern China played an important role, with Liaoning ranking top in national industrial share. Gansu and Shaanxi, which are two western and inland areas of China, accounted for more than 2 percent of national industry, surpassing that of some middle and eastern provinces.
- Beijing, Shanghai, and Tianjin covered very small areas, but their industrial shares were larger than those of many other provinces (Chen, Jin, and Lu 2006).

Figure 15.1 divides China’s provinces into coastal and inland provinces and depicts the share of each province in national industrial gross domestic product (GDP) from 1987 to 2005. Comparing the data for 2005 with the data for 1987 shows significant industrial agglomeration in China. To be more specific, during this time period:

- Industrial shares of coastal areas increased remarkably, with the top four provinces—Guangdong, Shandong, Jiangsu, and Zhejiang—accounting for 12.27, 11.20, 10.93, and 7.43 percent, respectively, in 2005.
- The industrial status of three northeastern provinces decreased noticeably, with the industrial share of Liaoning, Heilongjiang, and Jilin decreasing to 4.09, 3.16, and 1.60 percent, respectively.
- The industrial share of western provinces decreased on the whole.
- The industrial share of the four autonomous municipalities decreased distinctly, with that of Shanghai decreasing to 4.83 percent, Tianjin to 2.21 percent, Beijing to 2.0 percent, and Chongqing to 1.2 percent.

Industrial agglomeration showed other patterns as well. In 1987 only 2 provinces (Jiangsu and Liaoning) had more than 8 percent and 13 had less than 2 percent of industrial shares. In 2005 3 had more than 8 percent, and 14 had less than 2 percent. During the same period of time, 11 provinces increased their industrial share, including 7 coastal provinces, while 18 provinces decreased their industrial share, including 13 inland provinces. In the coastal areas, all
except the 3 autonomous municipalities of Beijing, Shanghai, and Tianjin and the provinces of Guangxi and Liaoning increased their industrial share. Provinces lost industrial share for various reasons: 3 autonomous municipalities were entering the post-industrialization period, Liaoning was part of a regional decline in northeastern China, and Guangxi lost industrial shares to its neighboring province Guangdong. Although Guangxi is a coastal province, its economy is relatively backward and thus an object of China’s “Go West” policy.

Changes in industrial share were accompanied by the movement of labor, especially redundant labor in rural areas, to the southeastern coastal areas. As indicated by an analysis of census data, labor flowed to the provinces that increased their industrial share (see Ding, Liu, and Cheng 2005). Therefore, changes in industrial share reflect the trend of industrial agglomeration rather than differences in industrial growth across regions. Lu and Tao (2006) use data at the industry level to calculate the Ellison-Glaeser index between 1998 and 2003. They find that regional industrial agglomeration in China was still rising during this period. Inland cities are far from coastal lines of transportation, which increases the costs of transportation, but labor costs are relatively low. Therefore, products suitable for inland production include staples, such as coal, that are carried by train or ship, or products with high added value, such as computer chips, that are transported by plane (Gill and Khara 2007).

Is industrial growth in these areas related to globalization and urbanization? To answer this question, we use provincial panel data and find that both economic opening up and urbanization enhance industrial agglomeration, while economic opening up is related to geographic location and initial degree of openness. At the same time, we also find that larger market size, improved transportation and telecommunications infrastructure, and weaker government intervention in a province are beneficial for industrial agglomeration (Chen, Jin, and Lu 2006). Figures 15.2 and 15.3 depict the relationship between the degree of globalization and urbanization and the level of industrial development.

Globalization is mainly the opening of commodity markets and capital markets. Both opening of capital markets as measured by per capita foreign direct investment (FDI) and opening of commodity markets as measured by dependence on international trade indicate that coastal areas have a higher degree of openness than inland areas and that globalization is the most important factor contributing to interregional income disparities (Wan, Lu, and Chen 2007). Does economic opening have something to do with industrial growth? To answer this question, we compare data for 1987, 1994, 2000, and 2005. In figure 15.2, the horizontal axis

![Figure 15.1 Industrial share in China, by province, 1987, 1995, and 2005](attachment:image.png)

Note: Beijing is counted as a coastal area. Provinces are sorted in ascending order in coastal and inland areas, respectively, according their industrial shares in 2005.
represents the proportion of import and export volume in GDP—that is, the international trade dependence ratio—of a specific province, the vertical axis represents the industrial growth rate of the province, and the width of the circles represents per capita GDP. By comparison, we find that the relationship between economic openness and industrial growth followed an inverse-U curve in 1987, 1994, and 2000, with most provinces located in the left half of the curve. This indicates that the phase of openness is beneficial for industrial growth. In these three years, the trade-related sector squeezed industrial growth when the degree of openness was too high. However, the curve for 2005 indicates that the relationship between economic openness and industrial growth sloped to the northeast. In other words, the higher economic openness is, the stronger is the effect of economic openness on industrial growth.

Industrial agglomeration and scale economy in cities
Urbanization supports industrial growth mainly due to economies of scale. To elaborate the relationship between scale effect in city development and industrial agglomeration, we use data at the city level to examine the relationship between per capita GDP and industrial share. The higher per capita GDP is, the larger is the local market, and the more beneficial this is for industrial agglomeration. However, when per capita GDP exceeds a certain level, the share of service industry is higher, and the city’s economy may enter the


Note: Weighted by GDP per capita. The equations of the fitted lines are $y = -0.0223x^2 + 0.9852x + 11.007 (R^2 = 0.9998)$ for 1987, $y = 0.0012x^2 - 0.1168x + 18.588 (R^2 = 0.9913)$ for 1994, $y = -0.0007x^2 + 0.1178x + 10.799 (R^2 = 0.0576)$ for 2000, and $y = 0.0003x^2 - 0.0245x + 21.142 (R^2 = 0.0104)$ for 2005.

a. Ratio of import and export volume to GDP.
Is China sacrificing growth when balancing interregional and urban-rural development?

post-industrialization phase, which means that industrial shares may decrease instead. A typical example is Shanghai, which has always been the country’s top city in share of industry; however, Shanghai’s industrial share first ascended and then descended as the city entered the post-industrialization era. In 1997 the value of its service industry in total production surpassed 50 percent for the first time. In 2006 its service industry provided more than half of employment opportunities for the first time.3

In figure 15.4, the horizontal axis represents per capita GDP in a city, while the vertical axis represents the industrial share of this city in the value of national industrial production. We present the data for 1991, 1995, 2000, and 2005 in a scatter diagram and add quadratic lines. Observing and comparing the figures for these four years, we find that (a) on the whole, the higher per capita GDP is in a city, the higher is its industrial share (although we add quadratic lines, very few sample cities appear on the right half of the inverse-U curve), and (b) with the elapse of time, the turning point of the quadratic curve moves to the right. For 2000 and 2005, the quadratic curves are substantially closer to the upward trend line. That is to say, with the elapse of time, economic development and market volume measured by per capita GDP became more and more beneficial for further industrial agglomeration. Moreover, in this period of 15 years, the goodness of fit of the lines increased from 0.2552 to 0.3678, 0.4628, and 0.4435. In other words, per capita GDP in a city has stronger explanatory powers for industrial agglomeration in recent years than in earlier years.

Figure 15.3 Urbanization and industrial growth in China, 1987–2005
Graphs by year

Note: Weighted by per capita GDP. In the data, the urbanization ratio in Shanghai in 2005 (point located in the most right position) was even lower than it was in 2000. This is because of a substantial increase in the number of rural population. The equations of the fitted lines are $y = 0.1028x + 13.039$ ($R^2 = 0.0878$) for 1987, $y = 0.1286x + 24.543$ ($R^2 = 0.0915$) for 1994, $y = 0.0546x + 10.126$ ($R^2 = 0.0407$) for 2000, and $y = 0.0884x + 17.262$ ($R^2 = 0.0134$) for 2005.
If scale economies are beneficial for industrial agglomeration and growth, then, in a city with a given area, enhancing a city’s population density should improve labor productivity, as shown in figure 15.5. More notably, except for 1995, an inverse-U curve appears for the relationship between population density and per capita GDP, and most cities are found in the left half, which means that, to maximize per capita GDP, cities could have their own optimal scale. In other words, during this period a great number of cities in China were suffering productivity losses as a result of their small scale. Econometric analysis indicates that 51 to 62 percent of the cities in China have unduly small scale. In typical cities, losses caused by small scale account for 17 percent of the average output of employees, and cities in which losses reach 25 to 70 percent of the average output account for a fourth of all the sample cities. As the services industry continues to grow, diversifying the service input in production chains will become increasingly important. At the same time, the scale effects of economic agglomeration on economic growth will also become more and more important, and the optimal scale of cities will become bigger and bigger (Au and Henderson 2006a, 2006b). Although a congestion effect will appear in the process of city expansion, it could be alleviated with improved transportation, environment, and security, which, in turn, would promote city development on a larger scale.

Due to the obstacles to labor flow and interregional market segmentation, industrial agglomeration in China has been far slower than possible and, indeed, necessary. Compared with Western countries, industrial agglomeration in China is still rather low (Lu and Tao 2006). Differences in scale among Chinese cities are much smaller than differences among cities in other countries (Fujita and others 2004). Lack of spatial agglomeration of population results in the inefficient use of land; this is especially evident in China. Since the mid-1990s, 338 big cities around the country have expanded their downtown area from 16,000 square kilometers to 25,000 square kilometers, with an increase rate of 60 percent. In the same period, population in the downtown area of these same cities increased from 0.27 billion to 0.3 billion, including migrant workers, with a growth rate of only 10 percent. The expansion rate of area is six times that of the population (Yan and Jiang 2007). Inefficient
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Use of land makes it difficult to improve the quality of life and to increase the amount of resources per capita in lagging areas. Worse still, if the population in inland areas cannot agglomerate toward coastal areas, migrants will move toward cities in inland areas. And once an unreasonable pattern of land use is formed, it will be very difficult to change.

China’s urban-rural and interregional development: is there a tradeoff between efficiency and equality?

To understand the relationship between China’s economic growth and income inequality, a spatial perspective is absolutely necessary. Correspondingly, if policy aims to balance urban-rural and interregional development, it is necessary to pay attention to the positive effect of spatial agglomeration on economic growth. Nevertheless, it is very important to balance interregional and urban-rural development with sustainable economic growth. In this section, we discuss the relationship between income disparities and economic growth.

Growth at the cost of interregional and urban-rural inequality

Numerous studies have indicated that interregional and urban-rural income disparities are the two major contributors to national income disparities (Kanbur and Zhang 1999; Khan and Riskin 1998; Li 2003; World Bank 1997; Yang 1999; Yao and Zhu 1998; Zhao and others 1999), while detailed analysis of income disparities shows that interregional disparity itself has something to do with China’s vast urban-rural income disparities (Hussain, Lanjouw, and Stern 1994; Kanbur and Zhang 1999; Tsui 1993). The recent decomposition of inequality shows that 70 to 80 percent of interregional income disparity is contributed by urban-rural income disparity (Wan 2007).

Figure 15.6 indicates that urban-rural income disparity narrowed in the early 1980s mainly because rural reform raised the income of rural dwellers. Thereafter, this ratio widened, before dropping again after 1994, when the government raised the purchase price of agricultural products. But since 1997, urban-rural income disparity has been growing. Although the government...
has made great efforts to treat the problems affecting agriculture, peasants, and rural areas—for example, the agricultural tax exemption and subsidy for grain-planting peasants—the gap is still expanding.

Figure 15.6 also indicates that the interregional gap is generally expanding and that changes in interregional income disparity are very similar to changes in urban-rural income disparity. In the existing research, interregional disparity in China arose for the following reasons:

- Preferential policies in which coastal areas benefitted from deregulation, which promoted economic openness and marketization, improving their ability to compete in global markets and to absorb more FDI (Démurger and others 2002; Wan, Lu, and Chen 2007);
- Unbalanced development of private economies and township-and-village enterprises (Rozzelle 1994; Wan 1998; Wan, Lu, and Chen 2007);
- Fiscal transfers in favor of eastern areas (Ma and Yu 2003; Raiser 1998);
- Differences in infrastructure in different areas (Démurger 2001);
- Industrial agglomeration toward coastal areas, especially the Yangtze River delta, Pearl River delta, and Bohai Bay area (Chen and others 2007; Lu and Chen 2006; Wen 2004).

A report by the World Bank (1996) argues that, although disparities are increasing because of policy bias in trade and investment, the fundamental reason is that comparative advantages of different areas in China were inhibited before the reform and favorable policies granted to coastal areas after the reform have brought interregional comparative advantages into play. In the process of opening up, the inflow of foreign capital and the development of an export-oriented economy began to create interregional comparative advantages. Our decomposition of interregional income disparities shows that per capita FDI and trade dependence have jointly become the most important among nine contributors to interregional income disparities (Wan, Lu, and Chen 2007).

Of all the elements affecting interregional disparities in the literature, the most essential is the difference in geography and policies, while others are more likely manifestations of disparities in interregional development. Geographic advantages and preferential policies are the major reasons for the current pattern of industrial agglomeration.

**Income disparities and sustainable growth**

Spatial agglomeration and regional comparative advantages enhance efficiency but also exacerbate interregional and urban-rural income disparities. However, income inequality itself might be detrimental to social harmony and economic growth. Most existing studies find that widening income disparities will have a negative influence on economic growth by reducing the accumulation of physical and human capital. In recent years, some literature using data from China has studied the influence of income disparities on economic growth. Ravallion (1998) uses survey data for rural areas in China and finds that inequality of wealth has a negative effect on the growth of consumption per capita at both the family and the
village levels. Benjamin, Brandt, and Giles (2004) use panel data at the village level in China and find no evidence that income disparities block economic growth, but they do find, in the long run, a negative relationship between them. In our own study based on provincial panel data, we introduce the polynomial inverse lag (PIL) framework, which allows us to measure the impacts of inequality on investment, education, and ultimately on growth at precisely defined time lags. Combining PIL with simultaneous systems of equations, we analyze the relationship between inequality and growth in post-reform China, finding that this relationship is nonlinear and negative, irrespective of time horizon (Wan, Lu, and Chen 2006).

The ratio of urban-rural income per capita, a proxy of inequality at the provincial level, has an effect on investment, education, and economic growth. A ratio of urban-rural income that is one unit higher will have a negative cumulative influence on investment, proxied by the ratio of investment to GDP, but a positive cumulative influence on education, proxied by per capita schooling. Higher urban-rural income disparities will have a lasting negative influence on economic growth. Because the negative effects of inequality on investment dominate the positive effects of inequality on education, and physical capital accumulation remains the major driver of China’s economic growth, it makes sense that the influence of income disparities on economic growth will be negative.

Theoretically, income disparities can affect investment in many ways. First, due to imperfections in the credit market, higher income disparities will constrain poor people by tightening credit lending and lowering their investment in physical and human capital (for example, Fishman and Simhon 2002; Galor and Zeira 1993). Second, in a democratic society, greater income gaps will make more people support higher taxation for redistribution, while it will have a negative influence on economic growth (Alesina and Rodrik 1994; Bénabou 1996; Persson and Tabellini 1994). Third, higher income disparity will also result in social and political unrest, constrain the investment environment, and direct more resources to the protection of property rights, thus reducing the accumulation of productive capital (see, for example, Benhabib and Rustichini 1996). The first two mechanisms could hardly be tested empirically, while the third mechanism may find some indirect evidence. Figure 15.7 shows the urban-rural income disparities and the number of infringement cases in China. Both trends are very similar.

In China, greater interregional income disparity is accompanied by market segmentation and local protectionism, which is harmful for sustainable economic growth. Before 1978, China made many industrial investments in the inland areas, in effect promoting interregional balanced development. During the reform period, fiscal transfers from the central government have been invested in economically richer areas to promote preferential development of the coast. Meanwhile, local governments on various levels have secured the power to make local economic policies. Because lagged areas receive fewer fiscal transfers from the central government, these local governments have sought to protect disadvantaged enterprises in the short term. Lagging areas invest in newly emerging industries and then protect their products to strengthen the bargaining power of local governments to negotiate fiscal transfers from the central government. Although the strategic actions of lagging areas could benefit the local area, they result in numerous duplicative constructions and loss of efficiency, which are disadvantageous for interregional specialization, economic

Figure 15.7 Urban-rural income disparities and infringement cases in China, 1981–2004

![Figure 15.7 Urban-rural income disparities and infringement cases in China, 1981–2004](chart.png)

Sources: National Bureau of Statistics of China, China Statistical Yearbook (2005); authors’ calculations.
agglomeration, and sustainable growth (Lu and Chen 2006). In our empirical study concerning market segmentation, we find that government intervention—proxied by the government consumption ratio and share of employment in state-owned enterprises lagged one year—increases the interprovincial market segmentation index. Although China’s domestic commodity market has been integrating gradually since the mid-1990s, government intervention as measured by the ratio of local government expenditure to local GDP has risen, which is disadvantageous for market integration, scale economy, and sustainable economic growth in China (Chen and others 2007).

Interregional and urban-rural economic development: policy adjustment and fiscal transfer

Obviously, the Chinese government has recognized the need to adjust its regional economic development policies. Deng Xiaoping, the general architect of China’s reform, mentioned in a speech dated 1986, “We allowed first prosperity of some areas and some people just to better achieve common prosperity, and we need to prevent polarization. This is called socialism.” (Deng 1993: 195). In the early years of reform, China adopted economic opening policies intended to support the economic development of coastal areas, and these policies widened interregional gaps while promoting the preferential development of coastal areas. However, since the end of the twentieth century, the government has sought to balance interregional and urban-rural development, as symbolized by a series of regional development strategies, including the “Go West” policy, “Revitalizing the Northeast,” and “Central Rising” programs, as well as by recent policies on agriculture, peasants, and rural areas.

The history of regional and urban-rural development policies

The policies of economic opening were first adopted in the coastal areas that had geographic advantages, taking the form of special economic zones (SEZs) or economic development zones. The Chinese government established SEZs in Shantou, Shenzhen, Xiamen, and Zhuhai in 1980 and in Hainan in 1988. SEZs were given greater powers of economic management and were allowed to establish joint venture, cooperative, and wholly foreign-funded enterprises. Enterprises in SEZs enjoyed managerial autonomy and preferential taxation rates. In 1984 the central government decided to open 14 coastal cities, granting preferential treatment to foreigners who invest in China and bring advanced technologies and expanding the ability of these cities to pursue foreign business activities. In 1985 the Yangtze River delta, Pearl River delta, and a triangular area in south Fujian comprising Quanzhou, Xiamen, and Zhangzhou began to enjoy the status of coastal economic open areas; Shanghai began to enjoy the status of a coastal economic open area and an open city. In 1988 coastal open areas were expanded to 153 cities and counties in 7 eastern provinces and municipalities and in Guangxi. The first 14 national economic and technological development zones (ETDZs) established between 1984 and 1988 were all located on the east coast. The effect of the opening policies adopted in the 1980s was to widen the regional disparities between coastal and inland areas.

During the 1990s, the central government began to seek balanced interregional development. In 1992, 15 additional ports and 26 additional counties were declared as “opening,” which brought the number of open ports and cities or counties to 167 and 825, respectively. In this period, opening policies began to reach inland areas. In March 1992, border economic cooperation areas were set up in 4 cities in the northeastern provinces and Inner Mongolia, making a national total of 14 border economic cooperation areas that year, most of which were located in middle and western areas (see table 15.1). In August 1992, the government announced its intention to declare as coastal open cities 5 cities along the Yangtze River, the capital cities of the 4 border provinces, and the capital cities of 11 provinces in inland areas. Concrete policies included expanding the powers of open cities to conduct foreign cooperation, introduce foreign advanced technologies and managerial
Is China sacrificing growth when balancing interregional and urban-rural development?  

practices, grant preferential treatment to foreign-invested enterprises, and allow the creation of ETDZs when conditions permitted. Some of the national ETDZs and national high-tech industry development zones established between 1992 and 1994 were located in the middle and western areas.

In recent years, the government has adopted various strategies to address the interregional development gap. In 2000 the government adopted the Go West policy, which sought to speed up the construction of infrastructure in the western areas, strengthen ecological and environmental protection and construction, actively adjust the industrial structure, accelerate the cultivation of talented people, and open up the economy. Thereafter, government investment grew each year, so that, by 2005, the central government had invested ¥ 460 billion for construction projects in the western areas and distributed fiscal transfers and subsidies totaling more than ¥ 500 billion; one-third of national bonds for long-term construction were used in the western areas. The country established 60 key projects with an investment of ¥ 850 billion, in which investment funded by national bonds amounted to more than ¥ 270 billion. In the same period, western areas absorbed more than US$9 billion in FDI; together with loans provided by international organizations and foreign governments,

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<th>Table 15.1 Historical development of opening areas</th>
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<tr>
<td>Period and type of opening</td>
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<td>Special economic zone</td>
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<td>Coastal open city</td>
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<td>National economic and technological development zone</td>
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<td>Coastal economic open area</td>
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<td>Capital city, city along Yangtze River</td>
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<td>National border economic cooperation areas</td>
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<td>National economic and technological development zone</td>
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<td>National high-tech industry development zone</td>
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<td>National industrial park</td>
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<td>National high-tech industry development zone</td>
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Source: http://www.caizj.org.cn/.

Note: The east area includes 11 provinces or cities: Beijing, Fujian, Guangdong, Hainan, Hebei, Jiangsu, Liaoning, Shandong, Shanghai, Tianjin, and Zhejiang; the middle area includes 8 provinces: Anhui, Heilongjiang, Henan, Hubei, Hunan, Jiangxi, Jilin, and Shanxi; the west area includes 12 provinces or cities: Chongqing, Gansu, Guangxi, Guizhou, Inner Mongolia, Ningxia, Qinghai, Shaanxi, Sichuan, Tibet, Xinjiang, and Yunnan. Inner Mongolia and Guangxi are included in the west, because they are objects of the Go West policy.
western areas absorbed US$15 million in foreign capital. More than 10,000 enterprises entered western areas to invest and develop their businesses, investing more than Y 300 billion.6 Government also invested in the construction of rural infrastructure and social affairs in the western areas.

In 2003 government put forward the Reviving the Northeast policy; deepened the reform of economic systems; promoted the upgrading of industrial structure; accelerated regional cooperation; sped up the transformation of resource-exhausted cities; strengthened ecological construction and environmental protection; quickened development in education, public health, culture, and sports; and granted preferential policies in taxation, national fiscal investment, and introduction of foreign capital in the three northeastern provinces and some areas of Inner Mongolia.

In 2004 government explicitly launched the Central Rising policy, promulgating its guiding documents in 2006. Moreover, the national ETDZs and high-tech industry development zones established since 2000 have favored the west (table 15.1).

With respect to urban and rural policies, China used to artificially depress the price of agricultural products and to restrict the interregional flow of labor from rural to urban areas. After the reform, the household responsibility system was implemented in rural areas, the centralized planning of the pricing and sale of agricultural produce was reformed, and the purchase price of agricultural produce was enhanced.

Between 2004 and 2007, the government stressed the problems affecting agriculture, rural areas, and peasants. As agricultural produce came to be priced by the market, the government sought to narrow the urban-rural income gap. In 2000 government experimented with reforms of the agricultural tax and fees in Anhui province, extending these reforms to 16 provinces, cities, and autonomous regions in 2002. The reform included canceling some administrative or institutional fees and governmental funds, reducing and then canceling all compulsory work, adjusting the policy of agricultural tax and measures for collecting the tax on special agricultural products, and reforming the collection and use of village funds. In 2004 the government declared its intention to lower the agricultural tax over the course of five years, canceling it altogether in 2006. In 2004 the government stopped subsidizing peasants indirectly by subsidizing the state-owned food supply and distribution enterprises and began subsidizing peasants directly, which helped to stabilize the price of grain and enhanced peasants’ income. Meanwhile, in education and medical care, government began to adopt a preferential policy step by step. In 2006 government declared its intention to waive all of the study and logistic fees for compulsory education in the rural areas within two years and pledged to provide poor students with free textbooks and to subsidize living costs for those in boarding school. This policy was expanded gradually from the western areas to the middle and eastern areas. Finally, in 2004 the government experimented with a new type of medical cooperation system in an attempt to reduce the burden of health care for peasants.

Finally, China’s current household registration system and the regionally segmented social security system, together with poorly defined property rights of land, which limit the ability to trade land freely in the market, have become major obstacles to the interregional flow of labor.

**Adjustment in the direction of fiscal transfers**

China’s attempt to adjust interregional and urban-rural policies is clearly embodied in the system of fiscal transfers. Figure 15.8 presents the change in the proportion of eastern, middle, western, and the three northeastern provinces in net fiscal transfers from the central government.7 After implementation of the Go West policy, western areas accounted for a growing share of central fiscal transfers between 2000 and 2002.

Because provinces in these four major areas are at different stages of development, figure 15.9 shows the relationship between the area’s share of net central fiscal transfers and its per capita GDP. Until 1998, wealthy
provinces received more fiscal transfers from the central government than poor provinces, but this relationship disappeared in 1999. Since 2000, central government transfers have been directed to poor provinces.

The share of agriculture-related expenditures in total fiscal expenditure also changed, as depicted in figure 15.10. Agricultural expenditures increased remarkably in 2004. This change appeared in 2002, as shown by the fitted trend line, but was interrupted in 2003, perhaps as a result of the appearance of SARS (severe acute respiratory syndrome).

Did more fiscal transfers bring higher growth rates? Figure 15.11 depicts the relationship between fiscal transfers and economic growth. In the figure, the horizontal axis represents the difference between the provincial share of fiscal transfers in a particular year and the average share in all years; the vertical axis represents the difference between the growth rate in a province in a particular year and the average growth rate in all years. We de-mean the data to eliminate the influence of time-invariant fixed effects of each province. Panel A of figure 15.11 depicts the relationship between central fiscal transfers and economic growth in a given year. Because central fiscal transfers may be both the reason for and the result of economic growth, panel A may not reflect how fiscal transfers affect economic growth. To alleviate the influence of two-way causality, in panel B of figure 15.11, the vertical axis represents the de-meaned growth rate of the following year. Figure 15.11 shows that higher shares of central fiscal transfers did not bring higher economic growth, at least in the short run. In other words, there is no evidence to indicate that central fiscal transfers enhance development in any way other than through income redistribution. For the moment, the market forces that drive interregional inequality may dominate governmental efforts to equalize regional income.

Conclusions and policy implications
The starting point of China’s reform and opening up was an economy dominated for many years by a planned economic system and interregionally balanced development. Therefore, China offers a good case for studying industrial agglomeration and regional economic development in the context of globalization, urbanization, and industrialization. China’s industry is experiencing agglomeration, with industry becoming highly concentrated in the coastal areas, especially the Yangtze River delta, the Pearl River delta, and the Bohai Bay area. Industrial agglomeration has boosted economic growth but also exacerbated interregional inequality.
and urban-rural income disparities. Meanwhile, two other forces have kept industrial agglomeration from advancing further: market segmentation by local governments and the household registration and land property systems in rural areas, which restrict the flow of labor. The size of cities in China typically is controlled, and differences in their scale are small, stunting economic development in the long run.

With the development of industrial agglomeration, interregional and urban-rural income gaps are expanding, and this could have a negative impact on sustainable economic growth. The Chinese government has realized the importance of balancing urban-rural and interregional development and has begun to invest more in lagging inland and rural areas by means of fiscal transfers. However, there is no evidence that fiscal transfers by the central government have promoted economic growth, perhaps because market forces have dominated the development-balancing function of fiscal transfers or because fiscal transfers have only been able to alleviate income gaps, not boost economic development. Therefore, interregional and urban-rural income gaps are still growing. How to balance interregional and urban-rural development is a challenging problem.

To sustain economic growth while balancing interregional and urban-rural development, the government should consider adjusting its policies in the following ways:

- Stop market segmentation and reform the household registration and land property systems in rural areas to promote interregional and rural-to-urban labor migration, improve urbanization, and enhance industrial agglomeration, especially toward the Yangtze River delta, Pearl River delta, and Bohai Bay area. Reasonable labor migration is beneficial for taking advantage of scale economies and improving the amount of resources per capita in lagging and rural areas; it also helps to narrow interregional and urban-rural income gaps.

- Emphasize investment in human capital and infrastructure in lagging and rural areas. When labor cannot move freely, such investment would help to create the conditions for long-term economic growth and enhance economic agglomeration toward coastal areas.

- Address urban-rural income gaps, especially in inland areas. This could substantially narrow interregional inequality, while narrowing urban-rural gaps.
Notes
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2. In the period of the National People's Congress and the National Political Consultative Congress of 2007, the number of migrant workers was widely quoted as amounting to 150 million.

3. Data are from the Shanghai Statistical Bureau.

4. The figure excludes the autonomous municipalities: Shenzhen for its abnormal per capita GDP and Putian, in Fujian province, for its abnormal population density.

5. China has frequently adjusted the preferential policies for special economic zones (SEZs). The Income Tax Law of People's Republic of China for enterprises, enacted on January 1, 2008, unifies the tax system between foreign-invested enterprises and domestically funded enterprises, which is expected to end the last preferential policy for SEZs.


7. The net central transfer is central-to-local subsidy less local-to-central contribution. Traditionally, China was divided into east, middle, and west areas. The reason for separating the three northeastern provinces is to check the influence of the Reviving the Northeast policy. Among the three northeastern provinces, Liaoning is usually included in the east, while Heilongjiang and Jilin are included in the middle.

8. In the budget and final accounts of every province, three categories of expenditures are related to agriculture: production expenditures for forestry, water conservation, and weather before 2002; and agricultural expenditures for forestry, water conservation, and weather in 2003 and 2004.

References


Is China sacrificing growth when balancing interregional and urban-rural development?


Industrial agglomeration and economic performance in transitional China

Canfei He

According to mainstream economic theories, comparative advantages and agglomeration economies are responsible for the geographic clustering of industries (Ellison and Glaeser 1997). The forces driving industrial agglomeration in China might differ, however, because China has experienced two fundamental changes since the late 1970s: the transition from a command economy to a market-driven economy and the transformation from a closed economy to an open economy. Such a process of economic transition has been conceptualized as a triple process of decentralization, marketization, and globalization, which has had a profound impact on spatial development in China (He, Wei, and Xie 2008; Wei 2000). Industrial restructuring in China, like the process of economic transition, has been a gradual, partial, spatially, and structurally uneven process. Chinese enterprises have been gradually exposed to market forces. Liberalization of investment and trade has opened the Chinese economy to global competition. Marketization and globalization have encouraged plants to locate in areas with comparative advantages and to exploit agglomeration economies. Meanwhile, decentralization has granted local governments more authority and responsibilities to develop local economies, resulting in fierce interregional competition and giving rise to local protectionism and a rational imitation strategy in pursuing economic development. As a consequence, China is experiencing both significant centripetal forces as well as centrifugal forces of industrial agglomeration.

Sectors and regions that have undergone economic liberalization may be prone to the formation of agglomeration economies and would benefit significantly from industrial agglomeration. This chapter empirically investigates the evolution and extent of industrial agglomeration in China. To provide empirical justification for the geographic clustering of Chinese industries, it also explores the relationship between industrial agglomeration and labor productivity across and within industries.

Theoretical understanding of industrial agglomeration in China

This section presents the theories that seek to understand economic marketization, globalization, and decentralization as they apply to industrial agglomeration. The following section has detailed discussion regarding how the triple process of economic transition affects industrial agglomeration.

Economic marketization

China’s economic reform seeks to build a market-oriented economy and to allow market forces to allocate resources. In the command economy, governments distributed resources. Literally, there were no well-functioning markets. Economic geography was heavily shaped by socialist ideology and national defense considerations. Industrial location failed to match comparative advantages, because governments located industries based on shifting social, political, and military considerations. The self-enclosed
nature of the economic system ruled out any horizontal economic flows or industrial specialization (Zhao and Zhang 1999). As the economic transition has proceeded, market forces have been progressively introduced, and limits on factor mobility and commodity exchanges have been gradually lifted. Nonstate capital and private firms have been playing an important role in local development.

In the context of market economies, neoclassical trade models, new trade models, and new economic geography models are the theoretical inquiries underpinning industrial location (Brülhart 1998). In the neoclassical world, industrial agglomeration is driven by exogenous endowments such as technology, labor, and natural resources. Industries are heavily agglomerated in locations with matched comparative advantages. The reduction of trade barriers makes regions specialize in their production based on comparative advantages (Kim 1995). In new trade models, internal economies of scale provide regions with incentives to specialize even in the absence of differences in resource endowments and encourage firms to agglomerate their production in a few locations. Economic activities concentrate to realize scale economies, locating in large consumer markets to minimize transportation costs (Krugman 1980). Regional integration allows underlying geographic advantages to play a greater role, encouraging industrial agglomeration. In the new economic geography models, geographic concentration is driven by the interaction of transportation costs, internal scale economies, and labor mobility (Fujita and Thisse 1996; Krugman 1991). Demand linkages represent incentives for producers to locate close to buyers, whereas cost linkages generate incentives for consumers to locate close to suppliers (Venables 1996).

Beyond the agglomeration economies from industrial linkages, other sources of external economies are also driving plants to cluster. Marshall (1898) pointed to the pooling of markets for specialized skilled labor, the development of subsidiary trade and suppliers of intermediate inputs, and the easy flow of information and ideas among firms as forces driving industrial agglomeration. As a consequence, industries and regions that have experienced economic liberalization will be favorable to the formation of industrial agglomeration. As the economic transition proceeds, Chinese industries, especially those driven by market forces, will be increasingly agglomerated in a few regions.

**Economic globalization**

China has participated in economic globalization by trading with other economies and by attracting foreign investment. Trade liberalization broadens the scope of industrial specialization along the lines of comparative advantages and enhances the importance of accessibility to international markets. Trade liberalization also provides trading firms with incentives to exploit scale economies and heighten international competitiveness. In China, labor migration resulting from relaxation of the household registration system has allowed trading establishments to cluster along the coastal region and to benefit from the best use of cheap resources (He, Wei, and Xie 2008). Moreover, Chinese trading enterprises take full advantage of backward and forward business linkages through a deeper division of labor, significantly cutting production and transaction costs (Wang 2001). Fujita and Hu (2001) find that increases in exports have reinforced industrial agglomeration in China, concentrating industries in the coastal region, which is close to international markets, has locational advantages, and enjoys the first-mover advantage of economic globalization. However, as Krugman and Elizondo (1996) argue, trade liberalization may significantly weaken the role of localized industrial linkages in promoting industrial agglomeration because trading establishments rely on external linkages. In China, many assemblers focus on labor-intensive functions, relying heavily on imported materials and intermediate goods. The localized industrial linkages may not play the expected role in industrial agglomeration.

Foreign direct investment (FDI) has significantly shaped the spatial structure of Chinese industries. First, foreign establishments are disproportionately agglomerated in the coastal region and in strong industrial bases (He 2002, 2003, 2006; Head and Ries 1996).
Second, foreign enterprises create demand for locally produced intermediate inputs and improve the efficiency of the whole sector, making domestic producers more profitable (Markusen and Venables 1999). Component sourcing in China is an important consideration for foreign firms because of local content requirements (Belderbos and Carree 2002; Head and Ries 1996). Third, major multinational corporations often bring a large number of suppliers to the host economy, facilitating industrial agglomeration.

**Economic decentralization**

Unlike governments in the developed market economies, central and local governments in China are still rather powerful and influential in economic development. Economic transition in China has resulted in considerable administrative decentralization from the central to local governments. As a result, local governments now have the primary responsibility and authority for local economic development (Qian and Weingast 1997).

During the period of economic reform, the government’s intervention in economic development may have discouraged the geographic concentration of Chinese industries, especially at the provincial level. First, the central and local governments have established a large number of economic and technological development zones (ETDZs) and high-tech industrial development zones to attract domestic and foreign investments. There are more than 50 development zones across the major Chinese cities. The targeted industries in those zones and parks are fairly similar, including electronics, medicine, equipment, and other high-tech industries. The centrally and locally administered development zones promote the geographic agglomeration of advanced industries but discourage the industrial localization of labor-intensive industries.

Second, local governments intend to duplicate industries highlighted in the national Five-Year Plans and in the national industry-specific development plans. For instance, the Tenth Five-Year Plan stressed the development of food processing, machinery and equipment, automobile, and high-tech industries such as electronics, biological engineering, and medicine. These are also the key industries chosen by almost all of the coastal provinces and many central provinces. The industrial duplication certainly discouraged the geographic concentration of Chinese industries. To support the development of key industries, local governments have taken serious measures to concentrate them in development zones.

Third, fiscal decentralization has triggered fierce interprovincial competition for economic and political performance, resulting in a rational imitation strategy of industrial policies (He and Zhu 2007). Competition among provinces provides incentives to replace poorly chosen strategies with strategies that appear to succeed elsewhere. The economic-oriented evaluation system for local officials and a judicious combination of local autonomy, fiscal incentives, and hard budget constraints have created a framework leading local governments to follow the leaders in industrial development. Thun (2004) observes that decentralization leads local governments to converge on successful development policies through a process of rational imitation. Rational imitation of successful industrial policies encourages local governments to attract duplicate industries that they believe could rapidly improve local revenues or promote local economic growth.

Finally, fiscal decentralization instinctively and explicitly has emphasized autarchic development because the localities have had to self-finance their own budgets and their own development (Zhou 2000). Fiscal decentralization has created conditions that encourage regionalism: disappearance of the traditional umbrella, unfairness to the poor regions, territorial segmentation and confrontation, central-local vertical confrontation, and failure of spatial programs of specialization (Zhao and Zhang 1999). At the macroeconomic level, fiscal decentralization has provided local governments with incentives to protect local industries, significantly contributing to economic and revenue growth (Lee 1998; Young 2000). As control over factor allocations has loosened, local governments have sought to capture these rents by developing high-margin industries. Continued reform and growing interregional competition among
duplicative industries threaten the profitability of these industrial structures, leading local governments to impose a variety of interregional barriers to trade (Young 2000). The Development Research Center of the State Council (DRCSC 2004) ranks the highly protected industries as follows: tobacco, food, medical and pharmaceutical products, construction, agriculture, beverages, real estate, power, gas and water production, post and telecommunications, and machinery equipment. The least-protected industry is nonmetal mineral products, followed by cultural education and sporting goods, chemical fibers, ferrous metal smelting, petroleum refining and coking, rubber and plastic products, electric machinery and equipment, instruments, meters and office machinery, nonferrous metal smelting and pressing, and leather products. Therefore, economic transition has fragmented domestic markets, distorted regional production away from the patterns of comparative advantage, and discouraged the geographic concentration of Chinese industries.

Overall, the spatial restructuring of Chinese industries is the result of interactions of centripetal forces and centrifugal forces of industrial agglomeration. On the one hand, there are driving forces for industrial agglomeration as marketization and globalization proceed. Highly liberalized and globalized industries tend to concentrate in regions with matched comparative and locational advantages and to become increasingly agglomerated in the coastal provinces. Geographic clustering of industries generates substantial cost savings and leads to higher labor productivity. On the other hand, the economic transition has created a market that preserves federalism, which provides local governments with strong incentives to protect local industries from external competition and to imitate successful industrial policies. Local protectionism and rational imitation run counter to the geographic agglomeration of Chinese industries. The geographic dispersion of industries loses scale economies and makes it difficult for related enterprises to exploit external economies, leading to lower labor productivity.

**Industrial agglomeration and industrial specialization in China**

Following Wen (2004), this chapter applies the widely used Gini coefficient to quantify industrial agglomeration of Chinese industries. The closer the distribution of industry $i$ is to a uniform distribution, the smaller the index is. If an industry is equally distributed across all regions, the index will be equal to 0. An index close to 1 suggests that an industry is entirely concentrated in a region. Data on Chinese manufacturing industries are collected from various issues of *China Industry Economy Statistical Yearbook* and *Annual Report of Chinese Industrial Statistics* and from the *China Economic Census Yearbook 2004*.

**Industrial agglomeration of Chinese manufacturing industries**

To investigate the overall temporal trend of industrial agglomeration in China, I have computed the yearly weighted average of the Gini coefficient of employment, value added, and gross output during the period of 1980–2004.

As shown in figure 16.1, Chinese manufacturing industries have undergone significant spatial transformations since the early 1980s and have been more geographically agglomerated during the period of economic transition. The weighted 1980 and 2004 Gini coefficients of gross output are 0.51 and 0.64, while the weighted Gini coefficients of employment are 0.41 and 0.58, respectively. However, industrial output experienced spatial dispersal in the 1980s and has become increasingly concentrated since the early 1990s. Industrial employment was much less agglomerated than industrial output in the 1980s but has become more concentrated since the early 1980s. Under the influence of socialist ideology and egalitarian ideas during Mao’s era, China’s industrialization policy favored the traditional industrial bases, tilted toward new industrial cities in the interior, and sought to achieve full employment. Consequently, at the beginning of China’s economic reform, Beijing, Gansu, Heilongjiang, Hubei, Jilin, Liaoning, Shanghai, Sichuan, and Tianjin
were the major industrial bases of China. The top four provinces produced less than 50 percent of industrial output in most industries.

With the shift of government policies toward a market-driven economy and the opening up of the coast, Fujian, Guangdong, Jiangsu, Shandong, Shanghai, and Zhejiang have gradually taken the lead in attracting investment, labor, advanced technology, and firms. The rapid growth of the coastal region and the relative decline of old industrial bases and interior provinces brought a decrease in the Gini coefficients of industrial output. Labor migration from the interior provinces to the coastal region stimulated industrial employment to agglomerate in the coast.

Further economic reform has made the coastal region an engine of remarkable economic growth in China, resulting in strong polarization effects. Gini coefficients of industrial output and employment have been growing since the early 1990s (figure 16.1). The Gini coefficient of gross industrial output increased from 0.50 in 1990 to 0.64 in 2004, and the Gini coefficient of industrial employment grew from 0.44 to 0.58. Industrial output in most industries was concentrated in the coastal provinces, including Fujian, Guangdong, Jiangsu, Shandong, Shanghai, and Zhejiang. For most industries, the share of industrial output of the top four provinces increased substantially. Industries such as leather and fur products, cultural education and sporting goods, chemical fiber, telecommunications and electronic equipment, instruments, and meters concentrated more than 70 percent of industrial output in the top four provinces.

The share of industrial output of the top four provinces ranged from less than 30 to 77 percent, indicating that industries differed substantially in the extent of geographic agglomeration. Table 16.1 presents the Gini coefficient of industrial output for all two-digit manufacturing industries in select years. The concentration indexes indeed differ significantly across industries. The Gini coefficient in 1980 ranged from 0.37 to 0.73, and it ranged from 0.46 to 0.83 in 2004. In 1980 the most-agglomerated industries included chemical fiber, cultural education and sporting goods, petroleum refining and coking, telecommunications and electronic equipment, ferrous metal smelting, and pressing, while the least concentrated industries were food processing and manufacturing, furniture making, printing and copying, nonmetal mineral products, leather and fur products, and paper making and paper products. The most-agglomerated industries were capital intensive and had strong internal scale economies, while the dispersed industries were resource-based or resource-processing industries. By 2004, cultural education and sporting goods, telecommunications and electronic equipment, and chemical fiber were much more agglomerated and remained as the most-agglomerated industries. The agglomeration of garments and other fiber, leather and fur products, textiles, instruments and meters, furniture making, electrical machinery and equipment, plastic products, and metal mineral products also gained momentum, with Gini coefficients greater than 0.70. Many highly agglomerated industries in 2004 were also highly globalized, exporting substantially or using a large amount of FDI. The most dispersed industries included nonferrous metal smelting and pressing, medical and
pharmaceutical products, beverage manufacturing, petroleum refining and coking, ferrous metal smelting and pressing, food processing and manufacturing, transportation equipment manufacturing, and tobacco processing, among which petroleum refining and coking and ferrous metal smelting and pressing were the most-concentrated industries in 1980. The dispersed industries were either resource based or domestic market oriented. Some were strongly favored and protected by local governments, because they are strategic and profitable, such as tobacco processing, transportation equipment, beverage manufacturing, and medical and pharmaceutical products.

I now compare the temporal trends of industrial agglomeration for different types of industries to shed light on some influential factors of industrial agglomeration. Figure 16.2 shows the temporal change in geographic agglomeration of select globalized industries. In 2004 all of these industries exported more than 55 percent of their gross output and had more than 45 percent of foreign capital. The two percentages in telecommunications and electronic equipment and cultural education and sporting goods were greater than 60 percent. In the beginning of economic transition, the spatial pattern of the select industries was rather diverse, with some agglomerated and others dispersed, because their provincial distributions were determined by central and local governments. As the open-door policy was successfully implemented, the international market and foreign capital drove the globalized industries to the coastal provinces, particularly Fujian, Guangdong, Jiangsu, Shandong, Shanghai, and Zhejiang (see figure 16.3). Since the early 1990s, the globalized industries have been increasingly agglomerated and more concentrated than the domestic market-oriented industries, with Gini coefficients greater than 0.70.

Figure 16.4 presents the pattern of industrial agglomeration of select domestic market-oriented industries, which exported less than 10 percent of their gross output and had little foreign capital. In 1980 there were no significant differences in the spatial pattern of globalized and less-globalized

| Table 16.1 Gini coefficient of manufacturing industries in China in select years, 1980–2004 |
|-----------------------------------------------|---|---|---|---|---|---|
| **Code**                        | **1980** | **Gini** | **Rank** | **1990** | **Gini** | **Rank** | **2004** | **Gini** | **Rank** |
| Food processing and manufacturing | 0.37 | 26 | 0.41 | 25 | 0.55 | 21 |
| Beverage manufacturing          | 0.43 | 20 | 0.44 | 22 | 0.49 | 24 |
| Tobacco processing              | 0.49 | 11 | 0.50 | 12 | 0.57 | 19 |
| Textiles                        | 0.58 | 6  | 0.58 | 5  | 0.75 | 7  |
| Garments and other fiber        | 0.47 | 18 | 0.55 | 7  | 0.77 | 4  |
| Leather and fur products        | 0.42 | 22 | 0.53 | 9  | 0.77 | 5  |
| Timber processing               | 0.49 | 12 | 0.49 | 14 | 0.61 | 16 |
| Furniture making                | 0.39 | 25 | 0.49 | 15 | 0.73 | 8  |
| Paper making and paper products | 0.42 | 21 | 0.42 | 23 | 0.68 | 12 |
| Printing and copying            | 0.40 | 24 | 0.41 | 24 | 0.64 | 15 |
| Cultural education and sporting goods | 0.72 | 2  | 0.71 | 1  | 0.83 | 1  |
| Petroleum refining and coking   | 0.70 | 3  | 0.59 | 4  | 0.54 | 23 |
| Chemical materials and products | 0.46 | 19 | 0.44 | 20 | 0.57 | 17 |
| Medical and pharmaceutical products | 0.47 | 17 | 0.45 | 18 | 0.47 | 25 |
| Chemical fiber                  | 0.73 | 1  | 0.63 | 2  | 0.79 | 3  |
| Rubber products                 | 0.49 | 13 | 0.45 | 19 | 0.69 | 12 |
| Plastic products                | 0.53 | 9  | 0.55 | 6  | 0.72 | 10 |
| Nonmetal mineral products       | 0.41 | 23 | 0.44 | 21 | 0.57 | 18 |
| Ferrous metal smelting and pressing | 0.58 | 5  | 0.51 | 11 | 0.54 | 22 |
| Nonferrous metal smelting and pressing | 0.54 | 8  | 0.54 | 6  | 0.46 | 26 |
| Metal mineral products          | 0.48 | 14 | 0.50 | 13 | 0.71 | 11 |
| General- and specific-purpose machinery | 0.47 | 16 | 0.47 | 17 | 0.64 | 14 |
| Transportation equipment        | 0.48 | 15 | 0.49 | 16 | 0.55 | 20 |
| Electrical machinery and equipment | 0.52 | 10 | 0.54 | 8  | 0.73 | 9  |
| Telecommunications and electronic equipment | 0.61 | 4  | 0.60 | 3  | 0.81 | 2  |
| Instruments and meters          | 0.57 | 7  | 0.52 | 10 | 0.76 | 6  |
industries. However, spatial restructuring of domestic market-oriented industries was less significant, and some became slightly dispersed as globalized industries became more agglomerated. They were also less agglomerated than the globalized industries, with Gini coefficients less than 0.60, because they served local markets and valued the accessibility of the domestic market. As shown in figure 16.5, substantial shares of industrial output of the least-globalized industries were located in the central provinces.

During the economic transition, industrial agglomeration in China has been associated with how governments treat the industries. Figure 16.6 presents the spatial pattern of industries favored or protected by local governments, including food, beverage, tobacco, medical and pharmaceutical products, and machinery and transportation equipment. Figure 16.7 shows the spatial pattern of industries not particularly protected or favored by local governments, including chemical fibers, rubber and plastic products, cultural education and sporting goods, electrical machinery and equipment, and instruments and meters. Overall, protected and favored industries were more geographically dispersed than less-favored and -protected industries. For example, during the past two decades, the Gini coefficients for medical and pharmaceutical products and beverages were smaller than 0.50. Unlike the trend of aggregate industries, favored and protected industries have not experienced significant increases in industrial agglomeration since the early 1990s. The tobacco industry experienced significant concentration before the mid-1990s, but it started to disperse in 1994, when the central government introduced the new tax-sharing system, which further hardened the local fiscal budgets (Zhou 2000). The machinery industry, characterized by strong scale economies and strong industrial linkages, was agglomerated during the 1990s but remains at a relatively low level of agglomeration compared with the least-protected industries.

The location of least-favored and protected industries was driven by market forces, and they have experienced a significant polarizing process since the 1990s. Cultural education and sporting goods had a Gini coefficient of 0.81 in 2004, with the top four provinces of Guangdong, Jiangsu, Shandong, and Zhejiang contributing 77 percent of gross industrial output. The Gini coefficient of chemical fiber in 2004 was 0.79, with the top four provinces of Jiangsu, Shandong, Shanghai, and Zhejiang responsible for 75 percent of gross industrial output. As expected, the spatial distribution of favored and protected industries was much more dispersed, with significant presence in the central and coastal provinces, while the least-favored industries were heavily agglomerated along the coast (see figures 16.8 and 16.9).

Causes of industrial agglomeration in China

Chinese manufacturing industries have experienced a U-shape spatial restructuring process, which is consistent with the temporal pattern of interregional income inequality. I argue that the spatial shift of Chinese manufacturing industries toward the coastal region has led to widening interregional inequality. The accelerating agglomeration of Chinese industries since the 1990s has been the result of economic transition. Specifically, the triple process of marketization, globalization, and decentralization has
driven the spatial reorganization of Chinese industries.

First, the accelerating marketization process since 1992 has lifted the limits on factor mobility and commodity exchanges and stimulated labor and capital mobility and interregional trade, providing incentives for Chinese enterprises to follow the line of comparative and locational advantages. A large number of workers migrated to the coastal provinces of Fujian, Guangdong, Jiangsu, Shandong, Shanghai, and Zhejiang, promoting industrial agglomeration in the coastal region. Meanwhile, interprovincial trade of commodities also stimulated Chinese provinces to specialize in production based on local resources. For instance, Fan and Scott (2003) relate the concentration indexes of Chinese manufacturing industries to capital per labor and find that labor-intensive industries are more agglomerated. Industries dependent on agricultural and mining resource inputs are significantly dispersed, indicating that industries based on immobile resources follow the resources (He, Wei, and Xie 2008). Marketization also allows Chinese enterprises to exploit scale economies. For example, Bai and others (2004) find that industries with large average firm size were significantly more concentrated during 1985–97, suggesting that internal scale economies drive industrial agglomeration in China. In addition, strong interindustrial linkages are also positively associated with industrial agglomeration, indicating the importance of pecuniary externalities in industrial agglomeration (He, Wei, and Xie 2008). In a word, market forces have been a fundamental force in reorganizing China’s economic geography by allowing comparative advantages and agglomeration economies to drive industrial
location and stimulate competitive industries to agglomerate.

Second, China has successfully integrated its economy with the international market in recent decades, and global forces have been critical to reshaping China’s industrial geography. Two-digit industries with more exports and foreign capital are more agglomerated and concentrated in the coastal region. Figure 16.10 provides additional evidence to support the argument that economic globalization leads to more industrial agglomeration in China. Panel A presents the relationship between the share of exports in industrial gross output and the Gini coefficient of three-digit manufacturing industries in 2004; panel B shows the relationship between the ratio of foreign capital in total capital and the Gini coefficient of three-digit manufacturing industries. The Pearson’s correlation coefficients are 0.71 and 0.55, respectively, suggesting that more globalized industries are more agglomerated.

Third, as discussed theoretically, decentralization results in local protectionism and an imitation strategy in industrial policies, which is to promote local economic growth and fiscal revenues. Industries characterized by high tax rates and profit margins are favored and protected by local governments, resulting in low levels of industrial agglomeration. Studies find less geographic concentration in two-digit industries where the past tax rates, profit margins, and share of state capital are high (Bai and others 2004; He, Wei, and Xie 2008). The negative relationship between industrial agglomeration and profit margins and tax rates also holds for three-digit manufacturing industries (see figure 16.11). The Gini coefficients of three-digit industries are significant and negatively related to the ratio of income tax and value added tax to sales revenues, with a Pearson’s correlation coefficient of −0.45. The Pearson’s correlation coefficient for the ratio of gross profits to sales revenues is −0.35. Due to interregional competition, local governments often duplicate profitable and strategic industries that are successful in other provinces. In addition, local governments have strong incentives to protect state-owned enterprises under their administrations, which are their base of political power and their source of private benefits as well as fiscal revenues (Bai and others 2004). Industries with a high share of state-owned capital are also less agglomerated (see figure 16.12). The correlation coefficient between industrial Gini coefficients and share of state-owned capital is −0.37 and significant. These results provide indirect evidence to support the finding that local governments act to discourage industrial agglomeration of Chinese industries at the provincial level.

Other channels also lead to industrial dispersion in China. On the one hand, local governments duplicate industries highlighted in the national Five-Year Plans. On the other hand, local governments also imitate each other when choosing key industries. He and Zhu (2007) find that provinces with similar economic and political status and with common borders are more likely to imitate each other and to converge in the industrial structure. Machinery equipment, medicine, food, automobiles, construction materials, chemicals and petrochemicals, and high-tech industries are listed as key industries in most provinces in both of the
Five-Year Plans. Many local governments have granted financial and policy supports for the development of key industries, leading to less industrial agglomeration. As discussed, the select industries are fairly dispersed, with Gini coefficients smaller than the weighted average Gini coefficient of 0.64.

In summary, Chinese industries have become more geographically agglomerated as the economic transition proceeds. The agglomeration forces of industries dominate the dispersion forces. Marketization allows comparative advantages and scale economies to play their roles in driving industrial agglomeration, and globalization allows underlying geographic advantages to play a greater role. Market and global forces have constantly driven Chinese industries to agglomerate in the coastal provinces, and spatial disparities in China are widening as industries shift to the coastal provinces.

**Spatial boundaries of industrial agglomeration in China**

To investigate the spatial boundaries of industrial agglomeration in China, I apply the global Moran’s I to uncover the spatial autocorrelation of the geographic distribution of Chinese industries. The global Moran’s I can be defined as follows:

$$ I = \frac{n \sum \sum w_{ij}(x_i - \bar{x})(x_j - \bar{x})}{\sum \sum w_{ij} \sum (x_i - \bar{x})^2} $$  \hspace{1cm} (2)

where $n$ represents the number of provinces, $w_{ij} = 1$ if provinces $i$ and $j$ share a
common border, otherwise $w_{ij} = 0$, and $x_i$ and $x_j$ are the provincial share of an industry. A positive and significant value of Moran’s I indicates that industrial agglomeration is beyond the provincial boundary and there may be spillover effects across provinces.

I have computed the value of Moran’s I for all two-digit manufacturing industries in select years. First, some highly agglomerated industries have insignificant values of Moran’s I, indicating that geographic agglomerations of these industries are confined within provincial boundaries and that no spillover effects occur across provinces. The industries include cultural education and sporting goods, telecommunications and electronic equipment, instruments and meters, furniture making, and printing and copying. Related companies in these industries often seek suppliers from highly localized sources, limiting their spillover effects within a province.

Second, some agglomerated industries have significant and positive values of Moran’s I, suggesting that the geographic agglomeration of these industries is beyond the provincial boundaries and that there are significant spillover effects across provinces. The industries include chemical fiber, paper making and products, garments and other fiber, leather and fur products, textiles, rubber and plastic products, metal mineral products, general- and specific-purpose machinery, electrical machinery and equipment, and timber processing. Most of these industries are labor intensive and market driven, facilitating the spillover effects beyond provincial boundaries. Business linkages in industries such as general- and specific-purpose machinery, electrical machinery and equipment, metal mineral products, and rubber and plastic products could easily go beyond the provincial boundaries.

Third, a couple of less-agglomerated industries have positive and significant values of Moran’s I. These industries include food processing and manufacturing, chemical materials and products, transportation equipment, and nonmetal mineral products. Business linkages beyond provincial boundaries in these industries are the reason for spillover effects. For instance, Shanghai has provided substantial auto components and parts to the auto-related industries in Anhui, Jiangsu, and Zhejiang. Development of transportation equipment in Beijing has also stimulated the industry of auto components and parts in Hebei (Thun 2006).
Finally, protected and favored industries are spatially dispersed and experience no spillover effects across provincial boundaries. The industries include beverage manufacturing, tobacco processing, medical and pharmaceutical products, and petroleum refining and coking. Provincial governments are able to exercise local protectionism because Chinese provinces have large markets, sufficient authority, and a favorable combination of resources with which to develop most industries. Local protectionism thereby prevents spillover effects beyond provincial boundaries.

**Industrial specialization of Chinese provinces**

Overall, Chinese industries have been increasingly agglomerated, which has changed the industrial structure of Chinese provinces. Figure 16.13 shows the relationship between industrial agglomeration and industrial specialization. As panel A shows, the industrial structure within Chinese provinces became more diversified in the 1980s, as Chinese industries became geographically dispersed, indicating an overall pattern of convergence in provincial industrial structure. Rapid development of labor-intensive and light industries was undoubtedly associated with the decreasing provincial specialization before the mid-1990s. Regional decentralization was apparent in the early stage of reforms (Wei 2000), providing local governments with power to implement protectionist policies. Intergovernmental competition and provincial protectionism are at least partially responsible for the convergence of provincial industrial structure (Young 2000). Beginning in the late 1990s, the increasing agglomeration of Chinese industries has caused the gradual increase in
industrial specialization, as shown in panel B of figure 16.13. First, marketization and globalization have forced manufacturing firms to specialize in production and to compete more effectively in the markets based on geographic agglomeration and comparative advantages. The interior provinces, in particular, have specialized further in resource-oriented production. Second, the increasing specialization is also related to the heavy industrialization strategy initiated by local governments in some coastal provinces such as Fujian, Guangdong, Jiangsu, and Zhejiang. With the increasing importance of machinery, chemical materials and products, petroleum refining and coking, transportation equipment, and ferrous metal smelting and pressing, some coastal provinces have gradually become more specialized. Therefore, the recent industrial agglomeration has resulted in industrial specialization in China.

There are substantial provincial variations in industrial specialization in China. In 1980 the specialization coefficient ranged from 0.77 in Xizang to 0.47 in Guangdong. All provinces except Guizhou, Xizang, and Yunnan were less specialized in the 1980s. The three western provinces were specialized due to the development of resource-based industries, including tobacco processing, chemical materials and products, nonferrous metal smelting and pressing, and nonmetal mineral products. The coastal provinces significantly diversified their industrial structures as industries were driven to the coastal region by global and market forces. As most Chinese industries increasingly agglomerated in the coastal provinces, the central and western provinces became more specialized while the coastal provinces became more diversified. Recently, the inland provinces have become even more specialized, while
the coastal provinces have begun to specialize. Due to marketization and globalization, the inland provinces are able to fully exploit their comparative advantages based on natural resources, leading to a higher level of industrial specialization. For instance, in 2004, the top four industries in inland provinces included typical resource-based or resource-processing industries such as ferrous metal smelting and pressing, nonferrous metal smelting and pressing, nonmetal mineral products, food processing, petroleum refining and coking, chemical materials and products, and tobacco processing. The coastal provinces have upgraded their industrial structures and begun to specialize in more advanced industries, including telecommunications and electronic equipment, transportation equipment, general- and specific-purpose machinery, petroleum refining and coking, electrical machinery and equipment, chemical industries, and ferrous metal smelting and pressing. Therefore, geographic agglomeration of labor-intensive industries in the coastal region caused industrial diversification in the coastal provinces in the 1990s, while the agglomeration of advanced industries has caused industrial specialization along the coast recently. With the upgrading of industrial structures in the coastal provinces and the implementation of heavy industrialization strategies, the coastal region probably will experience more industrial specialization.

To further probe the relationship between industrial agglomeration and industrial specialization, I compare the temporal evolution of industrial specialization in select Chinese provinces. Figure 16.14 shows the changes in industrial specialization in three centrally administered municipalities. The three municipalities diversified their industries with the development of light industries in the 1980s. Since the early 1990s, Beijing and Tianjin have become increasingly specialized, as telecommunications and electronic equipment, transportation equipment, ferrous metal smelting and pressing, and chemical materials and products have gained prominence. Shanghai has been less specialized than Beijing and Tianjin, and industrial agglomeration in Shanghai has caused industrial diversification. Only recently has industrial agglomeration in Shanghai resulted in increasing industrial specialization as capital- and technology-intensive industries, including telecommunications and electronic equipment, transportation equipment, machinery, and ferrous metal smelting and pressing, have topped the industrial structure.

Figure 16.15 presents the temporal changes in industrial specialization in select coastal provinces, which have agglomerated many industries during economic transition. All coastal provinces underwent significant industrial diversification as industries increasingly agglomerated in the coastal provinces in the 1980s and the early 1990s.
By the middle of 1990s, Fujian and Guangdong provinces had the most diversified industrial structures, with specialization coefficients smaller than 0.50. Further industrial agglomeration in the coastal provinces has caused more industrial specialization, particularly in Guangdong, Jiangsu, and Liaoning. Shandong and Zhejiang, however, show no significant increase in industrial specialization. Guangdong and Jiangsu are two critical manufacturing provinces and are among the top four provinces for many industries. Due to the recent development of heavy machinery and equipment industries, which has been initiated by local governments, the two provinces have become significantly more specialized. As marketization and globalization progress, advanced industries will be increasingly concentrated in the coastal provinces, which will also become more industrially specialized.

The inland provinces provide a rather simple picture of the temporal changes in industrial specialization. Figure 16.16 illustrates the evolution of industrial specialization in select western provinces. Most western provinces have been more specialized than the coastal region and also have experienced significant industrial specialization. The specialization coefficient for Yunan, for instance, increased from 0.56 in 1980 to 0.72 in 2004. The coefficient for Qinghai increased from 0.64 to 0.79 in the same period. As the economic transition has proceeded, labor and capital in the west have moved to the coast, generating strong incentives for local governments to develop industries based on natural resources. Rapid growth of resource-based or resource-processing industries in the western provinces has made them increasingly specialized. This is also true for central provinces, including Heilongjiang, Neimenggu, and Shanxi (see figure 16.17). The recent increase in the specialization coefficients of the central provinces of Hubei and Jilin is largely owing to the agglomeration of transportation equipment. Anhui, Henan, Hunan, and Jiangxi have not been the core manufacturing bases and have experienced no significant increase in industrial specialization. Recently, as labor and resource costs have skyrocketed in the coastal region, some labor- and resource-intensive industries, such as garments, shoe and hat making, and leather and fur products, started to relocate to the inland region. The coming spatial restructuring of traditional industries will possibly lower the level of industrial specialization in the inland provinces, especially those near the coastal provinces.

To summarize, as Chinese industries became geographically dispersed in the 1980s, Chinese provinces began to experience industrial diversification. Increasing industrial agglomeration since the late 1990s has caused more industrial specialization. As Chinese industries increasingly agglomerate in the coastal provinces, the inland
provinces gain opportunities to develop resource-intensive industries due to market forces, leading to more industrial specialization. Recently, the coastal provinces have also become increasingly specialized as more capital- and technology-intensive industries shift to the coast.

**Industrial agglomeration and labor productivity in China**

Theoretically, as Porter (2000) argues, industrial agglomeration would improve the productivity of constituent firms, upgrade the capacity of participants in clusters for innovation and productivity growth, and stimulate new business formation that supports innovation and expands the cluster. To justify the increasing industrial agglomeration in China, it is necessary to inquire more explicitly whether there are productivity effects of industrial agglomeration.

I conduct a statistical analysis based on a simple production-function approach with two-digit manufacturing industries as observations. The dependent variable is the log of gross industrial output per worker, and the independent variables include the log of capital per worker and the Gini coefficient of gross industrial output. Considering the evolutionary nature of marketization and globalization in China, I expect to find an increasingly strong and significant relationship between industrial agglomeration and labor productivity, controlling for capital per worker. I run the regression analysis for years in which provincial-industrial data are available. As shown in table 16.2, there is an extremely significant coefficient attached to $K/L$, and capital per worker has become more important since the 1990s. As expected, the variable of the Gini coefficient has a positive coefficient, indicating that labor productivity effects will emerge as industries become increasingly agglomerated. The variable of the Gini coefficient turned from insignificant to significant in the middle 1990s, implying that the increasing industrial agglomeration since the middle 1990s has driven up labor productivity in Chinese industries. The positive relationship between the Gini coefficient and labor productivity also provides economic justification for the formation of industrial clusters in China.

The results in table 16.2 represent a highly aggregated level of investigation. It is also critical to see whether the relationship between industrial agglomeration and labor productivity holds for all individual industries. To do so, I evaluate models based on a production-function approach for two-digit manufacturing industries, with the observations defined in terms of provinces. I apply the location quotient to measure the geographic agglomeration of industry $j$ in province $i$, defined as
where \( \text{OUTPUT}_{ij} \) represents the gross output of industry \( j \) in province \( i \) and \( \text{OUTPUT}_i \) is the gross industrial output in province \( i \). I then assume that labor productivity is a function of internal scale economies, localization economies, and urbanization economies, controlling for capital per worker, defined as follows:

\[
\frac{Q_{ij}}{L_{ij}} = f\left(\frac{K_{ij}}{L_{ij}}, \ln\text{SIZE}_i, \ln\text{UPOP}_i, \text{LQ}_{ij}\right),
\]

where \( Q_{ij} \) is the gross output of industrial \( j \) in province \( i \), \( K_{ij} \) and \( L_{ij} \) represent the total capital and employment of industry \( j \) in province \( i \), \( \text{SIZE}_i \) is the average employment per enterprise of industry \( j \) in province \( i \), \( \text{LQ}_{ij} \) is the location quotient of gross output of industry \( j \) in province \( i \), and \( \text{UPOP}_i \) is the total nonagricultural population in province \( i \).

I perform the regression analysis for each two-digit manufacturing industry in each year from 1980 through 2004. (More detailed data are available from the author.) All models are fairly significant, with relatively high values of \( R^2 \). For instance, the \( R^2 \) ranged from 0.24 for leather and fur products to 0.93 for tobacco processing in 2004. All industries but leather and fur products, cultural education and sporting goods, chemical fiber, and garment-making industries, have an \( R^2 \) greater than 0.50 in the models. I am particularly interested in the significance of the location quotient (\( \text{LQ} \)), which captures the effect of localization economies. There are wide variations in the significance and magnitude of the regression coefficients on \( \text{LQ} \). The relationship between industrial agglomeration and labor productivity differed significantly in the 1980s and in the 1990s. Similarly, industrial agglomeration was not significantly associated with labor productivity in a number of industries in the 1980s. Significant positive relationships only held for textiles, tobacco processing, cultural education and sporting goods, petroleum refining and coking, chemical fiber, plastic products, electrical machinery and equipment, telecommunications and electronic equipment, and instruments and meters, which were also the most agglomerated industries in the 1980s and mainly specialized in labor-intensive functions. They were also the first group of industries to allow nonstate-owned enterprises and to use foreign investment. Marketization and globalization therefore stimulated the spatial
agglomeration of these industries because geographic clustering was rewarding. The petroleum refining and coking industry was highly agglomerated and also productive in the 1980s because of internal scale economies. Ferrous and nonferrous metal smelting and pressing were also highly concentrated in the 1980s, but geographic concentration did not bring higher labor productivity because this industry was tightly controlled by state-owned enterprises.

The 1990s saw an optimal picture of the relationship between industrial agglomeration and labor productivity, as most industries became increasingly agglomerated and many more industries became liberalized and globalized. First, all industries but food processing, beverage manufacturing, tobacco processing, petroleum refining and coking, medical and pharmaceutical products, and ferrous metal smelting and pressing had a significant and positive relationship between industrial agglomeration and labor productivity. The exceptions are heavily protected, strongly favored by local governments or controlled by the state-owned enterprises, and fairly geographically dispersed. Regression coefficients on location quotients in petroleum refining and coking and tobacco processing have turned from significant and positive to insignificant or negative since the 1990s. The results suggest that government intervention and local protectionism account for the improvement in labor productivity and industrial competitiveness.

Second, the relations between industrial agglomeration and labor productivity remained positive and significant for labor-intensive industries such as textiles, cultural education and sporting goods, chemical fiber, and rubber and plastic products in the 1990s. Many more traditional labor-intensive industries have benefited from geographic agglomeration since the early 1990s, with a significant and positive relationship between industrial agglomeration and labor productivity. These industries include food manufacturing, garments, shoe and hat making, leather and fur products, timber processing and furniture making, rubber and plastic products, and nonmetal and metal mineral products. There are several critical reasons why labor-intensive industries could benefit from geographic clustering. The clusters of labor-intensive industries in the coastal region are characterized by a deeper division of labor across enterprises, which significantly cuts production costs and increases

![Figure 16.16 Temporal changes of industrial specialization in select western provinces of China, 1980–2004](image1)

![Figure 16.17 Temporal changes of industrial specialization in central provinces of China, 1980–2004](image2)
labor productivity of related enterprises. The majority of workers in the coastal industrial clusters are migrants, who are productive and hard working, which boosts labor productivity. The labor pool in the coastal region also lowers labor-related costs and improves labor productivity. The industrial clusters in the coastal region are particularly attractive to foreign investment, which brings capital, management, and advanced technology, resulting in higher labor productivity. In addition, state capital has largely withdrawn from the labor-intensive industries, stimulating fierce market competition and forcing related enterprises to be more competitive. Overall, market forces and globalization effects have driven labor-intensive industries to concentrate in a few coastal provinces due to the productivity effects of geographic clustering.

Third, capital- and technology-intensive industries such as general- and specific-purpose machinery, transportation equipment, telecommunications and electronic equipment, electrical machinery and equipment, and instruments and meters have significantly benefited from geographic agglomeration. The regression coefficients on the location quotient of machinery and transportation equipment have changed from insignificant to highly significant since the middle 1990s. The magnitude of regression coefficients on telecommunications and electronic equipment, electrical machinery and equipment, and instruments and meters has increased significantly since the 1990s. During 1980–2004, all these industries became more agglomerated.

The productivity effects of industrial agglomeration in these capital- and technology-intensive industries are derived from strong localized business linkages and the use of foreign investments. Upstream firms are close to downstream firms, as this is their main source of demand, while downstream firms want to be close to a large number of upstream firms, because this is where intermediate inputs are cheaper. The geographic proximity of related firms raises industrial labor productivity by speeding the process of matching downstream and upstream firms and by lowering transaction costs. The capital- and technology-intensive industries have also used a significant amount of foreign investments, facilitating industrial agglomeration. For instance, foreign capital accounted for 62 and 48 percent of total capital in telecommunications and electronic equipment and in instruments and meters, respectively; almost all major

<table>
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<tr>
<th>Year</th>
<th>Constant</th>
<th>Gini</th>
<th>Ln K/L</th>
<th>$R^2$</th>
<th>F</th>
<th>B-P</th>
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<td>5.42***</td>
<td>0.59</td>
<td>0.40***</td>
<td>0.28</td>
<td>4.57</td>
<td>0.08</td>
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<td>7.74***</td>
<td>2.00</td>
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<td>0.15</td>
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<td>0.79</td>
<td>0.63***</td>
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<td>0.71***</td>
<td>0.60</td>
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<tr>
<td>1990</td>
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<td>0.58</td>
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<tr>
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<td>0.79***</td>
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<td>0.83***</td>
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<td>0.87***</td>
<td>0.84</td>
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<td>1.62</td>
</tr>
<tr>
<td>2002</td>
<td>0.50</td>
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<td>0.90***</td>
<td>0.87</td>
<td>74.62</td>
<td>1.60</td>
</tr>
<tr>
<td>2003</td>
<td>0.46</td>
<td>0.97**</td>
<td>0.91***</td>
<td>0.87</td>
<td>76.64</td>
<td>3.05</td>
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<tr>
<td>2004</td>
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<td>0.93***</td>
<td>0.88</td>
<td>83.22</td>
<td>4.48</td>
</tr>
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</table>

Source: Author’s calculations.
*** p < 0.01.
** p < 0.05.
* p < 0.10.
Note: Number of cases = 26. Results are corrected with heteroskedasticity.
auto producers in China are foreign joint ventures. Many studies find foreign-invested enterprises to be more productive than domestic-owned enterprises. As economic transition proceeds, market and global forces will play a larger role in driving industrial agglomeration and allocating resources more effectively. This simple statistical analysis suggests that industrial agglomeration has been pervasive because industrial agglomeration has productivity effects. However, industrial localization will not necessarily bring higher labor productivity if industries are heavily protected or controlled by governments.

**Industrial clusters in China: a county-level analysis**

I now use employment data from the first economic census conducted at the end of 2004 to examine some typical industrial clusters in China. I first aggregate the industrial employment by county and map the county distribution of aggregate manufacturing employment (see figure 16.18). Overall, manufacturing industries are concentrated in the coastal region, including Fujian, Guangdong, Hebei, Jiangsu, Liaoning, Shandong, Shanghai, and Zhejiang provinces. Inland provinces such as Henan, Hubei, Jilin, and Sichuan are also important locations for manufacturing industries. From the northeastern province of Heilongjiang to the southwestern province of Yunnan, I could draw a line to separate the whole nation into two parts, with manufacturing employment heavily concentrated in the right part. To the northwest of the line, most counties have large and medium-size enterprises with fewer than 5,000 manufacturing workers, while those that have enterprises with more than 5,000 manufacturing workers are resource based. Several clusters of manufacturing employment are located along the coastal region, including the Yangtze River delta, the Pearl River delta, the Shandong peninsula, and the Beijing-Tianjin area. There are also some scattered industrial clusters in the central provinces, such as in Henan, Hubei, and Sichuan.

![Figure 16.18 Spatial distribution of manufacturing employment in China, by county, 2004](image-url)
For illustrative purposes, I map the county distribution of employment in one of the more successful clusters: telecommunications equipment, computers, and other electronic equipment. As figure 16.19 shows, employment in telecommunications equipment, computers, and other electronic equipment is clustered in the Pearl River delta and in areas near Beijing, Shanghai, and Tianjin, but there are also clusters in Chongqing, Dalian, Jinan, Wuhan, and Xi’an. The electronic industry typically agglomerates in cities that host ETDZs or high-tech industrial development zones set by the central and local governments. There are favorable financial incentives and policies to attract electronic-related companies to these development zones. The industrial policies have played an essential role in facilitating the formation of industrial clusters in telecommunications and electronic equipment. However, the expansion and development of electronic equipment clusters in coastal provinces are driven largely by foreign firms. Taiwanese electronic companies are mainly clustered in the Pearl River delta and recently moved to Kunshan and Suzhou in Jiangsu. Japanese electronic companies strongly favor the Yangtze River delta and Liaoning province. Korean electronic firms invest heavily in Beijing, Shandong, and Tianjin. The Xingwang Industrial Park in the Beijing economic and technology zone houses a manufacturing cluster of mobile telecommunications equipment centered on Nokia, with more than 30 component suppliers (Yeung and others 2006). The strong supplier-buyer relations and business networks are essential to the success of electronic clusters. The downstream and upstream firms in the electronic industry locate closer to each other and form the successful clusters. The existence of electronic clusters in some inland cities can be partially related to the combined effects of market forces and the past locational policies of the Chinese government in promoting the growth of inland cities.

Industrial clustering has been the critical source of industrial competitiveness and has
significantly stimulated industrial development in China. Market and global forces are responsible for the formation and success of industrial clusters, particularly in traditional labor-intensive industries. Related firms cluster together because clustering is rewarding. Central and local governments in China have also played critical roles in facilitating industrial clustering by concentrating companies in development zones, which are set up by the central government or local governments at different levels. Governments set up investment platforms to attract new companies, while market and global forces underpin the expansion of industrial clusters, especially in advanced industries such as telecommunications and electronic equipment, transportation equipment, machinery, and electrical machinery and equipment.

Conclusions

China’s economic geography used to be heavily shaped by a socialist ideology that downplayed agglomeration economies. Industrial location was planned by the government. China’s economic transition has gradually introduced global and market forces into the economic system, while decentralization has granted local governments the authority and responsibilities for local economic development. Therefore, China now is a mixed economy in which socialist legacies and government intervention and planning exist side by side with global and market forces. Theoretically, global and market forces may foster the geographic clustering, which allows Chinese industries to exploit locational and comparative advantages and agglomeration economies, while decentralization may result in local protectionism and a rational imitation strategy, which discourages industrial agglomeration.

Economic liberalization during the last decades in China seems to have fostered both the macroeconomic and local conditions under which viable industrial agglomerations can emerge. The empirical investigations show that Chinese manufacturing industries have become increasingly agglomerated since the early 1990s. I find significant industrial variations in the trend and level of industrial agglomerations. In 1980 the most agglomerated industries were capital-intensive industries with strong internal scale economies, while the dispersed industries were resource-based or resource-processing industries. In 2004 many agglomerated industries were highly globalized, while the dispersed industries were localized, resource-based, domestic market-oriented industries or profitable, strategic industries that were favored and protected by local governments. As expected, the globalized industries with the least intervention, such as telecommunications and electronic equipment, instruments and meters, cultural education and sporting goods, garments, shoe and hat making, leather and fur products, chemical fiber, and rubber and plastic products, have become increasingly and significantly more agglomerated since the early 1990s, while domestic market-oriented and protected industries have shown no significant trend of centralization. The globalized and market-driven industries have shifted to the coastal provinces, including Fujian, Guangdong, Jiangsu, Shandong, Shanghai, and Zhejiang. The empirical results indicate that sectors and spaces that have undergone economic liberalization are the most prone to the formation of agglomeration economies. Geographic agglomeration of many labor-intensive industries such as garments and other fiber, leather and fur products, and rubber and plastic products, has gone beyond provincial boundaries. Some capital-intensive industries such as transportation equipment, machinery, electrical machinery and equipment, and chemical materials and products, which rely on regional business linkages, have significant spillover effects beyond provincial boundaries. However, industries dependent on localized business linkages or protected by local governments are confined within a province.

Industrial agglomeration appears to have caused the change in industrial structure in Chinese provinces. In the 1980s, as Chinese industries became dispersed, Chinese provinces experienced industrial diversification. Increasing industrial agglomeration has resulted in gradual industrial specialization since the late 1990s. With labor and capital flowing to the coast, the inland provinces have been forced to develop industries based
on natural resources, leading to a higher level of industrial specialization. The agglomeration of labor-intensive industries in the coastal provinces before the middle 1990s allowed these provinces to diversify their industrial composition, while the recent geographic agglomeration of advanced industries has resulted in industrial specialization in the coast.

The empirical analysis of Chinese industries also supports the argument that a positive relationship can be found between industrial agglomeration and labor productivity in economies that were formerly dominated by central planning. The relationship has been increasingly significant as the economic transition proceeds, suggesting that economic reform has created the conditions for industrial agglomeration. There are substantial industrial variations in the relationship. As most industries became increasingly agglomerated in the 1990s, stronger and more significant positive relationships between industrial agglomeration and productivity emerged, especially in industries that have gained prominence since economic transition. The heavily protected or state-controlled industries have not significantly benefited from industrial agglomeration. Market and global forces not only have driven Chinese industries to agglomerate in the coastal provinces but also have improved labor productivity. Although decentralization has promoted local economic development, it has discouraged industrial agglomeration and sacrificed the labor productivity of Chinese industries. However, as the economic transition proceeds and domestic markets become more integrated, interprovincial competition will become more fierce and force locally protected industries to be more productive. As a matter of fact, provincial governments have worked hard to promote the formation of industrial clusters to improve the competitiveness of local industries. Protected industries are fairly concentrated in some counties or cities within a province. Provincial governments have also competed fiercely with each other to attract foreign investments into locally protected industries and make them more productive. Overall, market reforms and globalization have indeed pushed China’s industries in the direction of efficiency in spite of provincial protectionism.

Note
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Industrial agglomeration and economic performance in transitional China


With a record-high economic growth rate and an important role in the world’s economy, China has received ever-increasing research attention. An issue of great interest to researchers is the allocation of investment across regions in China. Some studies, such as Boyreau-Debray and Wei (2005), argue that capital allocation across Chinese provinces is becoming less efficient and that the direction of capital flows is from regions with high returns to those with low returns. In contrast, in a recent study, Bai, Hsieh, and Qian (2006) systematically investigate the aggregate returns to capital in China and find that they have remained high despite one of the highest investment rates in the world. Furthermore, they study the pattern of investment allocation across regions and find that the regional dispersion of returns to capital has decreased over time.

Another interesting issue is the degree of regional specialization in China. Has the degree of regional specialization increased or decreased as the economy has grown? What factors determine the trend of specialization across regions? In an earlier study, Young (2000) claims that regional economic structures in China are becoming increasingly similar, which implies a rise in local protectionism. In contrast, Naughton (2003) finds evidence consistent with increasing regional specialization in China using 1987 and 1992 input-output data. And Bai and others (2004) find that the degree of industrial agglomeration in China changed from a decline between 1985 and 1988 to an increase afterward during the sample period; they also find evidence consistent with both the market forces for specialization and the forces for local protectionism against specialization. In a recent paper, Bai, Tao, and Tong (2008) document a U-shaped relationship between regional specialization and per capita gross domestic product (GDP) in China, which is consistent with the finding in Imbs and Wacziarg (2003), which investigates cross-country data.

A closely related issue concerns the agglomeration effect among neighboring firms. There are tradeoffs regarding the spatial concentration of industrial activities. On the one hand, agglomeration may induce regional disparity in economic development. On the other hand, it may allow firms in the same industry to benefit from the proximity of their peers. To better understand the tradeoffs regarding the spatial concentration of industrial activities, it is necessary to understand the agglomeration effect. There is a large literature on the agglomeration effect. However, depending on the methodology used, data sets employed, and countries studied, the empirical results vary greatly across empirical studies. Our knowledge about the agglomeration effect in China is even more inadequate. Most of the existing work in this regard focuses on the effect of the presence of foreign direct investment (FDI) on the performance of domestic firms. Such a focus is useful if we want to evaluate the effect of FDI, but it is not enough if we want to understand the tradeoffs involved with the spatial concentration of industrial activities.
In this chapter, we follow Bai, Hsieh, and Qian (2006) and study the allocation of investment across regions in China. We also extend the work of Bai, Tao, and Tong (2008) by using the most recent time series data from 1999 to 2003 to investigate recent trends in China’s regional specialization. Our results confirm that the efficiency of China’s resource allocation has been improving and that market forces have played an increasingly important role in China’s economic development.

In addition, we study the spatial factors behind firm performance to contribute toward our knowledge about the tradeoffs regarding the spatial concentration of industrial activities. We consider the effect of the proximity of peers on firm performance and then explore how the effect depends on regional and industrial characteristics and whether firms of different ownership, different sizes, and so forth enjoy the agglomeration effect to the same degree.

The rest of the chapter is organized as follows. The following section addresses the allocation of investment across provinces and regional returns to capital in China. This is followed by an analysis of regional specialization and an examination of the spatial factors behind productivity growth among Chinese firms. A final section concludes.

**Returns to capital across provinces**

Bai, Hsieh, and Qian (2006) have studied returns to capital in China at length, especially aggregate returns to capital. They also provide some results regarding the allocation of investment as well as the returns to capital across provinces. Most results presented here closely follow their work.

**Methodology and data**

This section presents our methodology for estimating rates of return to capital; introduces data on aggregate output, capital stock, and share of capital; and reports our findings about rates of return to capital across Chinese provinces from 1978 to 2005. We pay particular attention to special features in China’s national account statistics and recent revisions to the statistics.

**Returns to capital.** Following Bai, Hsieh, and Qian (2006), we calculate the real rate of return to capital \( r(t) \) for each of China’s 28 provinces for the years from 1978 to 2005 using the following equation:

\[
 r(t) = i(t) - \hat{P}_Y(t) - \hat{P}_K(t) - \delta(t). \]

Where \( i \) is the nominal rate of return, \( P_Y \) is the price of the output good, \( P_K \) is the price of capital, \( \alpha \) is the share of payments to capital in GDP, \( \delta \) is the depreciation rate of capital, \( \hat{P}_Y \) and \( \hat{P}_K \) are the percentage rates of change of the prices of the output good and capital, respectively, and \( K(t) \) denotes the real value of the aggregate capital stock.

**Aggregate output.** To account for the possible bias in locally provided GDP, the National Bureau of Statistics adjusts the aggregate GDP based on nationwide economic censuses. Our estimation uses the revised national accounts data provided by the National Bureau of Statistics.

**Capital stock.** Compared with the widely used series for investment in fixed assets, the series for gross fixed capital formation is a more accurate measure of the change in China’s reproducible capital stock. On the one hand, the series investment in fixed assets includes the value of purchased land and expenditure on used machinery and preexisting structures, which should not be included in investment data. On the other hand, the series may also understate aggregate investment, because it is based on survey data for large investment projects only. In contrast, in calculating gross fixed capital formation, the value of land sales and expenditures on used machinery and buildings are excluded from investment in fixed assets, and expenditures on small-scale investment projects are added. Therefore, we use this series to measure the capital stock and assume that
For the investment price deflators, after 1990, the National Bureau of Statistics reports separate price indexes for investment in structures and buildings and for investment in machinery and equipment. For 1978–89, we use the deflator of value added in the construction industry for the price of structures and buildings and use the output price deflator of the domestic machinery and equipment industry for the price of machinery and equipment. Before 1978, we simply use the price of the two types of investment goods.

Then we employ the standard perpetual inventory approach to estimate the stock of the two types of capital. We initialize the capital stock in 1952 as the ratio of investment in 1953 (the first year for which investment data are available) to the sum of the average growth rate of investment in 1953–58 and the depreciation rate. The depreciation rate for structures and for machinery is assumed to be 8 and 24 percent, respectively.

**Share of capital.** We calculate the share of capital in total income from the residual of labor income. The National Bureau of Statistics provides annual data on the share of labor for each province and each sector, which can be used directly to estimate the share of capital for each province.

**Returns to capital across regions**

Figure 17.1 plots the returns to capital for each of China’s 28 provinces from 1978 to 2005. Provinces are grouped into one of three regions—eastern, central, and western—as shown in the figure. One striking feature presented in the figure is the heterogeneity in the regional returns to capital. As clearly shown, the returns to capital are generally highest in the eastern region and lowest in the western region. However, the differences over time in the returns to capital across provinces are shrinking. The convergence of the regional returns to capital is also confirmed by figure 17.2, which shows that the standard deviation of the returns to capital across provinces is declining over the sample period.

Therefore, contrary to the findings of Boyreau-Debray and Wei (2005), the results presented here demonstrate that the dispersion in the returns to capital across regions in China has been shrinking and there is no evidence that capital flows from regions with higher returns to capital to those with lower returns. In other word, China’s investment allocation across regions has become more efficient.
Regional specialization
This section considers how the degree of regional specialization depends on various factors. We use panel data across 31 Chinese regions to estimate the relationship between the degree of regional specialization and various factors.

Theory and hypotheses
There are a few theories about regional specialization, and each of them implies empirically testable hypotheses.

Stage of economic development and size of the economy. Using cross-country data, recent studies, such as Imbs and Wacziarg (2003), find that the relationship between the degree of regional specialization and per capita income is U shaped. They offer two possible explanations. First, consumers tend to demand a more diverse range of goods and services as their income rises, and this implies a diversification of economic activities if consumer demand cannot be met with imports from other countries due to high trading costs. Second, in the absence of perfect risk-sharing arrangements, it is risky for countries to specialize in producing a small set of goods and services, as predicted by the traditional theories of regional specialization (Kalemli-Ozcan, Sørensen, and Yosha 2003). To test whether this relationship holds for China’s regional data, we include both per capita GDP and the square of per capita GDP in our regression.

Several studies, including Kalemli-Ozcan, Sørensen, and Yosha (2003), argue that larger regions tend to have lower levels of specialization due to more diversified demand and the exhaustion of scale economy. To capture this effect, we include a region’s total population in the regression and expect it to have a negative effect on the degree of regional specialization.

Local protectionism. With fiscal decentralization, China’s local governments have strong incentives to protect local firms and industries. However, the level and effectiveness of local protectionism depend on a number of factors. One is the size of local government expenditures relative to local GDP. Government spending is known for favoring local firms and industries. Furthermore, local governments with high ratios of expenditures to GDP are under financial pressure to practice local protectionism and obtain fiscal revenue to maintain their large public sectors. Thus regions with higher ratios of local government expenditures to GDP are expected to have more severe local protectionism. Local protectionism is a form of trade barrier. With higher trade barriers, the degree of regional specialization is lower.

The share of GDP from primary industries is another proxy for the level of local protectionism. Like other planned economies, China had national policies for developing manufacturing industries at the expense of primary industries—specifically, artificially suppressed prices for the output of primary industries but artificially inflated prices for the outputs of manufacturing industries—before its economic reform in 1979 (the so-called price-scissors problem; see, for example, Sah and Stiglitz 1984). In addition, due to central planning, those regions with high shares of GDP coming from primary industries may not have been the ones that further processed the outputs from primary industries and thus could not take full advantage of their resource endowments. Consequently, the price-scissors problem led to severe misalignment of economic interests among China’s regions. Since China initiated its economic reform in 1979, the price of products from both primary industries and manufacturing industries has been increasingly determined by market forces, but it takes much longer to adjust the suboptimal geographic location of manufacturing activities. In general, manufacturing industries tend to have higher value added than primary industries do. As a result, it is expected that, in regions with higher shares of GDP from primary industries, local governments place more restrictions on the sale of the output from their primary industries to other regions, and consequently the degree of regional specialization is lower (Bhagwati 1988).

Market competition. Market competition greatly limits the effectiveness of local protectionist policies. To capture the domestic
competition from firms in other regions, we construct a market potential measurement by using the weighted (weighted by the inverse of distance between different provinces) average of GDP from other provinces. Compared with domestic firms from other regions, foreign-invested firms and foreign imports pose a greater threat to local firms. We use two measurements to capture the effects of competition from foreign firms. One is the share of annual FDI inflows in a region to its GDP. The other is the distance of a region’s capital to Hong Kong weighted by the percentage of China’s exports going through Hong Kong. It is expected that the degree of regional specialization will be higher in regions with higher market potential or a higher ratio of FDI inflows to its GDP and in those regions closer to Hong Kong.

Methodology and data
This section defines the Hoover coefficient of localization and other variables and presents summary statistics.

Hoover coefficient of localization. To measure a region’s degree of specialization in industrial production, we calculate the Hoover coefficient of localization (Hoover 1936) using output data for 32 two-digit industries in 31 Chinese regions over the period of 1999–2003. It is calculated based on the location quotient with respect to output, which is given by:

\[
L_{ij} = \frac{\text{OUTPUT}_{ij}}{\text{OUTPUT}_j} \div \frac{\text{OUTPUT}_i}{\text{OUTPUT}},
\]

where \(\text{OUTPUT}_{ij}\) is industry \(i\)’s output in region \(j\), \(\text{OUTPUT}_j\) is total output in region \(j\), \(\text{OUTPUT}_i\) is industry \(i\)’s total output, and \(\text{OUTPUT}\) is total industrial output of China. If \(L_{ij}\) is larger than 1, then industry \(i\) has a higher percentage in region \(j\) than its share in the total industrial output of China and vice versa.

Analogous to the Gini coefficient for income distribution, to calculate the Hoover coefficient of localization, we first need to plot the localization curve for region \(j\). Given the location quotient of region \(j\) for all industries, \(i = 1, \ldots, l\), we rank industries by their location quotient in descending order and obtain a sequence of industries. Then the localization curve for region \(j\) can be plotted by calculating the cumulative percentage of output in region \(j\) (y axis) over the industries (x axis). The localization curve is the 45° line if every industry in a region contributes the same share of output as the whole country. And the localization curve is more concave if a region’s economic activities are concentrated in only a few industries. Then the area between the 45° line and the localization curve divided by the entire triangular area in which the localization curve is contained defines the Hoover coefficient of localization, which is between 0 and 1. A higher Hoover coefficient corresponds to a higher degree of regional specialization.

Other variables. The following variables are used in this study:

- \(\text{HOOVER}_{jt}\) is the Hoover coefficient of specialization of region \(j\) in year \(t\);
- \(r\text{GOVT}_GDP_{jt}\) is the ratio of government expenditure to GDP of region \(j\) in year \(t\);
- \(\%\text{PRIMARY}_{jt}\) is the share of GDP contributed by primary industries of region \(j\) in year \(t\);
- \(\text{MP}\) stands for market potential and is the weighted (weighted by the inverse of distance between different provinces) average of GDP from other provinces;
- \(r\text{FDI}_GDP_{jt}\) is the ratio of annual flow of FDI to GDP of region \(j\) in year \(t\);
- \(\text{DIST}_{HK}j_t\) is the weighted distance to Hong Kong of region \(j\) in year \(t\);
- \(\text{pcGDP}_{jt}\) is GDP per capita of region \(j\) in year \(t\); and
- \(\text{pcGDP}^2_{jt}\) is the square of \(\text{pcGDP}_{jt}\); and
- \(\text{POP}_{jt}\) is the population of region \(j\) in year \(t\).

Summary statistics. Figure 17.3 plots the average Hoover coefficients across all regions from 1999 to 2003. The simple average for all regions was 0.541 in 1999 and 0.572 in 2000. The simple average Hoover coefficients remained at that level until 2001 and then jumped to 0.582 in 2003. The weighted (by regional industrial output) average across regions demonstrates a similar time trend, with each weighted average Hoover coefficient being about 0.04 larger than the corresponding simple average in each year. By using data
over the 13-year period of 1985–97, Bai, Tao, and Tong (2008) show that China’s regions have become more specialized in industrial production. Our result confirms that the degree of regional specialization in China has continued to grow in recent years. To see the significance of regional variations in the degree of specialization, we plot the time average of the Hoover coefficients of specialization for different regions. As shown in figure 17.4, Beijing has the highest degree of specialization, with a Hoover coefficient of 0.790, and Qinghai has the lowest degree of specialization, with a Hoover coefficient of 0.359.

The mean and rank of other variables across regions are presented in table 17.1. The ratio of government expenditure to GDP has a mean of 0.151, with that for Tibet (0.521) being the highest and that for Hebei (0.078) being the lowest. And the share of GDP from primary industries ranges from 0.017 (Shanghai) to 0.374 (Hainan), with a mean of 0.176. Market potential, the share of FDI in GDP, and capacity-weighted average distance to Hong Kong range from 2,764.0 (Gansu) to 4,640.3 (Anhui), from 0 (Tibet) to 234.734 (Jiangsu), and from 0.0004 (Beijing) to 0.0139 (Ningxia), respectively. The means are 3,656.51, 35.792, and 0.0058, respectively. With per capita GDP of 38,019.6, Shanghai ranks first among all regions. Guizhou has the lowest per capita GDP, at 2,957.6. The mean per capita GDP is 9,584.4. With regard to population size, Henan ranks first with a population size of 0.944, and Tibet ranks the lowest with a population size of 0.026. Table 17.2 summarizes the pair-wise correlation of the key variables.

**Regional specialization**

To understand the underlying property and pattern of China’s regional specialization, we estimate the following model:

\[
\text{LogitHOOVER}_j = \beta_1 + \beta_2 \text{GOVT}_{-}GDP_j + \beta_3 \text{ % PRIMARY}_j + \beta_4 \text{ FDI}_{-}GDP_j + \beta_5 \text{ pcGDP}_j + \beta_6 \text{ pcGDP2}_j + \beta_7 \text{ MP} + \beta_8 \text{ DIST}_{-}HK_j + \beta_9 \text{ POP}_j + \gamma_j + \epsilon_j,
\]

(17.3)

where \( \gamma_j \) is the time-specific effect, and \( \epsilon_j \) is the error term, and

\[
\text{LogitHOOVER}_j = \ln \left( \frac{\text{HOOVER}_j}{1 - \text{HOOVER}_j} \right),
\]

(17.4)
The estimation results are presented in table 17.3.

The most interesting result is the U-shaped relationship between regional specialization and per capita GDP, as shown by the negatively significant (at the 5 percent level) estimated coefficient of per capita GDP and the positively significant (at the 5 percent level) estimated coefficient of per capita GDP square. Consistent with Bai, Tao, and Tong (2008), our result provides further evidence for the stage of development theory. Another variable that is also significant (at the 1 percent level) is market potential, which is positive and consistent with our expectation that more severe domestic market competition leads to a higher degree of regional specialization. However, the other variables, although statistically insignificant, do not appear to be consistent with the findings of Bai, Tao, and Tong (2008). In particular, the estimated coefficient for the ratio of local government expenditures to its GDP ($rGOVT\_GDP$) is negative, as expected, and statistically insignificant. Thus a higher

<table>
<thead>
<tr>
<th>Variable</th>
<th>GOVT_GDP</th>
<th>%PRIMARY</th>
<th>rFDI_GDP</th>
<th>pcGDP</th>
<th>POP</th>
<th>MP</th>
<th>DIST_HK</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beta</td>
<td>-4.04E-06</td>
<td>0.25707</td>
<td>-0.000147</td>
<td>-1.54E-05</td>
<td>-1.76E-10</td>
<td>1.94E-05</td>
<td>-1.49E-06</td>
</tr>
<tr>
<td>t-value</td>
<td>-1.3813</td>
<td>1.416</td>
<td>-0.73112</td>
<td>-2.2466**</td>
<td>2.0832**</td>
<td>3.0433***</td>
<td>-1.2097</td>
</tr>
</tbody>
</table>

Source: Authors’ calculations.

*** Significant at 1 percent.
** Significant at 5 percent.
Capital allocation, regional specialization, and spillover effects in China

ratio of local government expenditures to its GDP implies a higher degree of local protection, although the relationship does not appear to be significant. Also consistent with our expectation, the coefficient for the weighted distance to Hong Kong is negative, implying that regions that are subject to stiffer competition from firms with foreign investment and foreign imports enjoy a higher degree of regional specialization. And the coefficient for a region’s population (POP) is negative, as expected. As discussed in Bai, Tao, and Tong (2008), larger regions have lower degrees of specialization due to more diverse demand. At the same time, with the massive investments in infrastructure, the trading costs across regions are decreasing and so is the negative effect of the size of economy on regional specialization over time. Contrary to our expectation and the results in Bai, Tao, and Tong (2008), the coefficient for the share of GDP from primary industries (%PRIMARY) is positive, and the coefficient for the ratio of annual FDI flows of a region to its GDP (rFDI_GDP) is negative. As pointed out by Bai, Tao, and Tong (2008), the insignificance of the role of primary industries could be due to the fact that primary industries have become more market oriented and, consequently, the relationship between the size of the primary industries and local protection has been weakened. And the role of firms with foreign investment in the whole economy may be more complicated than we thought.

Total factor productivity and underlying spatial factors
Due to data limitations, many empirical studies are based on employment growth; that is, they assume that growth in productivity is proportional to growth in employment. However, as discussed in Cingano and Schivardi (2004), this assumption is rather strong, and studies relying on this assumption might suffer from identification problems. Therefore, we follow Cingano and Schivardi (2004) and construct a measure of local total factor productivity (TFP) as the dependent variable. Specifically, we define TFP as Solow residual. To calculate TFP, we first estimate the following regression model using pooled panel data:

\[
\ln(\text{profit}_i) = \alpha + \beta_1 \ln(K_i) + \beta_2 \ln(L_i) + \epsilon_i. \quad (17.5)
\]

Then TFP can be obtained as

\[
sTFP_i = \ln(\text{profit}_i) - \beta_1 \ln(K_i) - \beta_2 \ln(L_i). \quad (17.6)
\]

Intraindustry spillovers.
We use two variables to capture the intraindustry spillover effects on the localization economies. One is \(N_{sr}\), which is the number of firms in the same sector \(s\) and region \(r\); the other is \(N_s\), which is defined as the number of firms in the same sector \(s\) but not in the same region. As pointed out by Marshall (1920), externalities can occur through three mechanisms: knowledge spillovers, labor pooling, and learning. In this study, we do not intend to separate these mechanisms from each other; instead, we use \(N_{sr}\) to capture the effects of the spatial concentration of other firms from the same industry and use \(N_s\) to demonstrate whether these spillover effects operate locally or decay with distance.

Interindustry spillovers.
To account for spillover effects from firms outside the same
industry, we use two indicators to represent product variety. One is $N_r$, the number of firms in the same region $r$ but not in the same sector. The other is a Hirschman-Herfindahl index, defined as

$$Variety_{r,s} = \sum_{j \neq s} \left( \frac{L_{r,j}}{L_{r,s} - L_{r,j}} \right)^2,$$

where $L$ is manufacturing employment.

**Scale of the local economy.** As suggested in Combes (2000), the scale of the local economy affects the intensity of spillover effects. On the one hand, the level and quality of spillover effects require a large enough number of firms. And large size of local markets helps to foster concentration of specialized inputs and to develop market demand. On the other hand, dense economic areas tend to have higher rent and higher input prices, as well as other negative effects such as congestion and pollution. We use the size of the regional population to represent the scale of the local economy.

**Local competition.** As discussed in Porter (1990), local competition fosters innovations and the adoption of new technology. However, if competition is too severe and the return to research and development (R&D) investment is too low, firms' motivations for R&D investment may be weakened. We define competition of sector $s$ in region $r$ as

$$Comp_{r,s} = \sum_{i \in s} \left( \frac{L_{r,s,i}}{L_{r,s}} \right)^2,$$

where $i$ is an index for the firm belonging to sector $s$ and region $i$. $L$ is labor employed.

**Other variables.** Given the special features of the Chinese economy, we also include the labor force employed at the firm level and its square, share of foreign capital, and share of state capital in the specification. Furthermore, to evaluate how the level of spillover effects differs across different types of firms, we also include interaction terms between intraindustry and interindustry spillover effects and firm assets, share of foreign capital, and share of state capital.

**Summary statistics**

Our estimated TFP ranges from 14.063 to 14.137, with a mean of 14.104. The average number of firms from the same sector in a region is 180.59, the minimum is 1, and the maximum is 726. For number of firms from the same sector but not in the same region, the mean, minimum, and maximum are 1,926.9, 3, and 4,193, respectively. And the number of firms in the same region and from the same sector ranges from 38 to 5,791, with a mean of 2,992.2. The various indexes have a mean, minimum, and maximum of 0.092, 0.046, and 0.618, respectively. The mean level of local competition is 0.111. The labor force employed ranges from 1 to 166,857 workers, with a mean of 483.937. And the mean share of foreign capital and state capital is 0.174 and 0.452, respectively. The average population size is 55.145 million, the minimum is 2.478 million, and the maximum is 95.847 million. And 64.24 percent of the firms are located in coastal areas. Finally, the firm assets range from Y 18,000 to Y 68.266 billion, with a mean of Y 126.28 million.

The final sample consists of 45,093 firms, which covers 30 regions and 37 industries, with a mean of 1,503.1 firms in a region.

**Empirical Results**

We estimate the following model:

$$\ln(TFP)_{it} = \alpha + \beta_1 N_{it} + \beta_2 N_{it} + \beta_3 N_{it} \times asset_{it} + \beta_4 N_{it} \times asset_{it} \times foreign_{it} + \beta_5 N_{it} \times foreign_{it} \times state_{it} + \beta_6 population_{it} + \beta_7 Variety_{it} \times Competition_{it} + \beta_8 state_{it} + \text{dummies} + \varepsilon_{it},$$

(17.9)
where four time dummies and a region dummy for coastal area are included to control for possible unobservable time and region effects that might confound with spatial spillover effects. The estimation results are presented in table 17.4.

The results show significant spillover effects, both intraindustry and interindustry, among Chinese firms. Specifically, the number of firms from the same sector in the same region has a positive effect on a firm’s TFP growth; and smaller firms that have lower asset levels appear to benefit more than larger firms. Likewise, firms with a higher share of state capital tend to benefit more from the presence of other firms in the same sector and the same region, while the foreign capital share does not affect the magnitude of this type of spillover effects. As another indicator of intraindustry spillover effects, the number of firms from the same sector in other regions also shows a positive association with TFP growth. For this type of spillover effects, larger firms and firms with a higher share of foreign capital tend to benefit more, while firms with a higher share of state capital tend to benefit less. In addition, the TFP growth of a firm is positively correlated with the number of other firms in the same region, regardless of the sector, which indicates the presence of positive interindustry effects in a region. In particular, smaller firms, firms with a lower share of foreign capital, and firms with a lower share of state capital appear to enjoy more positive externalities from other firms in the same region but not in the same industry. At the same time, variety, another indicator of interindustry spillover effects, shows a negative effect, although it is significant only at the 10 percent level. The size of local economy, which is captured by population size, has a direct effect on TFP growth (at the 5 percent level). And local competition also shows a positively significant effect on TFP growth. As for the other variables, foreign capital share does not show any significant relationship with TFP growth, while state capital share shows a positive effect at the 5 percent level. Interestingly, the labor force employed by a firm exhibits a U-shaped relationship with TFP growth of the firm. Because the results are obtained after controlling for time and region unobservable effects, we believe they provide sensible estimates for spatial and other factors underlying TFP growth among Chinese firms.

Table 17.4 Estimation results with dependent variable ln(TFP)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Beta</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nsr</td>
<td>1.43E-06***</td>
</tr>
<tr>
<td>Nr</td>
<td>2.41E-06***</td>
</tr>
<tr>
<td>Ns</td>
<td>1.88E-07***</td>
</tr>
<tr>
<td>Nsr*asset</td>
<td>-4.48E-12***</td>
</tr>
<tr>
<td>Ns*asset</td>
<td>2.38E-13***</td>
</tr>
<tr>
<td>Nr*asset</td>
<td>-2.84E-14***</td>
</tr>
<tr>
<td>Nsr*foreign</td>
<td>1.75E-07</td>
</tr>
<tr>
<td>Ns*foreign</td>
<td>3.65E-07***</td>
</tr>
<tr>
<td>Nr*foreign</td>
<td>-3.06E-07***</td>
</tr>
<tr>
<td>Nsr*state</td>
<td>6.09E-07***</td>
</tr>
<tr>
<td>Ns*state</td>
<td>-9.68E-08***</td>
</tr>
<tr>
<td>Nr*state</td>
<td>-5.52E-08***</td>
</tr>
<tr>
<td>Population</td>
<td>0.0001082**</td>
</tr>
<tr>
<td>Variety</td>
<td>-0.0003379*</td>
</tr>
<tr>
<td>Competition</td>
<td>0.0007005***</td>
</tr>
<tr>
<td>Labor</td>
<td>-2.89E-06***</td>
</tr>
<tr>
<td>Labor^2</td>
<td>2.17E-11***</td>
</tr>
<tr>
<td>Foreign</td>
<td>-0.0001842</td>
</tr>
<tr>
<td>State</td>
<td>0.0001377***</td>
</tr>
<tr>
<td>Time dummies</td>
<td>Yes</td>
</tr>
<tr>
<td>Coast dummy</td>
<td>Yes</td>
</tr>
<tr>
<td>Number of observations</td>
<td>45,093</td>
</tr>
</tbody>
</table>

Source: Authors’ calculations.
*** Significant at 1 percent.
** Significant at 5 percent.
* Significant at 10 percent.

Conclusions

Our study, along with recent studies including Bai, Hsieh, and Qian (2006) and Bai, Tao, and Tong (2008), shows that China, a country with a remarkable economic growth rate, has experienced improved resource allocation efficiency and exhibited an economic development trend consistent with that of other countries. Specifically, there is a convergence among returns to capital across regions in China, implying that investment has not been flowing to regions with lower returns to capital from those with higher returns. Consequently, China’s allocation of
investment across regions has not become more inefficient. The U-shaped relationship between regional specialization and per capita GDP demonstrates that, as an integrated part of the world’s economy, China follows the same development trend for regional specialization as other countries. And fierce market competition has significantly limited the effectiveness of local governments’ protectionist policies, which has helped to foster production specialization across provinces in China. These results suggest that market forces have played an increasingly dominant role in China’s economy development.

The findings on agglomeration effects among Chinese firms show significant intraindustry and interindustry externalities. In particular, the number of firms from the same sector, either from the same region or from other regions, has a positive effect on a firm’s TFP growth. And the TFP growth of a firm is positively correlated with the number of other firms in the same region, regardless of the sector. The strength of the spillover effect varies across different types of firms. Specifically, smaller firms and firms with a higher share of state capital benefit more from the presence of other firms in the same sector and in the same region. At the same time, larger firms, firms with a lower share of state capital, and firms with a higher share of foreign capital tend to benefit more from the presence of firms from the same sector but in other regions; however, larger firms and firms with a higher share of foreign capital appear to enjoy fewer externalities from other firms in other sectors and in the same region. Other factors, including product variety, local competition, scale of local markets, share of state capital, and labor force employed, also have a significant effect on TFP growth of Chinese firms.

Notes
Chong-En Bai is chair of the Economics Department, and Xu Lin is assistant professor in the Economics Department, both at Tsinghua University in Beijing. We thank Yukon Huang and other participants of the Tokyo workshop for their valuable comments and Jianhuan Xu for his excellent research assistance.

1. We include Hainan as part of Guangdong and Chongqing as part of Sichuan. Tibet is not included in our estimate of returns to capital due to data limitations.
2. To save space, we only report the mean and rank of the variables for some regions. The detailed information for all regions is available from the authors upon request.

References


Coastal China’s urban-rural spatial restructuring under globalization

Yue-man Yeung and Jianfa Shen

In China’s impressive dash to achieve economic development and modernization, its cities, especially those located in the coastal regions, have acted as catalysts, launching the nation on a trajectory of meteoric social transformation and economic uplift. Because of existing strengths such as economic agglomeration and large concentrations of population, much of the early impulse toward economic development in post-reform China was concentrated in the coastal regions of the country, especially in the Pearl River delta, the Yangtze River delta, and the Bohai Bay area in northern China. Urban and regional development in these three regions has centered on a few large cities such as Beijing, Guangzhou, Shanghai, Shenzhen, and Tianjin, because of their favorable initial conditions, coastal location, their attraction for foreign investors, and the presence of strong state-owned enterprises and active municipal governments.

Development in these regions and cities has been stimulated both by the forces of globalization, notably through foreign investment and international trade, and by internal forces, such as local development initiatives, decentralization, and marketization. The strong force of urban agglomeration in coastal China has produced a model of development that is led by large cities. At the macro level, the most important and obvious change is the exceptionally rapid growth of China’s cities during the reform period. The number of cities in the country grew from 223 in 1980 to 649 in 2004. The number of mega cities with more than 2 million inhabitants also grew, from 7 to 21, and cities with 1 to 2 million inhabitants mushroomed from 8 to 30 during the same period.

Rapid urban restructuring both within cities and across regions has been the result of bold changes in policy. The first such policy change was the decision of the central government to permit the decentralization of authority to provinces, cities, counties, and even enterprise units. With the launching of an open-door policy, the authority to develop a piece of land was decentralized to such an extent that every unit of authority now vies for the opportunity to control development and generate revenue. Naturally, this has created excessive competition among different levels of government. The result has been wasteful redundancy and inefficient land use practices. A footnote to the decentralization of power to cities, which allowed them to make plans for their development, is the fact that certain cities, like Shantou, Shenzhen, Xiamen, and Zhuhai, were designated special economic zones (SEZs) in 1980 or thereabouts and given the specific power to experiment with new policies. For example, in 1987 Shenzhen held the first land auction in post-1949 China. It was modeled after the Hong Kong system of government ownership of land, with leaseholds granted by the state for a specified period of time in exchange for a fee. The land lease model, having been implemented successfully in Shenzhen, has since been widely replicated across cities in China, even in faraway inland cities. The spread of this model
has been critical to the ability of Chinese cities to pursue rapid physical growth and modernization.

Apart from the fact that the leasing of land provided a major source of revenue for city administration, another factor that changed the fiscal position of cities is the change, implemented during the reform period, in the central government’s fiscal relations with provincial governments as well as with subordinate units such as cities. Since 1978, the central government has progressively relaxed the highly centralized fiscal system, giving provinces and cities a much greater degree of freedom to pursue development. Various practices that have been implemented at different times and in different provinces include the contracting out of fiscal duties, the remittance of a fixed proportion of a locality’s fiscal surplus to the central government, the sharing of revenues between the central government and the provinces, the launching of tax-for-profit reforms, and the assignment of taxes. In the spirit of openness and decentralization, the central government has taken a more liberal attitude toward fiscal administration and has fine-tuned or adjusted policies when it has perceived the need to do so.

During the reform period, the coastal provinces of Fujian and Guangdong enjoyed preferential policies, while the three provincial-level municipalities of Beijing, Shanghai, and Tianjin were kept under tighter control. Since 1994, Shanghai has also enjoyed a “tax-sharing system” of the sort previously implemented only in Fujian and Guangdong (Yeung and Sung 1996: 9). Shanghai’s rapid development since the early 1990s can be traced in part to this fiscal reform. The changes in China’s fiscal system since 1978 have led to a situation in which the tax revenues of a locality are strongly and positively associated with its level of development and rate of urbanization. Moreover, the fiscal reforms have created uneven fiscal relations between the center and different provinces, contributing to regional inequalities (Shen 2005; Wei 1996).

The third factor in the restructuring of Chinese cities in the reform period is the fact that urban development became premised more on market principles than on central planning. The result has been a profound change in the development landscape, with the relative decline of the industrial north and northeast areas that had been favored since the mid-1950s in previous national development plans. Instead, the decentralization of decision making has led to the emergence of the coastal regions and the south as new centers of growth, with their cities powering ahead of the rest of the country in development. An analysis of the gross domestic product (GDP) of the various provinces from 1978 to 1995 has borne out this dramatic shift in the focus of development to the south (Lin 1999). This shift has also led to a change in the relationship between cities in China and in the proportion of cities of different sizes. Whereas in the pre-reform period the urban hierarchy was organized by vertical linkages and political functionality, cities are now shaped primarily by horizontal connections and economic exchanges. The number of cities has vastly increased. As noted, small and medium-size cities in particular have proliferated. The pace of the increase is astonishing. Consequently, since 1978, China’s spatial transformation can be characterized as a reorganization of spatial relationships between northern and southern China, between large cities and small towns, and between cities and the countryside (Lin 1999).

The fourth factor follows from the rise of small towns and cities: the mushrooming of township-and-village enterprises (TVEs) across coastal China during the reform period. In the reform period, rural urbanization was led by the TVEs, with the active participation and support of local governments. Their growth and expansion have been major components of locally driven urbanization, or urbanization from below. This has given rise to the phenomenon of dual-track urbanization, a process in which the nonagricultural population of cities has grown rapidly, complemented by rural urbanization generated from below (Shen 2006). The rapid growth of small towns and cities has, to a degree, been fueled by the long-standing urban planning guideline of strictly controlling the growth of large cities and promoting the growth of
small and medium-size cities. This planning guideline has not been adhered to strictly, as can be seen by the rapid growth of very large cities, a result that is compatible with economic logic and trends in urban development at the global level.

The fifth and final factor accounting for the rapid change in the urban landscape in contemporary China is the hukou (household registration) system, established in 1958 to control population movements and essentially immobilize the urban and rural populations. In 1984 the government began to relax what had previously been a rigid system. Since then, rural migrants have descended en masse on coastal cities. Referred to as a temporary or floating population, rural migrants provide the crucial labor force for urban construction and a wide variety of services, especially in “3-D” occupations—that is, those that are dirty, dangerous, and difficult. Recent estimates have placed the temporary population of China at around 120 million. These migrants are not counted in official statistics on the hukou population, which means that many urban population figures, especially those for large coastal cities, clearly underestimate the real situation, because a quarter to a third of the population of such cities can be traced to this source. Cities like Shanghai and Shenzhen have introduced “blue stamp” hukou to cope with some “floaters,” but many cities have found these new migrants to be both a boon and a bane (Yeung 2002).

The following sections examine the process of urban development and spatial restructuring in the economically most advanced regions of the country: the Pearl River delta, the Yangtze River delta, and the Bohai Bay area (see figure 18.1). More than any other part of the country, these three coastal regions have been influenced by the forces of globalization, which have been accelerating since the early 1980s. The timing has been fortuitous for China, as this development has coincided with the early phase of the country’s opening to the outside world. The conjuncture of these two processes has been highly beneficial for China’s rapid development. Tables 18.1 and 18.2 present a summary of the main demographic and economic indicators for Beijing, Guangzhou, Shanghai, and Shenzhen, four major cities in the three regions. In 2005 each city had a population of more than 8 million. They are the most advanced cities in China, with per capita GDP well over the national average. The rest of the chapter refers to these tables from time to time.

**Guangdong and the Pearl River delta**

In the early 1980s, the provinces of Fujian and Guangdong were chosen to carry out experiments under China’s open-door policy, largely because of their history of early contact with Western countries; thus they were considered to be more in tune with worldly developments than other areas of the country. These two provinces were allowed more flexibility in trying out new
Coastal China’s urban-rural spatial restructuring under globalization

policies, particularly with respect to luring foreign investment and promoting trade and development. The SEZs and development zones were allowed even greater freedom to pursue new development policies. Similarly, from 1984 onward, China’s coastal cities, including Guangzhou and Zhanjiang in Guangdong, were allowed more leeway to pursue development and experimentation (Yeung and Hu 1992).

Fiscal reform constitutes a critical dimension of economic reform in China and has had a powerful impact on regional development. As early as 1979, Fujian and Guangdong were candidates for fiscal experimentation. For the first time, Guangdong enjoyed great fiscal autonomy by being allowed to remit a lump sum to the central government for five years, much to the envy of other provinces. In 1988 Guangdong was allowed a fixed quota, with adjustments for growth, in which the central government’s share was small. Shenzhen was exempt from remitting anything at all to the central government for 10 years, until 2003 (Shi 2003).

Within Guangdong, the most developed area of the province consists of nine prefecture-level cities—Dongguan, Foshan, Guangzhou, Jiangmen, Shenzhen, Zhongshan, Zhuhai, and part of Huizhou and Zhaoqing—that form the Pearl River delta region (see figure 18.2). They make up

Table 18.1  Demographic and GDP indicators of Guangzhou, Shenzhen, Shanghai, Beijing, and China, 1980–2005

<table>
<thead>
<tr>
<th>Year</th>
<th>Guangzhou</th>
<th>Shenzhen</th>
<th>Shanghai</th>
<th>Beijing</th>
<th>China</th>
</tr>
</thead>
<tbody>
<tr>
<td>Area (thousand square kilometers)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2005</td>
<td>7.4</td>
<td>2.0</td>
<td>6.3</td>
<td>16.4</td>
<td>9,600.0</td>
</tr>
<tr>
<td>Population (millions)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1980</td>
<td>5.02</td>
<td>0.33</td>
<td>11.57</td>
<td>9.04</td>
<td>987.05</td>
</tr>
<tr>
<td>1990</td>
<td>6.30</td>
<td>1.68</td>
<td>13.32</td>
<td>10.86</td>
<td>1,143.33</td>
</tr>
<tr>
<td>2000</td>
<td>9.95</td>
<td>7.01</td>
<td>16.21</td>
<td>13.64</td>
<td>1,267.43</td>
</tr>
<tr>
<td>2005</td>
<td>9.50</td>
<td>8.28</td>
<td>17.99</td>
<td>15.38</td>
<td>1,307.56</td>
</tr>
<tr>
<td>Population density (persons per square kilometer)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1980</td>
<td>427</td>
<td>170</td>
<td>1,870</td>
<td>551</td>
<td>103</td>
</tr>
<tr>
<td>1990</td>
<td>847</td>
<td>859</td>
<td>2,101</td>
<td>662</td>
<td>119</td>
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<tr>
<td>2000</td>
<td>1,338</td>
<td>3,591</td>
<td>2,556</td>
<td>831</td>
<td>132</td>
</tr>
<tr>
<td>2005</td>
<td>1,277</td>
<td>4,239</td>
<td>2,837</td>
<td>937</td>
<td>136</td>
</tr>
<tr>
<td>GDP (current price, yuan billion)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1980</td>
<td>5.8</td>
<td>0.3</td>
<td>31.2</td>
<td>13.9</td>
<td>454.6</td>
</tr>
<tr>
<td>1990</td>
<td>32.0</td>
<td>17.2</td>
<td>78.2</td>
<td>50.1</td>
<td>1,671.8</td>
</tr>
<tr>
<td>2000</td>
<td>249.3</td>
<td>218.7</td>
<td>477.1</td>
<td>316.1</td>
<td>9,800.1</td>
</tr>
<tr>
<td>2005</td>
<td>515.4</td>
<td>495.1</td>
<td>916.4</td>
<td>688.6</td>
<td>18,395.6</td>
</tr>
<tr>
<td>GDP per capita (current price, yuan per person)</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>1980</td>
<td>1,160</td>
<td>835</td>
<td>2,719</td>
<td>1,544</td>
<td>463</td>
</tr>
<tr>
<td>1990</td>
<td>5,418</td>
<td>8,724</td>
<td>5,891</td>
<td>4,635</td>
<td>1,644</td>
</tr>
<tr>
<td>2000</td>
<td>25,626</td>
<td>32,800</td>
<td>29,796</td>
<td>24,122</td>
<td>7,858</td>
</tr>
<tr>
<td>2005</td>
<td>53,809</td>
<td>60,801</td>
<td>51,461</td>
<td>45,444</td>
<td>14,040</td>
</tr>
<tr>
<td>Average annual growth rate of GDP (based on fixed price, percent)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1981–90</td>
<td>11.8</td>
<td>25.7</td>
<td>7.4</td>
<td>8.8</td>
<td>9.3</td>
</tr>
<tr>
<td>1991–2000</td>
<td>16.6</td>
<td>23.2</td>
<td>12.3</td>
<td>11.0</td>
<td>10.3</td>
</tr>
<tr>
<td>2001–05</td>
<td>13.8</td>
<td>16.3</td>
<td>11.9</td>
<td>12.0</td>
<td>9.9</td>
</tr>
</tbody>
</table>

Sources: Compiled or calculated using data from BMBS (2006); DCA and MPH (2000); GDPBS (1992, 2006); GMSB (2006); NBS (2006); SMSB (2001, 2006); SSB (2006); Guangzhou Economic Yearbook Editorial Committee (1983).

Note: All population data refer to usual residents, except the 1980 figure for Guangzhou, which is based on hukou population. The 1990 figure for Guangzhou is from the 1990 census (GDPBS 1992: 130).
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23 percent of Guangdong’s land area but contribute 80 percent of its GDP, or one-tenth that of the nation. The Pearl River delta has achieved a level of urbanization of 72.7 percent (Ta Kung Pao, January 18, 2005). These figures speak volumes about the achievements that the Pearl River delta has made after almost three decades of openness. By now, the delta has developed into the country’s largest production center for the electronics and information technology industries, accounting for as much as 40 percent of the world’s production of some computer components (Chen and others 2003: 38). A large proportion of the nation’s production of home appliances is manufactured in this province, such as electric fans (88.2 percent), air conditioners (38.2 percent), bicycles (35.7 percent), and refrigerators (25.1 percent; Chen and others 2003: 25; also Enright and others 2003: 40).

One of the most fundamental changes in Guangdong in the reform period has been the structural change of its economic base from an agricultural to an industrial orientation. The ratio of the contribution of the primary, secondary, and tertiary industries to Guangdong’s GDP has changed sharply, evolving from 33.2, 41.1, and 25.7 percent, respectively, in 1980 to 6.0, 51.3, and 42.7 percent, respectively, in 2006 (GDPBS 2007). In 27 years, the secondary sector has become far more important, and the tertiary sector has grown rapidly, at the obvious expense of the primary sector. In 1980–2005 Shenzhen led the province with a rising secondary sector and a stable tertiary sector, while Guangzhou experienced a significant increase in the share of the tertiary sector (table 18.2).

### Density, agglomeration, and economic growth

Many factors are behind the rapid economic development that has occurred in the Pearl River delta since the early 1980s. One is the agglomeration effects of towns and cities that
have found a particular niche in economic production. Many towns in the region, especially in the western wing of the delta, have achieved success in concentrating on and perfecting a single industry, a phenomenon that has been dubbed “one town, one industry” (Yeung, Shen, and Zhang 2005). Many of these towns and cities have grown at an astonishing rate, both in economic output and population. New cities that had been accorded special status, such as the SEZs of Shenzhen and Zhuhai, have grown even faster, with the former exploding from a border town of only 0.33 million inhabitants in 1978 to a metropolis of 8.28 million in 2005 (SSB 2006). The population of Shenzhen grew rapidly in the 1990s, and its population density reached 4,239 persons per square kilometer by 2005, the highest among cities in mainland China (table 18.1).

Another factor spearheading urban-regional change is the role played by Guangzhou, the provincial capital. While it grew more slowly than Shenzhen in the 1980s, Guangzhou caught up rapidly in the 1990s (table 18.1). Guangzhou adopted a new spatial policy of “expansion in the south, optimization in the north, advancement in the east, and linkage in the west.” True to the spirit of this policy, Guangzhou developed the mammoth new Baiyun airport in the north in 2004 and gained direct access to the sea in the south by annexing Panyu in 2000. Toward the west, the Guangzhou-Foshan twin-city region is being consolidated. In an easterly direction, Guangzhou has been expanding and consolidating its land transport network with Dongguan. Guangzhou has other infrastructure development plans that are envisaged to enhance its pivotal geographic role in the province, through the purposeful construction of new expressways, railways, and light railways. Guangzhou and Shenzhen grew faster than Beijing and Shanghai throughout the period of 1980–2005. By 2005, Guangzhou and Shenzhen had a higher per capita GDP than Beijing and Shanghai (table 18.1).

The third factor that has led to the increasing density of human settlements

![Figure 18.2 The Pearl River delta region and its constituent cities](Source: Yeung (2003: iv).)
and to greater economic development is the dual-track form of urbanization, which was referred to earlier. The contribution of TVEs is a component of rural urbanization, with Hong Kong businessmen having invested in no fewer than 66,000 such firms.

The fourth and last factor that has facilitated the concentration of economic and urban activities in the Pearl River delta is massive and sustained investments in infrastructure. Expressways, railways, ports, airports, power stations, and telecommunications facilities have developed at a breakneck pace.

The region would not have developed so rapidly had it not been for the fact that the open-door policy was attractive to Hong Kong industrialists, who were looking for ways to relocate their manufacturing operations away from the constrained environment of the city-state, which was experiencing rising wages and land prices. The town of Shenzhen, located just across a narrow river from Hong Kong, offered a plentiful amount of land and an almost inexhaustible supply of labor from all over the country, along with favorable policies for investors. Hong Kong entrepreneurs responded positively, moving their industrial production operations en masse, initially to Shenzhen and then to the next town, Dongguan, and elsewhere in the delta. A symbiotic relationship was soon established, with Hong Kong providing capital, modern management skills, and information about global markets and the Pearl River delta offering cheap land, labor, and favorable economic policies. Hong Kong has been serving as a front shop from which businesspeople face the world, handling production orders, designing products, and making major investment and management decisions, whereas the plants in the delta are engaged in the actual production process. This mutually beneficial model is widely known as the “front shop, back factory” arrangement. As many as 10 million workers are currently employed in these factories in the Pearl River delta, which are financed and managed by Hong Kong interests. Such investment also contributes to rapid growth of exports. As shown in table 18.2, Guangzhou and Shenzhen each attracted more foreign capital than Shanghai in the 1980s and 1990s, although they were overtaken by Shanghai in 2000–05. Exports from Shenzhen reached US$101.52 billion in 2005, even greater than Shanghai. It is clear that a portion of foreign investment in Shanghai targets the domestic market of China, such as the industry of car manufacturing, while Shenzhen’s industry is mainly export oriented.

An idea of how the Pearl River delta has been developing into a densely populated, economically vibrant, and environmentally sustainable region can be seen in figure 18.3, which shows an urban-regional plan for the delta until 2020. This plan was adopted in 2005 by the Guangdong People’s Congress. It envisages limiting the area of development in the delta to around 7,800 square kilometers, capping the population at about 65 million, and engaging in regional infrastructure planning to cope with a population of 80 million. The guiding principle of planning for coordinated development is to “strengthen development centers and create spines and corridors.” More specifically, “one spine, three corridors, and five belts” is the broad spatial framework for coordinating and maximizing the urban and regional strengths of the delta (Yeung 2005). The urban-regional plan was initiated by the provincial and central authorities and designed to minimize the costly problem of redundancy and overlap that has characterized some infrastructure and other developments in the delta’s cities. As the plan was undertaken and approved without the participation of the authorities of the Hong Kong and Macao special administrative regions, it is being updated by another more holistic study involving the original delta cities plus Hong Kong and Macao. Called the Greater Pearl River Delta Urban Coordinated Plan, the study is scheduled to be completed in 2008.

With Hong Kong and Macao having become part of China in 1997 and 1999, respectively, the integration of these special jurisdictions with the mainland is ongoing. In the first decade since Hong Kong’s return to Chinese sovereignty, the pace of integration, whether measured by the flow of people, goods, capital, or information, has been rapid. With ever more Hong Kong people traveling, working, and retiring in the Pearl River delta and beyond, cities in the delta are increas-
Coastal China’s urban-rural spatial restructuring under globalization

In many areas, the state is increasingly catering to their needs, in areas such as the provision of housing, medical care, work, schooling, and so on (Yeung 2007).

Against this trend toward closer integration, some recent policies have fostered better economic relations between Hong Kong and the mainland. Notable among these are the Individual Visit Scheme and the Closer Economic Partnership Arrangement, which were announced in 2003 and implemented beginning in 2004.

**Improving regional transport infrastructure**

Feverish construction continues in the region. In the four years from 1996 to 2000 alone, Guangzhou invested ¥ 60.5 billion in urban construction, more than twice the amount of its investment in the 47 years prior to 1996 (Chen and others 2003: 108). Guangdong now has 3,140 kilometers (2005) of expressways, most of them in the Pearl River delta. Guangzhou is the hub of many of these expressways, which is reinforcing the city’s bid to become a leading urban center. Within a radius of 100 kilometers, the delta has five large airports that together offer a daily total of 550 international flights and 600 domestic flights.

In ocean transport, container throughput in the three-port cluster of Hong Kong, Shenzhen, and Zhuhai is more than 30 million 20-foot equivalent units, surpassing any other port cluster in Asia (Chen and others 2003: 165). Connectivity between Hong Kong and the delta has continued to improve. The 5-kilometer western corridor link between Hong Kong and Shenzhen, consisting of a bridge and a highway, was opened in July 2007, followed the next month by the opening of a rail spur line to the border at Lok Ma Chau. The regional express railway linking Hong Kong with Guangzhou through Shenzhen is under construction and due for completion in 2010–14. In contrast to the situation before 1997, Hong Kong and its people clearly are increasingly taken into consideration in plans for the construction of large-scale infrastructure projects in the delta. There is little doubt that infrastructure will continue to be an important avenue along which the density of development in the Pearl River delta will thicken and lead to more economic and social gains for the people (Yeung and Kee 2007).

In the development of the Greater Pearl River delta region—that is, the Pearl River delta plus Hong Kong and Macao—the
concept of the “magic three hours” has been popularized, meaning that the aim is to enable a businessman to travel from Hong Kong to the Pearl River delta in three hours, allowing him to complete his day’s work the same day (Enright and others 2003). The present direct rail link between Guangzhou and Hong Kong, which runs 12 times a day in each direction, will be halved to less than an hour. The physical connectivity between cities in the delta will continue to improve with the application of new transport and telecommunications technology.

The area of Guangdong totals 177,901 square kilometers, representing 1.9 percent of China’s total area. Within the province, considerable intraregional differentiation and disparities exist. The contrast between those areas of the province that are located within the Pearl River delta and the peripheral areas is striking, both in terms of level of development and ecological endowments. Within the delta itself, there is a significant difference between the eastern and western wings. The eastern wing, represented by Dongguan and Shenzhen, has experienced rapid development during the reform period. This is primarily the result of the benefits derived from its geographic proximity to Hong Kong. The western wing, which includes Zhongshan, Zhuhai, and other cities, has lagged behind, although this area was economically and culturally more advanced than the eastern wing before the onset of economic reforms. Their economic, social, and general conditions have reversed since the 1980s, a result that is traceable to the presence or absence of the “Hong Kong factor.” By the same token, much of the available land in the eastern wing has been developed, leaving the western wing, especially Jiangmen, a relative latecomer, with much more room for development (Yeung, Shen, and Zhang 2005).

Traditional studies on regional economics have postulated that, in the experience of Western countries, agglomeration effects take place in developed areas toward which labor, capital, and other factors of production flow from less-developed areas. Central cities derive advantages on account of their economies of scale, the efficiency of their markets, circulation of information, large pool of talent, and superior infrastructure facilities. This agglomeration will continue until developed areas, usually led by central cities, no longer enjoy economies of scale. At this point, faced with escalating land prices and a rising cost of living, polarization begins to reverse.

In Guangdong, the transformation from centrally planned to market-oriented development was basically completed in all 21 prefecture-level cities by the 1990s. By the end of 1994, 95 percent of all retail commodities, about 94 percent of agricultural products, and 93 percent of production materials were regulated by market mechanisms. All of this shows that the opening up of the market occurred at a measured, but substantial, pace with regulatory controls (Zhou 1995).

The tendency has been for economic development in the Pearl River delta to be concentrated in the following six cities: Dongguan, Foshan, Guangzhou, Shenzhen, Zhongshan, and Zhuhai. In 2005 these cities accounted for 10.7 percent of the total area of the province, but 37 percent of its hukou population, 80.4 percent of its fiscal revenues, and 70.5 percent of its GDP. In addition, the relative concentration of people, wealth, and goods in the province exceeded Guangdong’s relative area by 26.3, 69.7, and 59.8 percent, respectively (GDPBS 2006). Over the past five years, the composite development of the province improved, although a weakening trend is probable in the future. However, the peripheral areas of the north and the west, together with the mountainous areas, were relatively weak over the past five years but are expected to perform more strongly in the future. In addition, considering the phenomenal growth of the province’s GDP, with a 14.7 percent rise over the previous year, per capita GDP of US$4,915, and a tertiary sector contributing 46.2 percent to GDP in 2005, there is considerable scope for economic agglomeration before the stage of polarization reversal is reached. Nevertheless, certain industries, especially labor-intensive ones in the electronics, telecommunications, and home appliance sectors, are beginning to relocate from the developed core to the peripheral areas.

The end effect of the structural changes and geographic relocation of industries is a
noticeable shrinking of the development gap between the Pearl River delta and peripheral areas. This is a major move toward the goal of building a xiaokang—or moderately affluent—society, which was set out as a national development objective in the Tenth Five-Year Plan, which concluded in 2005. In fact, by 1997, Guangdong had already reached a stage of development beyond that of being able to meet basic needs. In 2003, 16 poor counties in Guangdong were able to shake off poverty; by 2005, 50 poor counties in the mountainous region had reached xiaokang status (Chen and others 2003: 113).

Unbalanced development and regional cooperation
For decades or more, physical and artificial barriers have separated the developed from the economically laggard areas within Guangdong. Until recently, it seemed that the considerable regional disparities would be perpetuated. However, after almost three decades of reform, the barriers to factor mobility have been coming down.

The first barrier to fall was the mobility of people. Since 1984, people from the less-developed areas of the province and, in fact, from other provinces, have been allowed to move to more-developed areas, as the long-standing hukou or household registration system was relaxed. For the most part, rural people have been allowed to leave rural areas and move to cities to work, where they are considered a temporary or floating population. They have become a critical source of the labor that has fueled the engine of growth in the delta. For years, the recruitment of rural labor has proceeded successfully. The process has helped to minimize rural-urban and interregional disparities, as rural laborers have remitted sizable sums to their families back home. Lately, rising wages and competition for labor from the Yangtze River delta region have posed new challenges for factories in the Pearl River delta. Many rural workers from inland areas have been less inclined to travel long distances to the coastal cities, preferring to take advantage of improved opportunities back home. The migrant labor population in Guangdong is huge, with an official estimate placing it at 21.3 million in February 2004. One out of three jobs in Guangdong is held by someone whose “household registration” is elsewhere. The labor shortage has prompted companies to begin moving their operations farther inland to provinces such as Hunan and Jiangxi, a process facilitated by the recent formation of the Pan-Pearl River Delta Framework. In the long run, China is facing a labor shortage, as its population is aging rapidly (Yang 2005).

The second factor that has elevated the economic status of backward areas within Guangdong is the policy of paired assistance development, whereby an economically advanced city is paired with an economically laggard city or county to encourage the former to provide assistance to the latter, in the form of fiscal allocations, policy support, and technology transfers to alleviate poverty and accelerate development. This policy has, in fact, been applied across the nation and has helped backward cities and regions to achieve rapid economic progress. Especially prominent has been the recent effort to pair up cities, and even provinces, in the western region, where many minority groups live, with thriving cities and provinces along the coast. For example, the economically advanced Jiangsu has been paired with the relatively underdeveloped Guangxi under the paired assistance program. This is a crucial policy aimed at spreading the positive effects of rapid coastal development to other parts of the country, thereby minimizing the problem of growing regional disparities within the country (Yeung and Shen 2004).

In Guangdong, the policy of pairing a developed city with a developing city has been implemented since the mid-1980s. During the past 3 years, 7 developed cities in the Pearl River delta have provided paired assistance to 20 counties in hilly areas, with outstanding results. Over that period, Y 510 million was spent under the program, and 221,000 workers from the hilly counties were gainfully employed, earning a total income of Y 930 million. A total of 328 trade and economic cooperation projects were proposed, 265 of which have been implemented, involving a total investment of Y 845 million. Under the current Eleventh Five-Year
Plan (2006–10), the policy of pairing 7 developed cities with 20 backward counties remains unchanged (Nanfang Ribao, June 17, 2006).

Of the hilly and less-developed cities in peripheral areas of Guangdong, Qingyuan is noteworthy. Richly endowed in natural resources, its rapid development is due in part to its recent investments in infrastructure. The opening in 2004 of the expressway linking the city to Guangzhou at a distance of 60 kilometers has put it within a half-hour commute of the provincial capital, thus making Qingyuan more accessible to other areas of the Pearl River delta. This greatly enhances Qingyuan’s position as a new focus of development in northern Guangdong. There has been a marked increase in foreign investment in the city, an enhancement of its strategic location as part of a north-south development corridor, and a renewed commitment to harness its plentiful resources in minerals, agriculture, and tourism. Consequently, Qingyuan’s GDP soared more than 7.7 times between 1990 and 2005, reaching ¥32 billion in 2005. Foreign investment reached US$173.8 million in 2005, a nine-fold increase from 1990.

**Shanghai and the Yangtze River delta**

The chapter now turns to Shanghai, the hub of the Yangtze River delta. This section attempts to show the contribution of urban agglomeration to economic growth in Shanghai, Shanghai’s spatial restructuring, the role of development zones, and the economic diffusion from Shanghai to other cities in the Yangtze River delta region. Shanghai is considered as an emerging world city, and it is revealed that Shanghai’s major role in the delta is the diffusion of human resources and provision of producer services. Foreign investors are still the major source of capital and technology in delta.

**Density, agglomeration, and economic growth**

Shanghai has been the largest city in China and its leading economic center since the early twentieth century (Yeung and Sung 1996). Throughout its history as a city, it has had a superior agglomeration economy and embedded economic strength. With a population of 5.73 million in 1952, Shanghai’s per capita GDP (¥590) was about five times the national average (¥119) that year (NBS, Department of Comprehensive Statistics 1999). The city was transformed from an advanced service center to an industrial powerhouse during the decades of the 1950s to the 1970s in the Maoist period when China was closed to the outside world. In the 1980s, economic reform and foreign investment policies focused on Guangdong, and there was no significant development in Shanghai, which had a GDP growth rate of 7.4 percent a year, below the national average (table 18.1).

The city’s golden opportunity came in 1990 when the central government made the development of the Pudong New District in Shanghai a priority. Shanghai was designated by the central authorities to become the leading economic center in China, and this resolution was backed up with the most preferential policies for economic development and foreign investment. In less than a decade, a new Shanghai emerged, with advanced infrastructure and facilities. The investment in infrastructure has been fueled by favorable fiscal policies and land redevelopment in the urban area. The reform of the land market has made it possible for the city government to collect substantial revenues by converting industrial land in the urban area to commercial and residential uses. The change from low-density to high-density land use has led to substantial increases in land value. Another major policy change on the part of the central government has been to allow Shanghai to retain more of its fiscal revenues to enable the city to make major investments in economic restructuring and infrastructure. In 1978 Shanghai’s fiscal expenditures only accounted for 13.6 percent of its total fiscal revenues, with more than 86 percent being transferred to the central government. After the implementation of tax reforms and the launching of the Pudong development strategy, fiscal expenditures increased to 22.9 percent of total fiscal revenues in 1986 and to 38.1 percent in 1995. The figure remained at around 36–40 percent from 1995–2006. The Shanghai government’s fiscal expenditures
increased from Y 2.60 billion in 1978 to Y 181.38 billion in 2006 (SMSB 2007). Clearly, Shanghai’s dramatic development since the 1990s has been due to the decision to allow the Shanghai municipal government to reinvest a greater portion of its fiscal revenues in the city rather than due to the transfer of financial resources from the central government to the city.

Shanghai has grown in size since the 1980s. The optimal size of Shanghai’s population is an issue that scholars and the government have debated keenly, without coming to a definite conclusion (Zhou, Yang, and Xiao 2005). The long-standing official policy has been to control the growth of large cities such as Shanghai. In the 1980s, a temporary population was allowed to form in Shanghai. Since 1994, the Shanghai government has adopted more relaxed and positive migration policies. Incentives have been offered to encourage skilled and well-educated people from within and outside China to move to the city, while more and more social services have been extended to include the temporary population. About 30,000 people acquired the “blue-chop” hukou in Shanghai from 1994–2000, and about 20,000 of these acquired this status because of their investment in residential property (Kong 2001; Shen 2006). The “blue-chop” hukou was valid only in the city, while the normal “red-chop” hukou was valid in the whole country. By the end of 2006, 0.12 million foreigners were living in Shanghai (SMSB 2007).

Shanghai’s total population (its usual residents) increased from 12 million in 1982 to 18.2 million in 2006. Significant growth came from the temporary population, which reached 4.7 million in 2006. With only 0.1 percent of China’s area and 1.4 percent of China’s population, Shanghai accounted for 5 percent of the nation’s GDP, 12.2 percent of its fiscal revenues, 27.5 percent of its exports, and 10.2 percent of its foreign direct investment (FDI) in 2006 (SMSB 2007). At a fixed price, Shanghai’s GDP grew 12.2 percent a year, and per capita GDP grew 10.0 percent a year from 1991 to 2006. During the same period, the city’s exports grew 23.9 percent a year, while FDI grew 26.0 percent a year. It is likely that population growth is contributing to economic growth and to the rise in per capita income in Shanghai. However, migrants have provided the bulk of the labor required to construct the city’s many large infrastructure projects, which have been completed within a short period of time.

Many other Chinese cities have also grown rapidly in the reform period, due to a similar agglomeration effect. In 1978 Shanghai’s per capita GDP was Y 2,529, well above that of other cities in China. The gap between Shanghai and the rest of China narrowed significantly during the reform period. In 2005 Shanghai’s per capita GDP was Y 51,461, well above the average for mainland China of Y 14,040 and for Guangdong as a whole of Y 24,438 (table 18.1). However, due to particularly favorable policies for parts of Guangdong in the 1980s and to the influence of Hong Kong, Shenzhen’s per capita GDP overtook Shanghai’s in 1984. Guangzhou only overtook Shanghai in per capita GDP in 2005. Within the Yangtze River delta, Suzhou had a higher per capita GDP than Shanghai in 2005 (GMSB 2006; JPBS 2006; NBS 2006; SMSB 2007; SSB 2006). These cases have three implications. First, several economic centers may develop in mainland China along with Shanghai. Second, the scale of these centers may expand further without significant negative externalities, as shown by Shanghai. Third, Shanghai’s central controlling function is still limited, and it has made limited contributions to its hinterland in the Yangtze River delta and the rest of China in terms of transfers of capital and technology. Shanghai is still building its capacity in these areas and can only be considered an emerging world city. In the world urban system, Shanghai is performing as a “satellite-type” base for FDI and as a regional headquarters for foreign companies (Huang, Leung, and Shen 2007; Markusen 1996; Park 1996; Wei and Leung 2005). Foreign investors are still the major source of capital and technology in these cities as well as in Shanghai.

FDI has contributed to Shanghai’s dramatic economic growth since the early 1990s (Wei and Leung 2005). Shanghai has become a hot spot for foreign investment due to its advantageous geographic
location, solid economic foundation, business culture, human resources, and favorable open policies. By 2006, total FDI in Shanghai reached US$66.76 billion, distributed almost equally between the secondary and tertiary sectors. Hong Kong, China, was the largest source of FDI, followed by Japan, the United States; Germany; Taiwan, China; Singapore; and the United Kingdom. In 2006 foreign-funded enterprises accounted for 40.0 percent of industrial output in the city. In addition, Hong Kong; Macao-, and Taiwan, China-funded enterprises also contributed 13.2 percent of Shanghai's industrial output (SMSB 2007). As many foreign-funded enterprises are engaged in outward processing and assembly operations requiring large-scale imports and exports, their share of exports has increased greatly (table 18.2). To some extent, the growth of export-oriented manufacturing in the Pearl River delta in the 1980s and 1990s was reproduced in Shanghai after 2000. In 2006 foreign-funded enterprises contributed 66.9 percent of total exports from Shanghai. In addition, Hong Kong; Macao-, and Taiwan, China-funded enterprises also contributed 15.2 percent of Shanghai's industrial output (SMSB 2007). As many foreign-funded enterprises are engaged in outward processing and assembly operations requiring large-scale imports and exports, their share of exports has increased greatly (table 18.2). To some extent, the growth of export-oriented manufacturing in the Pearl River delta in the 1980s and 1990s was reproduced in Shanghai after 2000. In 2006 foreign-funded enterprises contributed 66.9 percent of total exports from Shanghai. In Shanghai, the share of exports due to outward processing also reached 56.2 percent that year (SMSB 2007).

As a major development strategy, the municipal government has made some attempts to develop competitive pillar industries by nurturing indigenous enterprises, attracting FDI, and promoting Sino-foreign joint ventures. In the Eighth Five-Year Plan period of 1991–95, automobile manufacturing, electronic and telecommunications equipment manufacturing, steel manufacturing, petrochemical and fine chemical product manufacturing, power plant equipment and large-scale electric equipment manufacturing, and household electrical appliance manufacturing were identified as six pillar industries. These were revised in 2000 for the Tenth Five-Year Plan period of 2001–05, when two industries remained unchanged, three industries were renamed, one industry was deleted, and a new industry was added (Lei 2005: 165). The value added of the six pillar industries increased from Y 46.81 billion in 1995 to Y 250.5 billion in 2006. Their share of the city's total manufacturing value added increased to 51.9 percent in 2006, indicating increasing specialization and agglomeration, which are expected to enhance the city's competitiveness according to the theory of new economic geography (Fujita, Krugman, and Venables 2001; Krugman 2007).

The service sector picked up momentum in the early 1990s when Shanghai was designated to become the economic center of China. In 1995 the central government proposed building Shanghai into an international economic, financial, trade, and shipping center. The four-centers strategy is in line with the world city postulation, which emphasizes the growth of advanced producer services and the controlling function of the city in regional and global economies. A number of giant projects have laid the foundation for Shanghai to become a world city (Shi and Hamnett 2002; Wu 2000; Yusuf and Wu 2002). These projects include a new mass transit railway system, the Lujiazui financial and trade zone, a new airport in Pudong, and more recently the new Yangshan container port. The completion of these platforms facilitates the agglomeration of service industries, which further attracts capital, talent, and businesses. Since 2000, the share of the tertiary industry in Shanghai’s GDP has exceeded 50 percent (table 18.2).

The Shanghai government has adopted various policies to attract transnational corporations to set up regional headquarters and research and development (R&D) centers in the city. In 2004 Shanghai had 86 regional headquarters of transnational corporations, 105 investment companies, and 142 R&D centers funded by foreign companies. There were 63 foreign banks and financial companies and 24 foreign insurance companies in 2006 (Fan 2007). About 80 percent of the top 50 banks in the world had set up branches in Shanghai. More than 400 of the top 500 transnational corporations in the world had invested in Shanghai. Many domestic companies had moved their headquarters to Shanghai, and more than 200 domestic companies had set up offices in Shanghai (Zhao 2005). The Bank of China set up its Shanghai headquarters in 2005. Some 842 companies were listed on the Shanghai Stock Exchange, with a total capitalization of US$918 billion, ranking the exchange the fourteenth largest in the world in 2006 in terms of stock market capitaliza-
In 2006 the financial industry’s share of the city’s GDP reached 7.8 percent. Clearly, Shanghai is making progress in its bid to become an advanced service center. Still, there is much room to develop advanced manufacturing operations in the inner and outer zones of Shanghai.

Spatial restructuring and development zones
Shanghai has an area of 6,340.5 square kilometers encompassing 18 districts and 1 county. Shanghai’s population and its economic activities have long been concentrated in the city’s old urban districts. Based on different population densities in 2006, the city can be divided into a core, an inner zone, and an outer zone (see table 18.3). The core consists of 9 old urban districts with a population density of 17,000–42,000 persons per square kilometer. The inner zone consists of 3 urban districts with a population density of 4,000–6,000 persons per square kilometer. The outer zone consists of 6 urban districts and Chongming County, with a population density of fewer than 2,000 persons per square kilometer. This zone still has large rural areas. The average population density of Shanghai was 2,863 persons per square kilometer in 2006.

The core only has an area of 289 square kilometers, but it accommodated 36 percent of the total population in 2006. The temporary population is concentrated in the inner and outer zones, where most industrial jobs are located. They accounted for more than 31 percent of the total population in the inner and outer zones and 14.5 percent of the total population of the urban core. The population in the urban core is the most educated, with 16.9 percent having received a university education, compared with only 3.6 percent in the outer zone in 2000. The population in the urban core declined 6.3 percent in the period of 2000–06, due to a negative rate of natural increase and relocation of the population to other areas. In contrast, the population in the inner and outer zones increased more than 22 percent in the same period, mainly due to the arrival of a temporary population.

However, large-scale urban renewal and land development have taken place in all three zones. Many factories were located in the urban core of the city in the 1980s, but many of them have moved elsewhere since the early 1990s. Like many other large cities, housing is in high demand in Shanghai, and the property market is booming. The price of new housing increased 65 percent from 2000–06. The price of residential land also increased 69.7 percent. This has not affected the price of land used for industrial and storage purposes, which declined 9.2 percent in the same period (SMSB 2007). The Chinese government has taken many measures to cool down the hot housing market, but with very limited impact at the time of writing.

With development of the commercial and service sectors in the urban core, a great deal of industrial development has been taking place in the inner and outer zones of the city. According to table 18.4, the urban core only accounted for 11.8 percent of industrial employees and 9.3 percent of industrial output in 2006. The value of industrial output increased 10.9 percent in the urban core in the period of 2001–06, but the increase in the inner and outer zones in the same period was 193.6 and 236.5 percent, respectively.

There were 7 national development zones and 24 municipal development zones in

Table 18.3 Distribution of population in Shanghai, 2006

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Core</th>
<th>Inner zone</th>
<th>Outer zone</th>
<th>City</th>
</tr>
</thead>
<tbody>
<tr>
<td>Usual residents (millions)</td>
<td>6.50</td>
<td>6.00</td>
<td>5.65</td>
<td>18.15</td>
</tr>
<tr>
<td>Population density (persons per square kilometer)</td>
<td>22,446</td>
<td>5,113</td>
<td>1,158</td>
<td>2,863</td>
</tr>
<tr>
<td>Share of temporary population (percent)</td>
<td>14.5</td>
<td>32.9</td>
<td>31.0</td>
<td>25.7</td>
</tr>
<tr>
<td>Population growth, 2000–06 (percent)</td>
<td>−6.3</td>
<td>23.9</td>
<td>22.0</td>
<td>10.6</td>
</tr>
<tr>
<td>Share of population with university education in 2000 (percent)</td>
<td>16.9</td>
<td>9.4</td>
<td>3.6</td>
<td>10.9</td>
</tr>
</tbody>
</table>

Shanghai in 2006. There were 3,701 industrial enterprises in these zones, accounting for 25.7 percent of all industrial firms and 34.9 percent of all industrial employees in Shanghai. These firms contributed 46.4 percent of industrial output and 68.5 percent of the industrial exports of the city. Thus the industrial zone development policy has contributed significantly to industrial growth in Shanghai. However, not all industrial zones have been successful so far. Only a limited number of them, such as the 7 national development zones and 7 of the municipal development zones, have achieved significant industrial agglomeration, which enhances the efficiency and competitiveness of industrial production. The other 17 municipal development zones are small in scale, contributing industrial output of ¥98 billion as a whole in 2006. Clearly, there is much room to improve the spatial distribution of industrial zones, although this may be difficult to do under the existing decentralized institutional framework of economic administration (Shen 2007; Zhang 2002). It has become a common practice for each city, district, or even town government to set up industrial zones to attract foreign investment to their own territory.

**Economic diffusion**

There is a close economic relationship between Shanghai and other cities in the Yangtze River delta region. Many cities have grown along with Shanghai. The region consists of 16 cities, including the municipality of Shanghai, 8 prefecture-level cities in Jiangsu province, and 7 prefecture-level cities in Zhejiang. The region comprises an area of 109,839 square kilometers with a population of 93.23 million in 2005. It accounts for about 1.1 percent of China’s territory and 7.1 percent of China’s population, while contributing 18.6 percent of the nation’s GDP.

Compared with Shanghai, other cities in the Yangtze River delta have a much lower population density and GDP density per square kilometer of land area (see table 18.5). In terms of per capita GDP, Shanghai is well above most cities in the region except for Suzhou. The per capita GDP of a city in the region generally declines as its distance from Shanghai increases. Shanghai’s population and total GDP are also far higher than those of any other city in the region. The second-largest city is Suzhou, which has less than half of Shanghai’s population and GDP. In terms of industrial output and exports, Shanghai’s contribution is much greater than that of any single city in the region. Thus Shanghai is strong in both services and advanced manufacturing, with services making up 51.4 percent of the city’s GDP in the first half of 2007. Other cities in the Yangtze River delta are still industrial cities, with services making up less than 42 percent of their GDP in the first half of 2007. The exceptions are Hangzhou, Nanjing, and Zhoushan.

Shanghai and other cities in the Yangtze River delta have close demographic, social, cultural, and economic connections. In fact, many people in Shanghai are originally from Jiangsu and Zhejiang. Since the early twentieth century, Shanghai has been the dominant service center in the region and indeed the nation and has attracted capital and

### Table 18.4 Industrial distribution in Shanghai, 2006

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Core</th>
<th>Inner zone</th>
<th>Outer zone</th>
<th>City</th>
</tr>
</thead>
<tbody>
<tr>
<td>Share in the total of the city (percent)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Employees</td>
<td>11.84</td>
<td>37.10</td>
<td>49.95</td>
<td>100.00</td>
</tr>
<tr>
<td>Industrial output</td>
<td>9.34</td>
<td>46.78</td>
<td>39.54</td>
<td>100.00</td>
</tr>
<tr>
<td>Total profit</td>
<td>14.60</td>
<td>56.29</td>
<td>27.99</td>
<td>100.00</td>
</tr>
<tr>
<td>Industrial indicators</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Industrial output per employee (yuan per person)</td>
<td>54,332</td>
<td>86,835</td>
<td>54,518</td>
<td>68,874</td>
</tr>
<tr>
<td>Industrial employees per 100 population</td>
<td>4.91</td>
<td>16.66</td>
<td>23.85</td>
<td>14.86</td>
</tr>
<tr>
<td>Change in industrial output, 2001–06 (percent)</td>
<td>10.85</td>
<td>193.58</td>
<td>236.49</td>
<td>181.22</td>
</tr>
</tbody>
</table>

Note: Including all state-owned enterprises and nonstate-owned enterprises with sales revenues of more than ¥5 million.
talent from all over China. In the 1970s and 1980s, Shanghai played an important role in the development of TVEs in Jiangsu and Zhejiang by providing technology, technical expertise, and subcontracting services. Since the early 1990s, advanced producer services such as financial services, trading, and port and airport logistics have played an important role in facilitating the inflow of FDI and industrial development in other Yangtze River delta cities. Shanghai has been attracting the regional and national headquarters of transnational corporations, R&D centers, and advanced manufacturing, while many other FDI and manufacturing operations have located in other Yangtze River delta cities. Shanghai is also an advanced center of higher education, and many young people have found employment in the region’s cities after receiving higher education and training in Shanghai. Thus the diffusion of human resources and provision of producer services are two important functions of Shanghai in the region.

In 2003 the Shanghai government announced the “173 project” to develop 173 square kilometers of low-cost industrial land in various industrial zones (Tan 2003). This project is considered to have induced unnecessary competition with other cities for FDI. We believe that Shanghai should focus on producer service functions and high value added advanced manufacturing. Industrialization based on cheap land and labor should be avoided for long-term, sustainable development. Shanghai should continue to improve the quality of its human resources, infrastructure, and institutional environment for investment, which will compensate for the rising costs of land and labor in the city—only two out of many factors that figure in the investment decisions of transnational corporations.

Overall, other Yangtze River delta cities have grown rapidly due to both the Shanghai factor and other development conditions. Their GDP growth rates ranged from 14 to

Table 18.5 Population and GDP density in the Yangtze River delta region, 2005

<table>
<thead>
<tr>
<th>City</th>
<th>Population (million)</th>
<th>Population density (persons per square kilometer)</th>
<th>GDP density (yuan million per square kilometer)</th>
<th>Per capita GDP (yuan)</th>
<th>GDP (yuan billion)</th>
<th>GDP growth rate first half of 2007 (percent)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shanghai</td>
<td>17.78</td>
<td>2,859</td>
<td>294</td>
<td>51,486</td>
<td>915</td>
<td>13.0</td>
</tr>
<tr>
<td>Jiangsu cities</td>
<td>43.57</td>
<td>898</td>
<td>60</td>
<td>33,587</td>
<td>1,463</td>
<td>15.6</td>
</tr>
<tr>
<td>Nanjing</td>
<td>6.86</td>
<td>1,042</td>
<td>73</td>
<td>35,147</td>
<td>241</td>
<td>15.6</td>
</tr>
<tr>
<td>Wuxi</td>
<td>5.57</td>
<td>1,163</td>
<td>117</td>
<td>50,353</td>
<td>280</td>
<td>15.4</td>
</tr>
<tr>
<td>Changzhou</td>
<td>4.11</td>
<td>939</td>
<td>60</td>
<td>31,712</td>
<td>130</td>
<td>15.5</td>
</tr>
<tr>
<td>Suzhou</td>
<td>7.53</td>
<td>887</td>
<td>95</td>
<td>53,473</td>
<td>403</td>
<td>16.0</td>
</tr>
<tr>
<td>Nantong</td>
<td>7.34</td>
<td>917</td>
<td>37</td>
<td>20,056</td>
<td>147</td>
<td>16.0</td>
</tr>
<tr>
<td>Yangzhou</td>
<td>4.51</td>
<td>680</td>
<td>28</td>
<td>20,444</td>
<td>92</td>
<td>15.5</td>
</tr>
<tr>
<td>Zhenjiang</td>
<td>2.96</td>
<td>769</td>
<td>45</td>
<td>29,448</td>
<td>87</td>
<td>15.3</td>
</tr>
<tr>
<td>Taizhou³</td>
<td>4.69</td>
<td>809</td>
<td>28</td>
<td>17,532</td>
<td>82</td>
<td>15.4</td>
</tr>
<tr>
<td>Zhejiang cities</td>
<td>31.88</td>
<td>578</td>
<td>37</td>
<td>31,922</td>
<td>1,018</td>
<td>14.8</td>
</tr>
<tr>
<td>Hangzhou</td>
<td>7.15</td>
<td>452</td>
<td>35</td>
<td>39,199</td>
<td>294</td>
<td>14.4</td>
</tr>
<tr>
<td>Ningbo</td>
<td>6.56</td>
<td>678</td>
<td>51</td>
<td>37,343</td>
<td>245</td>
<td>14.7</td>
</tr>
<tr>
<td>Jiaxing</td>
<td>4.00</td>
<td>1,021</td>
<td>59</td>
<td>29,021</td>
<td>116</td>
<td>14.0</td>
</tr>
<tr>
<td>Huzhou</td>
<td>2.72</td>
<td>467</td>
<td>22</td>
<td>23,703</td>
<td>64</td>
<td>14.5</td>
</tr>
<tr>
<td>Shaoxing</td>
<td>4.39</td>
<td>532</td>
<td>35</td>
<td>32,972</td>
<td>145</td>
<td>14.7</td>
</tr>
<tr>
<td>Zoushan</td>
<td>1.03</td>
<td>712</td>
<td>39</td>
<td>27,333</td>
<td>28</td>
<td>17.1</td>
</tr>
<tr>
<td>Taizhou³</td>
<td>5.68</td>
<td>604</td>
<td>27</td>
<td>22,038</td>
<td>125</td>
<td>14.4</td>
</tr>
<tr>
<td>Yangtze River delta</td>
<td>93.23</td>
<td>849</td>
<td>62</td>
<td>36,431</td>
<td>3,396</td>
<td>14.5</td>
</tr>
<tr>
<td>China</td>
<td>1,307.56</td>
<td>136</td>
<td>4</td>
<td>14,002</td>
<td>18,308</td>
<td>11.5</td>
</tr>
</tbody>
</table>


Note: The growth rate of the cities in Jiangsu and Zhejiang is the unweighted average of their cities. The growth rate of the Yangtze River delta region is the unweighted average of Shanghai and the cities in Jiangsu and Zhejiang. The population data for Jiangsu and Zhejiang are based on a survey of 1 percent of the population on November 1, 2005.

a. Two cities, Taizhou in Jiangsu and Zhejiang, have the same English spelling but different names in Chinese.
17 percent in the first half of 2007, greater than the 13 percent of Shanghai. In the long term, the per capita GDP of the various cities in the Yangtze River delta is expected to converge (table 18.5).

The current level of development of all cities in the Yangtze River delta is significantly higher than that of cities in many other areas in China. Yangtze River delta cities and even Shanghai still have ample land for further industrial and urban development. With effective measures for controlling pollution and negative externalities, these cities may expand further to create millions of jobs for skilled workers and labor migrants. In the meantime, public investment should focus on enhancing urban infrastructure and social services to match the increasing demand of a growing population for a high standard of living. Otherwise, urban agglomeration will lead to serious social and environmental problems. Thus the key question is not whether urban agglomeration should be adopted as a strategy for development, but whether suitable policies will be devised to prevent the emergence of serious social and environmental problems.

The Bohai Bay region

As the third major city-cluster region in China, the Bohai Bay region has always played a strategic role in the development of northern China. Conventionally, the Bohai Bay region refers to the area centered on Beijing and Tianjin, along with an agglomeration of eight cities that is sometimes called the Beijing-Tianjin-Hebei region, or, for short, the JJJ (Jing-Jin-Ji) region, “ji” being the alternative name of Hebei. The Greater Bohai region includes the JJJ region, together with the Liaodong peninsula and the Shandong peninsula (figure 18.1).

Compared with the two more-developed regions that have been the focus of the discussion so far, the Bohai Bay region has suffered from relatively slow growth since China reopened to the world in the early 1980s. This is largely due to the presence of Beijing, the national capital, which has been a double-edged sword. While Beijing is the center of political power and, hence, a place where economic agglomeration might naturally be expected to occur, its status as the nation’s capital has also meant that anything that might affect political or social stability in the city has been a source of concern. Any policy changes or experiments, such as those that were allowed to be carried out in Fujian and Guangdong in the early years of the launching of economic reforms, were frowned upon. Moreover, for years the JJJ region has suffered from a national fiscal system in which Beijing, Tianjin, and the surrounding cities in Hebei typically were only allowed to retain a small portion of their fiscal revenues. After remitting the required percentage to the central government, the fiscal resources that these cities retained were insufficient to pursue infrastructure and other development projects. Consequently, it is hardly surprising that per capita government expenditures in Beijing, Hebei, and Tianjin were among the lowest in the country, as all of these places suffered from a heavy tax burden (Wei 1996; Wei and Jia 2003). In addition, the JJJ region has paled in comparison to the Pearl River and the Yangtze River delta regions with regard to foreign investment. Over the past three decades, capital from Hong Kong, Taiwan, and elsewhere has poured into the other two destinations because of their more favorable policies, geographic propinquity, and cultural affinity. By comparison, the JJJ region has remained a backwater, as revealed by major economic indicators (see tables 18.6 and 18.7). Beijing is an outstanding case. Its GDP growth rate was below the national average in the 1980s but has gained momentum since then. It attracted much foreign capital and had a large share of exports in 2005 (table 18.1 and 18.2). Beijing had the highest share of tertiary industry among the cities in mainland China in 2005 due to its position as the national capital.

The region, nevertheless, is about to enter a new phase of rapid growth, as the national Eleventh Five-year Plan (2006–10) highlights the Tianjin Binhai New District (see box 18.1), as a new target for growth, much as Pudong in Shanghai was designated in 1990. Another powerful boost for the region is the fact that the Olympic Games were hosted by Beijing in August 2008. Beijing, Tianjin, and other host cities in the
region have begun to reap the benefits of the “Olympic economy,” with rapid urban (re)construction and upgraded transport networks. The agglomeration and dispersion effects arising from this new impetus for the development of the JJJ region are discussed below.

**A high-density JJJ city-region**

Broadly defined, the Bohai Bay region consists of an extensive area encompassing more than 30 cities surrounding the Bohai Bay. However, the focus of this report is on the JJJ city-region, with Beijing and Tianjin as its core. The dominance and agglomeration effects of Beijing and Tianjin in political, economic, and transport development are revealed in the data presented in table 18.7. The two cities cover only 15 percent of the area of the JJJ city-region, yet they account for approximately 35 percent of the population, 57 percent of the GDP, and 80 percent of the realized foreign investment. Beijing is unrivaled as the business center of the region. It is the top location in the country for the headquarters of domestic firms, with one-fifth of the top 500 Chinese enterprises locating their headquarters in that city. In addition, 239 foreign R&D centers and 16 headquarters of foreign enterprises are located in Beijing. It is hardly surprising that Beijing ranked first for three consecutive years in the China headquarters economy index. The economies of Beijing and Tianjin are well developed and veer toward high value added employment. Employment in the secondary and tertiary sectors accounted for 24.6 and 68.6 percent of the labor force, respectively, in Beijing and for 40.6 and 40.5 percent in Tianjin in 2005 (see table 18.8). The density of employment in the secondary and tertiary industries in both cities is far higher than in Hebei. For instance, in 2005, some 187,000 science and technology personnel, or 62 percent of such workers in Beijing, were concentrated in Zhongguancun, the Silicon Valley of Beijing (BMBS 2006, 2007). According to the 2007 Chinese Cities Competitiveness Report, Beijing ranks fourth while Tianjin ranks twelfth nationally in competitiveness. Among all of the Bohai Bay cities, they stand first and third, respectively, with second place going to Qingdao (eleventh overall) in the Shandong peninsula (Ni and others 2007: 3). Beijing has advantages in manpower, capital, science and technology, and infrastructure, while Tianjin has potential strengths in capital, science and technology, and infrastructure competitiveness.

The prominence of Beijing and Tianjin, however, has yet to bring better development to the region, as the problems of over-agglomeration have begun to afflict them. The problem is more acute in Beijing, because, as the nation’s capital from as far back as the Ming Dynasty (1368–1644), Beijing has been a magnet for all kinds of activities. By contrast, the pace of development in Tianjin has been slow in the past few decades, as it lies in the shadow of Beijing (Wei and Jia 2003). For instance, Beijing’s airport, the

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**Table 18.6 Comparison of the three coastal regions in China, 2005**

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Yangtze river delta</th>
<th>Pearl river delta</th>
<th>JJJ</th>
<th>Subtotal</th>
<th>China</th>
</tr>
</thead>
<tbody>
<tr>
<td>GDP (yuan billion)</td>
<td>3,389.83</td>
<td>1,805.94</td>
<td>1,848.97</td>
<td>7,044.74</td>
<td>18,308.50</td>
</tr>
<tr>
<td>Economic structure</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Primary</td>
<td>4.1</td>
<td>2.8</td>
<td>7.0</td>
<td>4.5</td>
<td>12.6</td>
</tr>
<tr>
<td>Secondary</td>
<td>55.0</td>
<td>50.9</td>
<td>44.0</td>
<td>51.2</td>
<td>47.5</td>
</tr>
<tr>
<td>Tertiary</td>
<td>40.9</td>
<td>46.3</td>
<td>49.0</td>
<td>44.3</td>
<td>39.9</td>
</tr>
<tr>
<td>Per capita GDP (yuan)</td>
<td>40,612</td>
<td>41,990</td>
<td>24,772</td>
<td>35,146</td>
<td>14,040</td>
</tr>
<tr>
<td>Total investment in fixed assets (yuan billion)</td>
<td>1,617.20</td>
<td>529.68</td>
<td>768.72</td>
<td>2,915.60</td>
<td>8,877.36</td>
</tr>
<tr>
<td>Total consumption (yuan billion)</td>
<td>1,073.89</td>
<td>563.05</td>
<td>639.19</td>
<td>2,276.13</td>
<td>6,717.66</td>
</tr>
<tr>
<td>Exports (US$ billion)</td>
<td>275.96</td>
<td>227.12</td>
<td>67.68</td>
<td>570.76</td>
<td>761.90</td>
</tr>
<tr>
<td>Realized foreign capital (US$ billion)</td>
<td>26.33</td>
<td>11.51</td>
<td>9.05</td>
<td>46.89</td>
<td>63.81</td>
</tr>
</tbody>
</table>

Sources: JPBS (2007: 530); NBS (2007); NBS, International Statistical Information Center (2007: 4, 6, 13); see also table 7. a. Figures for the JJJ city-region are used here for comparison instead of those for the whole Bohai Bay region. b. All figures in the subtotal have been calculated by the authors.
### Table 18.7 Major indicators of the JJJ city-region, 2005

<table>
<thead>
<tr>
<th>Area</th>
<th>Area (square kilometers)</th>
<th>Population (millions)</th>
<th>GDP (yuan billion)</th>
<th>Economic structure (percent)</th>
<th>Per capita GDP (yuan)</th>
<th>Total investment in fixed assets (yuan billion)</th>
<th>Total consumption (yuan billion)</th>
<th>Exports (US$ billion)</th>
<th>Realized foreign capital (US$ billion)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beijing</td>
<td>16,578</td>
<td>15.38</td>
<td>688.63</td>
<td></td>
<td>1.39</td>
<td>29.43</td>
<td>45,444</td>
<td>282.72</td>
<td>290.28</td>
</tr>
<tr>
<td>Tianjin</td>
<td>11,611</td>
<td>10.43</td>
<td>369.76</td>
<td></td>
<td>3.04</td>
<td>55.47</td>
<td>35,783</td>
<td>151.68</td>
<td>119.01</td>
</tr>
<tr>
<td>Shijiazhuang</td>
<td>15,722</td>
<td>9.61</td>
<td>178.68</td>
<td></td>
<td>13.87</td>
<td>48.45</td>
<td>19,370</td>
<td>92.90</td>
<td>60.60</td>
</tr>
<tr>
<td>Qinhuangdao</td>
<td>7,467</td>
<td>2.88</td>
<td>49.12</td>
<td></td>
<td>10.44</td>
<td>38.75</td>
<td>18,087</td>
<td>16.49</td>
<td>14.70</td>
</tr>
<tr>
<td>Tangshan</td>
<td>13,206</td>
<td>7.26</td>
<td>202.76</td>
<td></td>
<td>11.65</td>
<td>57.30</td>
<td>28,466</td>
<td>63.57</td>
<td>46.86</td>
</tr>
<tr>
<td>Cangzhou</td>
<td>13,419</td>
<td>6.84</td>
<td>113.08</td>
<td></td>
<td>11.97</td>
<td>53.39</td>
<td>16,532</td>
<td>35.45</td>
<td>25.01</td>
</tr>
<tr>
<td>Chengde</td>
<td>39,519</td>
<td>3.37</td>
<td>36.03</td>
<td></td>
<td>18.25</td>
<td>50.94</td>
<td>9,870</td>
<td>18.93</td>
<td>11.79</td>
</tr>
<tr>
<td>Langfang</td>
<td>6,300</td>
<td>3.96</td>
<td>62.12</td>
<td></td>
<td>21.22</td>
<td>54.40</td>
<td>16,200</td>
<td>34.16</td>
<td>17.82</td>
</tr>
<tr>
<td>Baoding</td>
<td>22,159</td>
<td>10.73</td>
<td>107.21</td>
<td></td>
<td>18.29</td>
<td>48.80</td>
<td>9,990</td>
<td>56.03</td>
<td>38.51</td>
</tr>
<tr>
<td>Zhangjiakou</td>
<td>36,829</td>
<td>4.18</td>
<td>41.58</td>
<td></td>
<td>16.20</td>
<td>44.72</td>
<td>9,876</td>
<td>16.78</td>
<td>14.61</td>
</tr>
<tr>
<td>JJJ</td>
<td>182,840</td>
<td>74.64</td>
<td>1,848.97</td>
<td></td>
<td>7.08</td>
<td>43.96</td>
<td>24,772</td>
<td>768.72</td>
<td>639.19</td>
</tr>
<tr>
<td>Hebei</td>
<td>190,000</td>
<td>68.51</td>
<td>1,009.61</td>
<td></td>
<td>14.89</td>
<td>51.83</td>
<td>14,782</td>
<td>421.03</td>
<td>295.29</td>
</tr>
</tbody>
</table>


a. Beijing and Tianjin are both municipalities, and the remaining eight are prefecture-level cities under the administration of Hebei province.

b. The per capita GDP figures for Cangzhou and JJJ were calculated by the authors.

c. Chengde’s per capita GDP was US$1,205, and the exchange rate was US$1 = CNY 8.1917.
BOX 18.1  
Tianjin Binhai New District: the third pole in China

The Tianjin Binhai New District (TBND), strategically positioned as the only coastal window of Tianjin, encompasses the Tianjin technological development area, the Tianjin free trade zone, Tianjin port, and some other local administrative districts (figure 18.1). The TBND is the third type of zone in China for carrying out experiments in reform; as such, it enjoys various preferential policies and rights (the other two types are the SEZs in Guangdong, Fujian, and Hainan and the Pudong New District in Shanghai). It is set to develop into the new economic center of North China and to become its most populated area. The latest United Nations estimate puts the combined nonagricultural population of Beijing and Tianjin at more than 18 million (UN Population Division 2006), but with the national urbanization policy and the present Olympic fervor, the Chinese government revealed that the figure has surpassed 20 million already. The TBND is now home to a hukou population of about 1.1 million and will probably be one of the most popular urban destinations for newcomers.

In the past few years, the authorities of the TBND have chosen to adopt some progressive strategies in developing the zone’s industrial and financial activities. For example, an A320 Airbus assembly line has been set up next to the Tianjin Airport. Also located in the zone are a large-scale (1-million-metric-ton scale) ethane manufacturing enterprise, a chemical industrial park, a high-tech textile industrial park, and more. With the attraction of these new manufacturing operations, the TBND is on the way to establishing itself as a strong industrial base in the region. Its stronger industrial presence is reflected in the heightened contribution of secondary industries to GDP, from 66.9 percent in 2003 to 71.5 percent in 2006 (TMBS 2007: 489). In relation to Tianjin, TBND accounted for 43.9 percent of the city’s GDP, 67.4 percent of its exports, and 76.0 percent of its realized FDI in 2005, compared with 40.6 percent, 62.2 percent, and 74.4 percent, respectively, in 2003. However, a sound financial architecture and an efficient transport infrastructure network are necessary to support healthy industrial development. In this respect, the TBND has been allowed to experiment with reforms in the financial sector, especially in dimensions not presently offered in Shanghai and Shenzhen, with a view to pursuing greater openness in China’s financial sector. For example, a new commercial bank—China Bohai Bank—was established in 2005. It runs with a high degree of flexibility and freedom that no other bank in China enjoys at this moment; it provides various banking, investment, and insurance services. Also, the central government has initially granted the Tianjin branch of the Bank of China the sole right to provide qualified individual direct investment services in the Hong Kong stock market, a new investment vehicle in China that is expected to be implemented in the near future.

For the construction of transport infrastructure, besides the highway and railway linkages to other cities of the JJJ city-region, the projects expanding Tianjin’s airport and port are the most significant. Even though the work of expanding the airport is ongoing, this has not affected its operations. The airport continues to set records in the number of routes, frequency of flights, number of passengers, and volume of goods handled. The 2008 Summer Olympic Games in Beijing will surely provide the airport with the opportunity to realize a new wave of rapid growth and development. Immediate coordination with the Beijing airport appears to be a matter of high priority. Similarly, Tianjin’s port is experiencing speedy growth in size and capacity, and its total throughput has soared since 2001. It is now the sixth-largest port in the world, the fourth-largest in China, and the largest in North China. The port has been allowed to set up the largest bonded port zone in China. The present imperative of Tianjin port is to seek closer integration and coordination with other ports in the Bohai Bay to consolidate its hub status. Of all ports, Caofeidian port in Tangshan is the first choice in seeking greater integration. Caofeidian has benefited from the integration of Beijing Shougang (the country’s best-known iron and steel manufacturing enterprise) and Tanggang, whose production line has been relocated to Caofeidian. Caofeidian is likely to develop as a modern heavy industrial port city in the future.

busiest air hub in China, handled 48.74 million passengers in 2006, but Tianjin’s airport ranked only thirty, with a mere 2.76 million passengers. In rankings of competitiveness, Tianjin’s airport came fourth out of five major airports in the region, clearly a mismatch with its status as one of the four special municipalities in China (Chu and Wu 2006). At present, the two cities, especially Beijing, are facing the consequences of over-agglomeration, such as serious air pollution; worsening traffic jams; increasing shortages of water, land, and energy; population pressure; and so on (Li and Hu 2007: 175). With regard to the province of Hebei—the immediate hinterland of Beijing and Tianjin—poverty has become a challenge due to a “vacuum effect.” A recent report has shown that some 2.73 million people in the peripheral areas of Beijing and Tianjin live in poverty, and such regional imbalance has been described as “modern mega cities and backward hinterland” by Lu Dadao (quoted in Li and Hu 2007). Thus
the competitiveness of other cities in the JJJ city-region is far lower than that of Beijing and Tianjin. Even Tangshan, generally considered the third JJJ city after Beijing and Tianjin, ranked only forty-third among all Chinese cities.

**Improving regional transport infrastructure**

In developing the JJJ city-region, shortening travel distances and minimizing socioeconomic disparities are high on the list of priorities. Support from the central government and effective local policies are equally important. Consequently, the top-down national expressway and railway plans have called for building a comprehensive transport network in the region. This will be complemented by local public works plans, such as the new urban planning strategies of Beijing and Tianjin, the JJJ regional planning study, the JJJ transport infrastructure development plan, and so on. A clear division of labor is envisaged for the cities. For example, Beijing will play down its role as an economic center, with the intention of decentralizing some major financial activities and heavy industries from Beijing to the Tianjin Binhai New District, Tangshan, and other cities (Li and Hu 2007).

Several projects to build expressways, high-speed railways, ports, and airports have been or are about to be launched in the region. The main purpose is to strengthen the coherence of the JJJ city-region and the Greater Bohai Bay region. Among these, a new Beijing-Tianjin expressway will shorten the travel time between the two cities to about 1 hour from the present 2.5 hours, and another five new expressways will connect the JJJ city-region. New 200 kilometer per hour high-speed railways are now in service between Beijing and Bohai Bay cities, and a new intercity high-speed railway and a light railway will serve the route between Beijing and Tianjin. It is estimated that operation of the high-speed railway will contribute an extra ￥20 billion to China’s GDP. The lifestyles and travel patterns of Beijing and Tianjin commuters will change as a result. A new airport will be built between Beijing and Tianjin, in keeping with the view that all airports in the region will have to be integrated. Tianjin Port, now under expansion, will serve as the seaport hub and logistics center of North China. All of these projects will facilitate a smoother and denser flow of goods and people throughout the JJJ city-region, consolidate the hub functions of Beijing and Tianjin, and increase their spillover effects. For other parts of the Greater Bohai Bay region, the most spectacular project is the Bohai Strait channel project, which will provide a land link via a bridge between the Liaoqiong peninsula and the Shandong peninsula. It will sharply reduce the travel distance to about one-tenth of the present distance of more than 1,000 kilometers and contribute to the integration of the region. This project will fill a missing link in China’s north-south coastal corridor and is similar to the three bridges over Hangzhou Bay in the Yangtze River delta and the proposed Hong Kong-Zhuhai-Macao bridge in the Pearl River delta. The integration of the entire Chinese coastal region will be significantly advanced.

In sum, the experience of the development of the JJJ city-region reflects the view that core cities can, through their agglomeration and dispersion effects, not only decisively affect their own pattern of development, but also add to the strength of the whole region. Proper coordination, cooperation, and division of labor among cities are critical to circumventing the excessive agglomeration of core cities and the hollowing out of peripheral areas.

---

Table 18.8 Employment in three cities of China, 2005

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Beijing</th>
<th>Tianjin</th>
<th>Hebei</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total employed persons (1,000)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Primary</td>
<td>622</td>
<td>805</td>
<td>15,623</td>
</tr>
<tr>
<td>Secondary</td>
<td>2,264</td>
<td>1,733</td>
<td>10,484</td>
</tr>
<tr>
<td>Tertiary</td>
<td>6,318</td>
<td>1,831</td>
<td>8,566</td>
</tr>
<tr>
<td>Total</td>
<td>9,204</td>
<td>4,269</td>
<td>34,673</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Employment density (persons per square kilometer)</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary</td>
<td>37.52</td>
<td>69.33</td>
<td>82.23</td>
</tr>
<tr>
<td>Secondary</td>
<td>136.57</td>
<td>149.26</td>
<td>55.18</td>
</tr>
<tr>
<td>Tertiary</td>
<td>381.11</td>
<td>149.08</td>
<td>45.08</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Employment structure (percent)</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary</td>
<td>3.8</td>
<td>18.9</td>
<td>45.1</td>
</tr>
<tr>
<td>Secondary</td>
<td>24.6</td>
<td>40.6</td>
<td>36.2</td>
</tr>
<tr>
<td>Tertiary</td>
<td>68.6</td>
<td>40.5</td>
<td>24.7</td>
</tr>
</tbody>
</table>

Note: The data for Hebei province are used here instead of those for the eight cities, because of the availability of the data.
Support from the central government and local development strategies are equally critical to the success of regional development in China. Above all, on the evidence deduced from the Bohai Bay region, transport infrastructure is a forerunner to successful urban-regional change and the tool for enhancing the flow, communication, and integration of cities.

Conclusions
This chapter has chosen the three most developed city-regions of China to bring home their experiences in pioneering rapid economic development and social modernization in the country over the past three decades.

In the Chinese transition to rapid growth and development, Chinese cities, especially those along the coast, have been catalysts for change. This is in large measure due to the advantages of their geographic location, which provides easy access to and from foreign countries, and to their considerable store of administrative, technological, economic, and cultural experience. The growth of the three coastal regions as shown in this chapter is led by the urbanization of large cities such as Beijing, Guangzhou, Shanghai, and Shenzhen. While the rapid growth of the coastal regions is planned and expected by Chinese economists, the rapid growth and expansion of large coastal cities are beyond the imagination of urban planners, as the long-standing official policy is to control the growth of large cities. In a word, the strong force of urban agglomeration has produced a model of development in coastal China led by large cities. Large cities with powerful city governments and agglomeration advantages have been very successful in attracting foreign investment and promoting economic development under the triple processes of globalization, decentralization, and marketization (Shen 2007).

To conclude, we would like to draw the similarities and differences among the three coastal regions, focusing on Guangzhou, Shenzhen, Shanghai, and Beijing, which are their leading economic centers. Guangzhou and Shenzhen are in Pearl River delta, Shanghai is in the Yangtze River delta, and Beijing is in the Bohai Bay region. These four cities share the following characteristics. First, Beijing, Guangzhou, Shanghai, and Shenzhen are mega cities, each with a population of more than 8 million in 2005. From 1980–2005, their population grew dramatically due to the inflow of migrants, mostly from rural areas. For example, population in Shanghai grew from 11.57 million to 17.99 million in the period, and Shenzhen grew from a small town to a city with a population of 8.28 million. Second, these cities are densely populated, with population density over 1,277 persons per square kilometer, which may be underestimated, as some counties and rural areas are included in the city boundary. Third, these cities were more advanced and had higher per capita GDP at the beginning of the period than China as a whole. Their GDP grew faster than that of China as a whole, with the exception of Beijing and Shanghai in the 1980s. With an expanding population, the gap in per capita GDP widened between these cities and the rest of China, indicating the strong force of agglomeration economies. Finally, there is a tendency of convergence among these cities. The tertiary sector became important in 2005, contributing more than 46 percent of GDP. All cities attracted large foreign investment in 2005, and their exports expanded greatly in the period of 1980–2005. To some extent, the growth of export-oriented manufacturing in the Pearl River delta in the 1980s and 1990s was repeated in Shanghai after 2000.

Nevertheless, the leading cities in the three regions also demonstrate major differences in terms of growth dynamics, economic structure, and degree of internationalization. First, there are differences in growth dynamics. Beijing and Shanghai grew slowly in the 1980s, even slower than the national average. Their growth speeded up after 1990. Guangzhou and Shenzhen grew faster than Beijing and Shanghai from 1980–2005, although their growth slowed down after 2000. By 2005, Guangzhou and Shenzhen had a per capita GDP higher than that of Beijing and Shanghai. These cases demonstrate that a few leading cities rather than one primary city may achieve high levels of development in a large country like China. Their growth may not occur at the expense of other leading cities.
Second, there are differences in economic structure. Shenzhen and Shanghai had similar shares of secondary and tertiary industries in GDP in 2005, around 50 percent in each sector. Foreign investment plays an important role in the expansion of manufacturing industry in both cities. As the provincial capital of Guangdong, Guangzhou had a smaller share of secondary industry (39.7 percent) and a larger share of tertiary industry (57.8 percent) in GDP than Shenzhen and Shanghai in 2005. As the capital of China, Beijing had the smallest share of secondary industry (29.4 percent) and the largest share of tertiary industry (69.2 percent) in GDP. They experienced a different pace of economic restructuring. Shanghai and Beijing were industrial cities in 1980, and their share of secondary industry in GDP declined sharply from more than 68 percent to below 49 percent from 1980–2005. Their share of tertiary industry in GDP increased sharply, from below 27 percent to more than 50 percent in the same period. Guangzhou experienced similar changes on a smaller scale. In Shenzhen the share of secondary industry in GDP grew rapidly at the expense of agriculture, while the share of tertiary sector in GDP was stable at 45–51 percent in the period of 1980–2005.

Third, there are differences in the pace and degree of internationalization. The Pearl River delta region was the first to adopt favorable policies for foreign investment. Shenzhen led the country in attracting foreign investment and generating exports. Investment from Hong Kong played an important role in the development of an outward-processing-based and export-oriented economy. Shenzhen and Guangzhou outperformed other major cities in China in per capita GDP by 2005. Shanghai in the Yangtze River delta was China’s major industrial base before 1980. An open policy was implemented in Shanghai on a large scale only after 1990, and Shanghai underwent a dramatic transformation, with significant expansion of advanced manufacturing and tertiary industries. Shanghai has a good foundation of human resources, R&D capacity, and business traditions. Transnational corporations from Hong Kong and Western countries made significant investment in Shanghai. The Bohai Bay region is relatively less advanced. But as the capital of China, Beijing has considerable national resources, and its service economy is well developed. Under the general policy of economic reform and opening, the Pearl River delta, the Yangtze River delta, and the Bohai Bay region and their major cities have achieved significant development by making use of both domestic and foreign resources. They demonstrate the important role that urbanization and large cities have played in the development of China.

Guangzhou is the provincial capital of Guangdong province. It attracted more foreign capital than Shanghai and Beijing in the 1980s and 1990s. But by 2005, it attracted the least foreign capital among the four cities. Its exports also grew more slowly than those of other cities in the period of 2000–05. Clearly Guangzhou is less export oriented than other cities. Beijing is the capital of China, and its economy, like that of Guangzhou, is less export oriented. But foreign investment and exports grew rapidly from 2000–05, indicating the growing influence of globalization.

This chapter has shown that the Pearl River delta, the Yangtze River delta, and the Bohai Bay area, in a sequenced pattern of reform and openness, have accounted for the bulk of the success of the country’s reform program, which has been carried out over the past three decades. The Pearl River delta region was the first to adopt an open policy, and foreign investment from Hong Kong played an important role in the development of an outward-processing-based and export-oriented economy. Shenzhen and Guangzhou outperformed other major cities in China in per capita GDP by 2005. Shanghai in the Yangtze River delta was China’s major industrial base before 1980. An open policy was implemented in Shanghai on a large scale only after 1990, and Shanghai underwent a dramatic transformation, with significant expansion of advanced manufacturing and tertiary industries. Shanghai has a good foundation of human resources, R&D capacity, and business traditions. Transnational corporations from Hong Kong and Western countries made significant investment in Shanghai. The Bohai Bay region is relatively less advanced. But as the capital of China, Beijing has considerable national resources, and its service economy is well developed. Under the general policy of economic reform and opening, the Pearl River delta, the Yangtze River delta, and the Bohai Bay region and their major cities have achieved significant development by making use of both domestic and foreign resources. They demonstrate the important role that urbanization and large cities have played in the development of China.
Notes
Yue-man Yeung is emeritus professor, and Jianfa Shen is professor, both at the Chinese University of Hong Kong. Thanks are due to Gordon Kee for his research assistance in the preparation of this chapter.

1. These are 2 of 14 coastal cities in China that were declared open and granted the authority to pursue favorable policies and given other advantages to attract foreign investment.

2. China's currency is the renminbi, and its currency unit is the yuan.


5. For example, about 2.5 hours are needed to travel the 120 kilometers between Beijing and Tianjin. On average, for about 6 hours a day the travel speed on the Beijing-Tianjin expressway reportedly is less than 60 kilometers per hour. See “Traffic Accidents Keep Increasing, Slowing Down the Traveling Speed in Jing-Jin-Tang Expressway [in Chinese],” November 17, 2004 (http://news.xinhuanet.com/newscenter/2004-11/17/content_2227725.htm). Traffic accidents increased by double digits from 2001–03.


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A history of the Republic of Korea’s industrial structural transformation and spatial development

Sam Ock Park

The Korean peninsula, which is situated at the northeastern rim of the Asian continent, covers 221,000 square kilometers and includes both the Democratic People’s Republic of Korea and the Republic of Korea. Of that total, 99,000 square kilometers constitute the Republic of Korea, the focus of this paper.

The Korean peninsula historically served as a land bridge over which Chinese culture was diffused from China to Japan. Despite the significant influence of Chinese culture and the frequent invasions by foreign powers, the Republic of Korea has managed to preserve a cultural and ethnic identity that is different from that of either China or Japan, with a distinct language, alphabet, arts, and customs (Lee and others 1988).

The province (do) is the country’s largest administrative unit. Presently, Korea has nine provinces, with names originating in the early Chosun Dynasty. In addition, Korea has one special city (Seoul) and six mega cities (Busan, Daegu, Daejon, Gwangju, Inchon, and Ulsan) that have populations over 1 million and are at the same administrative level as provinces (see figure 19.1).

Traditionally, the Korean peninsula was divided into three geographic regions: north, central, and south. Due to the political division of the Korean peninsula in 1953, some of the northern part of the central region and the whole of the northern region belong to the Democratic People’s Republic of Korea. In addition, there are cultural and geographic differences between the east and west of each region. For example, the south is divided into Yongnam (the southeast region) and Honam (the southwest region).

In general, the western part of Korea consists largely of plains, while the eastern part consists largely of mountains.

Historically, when agriculture was the major economic activity, the western part of Korea was relatively affluent, largely due to high agricultural productivity in the plains. However, since the early 1960s, Korea’s economic geography has changed significantly, with rapid industrial development starting in the southeastern and capital regions. Construction of the Seoul-Busan express highway and the industrial development of the southeastern region, centered on Busan, increased the spatial disparity between the axis of Seoul-Busan and the axis of the southwestern and northeastern corners of Korea.

Korea has experienced remarkable economic growth for the past five decades. Korea was among the poorest countries in the world following the devastation of the Korean War (1950–53). Korea’s per capita gross national product (GNP) rose from less than US$100 (in 1996 US$) in 1960 to US$20,000 in 2007. This remarkable economic achievement, known as “compressed economic growth,” is closely related to the successful implementation of export-oriented, sector-specific industrial development strategies and the development of human resources since the launch of the First Five-Year Economic Development Plan in 1962.

Korea’s compressed economic growth is dynamic, resulting, first, in the concentration of industry and population in the
capital region and, subsequently, in the convergence of regional GDP per capita, as provincial cities and rural areas began to evolve with the development of information and communications technology (ICT).

Considering the dynamics of the Korean economy and the country’s rapid spatial development, this chapter investigates the following issues:

- The role of government policies in the transformation of industrial structure and spatial development;
- The spatial development of economic growth in terms of “distance” and “density” effects, agglomeration, factor mobility, and technological development; and
- The lessons and policy implications.

In Korea, structural dimensions are closely related to spatial dimensions, and so this chapter examines industrial policies, spatial transformation, and industrial restructuring. The analyses at the national level are conducted mostly for the period from the 1960s to 2005. However, the analyses at the regional level are conducted mostly for the period from the 1980s to 2005 due to the availability of data by regions and inconsistency of data for earlier years.

The basic unit of analysis is the province: 9 provinces and 7 major cities (Seoul and the mega cities), making 16 units. The 16 basic units of provinces and cities are classified into 4 regions: capital, middle, southwest, and southeast (see figure 19.2).

**Industrial policies, structural changes of industry, and spatial transformation**

The history of Korean industrialization is rather short. Manufacturing activities were mainly in handicrafts created by middle-class people in the Chosun Kingdom (1392–1910). During the period of Japanese occupation (1910–45), Japan began developing heavy and chemical industries in the north (now the Democratic People’s Republic of Korea) to make use of the abundant hydraulic power and mineral resources there. As a result, 90 percent of the minerals, 82 percent of the chemical industries, and 90 percent of the electronic power–generating facilities were located in the north when Korea was liberated from Japanese occupation in 1945 (Park 1981). To make matters worse, more than half of the manufacturing facilities were destroyed during the Korean War, weakening the foundations for industrial development.

Industrialization in Korea has progressed rapidly since the early 1960s, when the First Economic Development Plan (1962–66) was launched. The manufacturing industry became the major driving force of the Korean economy for the next two decades. The share of manufacturing in total national production increased rapidly from 12.1 percent in 1960 to 29.6 percent in 1980, while...
the share of agriculture decreased from 39.9 to 14.6 percent (see table 19.1).

The “density” of a core city and the “distance” to the core city were important in the industrialization phase, as rapid industrialization was accompanied by rapid urbanization. The urbanization ratio (share of cities with a population more than 20,000) increased from 35.9 percent in 1960 to 78.6 percent in 1990. Most of the rapidly growing cities during the last four decades were in the suburban areas of Seoul and the southeast region. In addition, most industrial cities grew rapidly, suggesting that agglomeration or scale economies were important. Most of the industrial cities in these regions were rural agricultural areas in the 1960s.

Industrial decentralization from Seoul was one of the major factors contributing to the proliferation of industrial cities in the capital region, while the development of a large-scale industrial complex was the major source of growth for industrial cities in the southeast region. Korea's rural-urban transformation took place through the concentration of industry and population in major urban areas, on the one hand, and the decentralization of industry and population from the large core cities to their hinterlands within the region, on the other. Both processes are related to distance and density effects.

Understanding the government’s industrial policy is a prerequisite to understanding the spatial transformation of Korea. Since the First Five-Year Economic Development Plan was launched in 1962, the national government has sought to promote particular sectors and locations. Export-oriented industrialization has been a major strategy since the early 1960s, and the strategy was fashioned to promote the most promising industries at a certain stage. These were called “strategic industries.” Labor-intensive industries were the key sectors for the expansion of industrial exports before the early 1970s, while heavy and chemical industries were the strategic industries for the expansion of exports in the late 1970s and early 1980s. The government’s policy of support for heavy and chemical industries contributed to the evolution of the chaebol (business conglomerate) system by allowing chaebols to borrow foreign capital and granting them incentives to invest in heavy industries (Park and Markusen 1995). Since the mid-1980s, high-technology industries such as semiconductors have been increasingly favored. Since the 1990s, especially since the financial crisis in November 1997, the Korean government has sought to promote the development of knowledge-intensive industries with the intention of opening up the country to trade and capital movements, restructuring the economy, including the financial sector, and making the labor market more flexible. Regional innovation has been the key policy in the twenty-first century (see figure 19.3).

Along with sectoral policies, the national government established several large industrial estates in the southeastern part of the
Table 19.1 Structure of production in Korea, by sector, 1960–2005

<table>
<thead>
<tr>
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<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Agriculture</td>
<td>39.9</td>
<td>31.1</td>
<td>14.6</td>
<td>9.0</td>
<td>4.6</td>
<td>3.4</td>
</tr>
<tr>
<td>Industry</td>
<td>18.6</td>
<td>28.4</td>
<td>41.4</td>
<td>44.7</td>
<td>42.8</td>
<td>40.4</td>
</tr>
<tr>
<td>Mining</td>
<td>2.3</td>
<td>1.3</td>
<td>1.4</td>
<td>0.5</td>
<td>0.3</td>
<td>0.4</td>
</tr>
<tr>
<td>Manufacturing</td>
<td>12.1</td>
<td>19.1</td>
<td>29.6</td>
<td>28.9</td>
<td>31.5</td>
<td>28.8</td>
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<tr>
<td>Construction</td>
<td>3.5</td>
<td>6.4</td>
<td>8.2</td>
<td>13.2</td>
<td>8.2</td>
<td>9.0</td>
</tr>
<tr>
<td>Utilities</td>
<td>0.7</td>
<td>1.6</td>
<td>2.1</td>
<td>2.1</td>
<td>2.8</td>
<td>2.2</td>
</tr>
<tr>
<td>Services</td>
<td>41.5</td>
<td>40.5</td>
<td>44.0</td>
<td>46.3</td>
<td>52.6</td>
<td>56.2</td>
</tr>
<tr>
<td>Total (GDP)</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Source: Bank of Korea (various years).

Figure 19.3 A brief history of Korean industrial policies

Source: Author.

country. The major new industrial cities or production agglomerations of Ansan, Changwon, Kumi, Pohang, and Ulsan were created as a result of industrial policies implemented in the late 1960s and the 1970s. Chaebols contributed heavily to the development and growth of industrial cities by establishing large branch plants with imported technology and borrowed foreign capital. However, the idea of territorial production systems was not successfully implemented in the early stage of development. That is, at the initial stage, the industrial estates in the industrial cities had only limited local interfirm linkages and were just agglomerations of production activities without significant intraregional production networks.

The industrial policies have had a significant impact on the structural and spatial makeup of industries. To show the structural changes more clearly, industries can be classified by level of technology or intensity of labor. In this chapter, manufacturing industries are classified, for the sake of convenience, into five types: labor intensive, capital intensive, resource intensive, assembly, and other special types. The classification is based on the results of a factor analysis of manufacturing industries conducted by Park (1993). Assembly-type industries are mostly technology-intensive industries,
except for the manufacture of furniture (see table 19.2). Since the share of furniture manufacturing is very small, assembly-type industries are considered to be technology-intensive industries.

The most distinctive structural change has been the shift from labor-intensive to technology-intensive industries. Labor-intensive industries played a dominant role during the phase of rapid industrialization in the 1960s and 1970s, but their share has declined steadily since the late 1970s. On the contrary, assembly-type industries have steadily increased their share since the late 1970s. There have been slight changes in the use of resources and capital, but the most significant structural shift at the national level has been from labor-intensive to technology-intensive industries.

In addition, there are considerable differences in the structural changes occurring in different regions. The southeast region became highly specialized in assembly industries during the last three decades. The middle region began to transform from labor-intensive to technology-intensive industries in the 1990s. The changes to the middle region are closely related to the extension of industrial agglomeration from the capital region to the nearby Chungcheong region as well as the development of Daeduck Research Park in Daejun in the 1990s. The shift to technology-intensive industries also occurred in the southwest region, but the degree of the shift is relatively small compared to the nationwide trend. The southwest region is rather specialized in resource-based industries.

Changes in the industrial structure of Seoul are significantly different from the nationwide changes. Seoul specialized in labor-intensive industries early in the country’s industrialization, and, even though the share of assembly-type industries has risen slightly since the early 1990s, it remains lower than the share of labor-intensive industries. In Seoul, the structural changes within an industry have been more intensive than the structural changes among types of industry. For example, within the apparel industry, Seoul is highly specialized in fashion design and high-value-added products rather than standardized mass production.

Spatial changes are closely related to the industrial policies and structural changes of industries. In the early phase of industrialization, the export-oriented industrial policy and heavy and chemical industrial policy reinforced spatial disparities, with industries concentrated in the capital region and the southeast region (Park and Wheeler 1983). The capital region increased its share of manufacturing employment in the 1960s and peaked in 1975, with 48.3 percent (see table 19.3). The southeast region increased its share sharply, peaking in 1980, with 40.4 percent.

Furthermore, the government’s heavy and chemical industrial development policy resulted in a spatial division of labor, with the headquarters of chaebols concentrated in Seoul and production functions decentralized to other regions, especially the southeast. The high-technology industrial policy resulted in a slight reconcentration of production in the capital region in the 1980s, due to the region’s locational advantages. The concentration of high-technology industries and advanced services, including research and development (R&D) activities, in the capital region intensified the spatial division of labor in the 1980s (Park 1993).

The middle and southwest regions, which can be regarded as peripheral regions,

### Table 19.2  Share of manufacturing industry in Korea, by type of firm, 1981–2005

<table>
<thead>
<tr>
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<th></th>
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<tbody>
<tr>
<td>Resource based</td>
<td>16.5</td>
<td>15.4</td>
<td>14.9</td>
<td>16.8</td>
<td>15.9</td>
<td>15.1</td>
</tr>
<tr>
<td>Technology intensive (assembly)</td>
<td>27.6</td>
<td>33.7</td>
<td>41.8</td>
<td>47.8</td>
<td>51.3</td>
<td>57.6</td>
</tr>
<tr>
<td>Labor intensive</td>
<td>43.5</td>
<td>38.3</td>
<td>29.8</td>
<td>21.5</td>
<td>19.0</td>
<td>14.3</td>
</tr>
<tr>
<td>Capital intensive</td>
<td>4.5</td>
<td>4.3</td>
<td>5.0</td>
<td>8.8</td>
<td>8.6</td>
<td>8.1</td>
</tr>
<tr>
<td>Other</td>
<td>7.9</td>
<td>8.3</td>
<td>8.5</td>
<td>5.0</td>
<td>5.2</td>
<td>4.9</td>
</tr>
<tr>
<td>Korea, total number of firms</td>
<td>2,559,473</td>
<td>3,290,035</td>
<td>4,231,080</td>
<td>3,748,516</td>
<td>3,415,996</td>
<td>3,450,893</td>
</tr>
</tbody>
</table>

Source: KNSS, Census on Basic Characteristics of Establishments (various years).
A history of Korea’s industrial structural transformation and spatial development

experienced a decrease in their share of manufacturing employment until the mid-1980s, after which the middle region recovered somewhat. The southwest region increased its share of manufacturing employment from the mid-1980s to the mid-1990s, but no significant change has occurred since the mid-1990s. Such regional changes are shown in table 19.3.

**Firms’ industrial restructuring, spatial changes, and globalization**

In the 1990s Korea experienced two phases of industrial restructuring: one was related to the labor movement in the late 1980s and one to the financial crisis in 1997. From 1987 to 1989, the country experienced severe labor disputes, and wages rose sharply. The sharp wage hikes, appreciation of the won with regard to the U.S. dollar, high interest rates, weak financial structure, high turnover rates, and labor shortages in production lines triggered the restructuring of firms, especially the labor-intensive small and medium enterprises (SMEs; see Park 1993, 1994).

Individual corporate strategies became more important than ever for firms’ survival and competitiveness as consumer markets became more diversified, technology advanced rapidly, and product life cycles became shorter. Before the early 1990s, the government played a critical role in the industrial development and structural changes taking place in Korea (Markusen and Park 1993; Park 1991). Since the liberalization of labor in 1989, the strategies of private firms have been as important as the policies of the government, and many firms in labor-intensive industries were either closed or restructured in the early 1990s.

According to research on industrial restructuring in the Asian newly industrializing economies of Korea; Taiwan, China; Hong Kong, China; and Singapore in the early 1990s, Korean firms pursued four strategies for industrial restructuring in the areas of labor, organization, location, and technology development (Park 1995). Flexible labor strategies, which focused on numerical rather than functional flexibility, reduced the costs of production by increasing the use of flexible labor, such as temporary workers, part-time workers, and foreign workers. Subcontracting—the major organizational strategy—reduced costs by outsourcing production activities or separating some parts of production lines. Locational strategies focused on foreign direct investment (FDI), which was mainly geared toward low-cost areas such as China and Southeast Asian countries during the early 1990s. There was an increase in outward FDI from Korea during the 1990s until right before the financial crisis in 1997 (see figure 19.4). Along with efforts to reduce costs, technological developments also were emphasized, and the number of firms involved in R&D activities rose. About 19.9 percent of firms conducted R&D activities in 1993, compared with about 34 percent in 1996 (Park 2000).

A second industrial restructuring occurred after the financial crisis in 1997, when the central government took a leading role in restructuring chaebol groups. During this period, outward FDI stagnated, while inward FDI increased dramatically. Since 2002, outward FDI has again increased. The

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<td>7.5</td>
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<td>7.9</td>
<td>10.3</td>
<td>11.4</td>
<td>12.2</td>
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<tr>
<td>Southeast region</td>
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<td>37.5</td>
<td>40.4</td>
<td>40.2</td>
<td>37.8</td>
<td>35.6</td>
<td>34.8</td>
<td>33.6</td>
</tr>
<tr>
<td>Southwest region</td>
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<td>9.7</td>
<td>6.5</td>
<td>6.3</td>
<td>5.6</td>
<td>6.4</td>
<td>7.3</td>
<td>7.2</td>
<td>7.2</td>
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<tr>
<td>Korea, total number of firms</td>
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<td>861,041</td>
<td>1,420,144</td>
<td>2,014,751</td>
<td>2,437,997</td>
<td>3,019,816</td>
<td>2,951,885</td>
<td>2,852,590</td>
<td>2,865,549</td>
</tr>
</tbody>
</table>

Source: KNSO, Census of Mining and Manufacturing Industry (various years).
two periods of industrial restructuring significantly contributed to the globalization of the Korean economy by strengthening the relationship between Korea and other Asian countries in terms of trade and FDI.

The two restructuring processes in the 1990s had a considerable impact on space and globalization in Korea. In the early 1990s, many SMEs in labor-intensive industries were closed or relocated to China or Southeast Asia, seeking low-cost areas. Accordingly, regions that specialized in labor-intensive industries, such as Seoul, were under severe pressure to restructure. Because the firms pursuing strong technological development were mostly located in the capital region, the share of the capital region did not decline in the early 1990s. Because many new high-tech start-ups were established in the capital region, especially in Seoul, there was a slight reconcentration of industries for three to four years after the crisis. During the subsequent restructuring phase, scale economies and “density” effects were significant for high-tech spin-offs. Globalization progressed rapidly, with increasing outward FDI. Especially in the case of outward FDI to China, physical and cultural “distance” effects were important. Two-thirds of outward FDI to China went to northeast China, focusing on Shandong province, which is near to and has close historical linkages with Korea.

Changes in innovation systems, recent regional innovation, and cluster policies

Innovation systems in Korea have changed significantly during the last four decades. In Korea the issues of innovation were relatively neglected in the 1960s, because the ultimate goal was to provide a foundation for industrialization. The government took the initiative in the 1960s and 1970s by helping research institutes to take a leading role in improving industrial technologies. Most firms were more interested in receiving technology transfers from the industrial countries than in conducting their own R&D activities. Universities, not firms, took the lead in the development of technology. Therefore, the national systems of innovation in the 1960s and 1970s were directed mainly by the government’s science and technology policy, which supported the transfer of technology to firms and the process of learning from imported technology. The impact of inbound FDI on the development of innovation systems was not significant during this period.

Since the 1980s, however, the major role in R&D and innovation has shifted from the government to private firms (Park 2001). Many firms have established their own R&D centers and significantly increased R&D expenditures. Private firms accounted for 56 percent of total R&D expenditure in 1981, surpassing the share of government expenditure, and reached 81 percent in 1985 (MOST 1990). In 1980 only 54 firms, most of which belonged to chaebols, had their own R&D centers, but the figure increased to 2,226 in 1995 (KITA 1995, 1996). Chaebols aggressively established R&D centers in the early 1980s, but by the late 1980s, even the SMEs began to establish their own R&D centers.

According to a survey conducted right after the financial crisis in December 1997, SMEs continued to be involved in R&D activities in the 1990s (Park 2000). Out of 825 firms that responded to the question-
naire, 20 percent of firms conducted R&D activities in 1993 and 34 percent did so in 1996. All in all, the survey revealed that larger SMEs were more interested in R&D activities than smaller SMEs. However, among the firms that conducted R&D activities, smaller SMEs spent a higher percentage of total sales on R&D than larger SMEs, which suggests that a considerable proportion of these smaller SMEs are high-tech businesses. Presently, more than two-thirds of all R&D centers were established by SMEs.

The R&D activities of firms in the 1990s had some distinctive characteristics (Kim 1997): (1) large firms of chaebols established strategic alliances with worldwide high-tech firms; (2) large firms, which mostly belong to chaebols, were aggressive in establishing foreign R&D centers and labs; and (3) due to the difficulties in getting licenses for leading-edge complex technology, large firms sought to secure original technology by merging with or acquiring high-tech firms in the developed countries.

Since the 1990s, regional innovation networks have begun to evolve due to the development of regional clusters of SMEs in technology-intensive sectors. The establishment of science parks and high-tech parks in areas outside the capital region, in addition to the Daeduck Research Park, has contributed to the clustering of innovation networks since the 1990s. Starting in 2002, the participatory government has emphasized balanced national development and promoted regional innovation and cluster policies (Park 2007). Regional innovation policies, which have been promoted as essential for balanced national development, seek to integrate "talent," "technology," and "industry." Major policies for regional innovation are seeking to establish regional innovation systems, strengthen the innovation capacity of universities in provinces, promote science and technology in the provincial regions, and establish networks of industries, universities, and research centers.

In addition to regional innovation policies, the policy of promoting innovative clusters has been pursued strongly since 2002. Seven innovative clusters have been reformulated through the reorganization of national industrial complexes, including the electronics and information technology (IT) cluster in Kumi, the machinery cluster in Changwon, the automobile cluster in Ulsan, the parts and components cluster in Ahnsan, the parts and components of automobile and machinery cluster in Gunsan-Janghang, the photonics cluster in Kwangju, and the medical instruments cluster in Wonju. Thirty-six mini-clusters emanating from the seven innovative clusters have been developed to promote collaboration and solve problems in industrial practices.

Daeduck Research Park in the city of Daejun has been supported by the special law to promote commercialization of R&D and innovations and was renamed as the Daeduck R&D Special District in 2003. Innovation clusters have been promoted through support for strategic industries in each region. High-tech IT clusters and local culture clusters have been supported through collaboration among diverse economic actors. And the development of clusters by private firms, such as Suwon’s IT cluster by Samsung, Paju’s semiconductor cluster by LG-Phillips, and Pohang’s material cluster by POSCO, has also been promoted.

This strong promotion of balanced national development seems to have had an impact on the share of regional GDP compared to the share of population in the capital region, a subject examined in the next section. The regional innovation policies have certainly increased the density of regional innovation networks in the provinces. However, restrictions on the autonomy of universities have exerted negative effects on the development of high-quality manpower, limiting the ability of Korea to innovate.

**Spatial development and change**

During the last five decades in Korea, “distance” and “density” effects have been significant in Korea. Population and economic activities have become increasingly concentrated in the capital region, which accounted for only 28.3 percent of the country’s total population in 1970 and for 48.2 percent in
2005. Other regions, accordingly, experienced a decline in their share of population (see figure 19.5).

However, there were meaningful exceptions to and fluctuations in this trend. The southeast region’s share of population remained steady during the 1970s, when heavy and chemical industries developed rapidly along the southeastern coast, but its share of population has decreased slightly since then. The population share of the middle region declined steadily until 1995, after which it increased slightly. The southeast region, which was underdeveloped during the phase of rapid industrialization, has seen a steady decrease in its share of the population, from 21.3 percent in 1970 to 11.7 percent in 2005, having lost many residents to the capital region. Seoul’s share of population increased steadily until the end of the 1980s, but has declined since then, even though there has been no significant change in the absolute number of population (see table 19.4). Gyeonggi province, which is essentially a suburb of Seoul, has steadily increased its share of population from 8.2 percent in 1970 to 22.0 percent in 2005, reflecting the effect of distance from Seoul. Furthermore, the middle region, which is adjacent to Gyeonggi province, has declined in population share, reflecting the effects of distance from the capital region.

The entropy index, which declines as disparity rises, suggests that the distribution of population has become more regionally uneven over time (see figure 19.6). While the degree of spatial disparity of population is lower than that of regional GDP and of manufacturing, the spatial disparity of population is increasing, whereas that of regional GDP or manufacturing is not. The entropy value in this chapter is measured as follows:

\[
H = -\sum_{i} q_i \log_2 q_i,
\]  

where \( H \) is entropy value; \( q \) is a set of nonnegative numbers that sum to unity \( \sum_n q_i = 1.0 \); \( n \) is the number of subgroups (in this case, 16). If any \( q \) is equal to 1 and all other \( q \)'s are 0, then \( H \) is equal to 0. For a given \( n \), \( H \) is at its maximum when all \( q \)'s are equal, so that

![Figure 19.5 Share of population in Korea, by region, 1970–2004](image)

Source: KNSO, Resident Registration Population (various years).
Table 19.4 Share of population in Korea, by region, 1970–2005

<table>
<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>Seoul</td>
<td>17.6</td>
<td>19.9</td>
<td>22.3</td>
<td>23.8</td>
<td>24.4</td>
<td>22.9</td>
<td>21.4</td>
<td>20.8</td>
</tr>
<tr>
<td>Incheon</td>
<td>2.5</td>
<td>2.8</td>
<td>3.3</td>
<td>3.8</td>
<td>4.4</td>
<td>5.2</td>
<td>5.4</td>
<td>5.4</td>
</tr>
<tr>
<td>Gyunggi</td>
<td>8.2</td>
<td>8.9</td>
<td>9.9</td>
<td>11.5</td>
<td>13.9</td>
<td>17.2</td>
<td>19.5</td>
<td>22.0</td>
</tr>
<tr>
<td>Capital region</td>
<td>28.3</td>
<td>31.5</td>
<td>35.5</td>
<td>39.1</td>
<td>42.8</td>
<td>45.3</td>
<td>46.3</td>
<td>48.2</td>
</tr>
<tr>
<td>Middle region</td>
<td>19.7</td>
<td>18.2</td>
<td>16.5</td>
<td>15.1</td>
<td>13.9</td>
<td>13.2</td>
<td>13.4</td>
<td>13.2</td>
</tr>
<tr>
<td>Southeast region</td>
<td>30.4</td>
<td>30.5</td>
<td>30.5</td>
<td>29.8</td>
<td>28.9</td>
<td>28.6</td>
<td>27.9</td>
<td>26.8</td>
</tr>
<tr>
<td>Southwest region</td>
<td>21.6</td>
<td>19.8</td>
<td>17.4</td>
<td>15.9</td>
<td>14.4</td>
<td>12.9</td>
<td>12.5</td>
<td>11.7</td>
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Korea, total

<table>
<thead>
<tr>
<th>Year</th>
<th>Population</th>
<th>GRDP</th>
<th>Manufacture (value of products)</th>
<th>Manufacture (wage)</th>
<th>Manufacture (employment)</th>
</tr>
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<tr>
<td>1955</td>
<td>32,240,827</td>
<td>2.600</td>
<td>2.700</td>
<td>2.800</td>
<td>2.900</td>
</tr>
<tr>
<td>1957</td>
<td>35,280,725</td>
<td>2.700</td>
<td>2.800</td>
<td>2.900</td>
<td>3.000</td>
</tr>
<tr>
<td>1959</td>
<td>38,123,775</td>
<td>2.800</td>
<td>2.900</td>
<td>3.000</td>
<td>3.100</td>
</tr>
<tr>
<td>1961</td>
<td>40,805,744</td>
<td>2.900</td>
<td>3.000</td>
<td>3.100</td>
<td>3.200</td>
</tr>
<tr>
<td>1963</td>
<td>42,869,283</td>
<td>3.000</td>
<td>3.100</td>
<td>3.200</td>
<td>3.300</td>
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<tr>
<td>1965</td>
<td>45,092,991</td>
<td>3.100</td>
<td>3.200</td>
<td>3.300</td>
<td>3.400</td>
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<tr>
<td>1967</td>
<td>47,008,111</td>
<td>3.200</td>
<td>3.300</td>
<td>3.400</td>
<td>3.500</td>
</tr>
</tbody>
</table>

Source: KNSO, Resident Registration Population (various years).

This trend of increasing population disparity is closely related to the continuous concentration of population in the capital region, suggesting the significant effect of agglomeration economies and density.

Spatial pattern of regional GDP growth in 1985–2005

Since the launch of the First Economic Development Plan in 1962, the annual growth rate of gross domestic product (GDP) has been impressive, as shown in figure 19.7. For the most part, annual growth rates were more than 5 percent, turning negative only twice: during the second oil crisis in 1979 and during the financial crisis in 1997.

There have been some spatial changes in regional GDP (see figure 19.8). The capital region steadily increased its share of total regional GDP until 1993, when it peaked at 49.1 percent. There were some fluctuations after that time: a decrease to 46.8 percent in 1998 and then an increase to 48.6 percent in 2002. There was an opposite trend in the southeast region, where the share of regional GDP declined slightly from 1985 until 1993 and increased slightly from 1993 to 1998. The share of the middle region remained fairly steady, whereas the share of the southwest region declined slightly.

\[
H = -n \left( \frac{1}{n} \log_2 \frac{1}{n} \right) = \log_2 n. \quad (19.2)
\]
Regional GDP per capita, by region, however, shows an interesting pattern, with a general trend of convergence. There were two turning points (see figure 19.9, panel A). First, the middle region overtook the southeast region in 1989, when President Tae-Woo Rho liberalized labor. During the phase of rapid industrialization in the 1970s, industry clearly was concentrated in the capital and the southeast regions. However, with the high-tech industrialization that began in the 1980s, especially after the labor disputes from 1987 to 1989, the southeast region lost its second-place position to the middle region.

Second, the capital region lost its primacy in terms of regional GDP per capita to the middle and southeast regions in 2003. Until 2003, the capital region had always been the leader. Beginning in 2002, the participatory government offered diverse incentives for industries to locate in provinces other than the capital region, on the one hand, and imposed strong restrictions on the expansion of economic activities in the capital region, on the other.

Moreover, spatial disparity, in terms of regional GDP per capita, declined continuously from the mid-1980s until the financial crisis in 1997, showing a clear trend of convergence (see figure 19.9, panel B). In 1997 the southwest region reached 95 percent of the national average, rising from 77 percent in 1985. However, there was a trend of slight divergence after the financial crisis until 2002. Since 2002, the trend once again has been toward convergence.

Seoul’s regional GDP per capita has been continuously higher than the national average, even after 2002, when the capital region’s GDP per capita was lower than the national average. Seoul has attracted new industries or restructured its economy to keep its comparative advantages. Seoul is the center of new industries and innovations, taking a leading role in the spatial division of labor in Korea.

Accordingly, the relative stagnation of regional GDP per capita in the capital region is not the result of the stagnation of Seoul. It is due to the stagnation of Gyunggi province. Per capita regional GDP in Gyunggi province has stagnated for the following reasons. First, the population growth rate is high in Gyunggi because of the continuous in-migration from the rest of the country, while the location of industry in the capital region is controlled by law. Second, the statistics underestimate the amount of service activities in regional GDP because of difficulties in measuring the production of small service-related firms. Because service activities are concentrated overwhelmingly in the capital region, the capital region’s regional GDP is underestimated, especially in Seoul.

**Spatial division of labor**

Large industrial firms or chaebols evolved during the phase of heavy and chemical industrialization in the 1970s. Large firms located their headquarters mostly in Seoul and located their plants in the major

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**Figure 19.7 Annual growth rate of GDP in Korea, 1960–2005**

Source: Bank of Korea (various years).

**Figure 19.8 Regional GDP in Korea, by region, 1985–2003**

Source: www.kosis.kr.
industrial estates outside Seoul, especially in the southeast region. With the trend of spatial separation between headquarters and manufacturing plants, about 85 percent of the headquarters of firms that had spatially separated plants were located in Seoul, while about 87 percent of the plants that had spatially separated headquarters were located outside Seoul (Park 1985).

During the 1970s, to develop heavy and chemical industries in the 1970s, the government provided support mainly to large firms because the scale of investments required in these industries was exceptionally large. During the 1970s, loans to heavy and chemical industries accounted for more than 70 percent of all government funds made available to manufacturing (Park 1981). These government loans were provided at very low interest rates, often negative in real terms. In addition, government supported the rise of large firms by
establishing highly protective barriers for infant industries and by permitting monopolistic production to overcome the problems of a small domestic market.

During the 1980s, when government policy emphasized high-tech industrial development, another spatial division of labor evolved beyond the division between the headquarters’ control functions and the plants’ production functions. Because the capital region had advantages in terms of skilled labor, technology, engineering services, and so forth, it became more specialized in high-tech industries and R&D activities, while the rest of the country remained more specialized in the less high-tech industries. Even in the traditional sectors, such as textiles and apparel, the production of technology-intensive or high-value-added products was concentrated in the capital region.

R&D activities in Seoul were oriented more toward basic and applied research, which required more qualified manpower and information infrastructure, whereas R&D activities in the periphery were oriented more toward production research. In addition, high-tech sectors in the capital region had much stronger local linkages than other areas for purchasing input materials. Such differences in R&D activities and the degree of local linkages of high-tech sectors indicate that spatial divisions of labor intensified significantly during the 1980s (Park 1993).

Since the early 1990s, headquarters and high-tech industries have tended to locate outside the capital region, especially in the middle region. However, the spatial division of labor persists. In recent years, more than half of the headquarters of the top 100 firms were located in Seoul, even though some of them have decided to leave Seoul, and the share of manufacturing plants of the top 100 firms in Seoul has declined from 3.0 percent in 2002 to 2.3 percent in 2007 (see table 19.5).

In addition to the concentration of headquarters in the capital region, knowledge-intensive activities are concentrated in Seoul, suggesting that distance and density effects are important in the advanced services. However, the capital region’s share of the headquarters of the top 100 firms declined from 79 percent in 2002 to 72 percent in 2007, and its share of patents declined from 80.6 in 1995 to 75.3 percent in 2005 (see table 19.6). Seoul has specialized in advanced production services, such as design, advertising, legal and financial, management consulting, and ICT services. For example, Internet domains are highly concentrated in Seoul, as is the transaction of business-to-business (B2B) e-commerce (Park 2004).

### Dynamics of Seoul and the capital region

Population growth in Seoul was rapid in the 1970s and 1980s but has stagnated in recent years, whereas population growth in Gyunggi province has been rapid since the 1990s, due to the influx of in-migration. Regional GDP seems to be related to population growth. During the recent years of growth, Gyunggi’s regional GDP per capita has been lower than the national average. During its period of growth in the 1980s, Seoul’s regional GDP per capita was lower

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**Table 19.5** Share of headquarters and plants of top 100 firms in Korea, by region, 2002 and 2007

<table>
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<tr>
<th>Region</th>
<th>HQ of top 100 firms</th>
<th>Plants of top 100 firms</th>
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<tr>
<td>Seoul</td>
<td>66.0</td>
<td>58.0</td>
</tr>
<tr>
<td>Incheon</td>
<td>4.0</td>
<td>5.0</td>
</tr>
<tr>
<td>Gyunggi</td>
<td>9.0</td>
<td>9.0</td>
</tr>
<tr>
<td>Capital region</td>
<td>79.0</td>
<td>72.0</td>
</tr>
<tr>
<td>Middle region</td>
<td>6.0</td>
<td>6.0</td>
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<tr>
<td>Southeast region</td>
<td>12.0</td>
<td>17.0</td>
</tr>
<tr>
<td>Southwest region</td>
<td>3.0</td>
<td>5.0</td>
</tr>
<tr>
<td>Korea, total number of firms and plants</td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>

Source: Maeil Economic Daily (various years).

**Table 19.6** Share of industrial patents in Korea, by region, 1995, 2000, and 2005

<table>
<thead>
<tr>
<th>Region</th>
<th>1995</th>
<th>2000</th>
<th>2005</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seoul</td>
<td>57.8</td>
<td>43.7</td>
<td>44.9</td>
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<tr>
<td>Incheon</td>
<td>4.6</td>
<td>5.1</td>
<td>4.2</td>
</tr>
<tr>
<td>Gyunggi</td>
<td>18.2</td>
<td>24.9</td>
<td>26.2</td>
</tr>
<tr>
<td>Capital region</td>
<td>80.6</td>
<td>73.7</td>
<td>75.3</td>
</tr>
<tr>
<td>Middle region</td>
<td>5.2</td>
<td>8.4</td>
<td>8.2</td>
</tr>
<tr>
<td>Southeast region</td>
<td>12.5</td>
<td>14.3</td>
<td>12.8</td>
</tr>
<tr>
<td>Southwest region</td>
<td>1.7</td>
<td>3.5</td>
<td>3.7</td>
</tr>
<tr>
<td>Korea, total number of patents</td>
<td>52,449</td>
<td>106,363</td>
<td>162,844</td>
</tr>
</tbody>
</table>

Source: MOST (various years).
than the average of the capital region, though still higher than the national average; as Seoul’s population growth has stagnated, its regional GDP per capita has risen and is now higher than the average of the capital region (see table 19.7).

Seoul is the home of many new start-ups in the technology-intensive sectors or newly emerging industries, even though many firms have relocated to adjacent Gyunggi province. In the late 1980s and early 1990s, new high-tech firms that were established in Seoul relocated to or established branch plants in Gyunggi province, while maintaining their headquarters in Seoul, creating a spatial division of labor in high-tech sectors within the capital region. Gyunggi province has specialized in high-tech industries and has hosted a number of high-tech agglomerations since the 1990s, whereas Seoul has specialized in advanced services, such as computer software, engineering, legal services, and high-tech start-ups.

Three factors have been significant in this spatial restructuring: distance, density of network, and path dependence and creation. First, the movement of industrial agglomeration from the central part of Seoul before the early 1960s to the inner city of Seoul in the 1970s; the movement of high-tech industrial agglomeration from Seoul in the 1980s to the nearby suburbs in Gyunggi province in the 1990s; and the current extension of high-tech agglomeration to distant suburbs of Gyunggi province and the nearby middle region, such as the city of Cheonan. The extension of agglomeration has a wave-like pattern, with “distance” being the key factor.

Second, the density of networks and collaboration is critical for innovation and the generation of new firms and industries. New industries in Korea always evolve from Seoul, especially from the Gangnam area, where informal and formal networks are intensive. The Gangnam area is the center of breakfast meetings and evening gatherings, where new ideas, information, and knowledge are exchanged, transferred, and generated (Park 2005). There are many high-class hotels and restaurants, and Gangnam is the center of new fashion, knowledge creation, and innovation.

Third, path dependence and path creation are important spatial processes in the capital region. The extension of high-tech industrial agglomeration to the middle region along the Seoul-Busan expressway is a spatially path-dependent process, on the one hand, and the development of Gangnam as a new core in Seoul and the development of a new R&D center in Hwasung, Gyunggi province, are examples of the creation of new spatial paths, on the other hand.

**Development of ICT and spatial changes**

The number of ICT-related firms has grown considerably in recent years, and almost half of all ICT firms (44.8 percent) were concentrated in Seoul in 2003. The degree of concentration in Seoul varies by type of firm. Firms in the ICT-related service sector and in wholesale and retail trade are far more concentrated in Seoul than firms in ICT-related manufacturing. During the last decade, IT-related service industries have tended to concentrate in Seoul, whereas IT-related manufacturing industries have dispersed to other regions.

The impact of ICT on the Korean economy can be examined through the creation of Internet domains, e-commerce, and virtual networks in the rural areas. The Internet infrastructure in Korea has been well developed since the late 1990s. By the end of

<table>
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<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Seoul</td>
<td>5.4</td>
<td>8.5</td>
<td>10.0</td>
<td>10.7</td>
<td>13.2</td>
<td>13.7</td>
<td>15.4</td>
<td>15.8</td>
</tr>
<tr>
<td>Gyunggi</td>
<td>6.4</td>
<td>9.0</td>
<td>10.0</td>
<td>10.2</td>
<td>11.1</td>
<td>12.2</td>
<td>13.2</td>
<td>15.0</td>
</tr>
<tr>
<td>Capital region</td>
<td>5.7</td>
<td>8.7</td>
<td>9.9</td>
<td>10.4</td>
<td>12.2</td>
<td>12.7</td>
<td>14.0</td>
<td>15.1</td>
</tr>
<tr>
<td>Korea, total</td>
<td>4.9</td>
<td>7.8</td>
<td>8.9</td>
<td>9.4</td>
<td>11.7</td>
<td>12.3</td>
<td>14.0</td>
<td>15.2</td>
</tr>
</tbody>
</table>

Source: [www.kosis.kr](http://www.kosis.kr).
June 2007, there were 34.43 million Internet users, and the rate of Internet usage had risen to 75.5 percent (see www.nida.or.kr). In general, the younger generation shows a much higher usage rate than older generations, and the usage rate of males is somewhat higher than that of females. The data on Internet usage suggest that there is no significant difference in access to the Internet by regions (that is, between the capital and other regions), but rural and urban areas differ somewhat, largely as a result of the age distribution of the population. In 2000 the proportion of persons belonging to the older age groups in rural areas was 17.9 percent, compared with only 4.3 percent in the cities (see isis.nic.or.kr).

Even though the regional disparity in usage rates is not significant, the dot-kr domains are concentrated mostly in the capital region. According to a survey by the Korea Network Information Center (see www.nida.or.kr), in August 2007, Seoul had 58 percent and the capital region had 78 percent of the total number of dot-kr domains in Korea. The share of Seoul and the capital region has increased slightly in recent years (see table 19.8). The higher concentration of dot-kr domains in the capital region compared with the share of population or Internet users suggests that the concentration might be related to other factors that attract ICT-related firms in Seoul. The number of B2C (business-to-consumer) e-marketplaces is also highly concentrated in the capital region, with Seoul having about 73 percent of the total number (Choi 2003).

Firms operating B2B e-marketplaces are even more concentrated in Seoul and its surrounding areas. The capital region had a 79.5 percent share of the total firms operating B2B e-commerce sites in Korea in 2003 (Park 2004). If we consider only the public B2B e-marketplaces, in which many sellers and many buyers can conduct transactions, the degree of concentration in Seoul is overwhelming, at 84 percent (Choi 2003). The predominance of Seoul in the location of public B2B e-marketplaces might be related to the clustering of ICT firms, ICT-related spin-offs, and innovative entrepreneurs and knowledge workers, especially in Gangnam area (Park 2004). ICT-related firms and advanced producer services are strongly concentrated in the Gangnam district within Seoul (Park and Choi 2005). The overwhelming concentration of the dot-kr domain, B2B e-commerce, and B2C e-commerce in Seoul suggests a strong tendency of ICT firms to cluster in Seoul, even though the Internet infrastructure (transferability) is present throughout the country.

### Virtual innovation networks in peripheral areas

Although many people regard the importance of networks in spatial clustering and dispersal as applicable only to advanced economies, box 19.1 shows that new economic spaces can also occur in peripheral areas.

The case of Sunchang suggests a new paradigm in the organization of production systems and economic spaces, with the creation of new ideas based on intensive local and nonlocal networks. Sunchang has insufficient high-quality manpower, but it has networks of advanced services and top-level scientists and engineers. These networks do not represent actual clusters of advanced services; rather, they represent a virtual innovation network that has allowed the transfer of knowledge and innovation. High-quality Internet infrastructure has enabled high-tech engineers and scientists to meet periodically, while paved roads and easy access to highways have made Sunchang accessible to major regional cities and Seoul.

### Policy implications

Industrial and innovation policies need to keep pace with the transformation of society and economy. In the knowledge-based

<table>
<thead>
<tr>
<th>Region</th>
<th>2001</th>
<th>2003</th>
<th>2005</th>
<th>2007</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seoul</td>
<td>58.50</td>
<td>55.60</td>
<td>56</td>
<td>57.60</td>
</tr>
<tr>
<td>Incheon</td>
<td>1.20</td>
<td>1.30</td>
<td>3.40</td>
<td>3.40</td>
</tr>
<tr>
<td>Gyunghi</td>
<td>2.00</td>
<td>2.00</td>
<td>17.30</td>
<td>17.10</td>
</tr>
<tr>
<td>Capital region</td>
<td>61.70</td>
<td>58.90</td>
<td>76.70</td>
<td>78.10</td>
</tr>
<tr>
<td>Middle region</td>
<td>11.80</td>
<td>12.10</td>
<td>5.90</td>
<td>5.80</td>
</tr>
<tr>
<td>Southeast region</td>
<td>21.70</td>
<td>24.40</td>
<td>13.00</td>
<td>12.00</td>
</tr>
<tr>
<td>Southwest region</td>
<td>4.70</td>
<td>4.50</td>
<td>4.40</td>
<td>4.10</td>
</tr>
<tr>
<td>Korea, total number of domains</td>
<td>457,450</td>
<td>611,548</td>
<td>642,770</td>
<td>928,177</td>
</tr>
</tbody>
</table>

Source: www.nida.or.kr (National Internet Development Agency of Korea).
A history of Korea’s industrial structural transformation and spatial development

A new industrial policy is needed that focuses on the supply of qualified human resources. A policy of simply relocating industrial firms may not be enough to spur regional development in the provincial areas. Accordingly, Korea needs integrated regional innovation policies, which can be improved to promote spontaneous regional development. Future policy should seek not only to promote balanced national development but also to provide an engine for sustainable development with the interplay of scale economies, factor mobility, and development of ICT.

First, attracting talented persons to the provincial regions is critical, as regional development depends largely on the creation of knowledge and capacity to innovate. To entice such talent to areas outside the capital, it is essential to promote the interaction of all economic actors in the region and to create an environment in which creative people and scientists can thrive. A policy of merely relocating R&D centers and firms will not sufficiently improve the innovation potential of peripheral regions. “Brain drains” of the past, which represent out-migration of talented people toward Seoul and foreign countries, should be transformed into “brain circulation,” which encourages talented people to live in the provincial areas. Qualified high schools and good living and service environments are needed if regions outside the capital are to attract and retain talented people. Specifically, university-industry collaborative networks should be strengthened in the provinces, and at least one good high school should be nurtured in each province.

Second, regional innovation and clustering strategies should be promoted with regional integration of the central city and hinterlands. The regional innovation policies in Korea have been promoted based on the administrative boundaries of 16 cities and provinces. Special cities and provinces have promoted regional innovation policies separately, and there has been no regional integration between a central city and its surrounding province(s). To promote regional innovation successfully, a central city (special city) and its hinterlands (provinces) should be integrated to generate synergy effects and scale economies. Accordingly, a wide-area regional integration plan, which considers a central city and surrounding province(s) as one regional innovation system, should be developed. Strategic industries and cluster strategies should also be promoted at the level of an integrated

**BOX 19.1 The case of Sunchang**

Sunchang-gun in Jeonbuk province is one of the most underdeveloped regions in Korea (Park 2005). Sunchang is located in a mountainous, peripheral area in southwestern Korea where the population has been declining steadily since the 1970s. Agriculture is the key economic sector, producing principally tobacco, red pepper, and diverse vegetables and fruits. Gochoojang (a thick soy paste mixed with red pepper) is a product of Sunchang, famous for its distinct taste, which is acquired in the fermentation process. Traditionally, most of the households in Korea made their own gochoojang. However, nowadays most households buy gochoojang in the market, and the brand name “Sunchang Gochoojang” has become famous.

Since the late 1990s, the production system of Gochoojang has changed significantly as a result of two developments. First, Daesang Company, one of the large companies in the food industry of Korea, established a branch plant in Sunchang to produce standardized gochoojang under the brand name “Sunchang Gochoojang,” with quality control and a traditional taste. Daesang Company has invested in advertising and R&D activities and has introduced automated mass production. Daesang Company illustrates the possible link between the production technology of a large company and traditional local culture and resources. That is, the codified knowledge of the Daesang Company is linked to locally embedded knowledge and resources.

Second, the county of Sunchang designed a complex to gather the traditional gochoojang makers together in one place. The county allowed skilled persons, who have a license to make traditional gochoojang and more than 10 years of experience in making it, to move their household into the complex. As a result, 54 households live in the complex and make their own specialized traditional gochoojang, selling their products in the local market and through the Internet to consumers in large cities. In addition, the county recently established a Research Institute of Soybean Paste for continuous development of several types of soybean paste industries.
wide area, not at the level of a province or city within a wide area.

Third, new strategies to diffuse innovation to the level of counties and small cities within an integrated region are needed. For example, a “local learning festival” could be considered, in which firms, schools, public institutes, all levels of students, and residents from counties or cities get together to display their creative and cooperative power. To counter the recent trend of high school students avoiding engineering school and the natural sciences, efforts should be made to inspire them to study science and engineering and to help them to understand the importance of scientific technology and enterprise in their daily lives through fun opportunities such as symposiums, work in scientific laboratories, and programs that expose students to science and open them to the exchange of ideas. Regional innovation should be promoted, as should networks joining firms, universities, research institutions, and government agencies.

Fourth, considering the demographic trends of low birth rates and population aging, a new system should be established to use talented people in the provinces to assist Korea’s aging society. As most longevity is occurring in the provinces, efforts are needed to attract “retired brains” to provinces and involve them in contributing to local development. Attracting retired brains to the provincial regions could enhance the innovation capacity of regions and help to solve regional problems, including the shortage of qualified manpower.

Finally, beyond the regional industrial strategy and cluster polices, sustainability of rural areas should be considered. Continuous out-migration of population from rural areas can result in the deterioration of rural economies. Virtual innovation networks using local resources and culture should be promoted in remote areas. Regional integration of diverse areas within a region with an emphasis on sustainability should be actively promoted, in addition to balanced national development. Spatial disparity among regions has declined somewhat, but disparities among localities within a region are still problematic. Some rural areas can be globally competitive by supporting the sustainability of their population and the development of virtual innovation networks.

Note
Sam Ock Park is a professor at Seoul National University.

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Lessons from experience: reshaping economic geography in East Asia

Yukon Huang and Alessandro Magnoli Bocchi

This chapter provides an overview of the development of East Asia over the last few decades, as seen through the lenses of economic geography (WDR 2009). The main message is that the region’s impressive economic performance can be understood within the context of—and, in turn, was shaped by—the dynamics of spatial economics. As discussed in a recent study (Gill and Kharas 2007), East Asia is the fastest-growing region in the world, with many countries achieving impressive gross domestic product (GDP) growth (see table 20.1). The major driving force for this performance was regionalism, as East Asian economies took advantage of globalization by rapidly expanding trade, especially with each other. This was facilitated by the remarkable growth of China and the prominent role that it played in regional production-sharing networks.

**Context: the rise of regionalism and the role of production-sharing networks**

As Hamaguchi discusses in chapter 1, economic geography—through the opposing forces of concentration and the dispersion of economic activity across countries—has played a key role in shaping these trends. To begin with, East Asian countries lowered their international transaction costs through trade policies facilitating imports of intermediate goods, favorable treatment of foreign direct investment (FDI), and the development of infrastructure. This encouraged a proliferation of free trade agreements, both bilateral and multilateral. Transport costs between countries fell, allowing for greater specialization and, because trade in intermediate goods is especially sensitive to transport costs, radically altered trade patterns. Trade with neighbors became more important than trade with others outside the region. Intraregional trade now accounts for between 55 and 60 percent of all imports and exports in East Asia, approaching that in the European Union (EU) and the North American Free Trade Agreement (NAFTA). The driving force has been growth in the trade of intermediate goods, which accounted for about 60 percent of total intraregional trade in 2005. Driven by booming intraregional trade of manufactured goods, industrialization spread across East Asia. Productive activities became geographically concentrated in each country, reinforcing the leading role of industrial agglomeration in the development process.

Today, the pattern of East Asian trade is complex and multidirectional, with the transformation revealing the importance of scale economies. The reduction of transportation and communication costs has enabled firms to cut production processes into “pieces of tasks” and to allocate each “piece” to the most suitable location given factor price differences, a process dubbed “fragmentation.” This has lowered costs and, with the shift to more efficient production centers, allowed firms to benefit from economies of scale. Thus “fragmentation” in East Asia explains much of the rise of production-sharing networks.
Lessons from experience: reshaping economic geography in East Asia

Accompanied by increasing disparities

Everywhere in the world, economic development is uneven across space. Some countries grow rich, while others stay poor, and when countries grow, prosperity does not come to every place at the same time. People and firms concentrate in prosperous areas, cities quickly pull ahead of the countryside, and the quality of life—in terms of consumption levels—improves in some provinces and lags in others. Higher premiums are paid to skilled labor and to knowledge-intensive products.

East Asia is no exception. A compelling feature of the East Asian growth experience over the last two decades has been the uneven spread of economic benefits, especially within countries. The same forces that contributed to rapid growth have also shaped its unevenness. In almost all countries, growth has been accompanied by the widening, or at least the persistence, of disparities and inequalities across space, sectors, groups, and, ultimately, individuals. As a result, there are growing concerns about the equity and social cohesion of the development process. Governments uniformly face increasing pressure to deal with distributional issues, which often have a spatial character; examples are the focus on narrowing urban-rural differences and on implementing targeted regional programs for lagging areas.

In East Asia, the distributional or equity implications differ depending on whether the results are viewed from a regional or a national perspective. On a regional basis, during the period of 1990–2005, each economy made progress toward catching up with Japan, although the progress was speedier in some countries than in others: Singapore among the upper-income countries, China among the lower middle-income countries, and Vietnam among the low-income countries (Hamaguchi in chapter 1). Over time, the region has become more diverse and less reliant on Japan, given the rise of agglomeration economies in many countries. Within each country, however, despite regional convergence, income disparities have become more serious. Between 1990 and 2005, inequality appears to have increased in six of the seven countries studied in this book, the only exception being Thailand. Increases have been especially pronounced in China, but to a lesser degree also in Indonesia, Lao PDR, the Philippines, and Vietnam (table 20.1).

The new economic geography

Until recently, the traditional trade theory, based on differing comparative advantages as reflected in varying resource endowments, relative factor prices, and technological advantages, could explain these trends in production and distribution rather easily. The first attempt to model the shifting location of production in East Asia was put forward in the famous “flying geese” pattern of catch-up industrialization, with Japan

Table 20.1 Key indicators for growth, urbanization, and income distribution in East Asia, by country, various years

<table>
<thead>
<tr>
<th>Country</th>
<th>Gross national income per capita, 2006a</th>
<th>GDP growth (average annual percent)</th>
<th>Urban population (percent of total)</th>
<th>Theil index</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lao PDR</td>
<td>1,740</td>
<td>5.9</td>
<td>7.9</td>
<td>12.4</td>
</tr>
<tr>
<td>Vietnam</td>
<td>2,310</td>
<td>6.8</td>
<td>14.7</td>
<td>19.2</td>
</tr>
<tr>
<td>Indonesia</td>
<td>3,310</td>
<td>5.3</td>
<td>14.6</td>
<td>22.1</td>
</tr>
<tr>
<td>Philippines</td>
<td>3,430</td>
<td>2.9</td>
<td>30.3</td>
<td>37.5</td>
</tr>
<tr>
<td>Thailand</td>
<td>7,440</td>
<td>6.0</td>
<td>19.7</td>
<td>26.8</td>
</tr>
<tr>
<td>China</td>
<td>4,660</td>
<td>9.9</td>
<td>16.0</td>
<td>19.6</td>
</tr>
<tr>
<td>Korea, Rep. of</td>
<td>22,990</td>
<td>7.8</td>
<td>27.7</td>
<td>56.7</td>
</tr>
</tbody>
</table>

For the Theil index, see Gill and Kharas (2007).
— Not available.
a. Purchasing power parity, current international $ (a hypothetical unit of currency that has the same purchasing power that the U.S. dollar had in the United States at a given point in time).
as the lead economy successively shedding industries over time to less-developed economies, first to the newly industrializing economies (NIEs) such as Hong Kong, China; Singapore, Republic of Korea; and Taiwan, China, then to lower-income Association of South East Asian Nation (ASEAN) countries such as Indonesia, Malaysia, the Philippines, and Thailand, and then to China. But one drawback of this model is that, although it focuses on interindustry relocation and trade, it does not explain intraindustry trade or why some industries move to low-wage countries, while others do not. Indeed, the model suggests a predetermined homogeneous trajectory and a minimal role for policy. In contrast, the “new economy geography” allows for less determinism. There is more potential for multiple equilibria, and small changes in initial conditions may have large effects. History and luck also play a role in determining which cities or countries are selected as the location of firms. And given the presence of unexhausted economies of scale, the selected areas will have a persistent advantage into the future.

East Asia’s success is evident in the concentration of industrial agglomeration in large urban areas in each country, exemplified by the core economic regions in Japan and in major production centers throughout the region. The transformation is from a one-dimensional flying geese pattern to a more complex pattern that encompasses multiple technological centers built on concentrations of industrial and service activities that foster economies of scale. In this model, high transport costs can affect the location of activities and prevent agglomeration economies from being realized.

In contrast to previous studies on East Asia, this volume takes a country-specific approach, focusing more on what is happening within each country rather than what is happening across countries regarding the impact of spatial factors.

As indicated in the preface to this book, the body of thought encompassed in the new economic geography constitutes the analytical framework of this volume, explaining how spatial factors affect the course of a country’s development by influencing its public policies, the location of production, and, in turn, trade and growth patterns. Everything starts with the desire of firms to concentrate production in one location so as to enjoy plant-level economies of scale and to be near customers and suppliers to reduce transport costs. Once a market has reached a certain scale, other firms locate there to take advantage of market size, thereby giving rise to “agglomeration economies.” The existence of a large manufacturing sector represents an incentive for others to come, reinforcing the original advantages. Factors of production, however, and especially labor, are not mobile across countries in the same way they are mobile within countries; thus cost structures may drive firms from larger, higher-wage areas to smaller, lower-wage areas both within and across countries. The lower the transport costs firms face, the less likely they are to congregate in one major center.

In this volume, the three spatial dimensions of development proposed in the World Development Report 2009 (WDR 2009; World Bank)—density, distance, and divisions—provide a conceptual framework for the geographic transformation of East Asia.

For policy makers, the challenge is getting density right by fostering the appropriate concentration of economic activities to realize the potential benefits of agglomeration economies. If this is done well, economic growth will be driven by geographically concentrated clusters, and living standards between lagging and leading areas and between urban and rural areas will converge over time. But the distance between concentrated activities is also an important factor, which can be addressed both by favoring the mobility of labor and by reducing transport costs with infrastructure investment. In the process, any artificial or politically driven divisions—due to jurisdictional boundaries, ethnicity, language, or religion—can divide people, hamper economic activities, impede growth, and exacerbate social development.

The country studies collected in this volume illustrate how the role of economic geography in shaping outcomes depends largely on the stage of a country’s development as
well as on the nature of government policies. For this purpose, our discussion categorizes countries into four groups, which reflect different developmental stages:

1. Vietnam and Lao PDR, low-income economies on a path of rapid growth;
2. Indonesia, the Philippines, and Thailand, middle-income countries with a variety of growth experiences;
3. China, the most populous middle-income country, which is transforming very rapidly into a world economic power; and
4. Republic of Korea, unique in moving from low- to high-income status in less than 50 years.

**Vietnam and Lao PDR: emerging spatial patterns at low income levels**

Much of Vietnam’s economic history since World War II is a tale of internal conflicts, wars, and the legacies of central planning. By the mid-1980s, a very poor and largely agrarian-based economy was impatient for change. The market-oriented reforms initiated in the mid-1980s revitalized agriculture and gave a new emphasis to industrialization. GDP growth took off, averaging 7 percent a year over 1980–2006. As Son describes in chapter 7, a significant portion of this success was due to an increase in agricultural productivity, but the largest share came from growth in services and industry. These outcomes indicate the increasing role being played by agglomeration effects associated with rising density in economic activities. In Vietnam, this is illustrated by the gradual rise of the urbanization rate, which started from a low of 19 percent in 1980, began to increase in the 1990s, and is now at about 27 percent. This is also confirmed by the share of the labor force in agriculture, which accounted for about two-thirds of the total labor force up to 1990 but since then has declined to about 50 percent. Increasing density has been facilitated by large-scale labor migration from rural areas, with the bulk of the movement going to the southeast region, drawn by the growing commercial and industrial activity around Ho Chi Minh City. This pattern is consistent with that of a rapidly transforming economy, with growth increasingly evident in more urbanized areas that benefit from industrial expansion. This process was supported by government policies, which allocated more fiscal resources for the more rapidly growing provinces, thus providing further incentives for industrial development. Today, the agglomeration process is being facilitated by Vietnam’s active participation in regional production-sharing networks. FDI is also becoming significant, with more than half going to areas around Ho Chi Minh City in the southeast and another quarter going to Hanoi (and the surrounding Red River delta).

At this stage of income, Vietnam’s quality of infrastructure is still relatively underdeveloped. Reducing distances through investment in transport and communications is thus receiving high priority. Areas that are along the coast or are more accessible to international markets are being favored, as is the expansion of the internal road network connecting the north and the south. As highlighted in Son’s chapter, the highest priority at this stage is to strengthen access to resources and services. Thus he recommends improving connectivity by eliminating barriers and providing the necessary infrastructure to link rural with urban areas, labor-supplying regions with labor-demanding ones, and national with international markets. Internal divisions in terms of provincial boundaries or restrictions on labor mobility are not seen as significant barriers to the agglomeration process. However, Vietnam’s geographic contours, specifically the concentration of the poor in the mountainous areas in the northeast, northwest, and central highlands (many of whom are ethnic minorities), pose significant challenges to developing workable solutions to reduce disparities in living standards across space.

The concentration of higher-productivity activities in urban areas, in combination with the problems of remote lagging regions with poor resource endowments, is becoming evident in the measures of social and income disparities. These disparities are widening between the urban and the rural population, between the plains and
the mountainous areas, and among ethnic groups. However, by international standards, inequality in Vietnam is still relatively low, and budget allocations for social programs have a significant redistributive impact. Given the experience of other countries, disparities may increase before eventually moderating.

Lao PDR shares some of the same history as Vietnam: suffering from conflict and dealing with a legacy of centrally planned policies. In chapter 3, Ohno cites how a low-income land-locked country such as Lao PDR can deal with distance and divisions, illustrating the case of remote villages that are dependent on traditional hand-weaving activities. Although clustered in proximity to each other, weavers may not have products that are specialized enough to find a niche in global markets. This presents a formidable barrier to facilitating spatial connectivity. To achieve agglomeration benefits from density, these villages must deal with their isolation. Ohno documents the very high transaction costs for these isolated producers, which essentially condemn them to low returns. At this stage of development, he argues that “culture brokers” who can both inspire informal, trust-based mechanisms at the community level and assess the demands in external markets can provide the necessary connectivity to narrow the vast distances involved. Reducing distances in this case is not just an issue of developing transport links, which may not be financially feasible in such circumstances, but also an issue of linking isolated clusters of rural producers to the preferences of more sophisticated buyers overseas.

**Indonesia, the Philippines, and Thailand: diverse settings and varied outcomes in three middle-income ASEAN countries**

As relatively large and geographically diversified countries, the ASEAN-3—Indonesia, the Philippines, and Thailand—share a number of characteristics as middle-income economies. Over the past quarter century, their average GDP growth rates have been in the range of 3–6 percent, with Philippines at the lower end and Thailand at the upper. All three economies are dominated by their capitals: Jakarta, Manila, and Bangkok. And all three show wide spatial variations in the level of economic activity, resource endowments, and population settlements, including the presence of ethnic minorities. Indonesia and the Philippines are the two largest archipelagic economies, and this appears to be a major factor in how their geography has been influencing economic trends. For Thailand, the mountainous borders that it shares with other countries and the diversity of its local communities may have played a similar role.

For all three countries, a strong urbanization process has been under way, contributing to rising density, more so in the Philippines and Indonesia than in Thailand. The extent to which this has fostered agglomeration benefits is less clear, perhaps due to the lack of disaggregated regional data on the location and nature of economic activity needed to assess such relationships.

**Indonesia**

In Indonesia, economic agglomeration is hampered by the geographic setting of the country. With its 13,000 islands, Indonesia is the world’s largest archipelagic state and one of the most spatially diverse nations. In the last two decades, there has been no significant change in the concentration of economic activity across the major island groupings. Economic activity has continued to cluster around some key regional economies. With only 6 percent of the land area, Java has remained dominant, accounting for 60 percent of the population and 52 percent of GDP.

Over the course of several decades, the group of top-performing regions has been quite diverse, as to location, size, and socioeconomic characteristics (as described by Hill, Resosudarmo, and Vidyattama in chapter 8). There has been no significant shift in the concentration of economic activity across the major island groupings, although how the mining sector is treated affects results. In general, the poorest regions have performed about as well as the national average. The better-performing regions are typically those that are the most connected to the global economy. Jakarta stands out as a special case, growing richer than the
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rest of the country over time and accounting for the clear shift in economic activity toward Java. Although two of the strongest performers are resource-rich regions, the performance of this group of provinces has varied considerably, and there is no clear natural resource story. Conflict is particularly harmful to economic development, as illustrated in the case of Maluku since 1997 and to a lesser extent Aceh.

Income disparities using national indicators have increased steadily, but not substantially, over the past decade and a half, but the picture is complicated by a large increase up to 1999 and a gradual decline since then. However, at the subnational level, the growth pattern is more mixed, with disparities among provinces declining steadily over time and disparities among districts within provinces being more varied (see McCulloch and Sjahrir 2008). Analysis of growth trends shows some evidence of convergence, with poorer districts growing faster than better-off ones, but this may have been the result of the financial crisis affecting the richer districts relatively more than a structural change in growth dynamics. However, Hill, Ressosudarmo, and Vidyattama conclude that disparities are either declining or stable, depending on the production series used, and that convergence either was not taking place or was relatively weak, depending on the indicators chosen.

Looking at firm-level production trends for Indonesian manufacturing, in chapter 10 Kuncoro describes how density of industrial activity evolved as the economy developed. Liberalization of the economy brought economic activities to concentrate in a few places, but also fostered unintended negative externalities associated with agglomeration. By improving roads in rural areas, the government made it possible for firms to reconcentrate in smaller, less expensive cities, including those in low-income or lagging regions in Java. Based on empirical exercises conducted on Indonesia's four most important industries, Kuncoro finds that the nature of externalities and agglomerations favored industrial spillovers—that is, localization was stronger than urbanization effects. The deconcentration process is evident in nonmetallic minerals and machinery industries, but less evident in textiles and chemicals, because their externalities are dynamic (firms are less willing to move to locations without a prior history of the industry and hence no accumulated stock of knowledge). If externalities are localized, smaller cities are more likely to specialize in just one industry or in closely connected industries. However, if the externalities happen to be urban in nature, an industry will have to find a location in a diverse, large urban environment. Kuncoro suggests that government policies should not interfere with the decisions formed by private incentives but that the most important intervention is to improve the quality of roads and cut travel costs between factory sites and markets or ports. Thus a policy of (a) mixing infrastructure development in lagging regions to reduce distance and (b) using private investment incentives to reconcentrate industries (density) in smaller cities in lagging regions could meet the twin objectives of efficiency and more balanced growth.

At the national level, especially for smaller cities and localities adjacent to major cities, connectivity to more dynamic commercial areas is the most likely path out of poverty. However, improved spatial connectivity that reduces distances can also affect local activities in rural areas. In chapter 4, Yamauchi, Muto, Dewina, and Sumaryanto explore this issue, examining how investments in local roads can affect allocative efficiency in Indonesia. Going beyond other studies on the distance factor, they assess the interactions involving choices among investments in “local” roads connecting villages with “trunk” roads that lead to economic centers. Their study also examines how investment in household education affects such decisions. The results show that investments to improve the quality of local roads have a positive impact on income growth as well as the transition to nonagricultural activities. The extent depends on the distance to economic centers and the degree of post-primary household education. Thus investments in education and in local infrastructure are complementary in promoting growth and are not competing choices.

Given the diversity of needs across the major island groupings, the Indonesian
government launched an ambitious decentralization initiative in 2001, as analyzed by Arze del Granado in chapter 9. This initiative could potentially have a major impact on the pattern of urbanization, industrial agglomeration, and welfare objectives. His findings suggest that more-urbanized areas tend to attract migration from less-urbanized areas but that, where urbanization is the most advanced, congestion costs tend to push the inhabitants to neighboring areas. Thus the forces that promote concentration tend to go only so far before reversing. In addition, the degree of public expenditures on social services and infrastructure influences the pattern of migration. The higher these expenditure levels, the lower the outflows of population toward larger districts—that is, residents will move to districts with better services or employment opportunities. Employment growth is inversely related to the distance between a district and its nearest higher-order urban center, and thus investments that reduce distance matter. But the impact of decentralization on industrial expansion is more ambiguous. There is no evidence that expenditures on social services will encourage more industrial concentration in that area. This suggests that natural advantages and production externalities affect firm-level decisions more than the impact of government expenditures. Nor are special tax incentives to attract industries likely to provide sustainable solutions. Empirical tests on the importance of localization and urbanization externalities are inconclusive. This may be due to a lack of more disaggregated data, but it could also mean that the full impact of agglomeration effects has not yet been felt in Indonesia; that is, at this stage of development, the structure of industries may not have evolved enough to secure all of the benefits that can accrue to specialization.

The Philippines

The Philippines, with more than 7,000 islands, is the second-largest archipelagic state in the world. For most of the past 25 years, economic growth barely exceeded the population growth rate, which continued to expand rapidly at 2.3 percent a year. Growth has quickened in the present decade, but questions linger regarding its sustainability. Economic activity has been highly uneven and concentrated particularly in Metro Manila. Together with the two adjacent regions, Metro Manila produces about 55 percent of the country’s GDP. Thus building more density is not seen as a desirable objective. Instead, the pattern of uneven development, coupled with a disappointing performance in poverty reduction, has focused the policy debate on whether a more balanced approach is needed regarding the allocation of resources to address disparities (as discussed by Balisacan, Hill, and Piza in chapter 11). Inequality in the Philippines is seen as a more serious problem than in other East Asian countries, with inequality due largely to disparities within regions rather than among regions. Relative income differentials also drive migration, with the bulk of movement going to the region around and including Manila and, to a lesser extent, a few other prosperous areas such as Cebu City.

In recent years some regions have done quite well in attaining high per capita income growth and poverty reduction, while others have experienced a decline in their average per capita income and an increase in poverty. On average, most of the poor regions grew more slowly than the national average from 1985 to 2003, and there is no firm evidence that incomes are converging across provinces.

The poor performance in economic growth and poverty reduction is related to the large disparities in access to infrastructure and social services across regions and island groups and between urban and rural areas. A widely held view is that development efforts have favored Luzon, particularly the national capital region (Metro Manila), and discriminated against the Visayas and, especially, Mindanao. This development pattern is seen as having led to substantial spatial differences in access to economic opportunities, in rates of poverty reduction, and in the incidence of armed conflict. Similar to Indonesia, it is also worth pondering whether the divisions inherent in being a nation of islands create the same kinds of inefficiencies that result from international borders.
The government’s allocation of infrastructure funds has had implications for regional development patterns. Following the dismantling of the old import substitution growth regime, the new driver of spatial development patterns has been decisions regarding the location of export zones. In the last two decades, the Philippine government (and donors) has been more inclined to invest in internationally oriented infrastructure (ports, harbors, and associated facilities) than in domestic transport networks and corridors. The effect has been to reinforce the internationally connected enclaves at the expense of a denser set of domestic connections, a factor exacerbated by the regulatory barriers erected between firms inside and outside the export zones.

Balisacan, Hill, and Piza stress that spatial disparities need not reduce growth if they arise from efficiencies associated with agglomeration. If so, the strategy to prevent unreasonable spatial disparities during the development process would be to improve market links between leading and lagging regions through greater factor mobility, particularly of labor. This would need to be supported by improved social services that, given the fiscal constraints, need to be targeted more efficiently. Infrastructure, however, is seen as the glue that unifies the national economy and the single most important instrument of regional policy. But where the infrastructure should be located can have ramifications in balancing the desirability of fostering links with international markets or strengthening ties with the lagging hinterland. Overall, the Philippines is seen as being deficient in the quality of its infrastructure, especially in its road network, and this has held back efficient regional economic integration.5 The consequence is that the country has made little progress in national market integration, as evidenced by the widening variations in regional prices over the past decade and half.

**Thailand**

In Thailand, growth in density or economic concentration and poverty reduction went hand in hand. The structure of the Thai economy began to change in the early 1980s, during which the Thai government promoted industrialization and shifted the policy emphasis from import substitution to export promotion. Supported by major infrastructure investments, the manufacturing sector grew rapidly from 27 to 38 percent of GDP from 1980 to 2005. The share of agriculture fell from 23 to 13 percent over this period. Services remain the largest sector, contributing half of the country’s GDP in 2005. Overall, GDP grew at a rate of 6 percent a year for more than 25 years, despite the impact of the Asian financial crisis. As a consequence, the proportion of people living below the poverty line declined from 38 percent in 1990 to less than 10 percent in 2007.

As discussed by Wisaweisuan in chapter 12, despite this impressive growth and poverty performance, there are strong feelings about the extent of spatial disparities and an ongoing debate about the role that market forces or policies play in shaping outcomes. Special emphasis is placed on urban-rural as well as regional differences, with a particular attempt to determine whether the growth-promoting policies as well as public finances have alleviated or aggravated spatial disparities in Thailand. There is no clear evidence that spatial disparities have become better or worse at the national level—the Gini and Theil indexes show little change and possibly some improvement—but perceptions persist about increasing disparities across regions and between rural and urban areas as well as within sectors and regions.

Over the past decade and a half, growth in regional GDP of Bangkok has been slightly lower than the national average, and some areas like the eastern and central regions have been doing much better. These regions have benefited from a more active industrialization process brought on by globalization and designation of some special export-processing zones. This has made these regions a magnet for labor migration from other lagging areas. Thailand has benefited from the globalization process more than Indonesia and the Philippines, as indicated by the increase in the ratio of trade to GDP, which rose from 90 percent in 1990 to nearly 150 percent in 2005.
However, the consequence may have been an inevitable deterioration in income distribution; the poorest regions have tended to grow slower than the national average, leading to a sense that disparities are increasing. Those regions, especially the south, are highly dependent on agriculture, which makes it difficult for them to catch up. This suggests that Thailand is still in the stage of development where agglomeration economies are strong and structural shifts in production may still lead to increasing regional disparities.

**China: agglomeration, rapid growth, and major spatial consequences**

China, the most populous and arguably the most geographically diverse country in the world, reshaped its economic geography to reverse half a century of economic decline. History tells us that recent successes represent a marked shift from failed policies in the pre-1980 “centralized planning era,” which supported “balanced” growth and even the spread of industrial capacity across regions (as discussed by Yao in chapter 14). Over much of this period, China shifted back and forth from centralized and decentralized fiscal policies in response to major economic and political events, with the consequence that, by 1980, China was a very poor but egalitarian society, with one of the lowest Gini coefficients in the world.

During the post-1980 reform era, preferential policies were sequenced to work with, rather than against, differences in natural endowments and comparative advantages; in the process, they fundamentally reshaped China’s economic geography. These policies had two distinct consequences: (a) they reshaped the spatial dimensions of development by increasing the density of industrial activity and ratcheting up the urbanization process, and (b) in reducing distances and breaking down divisions, they broke the gridlock in the mobility of factors and goods both internally between provinces and urban and rural areas and externally between China and the rest of the world.

How was density encouraged? According to Yao, leadership was critical as exemplified by Deng Xiaoping’s signal not just to allow but to encourage industrial expansion in the major commercial centers along the coast. The most notable policy manifestation was the establishment of special economic zones (SEZs) in four cities along the southern coast, which then spread to the other coastal areas and eventually to all the capitals (Chen and Lu in chapter 15). These SEZs laid the basis for a massive inflow of FDI, which even today is concentrated largely in the coastal provinces. These incentive policies were complemented by fiscal reforms that gave preferential treatment to the coastal provinces of Fujian and Guangdong and ensured that these areas would receive an increasing share of public investment relative to the inner provinces. With the requisite resources and supportive incentive policies, these coastal areas were then well positioned to benefit from the globalization process that has characterized East Asia’s recent successes.

Rising density brought forth agglomeration economies, which uplifted the productivity of Chinese industrial enterprises concentrated in the major commercial centers along the coast. Although the coastal areas grew much faster than the inland provinces, the inland provinces also performed much better than before; together with sustained growth in agriculture, this resulted in near double-digit GDP growth for more than a quarter of a century.

The pattern of industrial growth in this process is broadly consistent with the tenets of the new economic geography. According to He in chapter 16, as market integration deepened, provincial industrial structures initially became more diversified, but by the late 1990s the agglomeration process began to take hold, with the effect of nurturing more specialization. The relationship between regional specialization and per capita GDP is U shaped. Driven by market forces, both the very poor and very rich regions are now more specialized, with the more service-oriented or higher-technology industries concentrated in the coastal urban areas and the more heavily protected and resource-intensive industries remaining relatively more dispersed within provincial boundaries. Industries with less local protection and government intervention typically are more exposed to external
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competition. Eventually, as agglomeration effects have taken hold, these industries have become more regionally specialized as well as more productive. Over time, returns to capital across provinces have converged, although returns remain greater in the coast than in the west. This lends support to the view that the agglomeration process has not become wasteful over time; rather, market forces have been encouraging the more efficient allocation of resources (Bai and Lin in chapter 17).

China’s urbanization process was both a consequence of and a factor contributing to the agglomeration process (Yeung and Shen in chapter 18). Rapid urbanization and specialization drew their impetus from the coastal areas. China’s urbanization rates, which rose from around 25 percent two decades ago to nearly 50 percent today, accelerated with the introduction of township-and-village enterprises, which drew workers out of farm production and inspired large-scale migration. Over time, this spawned a huge cohort of migrant workers, which now totals an estimated 140 million to 150 million, heavily concentrated in the major commercial centers along the coast. As reforms deepened, administrative constraints on labor mobility were progressively alleviated. Although access to housing and social services remained unequal for migrants without urban residency status (hukou), they became less prohibitive over time. The main lesson here is that the forces of agglomeration are very powerful: despite fairly stringent barriers discouraging migration, many have, in fact, chosen to move.

Over time, national market integration facilitated labor and capital mobility across provinces and greater concentration of resources. This process allowed many Chinese companies to exploit economies of scale (Chen and Lu in chapter 15; He in chapter 16). As the coastal cities became more linked to the global economy, the benefits became obvious, as exemplified by rapid employment creation, competitive pressures on enterprises to restructure, and a much improved domestic and external financial position (Yeung and Shen in chapter 18).

How did China reduce distances? On the one hand, massive migration of labor to the major commercial centers along the coast effectively reduced distances, and, on the other, China embarked on an infrastructure-led investment program that was unprecedented in its scale. While labor migration arose spontaneously, China’s success in dealing with the distance factor came from a concerted strategy to improve connectivity through investments in transport and communications. Initially, priority was given to the coastal provinces, but starting in the late 1990s, the central and western regions began to receive increasing attention. Over the past decade, considering both highway and railway investments, China spent more than 5 percent of GDP annually on transport investments amounting to more than US$100 billion in 2006, which is roughly twice as much as in other comparable countries.

Reducing distances would not have had such a positive impact, given China’s size and decentralized administrative system, without major efforts to eliminate internal divisions. During much of the reform period, China was better integrated externally than internally. This was due largely to the priority given to trade and globalization. Prior to 1990, internal divisions in the form of provincial boundaries essentially made each province a separate fiefdom, effectively locking in resources (labor and capital), creating protective markets for producers, and limiting the choices for consumers. Empirical studies for that period showed widely divergent availability of goods and huge regional price differentials. Subsequent price liberalization reforms and reductions in provincial barriers governing the movement of goods and factors of production have done much to bring down internal divisions, but more work is needed to create a unified national market (Huang and Luo in chapter 13).

Despite the surge in per capita incomes over the past several decades, spatial indicators measuring income inequality—between coastal and inland regions and between rural and urban areas—deteriorated. But China shows that there are “good” and “bad” manifestations of inequality. The dynamics of spatial disparities across subnational areas have taken the form of a “race to the top.” Disparities are not the result of stagnant income growth among certain segments
of society or regions but rather the consequence of unusually high and sustained growth of coastal and urban areas fostered by agglomeration economies. But growth in the inland provinces was not low by global standards, averaging around 8 percent annually. Yet this paled in comparison with growth in the coastal provinces, which averaged an impressive 12 percent during this decade (Huang and Luo in chapter 13).

Although regional disparity is widely considered as the key determinant in China, the rural-urban divide is the more important factor in shaping overall inequality. Changes in the Gini, which rose from 30 to 45 over the past 25 years, are closely associated with changes in the urban-to-rural income ratio and the coastal-to-inland per capita GDP ratio. The challenge in reducing income inequality, however, is that as impressive as growth in rural incomes has been (4 percent annually for several decades), it is still much lower than growth in urban incomes, which for some periods was twice as high. Thus the ratio of urban to rural incomes has been rising steadily since the mid-1980s. Because urban-rural differences are greater in the poorer inland provinces than along the coast, this drives regional differences, especially because urbanization rates are about 65 percent higher along the coast than in the western region.

Within provinces, inequality within rural and urban areas has accounted for a larger share of total inequality over time. With the structural transformation of the economy, individual circumstances have gradually played a more important role in determining income, including the high premium accorded to education. This suggests that increasing income inequality is, to some extent, a consequence of the stage of China’s development: the growth process unleashed competitive pressures and created greater rewards for skilled workers.

But if not addressed, rising disparities—whatever their source—can lead to social and political pressures. China’s policy makers have been sensitive to these concerns. At the national level, this awareness is reflected in the recognition given to achieving more uniform and equitable social outcomes across regions and between urban and rural areas. However, the gap in social welfare achievements by region, especially for health compared with education, while narrowing over time, remains large, as indicated in government policy statements.

The principal instrument with which to address spatial disparities in living standards is to give more priority to the poorer inland provinces in the provision of social and infrastructure services through the public expenditure program. China’s capacity to use public finances for redistribution purposes, characterized by distinct intergovernmental layers of responsibility for the collection of revenue and the provision of services, has been hindered by several factors. The most critical has been the steady decline in the ratio of revenues to expenditures, from more than 25 percent in 1980 to 12 percent in 1995.7 With this near collapse in revenues, the country’s capacity to redistribute resources through the budget in favor of the poorer regions was limited. Beginning in the mid-1990s, an improved revenue position led to a shift in the share of resources going to the inland provinces. While the trend in recent years has been in the right direction, most observers feel that more needs to be done (Huang and Luo in chapter 13; Yao in chapter 14; Chen and Lu in chapter 15).

Aside from shifts in the public expenditure program designed to ameliorate regional differences in social welfare, incentives were also geared to provide a more balanced approach in development objectives. These concerns underpin several regionally targeted development programs, the first of which was focused on developing the western regions in the late 1990s, later the northeast, and more recently the central region (Yao in chapter 14). What characterizes these targeted initiatives is the pragmatic approach to crafting strategies that reflect geographically differentiated needs as well as political pressures. For the western region, government policies focused on developing more sustainable agricultural production systems that would preserve natural forests and invest in irrigation systems suitable for dry land farming. These were combined with stepped-up efforts to facilitate labor migration by improving access to social
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services. These policies were complemented by a ratcheting up in funding for infrastructure—roads and rails—that improved connectivity to the rest of the country. For the northeast, the major challenge was to deal with an outdated industrial structure based on state-owned heavy industries and underlying geographic conditions (low population density and inappropriate positioning to tap national and global markets). The strategy that has emerged encompasses two general concerns. One is to strengthen social protection systems to deal with unemployment, pension, and retraining needs, including facilitating labor migration as needed. The other takes more of a spatial perspective by looking at the three affected provinces in a broader regional context to see how existing industrial activities could be reshaped to complement national and globally linked production-sharing networks. This approach includes recognition that the northeast is well placed to connect China with external markets in Japan and Korea. The strategy also includes recognition that some traditional agricultural areas could prosper with more support to realize their resource-based advantages. Work on strategies for the central region is just beginning.

As future growth dynamics are likely to be driven more by domestic consumption than by exports, the region has significant locational advantages as a centralized hub serving the surrounding, heavily populated provinces. This should provide a rationale for investments designed to improve connectivity with the surrounding regions.

Korea: from developing to developed status and eventual equalization in living standards

Much has been written about the Korean success story. The Republic of Korea is unique in having gone from an income of less than US$100 per capita in 1960 to US$20,000 in 2007 in the aftermath of the devastating Korean War. Such a remarkable achievement in such a short time (by the standards of economic history) is the consequence of an impressive export-oriented and sector-specific industrial development strategy, which Park characterizes in chapter 19 as “compressed economic growth.” This approach has concentrated industry and population in the capital region and achieved a major spatial transformation.

This process was broadly characterized by the building of density to achieve the associated agglomeration effects. The share of industry in production increased from 19 percent in 1960 to 41 percent by 1980 and has since stabilized around that level. Since 1980, the changes lie more in the nature of the industrial structure, with a steady decline in the share of labor-intensive industries in favor of the production of more technology-intensive parts and components for assembly and capital-intensive goods. In the early stages of industrialization, there was a bipolar concentration of industries separating the capital region from the rest of the country. Over time, this disparity was considerably reduced by forces that linked provincial cities and rural areas with the more dynamic centers and by the rapid dissemination of information and communications technology (ICT) services. This shift is mirrored by a steady decline in the role of agriculture: from 40 percent of GDP in 1960 to 3 percent today. However, it is also worth noting that industrial restructuring in response to globalization pressures was not an easy process; it required major shifts in the nature and location of activities; for some product lines, it entailed relocation to lower-cost centers abroad, such as China. This process is now being nurtured by a persistent pressure to build new innovation systems (Park in chapter 19).

These trends are reflected in the sharp increase in the urbanization rate, which rose from 27 percent in 1960 to 57 percent by 1980 and to 81 percent by 2006. In the process, the economic geography of Korea changed dramatically. At the beginning, when agriculture was the major activity, the western part of Korea was relatively affluent due to the fertility in the plains. However, the rapid industrial expansion in the capital and southeastern region, supported by the Seoul-Busan highway, created a disparity between the axis formed by Seoul and Busan relative to the axis formed by the southwestern and northeastern corners of Korea.

Seoul continues to play a dominant role in the economy and continues to be
a magnet for attracting skilled labor and resources; however, its share of the population peaked more than a decade ago. Today, the migration to the capital region flows mainly to Seoul’s surrounding areas, such as Incheon and Kyunggi, nurtured by the spillover of economic activities, due to the attractiveness of lower-cost settings.

These industrial spillover effects are now being felt in other regions, notably the southeast, which has benefited from being highly specialized in assembly-related production and its position as a major port connecting key markets in China and Japan. The middle region has also benefited in taking up a large share of high-technology-intensive industries from the capital region. The southwest region is more specialized in resource-based industries. Over time, the structure of industrial organizations has also evolved, with the concentration of headquarters and research activities of major firms in Seoul but the decentralization of production functions to non-capital regions.

The consequence of these shifts in industrial specialization and location over the past several decades has been a marked decline in disparities due to the natural spreading out of economic activities supported by major infrastructure investments, improved ICT, and stronger social services, notably education. Particularly striking is that the gap between per capita GDP for the capital region, which is the highest nationally, and that for the lowest region—the southwest—dropped from about 40 percent in 1985 to about 10 percent by the late 1990s (Park in chapter 19). More disaggregated data for subnational administrative units indicate that per capita GDP in the poorer areas is typically no more than 20–25 percent below the national average. Other indicators such as the Theil coefficients also illustrate that the Korean development experience has been remarkable in terms of its equity implications (table 20.1).

**Lessons learned**

The WDR 2009 concludes that spatial transformations—rising density, falling distance, and dissipating divisions—will remain essential prerequisites for economic success in the foreseeable future. Do these same three principles apply to East Asia?

As argued in the WDR 2009, economic growth is seldom balanced, and efforts to spread it out prematurely may jeopardize sustainable progress. Centuries of economic development in other parts of the world show that spatial disparities in income and production are inevitable. However, as countries develop, a series of policies are enacted to make basic living standards more even across space.

The East Asian experience conforms to these stylized facts. Plants have become big to exploit economies of scale, but places do not have to be big to generate those economies. The function of cities matters, not their size. The medium-size cities are often large enough for “localization” economies. As a city grows, localization economies become less important, giving way to “urbanization” economies, which tend to generate, especially in large cities, knowledge spillovers. Human capital moves to where it is abundant, not scant. Falling transport costs make specialization possible and increase trade not only with neighboring countries but also across internal provinces. The move to density is quick at the local level, manifested in a rapid rural-urban migration that accompanies the sectoral shift from agriculture to industry. Over time, this leaves an uneven landscape, with people and production concentrated in some places and not in others. Migration, trade, taxes, and transfers influence the pace of convergence. As incomes rise, living standards converge between places where economic mass has concentrated and places where it has not. The challenge for governments is to allow—even encourage—“unbalanced” economic growth and yet to ensure “balanced” development in terms of quality of life and consumption levels.

As suggested by the WDR 2009, East Asia can do this through economic integration:
by building density, reducing distance, and eliminating divisions.

**Density and scale economies**

The studies in this volume show that, as a country grows richer, location becomes more important for economic production. Put another way, as countries develop, production becomes more concentrated spatially, and location matters less for families but more for firms. In the early stages of development, such as in Vietnam, this means a gradual movement of labor out of agriculture and into industry and services and the beginnings of migration to the major production centers such as Ho Chi Minh City and along the coast. The ASEAN-3 exemplify an agglomeration process that is well advanced, as indicated by the dominance of their three major capitals, which account for as much as half of national GDP. The same process has now taken place in China, but over a much shorter time horizon in terms of the concentration of activity along the coastal provinces.

As illustrated for Indonesia (Kuncoro in chapter 10), China (He in chapter 16), and Korea (Park in chapter 19), as density rises and agglomeration economies become more dominant, industrial structures evolve. Regions, and areas within provinces, show a distinct pattern in the structure of their industries, moving from a more diversified base at lower income levels to a more specialized structure at more advanced stages, given the interplay of localization and urbanization externalities. Cities eventually become more specialized, with some focusing on capital-intensive production, others focusing on more technology-intensive production, and yet others shaped by the availability of resources and the proximity to consumer markets. In the process there is a role for both large diversified cities and smaller specialized cities.

As discussed earlier, agglomeration economies, exemplified by the concentration of production along coastal areas and in the major capitals of East Asia, have been nurtured by the forces of globalization, as indicated by the rapid growth in trade of intermediate goods and the development of regional production-sharing networks (Hamaguchi in chapter 1). Those countries and those areas within countries that have been participating more actively in this process also have benefited the most in terms of growth and employment generation.

Broadly speaking, rising density allows a country to realize the externalities of bringing producers together and linking production to dense consumer markets. Economic development thus brings with it the conditions of even greater prosperity, creating a virtuous circle. Neighborhoods also matter. A prosperous city like Seoul or Shanghai seldom leaves its periphery mired in poverty. A province’s prosperity is sooner or later shared with those nearby. Thus the evidence shows that, over time, spillover effects occur, nurtured in part by the higher congestion costs of large cities.

How these clusters form and whether they become innovative enough to spur growth can determine why countries prosper or lag behind, as Otsuka and Sonobe discuss in chapter 2. They point out that the formation of industrial clusters is vital for information spillovers and lowering transaction costs among enterprises and traders. As innovation possibilities are enlarged, sustainable growth of industries becomes possible. Their case studies show that such clusters have spurred industrial development in a number of East Asian countries, such as China, Japan, the Philippines, and Vietnam.

Overall, the impact of density is illustrated by rising urbanization, which correlates well but not strictly with a country’s stage of development and pattern of growth. For low-income countries like Lao PDR and Vietnam, urbanization rates cluster around 20–25 percent. The rate rises to around 40–60 percent for the middle-income countries in ASEAN and China and then to as high as 80 percent for Korea. Thus a distinguishing aspect of the East Asian success story and the role of economic geography is the rapid pace of urbanization.

**Distance and factor mobility**

Location is the most important correlate of a person’s welfare, and choice of location—proximity to markets and other producers—will often determine whether a firm succeeds
or fails. Reducing distances has been fundamental to East Asia’s economic success over the past several decades. The impact has been felt at three levels: regional, national, and local. At the regional level, declining transport costs and improved logistics gave rise to the production-sharing networks that underpin the region’s explosive growth in the trade in parts and components (Hamaguchi in chapter 1). This has made possible the attainment of economies of scale even for small enterprises and facilitated industrial expansion across a broader range of technology-rich products not only in China but also in the middle-income economies of Southeast Asia and now even in low-income economies like Vietnam.

At the national level, improved transport links have influenced the location of firms and promoted more diversification and specialization in industrial structures. As Huang and Luo discuss in chapter 13, China’s impressive performance in expanding trade and restructuring its industries was greatly facilitated by a massive investment program that upgraded its transport network. This partly explains why China is ranked so highly in terms of its competitiveness. In contrast, as Balisacan, Hill, and Piza note in chapter 11, the disappointing economic performance of the Philippines may be partly due to its very low rankings in terms of the quality of its infrastructure.

Over time, the reduction of distance will reshape the industrial composition of production and its location in major cities, as industries that are less dependent on “national” versus “local” agglomeration economies move to lower-cost centers. Also, industries relocate to gain better access to external markets or natural resources. This pattern is especially true for China (He in chapter 16; Yueng and Shen in chapter 18), but it is also exemplified by the experiences of Indonesia, the Philippines, Thailand, and Korea (Hill, Resosudarmo, and Vidyattama in chapter 8; Kuncoro in chapter 10; Balisacan, Hill, and Piza in chapter 11; Wisawesuan in chapter 12; Park in chapter 19). Yet the impact of reducing distances is not just a force that shapes industrial expansion; it can also be vital at the local level in linking rural markets (Yamauchi and others in chapter 4) and essential for low-income, landlocked countries (as indicated by Ohno in chapter 3 on Lao PDR).

Divisions

How significant are the divisions that separate nations for reducing economic efficiency? The WDR 2009 elaborates on these issues: differing incentive regimes in the form of divergent tariffs, tax, and investment systems often distort the spatial location of firms and their access to markets. These distortions lie behind the global efforts to achieve more integration through bilateral and multilateral trade agreements and more comprehensive arrangements such as the European Community and ASEAN. In this volume, however, the focus is largely on internal divisions such as provincial boundaries and the barriers that differing ethnic, religious, and geographic circumstances create.

For the large and more diversified countries such as China, Indonesia, the Philippines, and Thailand, internal administrative boundaries (for example, provincial and district borders) can matter as much as the existence of mountains, deserts, and islands. Internal administrative boundaries can lead to the same kinds of inefficiencies that occur with international borders, if they lead to differential access to resources or impede the flow of factors of production. Geographic formations can have a similar effect in terms of discouraging factor mobility and creating protective barriers for local industries. As described in previous chapters, these situations appear to have played a significant role in shaping developments in countries like China, Indonesia, the Philippines, and Thailand. The case of large archipelagic nations like Indonesia and the Philippines may present special challenges, encouraging more self-sufficient industrial structures for each of the major islands, but in the process making it more difficult to achieve agglomeration economies and the benefits of specialization. Rigidities in the movement of labor can also be a problem, as illustrated by the unique hukou system in China. The solution lies partly in eliminating artificial barriers to the movement of goods and factors of production and
partly in improving connectivity through infrastructure investments.

Cross-border divisions are even more important. Two special cases are addressed in this volume. Bhaskaran, in chapter 5, analyzes the potential benefits that could be gained from greater cooperation and cross-border flows of resources between Malaysia and Singapore. Both countries have done well over the past several decades, but both would benefit greatly from a policy of more seamless collaboration. This would create a much larger and diversified market and greater economies of scale. Given their differing endowments of land, capital, and service-related skills, both would be able to realize efficiencies and more rapid growth, while avoiding duplication of costly infrastructure and wasteful competitive investments. However, while the economic benefits are obvious, the politics of collaboration may result in an insurmountable barrier.

As Rigg and Wittayapak discuss in chapter 6, the subregion with the most significant cross-border spillover of poverty is the Greater Mekong subregion, which includes Cambodia, Lao PDR, Thailand, Vietnam, and Yunnan province in China. Given the major logistical challenges presented by the numerous hills and rivers and the presence of numerous ethnic communities, the concerned governments have launched a comprehensive program to promote collaboration and ensure that the development of vital resources with cross-border consequences such as water and energy is in keeping with the interests of everyone. At the heart of this initiative is the effort to promote more connectivity in the form of a network of highways and improved border logistics so that cross-border trade and related production are encouraged. These benefits can be substantial, but, as the authors point out, there are also costs involving those whose situation might be made worse by the integration process.

**What to do: the role of government policies**

The key message of the WDR 2009 is that policy makers should aim to build density, reduce distance, and eliminate divisions. The consequence will be uneven growth, but, with appropriate policies, more inclusive development will come, sooner rather than later.

However, as seen throughout all the papers in this volume, governments are under enormous pressures to deal with perceptions—real or imagined—about increasing disparities, which in most cases have a spatial dimension. At the national level this is exemplified by indicators like the Gini and Theil coefficient (table 20.1) and by wide spatial variations in welfare indicators (see figure 20.1). Disparities increase most rapidly in the earlier stages of development, typically below per capita incomes of US$3,500, when the forces leading to concentration in production are the greatest (WDR 2009). By the time countries reach the upper middle-income levels of around US$10,000, they tend to moderate.

Most disparities are in some sense undesirable from a social perspective. If unchecked, they can lead to pressures that ultimately could jeopardize otherwise successful development processes, but there are so-called “good” and “bad” disparities. In a successful transformation from developing to developed status, inequality almost always surfaces, as the population moves from lower-productivity agriculture to higher-productivity urban activities. There is then a lengthy period of rising inequality overall, as the share of higher-paid urban workers increases relative to the less-well-off rural population. Ultimately, however, with labor migration and industrial spillover effects to

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**Figure 20.1 Provincial disparities: human development indexes in East Asia**


Note: The connected line shows the highest and lowest national values of the human development index for each country.
peri-urban and rural areas, disparities begin to decline. As documented in the WDR 2009, this has been the experience of developed countries. Also, the more successful a country is, the shorter is the compression of this transition, as illustrated by the case of Korea. If this is the nature of “good” disparities, then “bad” disparities emanate from situations where growth stagnates for long periods of time or policies tend to restrict access to opportunities and resources to a select few. The solution is a more inclusive development process, to reach a broader range of society.

For most countries, significant regional or locational aspects characterize disparities. As discussed in nearly all of the chapters, governments often feel the need to give priority in the allocation of resources to rural areas or lagging regions. In some cases, ethnicity is a factor. The special needs of relatively poor ethnic communities that inhabit isolated and often mountainous areas are exemplified by the situation in the hills and mountains of Vietnam, Thailand, Lao PDR, and the western region of China and in communities spread among the many islands in Indonesia and the Philippines.

What is the message, then, about dealing with the pressures for more “balanced” social outcomes given the benefits of an agglomeration process that contains the promise of more rapid growth? The solution is to promote economic integration while also nurturing more inclusive social development in the process. The market forces of agglomeration, migration, and specialization can, if combined with progressive policies, yield both a concentration of economic activity and a convergence in living standards.

Governments typically have a range of instruments with which to achieve this objective. These broadly fall into two categories: promoting connectivity by linking markets and improving factor mobility and ensuring that all families, regardless of their location, are provided with roughly equal access to social and public services. In these country studies, two instruments stand out in terms of how governments have been dealing with spatial factors: (a) fiscal programs that support infrastructure and provide social services and (b) spatially targeted programs.

**Fiscal programs**

The evidence from both the developed economies and the recent experiences in East Asia show that the most successful countries institute policies that make basic living standards more uniform across space. Because budgetary resources are invariably constrained—and richer regions tend to be better able to collect revenues—the degree to which governments can redistribute in favor of poorer regions varies considerably across countries and over time. Moreover, for the larger countries, decentralization and the role that subnational layers of government play can be instrumental in implementing these objectives.

Throughout East Asia, fiscal decentralization has gained momentum over the past decade. While different structural and political imperatives propelled the process in different countries (ranging from regime changes in Indonesia and the Philippines, to the transition to a market economy in China and Vietnam), the share of subnational government spending has risen to significant, though varying, levels (see figure 20.2).

However, while fiscal decentralization has progressed, subnational fiscal disparities remain persistently large. There are significant differences in revenue capacity across local governments, reflecting the underlying large variations in their economic and resource base. Vertical imbalances between subnational revenues and expenditures are sought to be filled through transfers from the central government, but such transfers have not gone far in addressing horizontal inequality. Transfers from the central government reduce the disparities in per capita revenues, but often not by much (see figure 20.3). As a consequence, there are large disparities in per capita local government spending across lower levels of government in countries like Indonesia (Arze del Granado in chapter 9), the Philippines (Balisacan, Hill, and Piza in chapter 11), Thailand (Wisaweisuan in chapter 12), and China (Huang and Luo in chapter 13).

The potential to use fiscal transfers and social expenditures to reduce disparities thus depends partly on a country’s overall fiscal position, the rules that determine how resources are cascaded down to lower levels, and often the politics involved. However,
decentralization can also be misused as an instrument, for example, if resources are directed to encourage industrial expansion in areas that are not suitable (Arze del Granado in chapter 9; Kuncoro in chapter 10).

In addressing disparities, the focus is usually on influencing the pattern of social expenditures, such as health, education, and social protection. As indicated in the WDR 2009, such policies should be “spatially blind,” in the sense that the objective is to provide the same level of social services to all, regardless of location or, taking it one step further, to aim for similar social outcomes for all, regardless of location. This may mean providing extra resources to serve hard-to-reach or high-cost areas. Moreover, a spatially blind policy does not necessarily mean that programs are similar in design for all regions. The reality may mean that, in diverse spatial settings, differentiated approaches may be necessary to realize similar outcomes.

Infrastructure investments, particularly those relating to transport, are usually not perceived as a vehicle for addressing disparities, although they are seen as fundamental for reducing distances, promoting density, and bringing down divisional barriers. As such, infrastructure is the basis for promoting national economic integration. Often overlooked, however, is that such expenditures also can be an important factor in reducing poverty and moderating disparities. As exemplified in the case of China, improved connectivity, which facilitated the movement of rural labor to more productive employment opportunities, mostly in urban areas, is an effective way to reduce poverty. However, the impact on poverty and regional disparities can also be more subtle. Transport investments that reduce the logistics costs of traded goods whose prices are established by national or global markets allow wages to be higher for workers who are farther away from consumer markets.

**Spatially targeted interventions**

Practically all developing countries have some spatially targeted interventions. The WDR 2009, however, suggests that many of these programs turn out to be ineffective, particularly if they attempt to redirect production to areas where market forces would render such activities uncompetitive or unsustainable. These efforts often include incentives to promote new industrial activities in lagging regions or to concentrate more production in rural areas. But they also can involve special efforts to deal with the problems of slums in mega cities.

In Indonesia, the success of such efforts to encourage industries to relocate to less-congested areas or lagging regions has been mixed. Similar efforts have been tried in other countries, including China and the Philippines. Firms that depend on localization externalities might find it attractive to move from high-cost centers in major urban areas.
to smaller, specialized cities, but in some cases incentives are not enough to overcome their reluctance to relocate (Otsuka and Sonobe in chapter 2; Arze del Granado in chapter 9; Kuncoro in chapter 10; He in chapter 16; Bai and Lin in chapter 17).

Spatially targeted programs in many East Asian countries are often designed to provide special support for rural areas and may be warranted if there are biases favoring major urban centers (Balisacan, Hill, and Piza in chapter 11; Wisaweisuan in chapter 12). For low-income countries such as Vietnam, the potential for increasing agricultural productivity is often substantial, and thus programs to tap this potential are attractive. At the same time, as the country develops, labor will gradually move out of agriculture, and, as Son suggests in chapter 7, efforts to strengthen connectivity between rural and urban areas and to link factor and goods markets are attractive options. In middle-income countries where crop yields are already relatively high and land resources are scarce, the strategy should be to encourage more off-farm employment and, if the employment opportunities exist, migration to urban areas.

Spatially targeted interventions may also be needed to equalize opportunities to access education and health services. The benefits of such programs are enhanced by the fact that a healthier and more skilled labor force produces benefits that are “portable”; that is, they move with the person and thus do not carry the same risks as investments in fixed assets.

More controversial are targeted development programs for lagging regions, which often are designed to concentrate more production mass in those areas. The experience with such programs is often not satisfactory, especially if they run counter to market forces and the limitations brought on by geographic endowments. But if programs are designed to reflect the realities of the situation in lagging areas and, as in the case of China, custom tailored because of differing regional needs, they can be a sensible complement to other policies, which continue to promote growth-enhancing agglomeration effects (Huang and Luo in chapter 13; Yao in chapter 14).

**Future trends in spatial disparities and links with development**

Sustained growth eventually will raise all incomes regardless of location and, in time, will provide access to social services and equitable living standards. But the process can be lengthy and often disruptive. In the case of China, simulations suggest that, with good policies and continued rapid growth, income inequalities may begin to decline in a decade or so but, with less successful policies and outcomes, may take several decades (Huang and Luo in chapter 13). The reasons lie in the complexities of the growth process: the interplay between the structure and spatial location of production, the implications for labor mobility, and differential earnings of workers by industry and location.

Thus spatial disparities in production appear to be inevitable and, within countries, even desirable, but policy makers in East Asia can do better in moderating the rising disparities in living standards that accompany the growth process. Doing so means that they need to overcome the many challenges in making their fiscal systems and institutions more effective in providing basic services for a broader spectrum of society, especially in disadvantaged areas, while also improving connectivity between leading and lagging regions.

In most of developing East Asia, income inequality will likely continue to increase in the future, although the rate of deterioration appears to be moderating in the middle-income countries. As economies develop, such disparities will diminish, but only slowly and never completely. This concentration should be viewed with patience, because it brings spatial efficiency. But with more inclusive public expenditure programs and stronger institutions—which reinforce the forces of agglomeration, migration, and integration—countries can be both spatially efficient and equitable.

**Notes**

1. For many countries, the key period for widening inequalities was from 1960 to 1990, as they moved from low- to middle-income status. However, comparable data across countries are not readily available for that period.
2. See the editors’ preface to this book for a more detailed discussion of these concepts.

3. In their analysis of growth determinants and impact on poverty, Balisacan, Hill, and Piza find that the low growth rates largely explain the poor performance in poverty reduction, but even the growth achieved did not have as much of an impact on poverty reduction in the Philippines as it did in other countries, suggesting that how the targeted programs are formulated may need to be reconsidered.

4. As noted in the literature, the mere existence of borders separating countries creates inefficiencies, as exemplified in the studies on the implications for Canada and the United States.

5. The Philippines ranks 89 out of 102 countries regarding the quality of its infrastructure performance in the *Global Competitiveness Report* (World Economic Forum various years).

6. Officially, these workers must retain their official residency in their home province and, in most cases, leave their family behind. Normally, they return to their home province for major holidays and as needed.

7. This was typical of the problems that transition economies faced in moving to a more market-based economy, with revenues depending on taxes rather than surpluses of state-owned enterprises. In the interim, the revenue base of most centrally planned economies typically collapsed.

8. This section draws extensively on the editors’ preface in this volume.

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<td>• 15 trees</td>
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<td>• 5,556 gallons of waste water</td>
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“Having spent much of my career pioneering the principles that underpin the ‘new economic geography,’ or spatial economics, it is gratifying to see how these principles are now being used to deepen our understanding of the most dynamic region of the world and its development process.... These studies illustrate how well the concepts underpinning the new economic geography can explain what is happening in East Asia. Despite a few exceptions, urbanization and related agglomeration benefits are part of the region’s success story, along with the related pressures on policy makers to deal with increasing spatial disparities.”

From the foreword by Masahisa Fujita

Reshaping Economic Geography in East Asia, a companion volume to the World Development Report 2009, brings together noted scholars to address the spatial distribution of economic growth in Asia. It reveals how the new economic geography is reshaping development objectives: from initiatives to foster growth via enhanced agglomeration and connectivity to the world economy, to programs that channel resources to lagging regions. Key themes include how East Asian governments have dealt with agglomeration economies, urbanization, and regional disparities; improving connectivity with infrastructure investments; and eliminating barriers both inside and outside borders to favor the movement of labor, goods, and services.

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