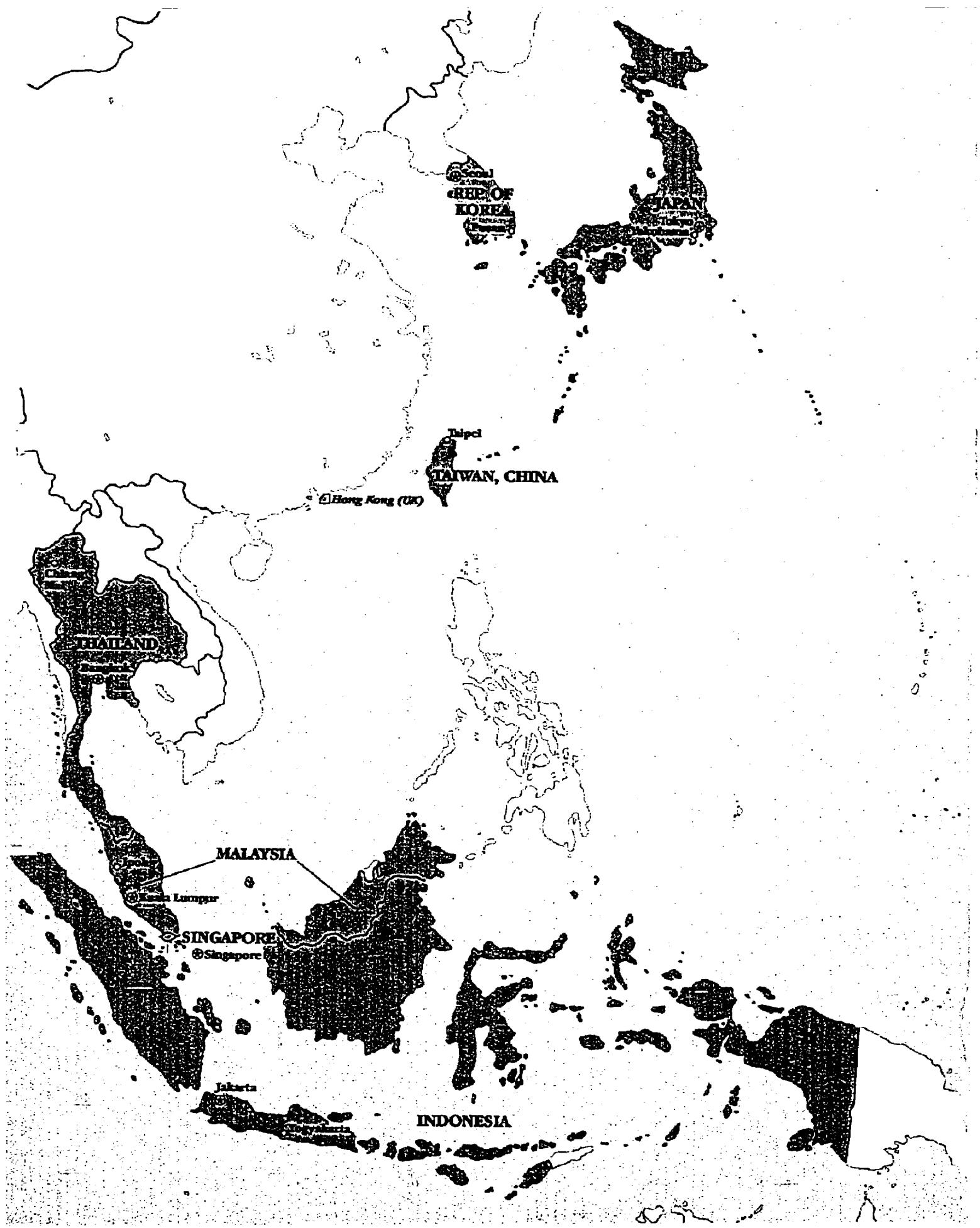


THE EAST ASIAN MIRACLE

ECONOMIC GROWTH AND PUBLIC POLICY



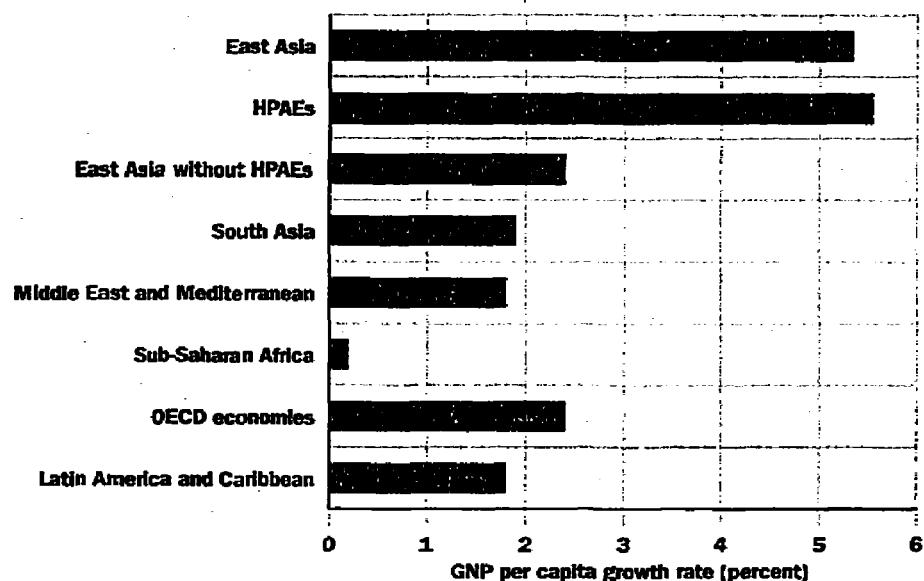


Overview: The Making of a Miracle

EAST ASIA HAS A REMARKABLE RECORD OF HIGH AND sustained economic growth. From 1965 to 1990 the twenty-three economies of East Asia grew faster than all other regions of the world (figure 1). Most of this achievement is attributable to seemingly miraculous growth in just eight economies: Japan; the “Four Tigers”—Hong Kong, the Republic of Korea, Singapore, and Taiwan, China; and the three newly industrializing economies (NIEs) of Southeast Asia, Indonesia, Malaysia, and Thailand. These eight high-performing Asian economies (HPAEs) are the subject of this study.*

Selecting any set of economies and attempting to understand the origins of their successful growth are necessarily arbitrary processes.¹ Botswana, Egypt, Gabon, and Lesotho in Sub-Saharan Africa have also been among the world’s top growth performers in the past two decades, as have such diverse economies as Brazil, Cyprus, Greece, and Portugal (see figure 2). Why focus on eight economies in East Asia? In part the choice reflects popular interest; it has become common to see references to the “Asian Economic Miracle.” In part it reflects recent attention by the academic and development policy communities to the relationship between public policies—which some authors have argued have a number of common threads in the eight economies, especially Japan, Korea,

*Recently China, particularly southern China, has recorded remarkably high growth rates using policies that in some ways resemble those of the HPAEs. This very significant development is beyond the scope of our study, mainly because China’s ownership structure, methods of corporate and civil governance, and reliance on markets are so different from those of the HPAEs, and in such rapid flux, that cross-economy comparison is problematic. We touch on China’s recent development in chapters 1 and 3. The economic transition in China is the subject of current research by the Policy Research Department of the World Bank (see Bibliographic Note).

Figure 1 Average Growth of GNP per Capita, 1965–90

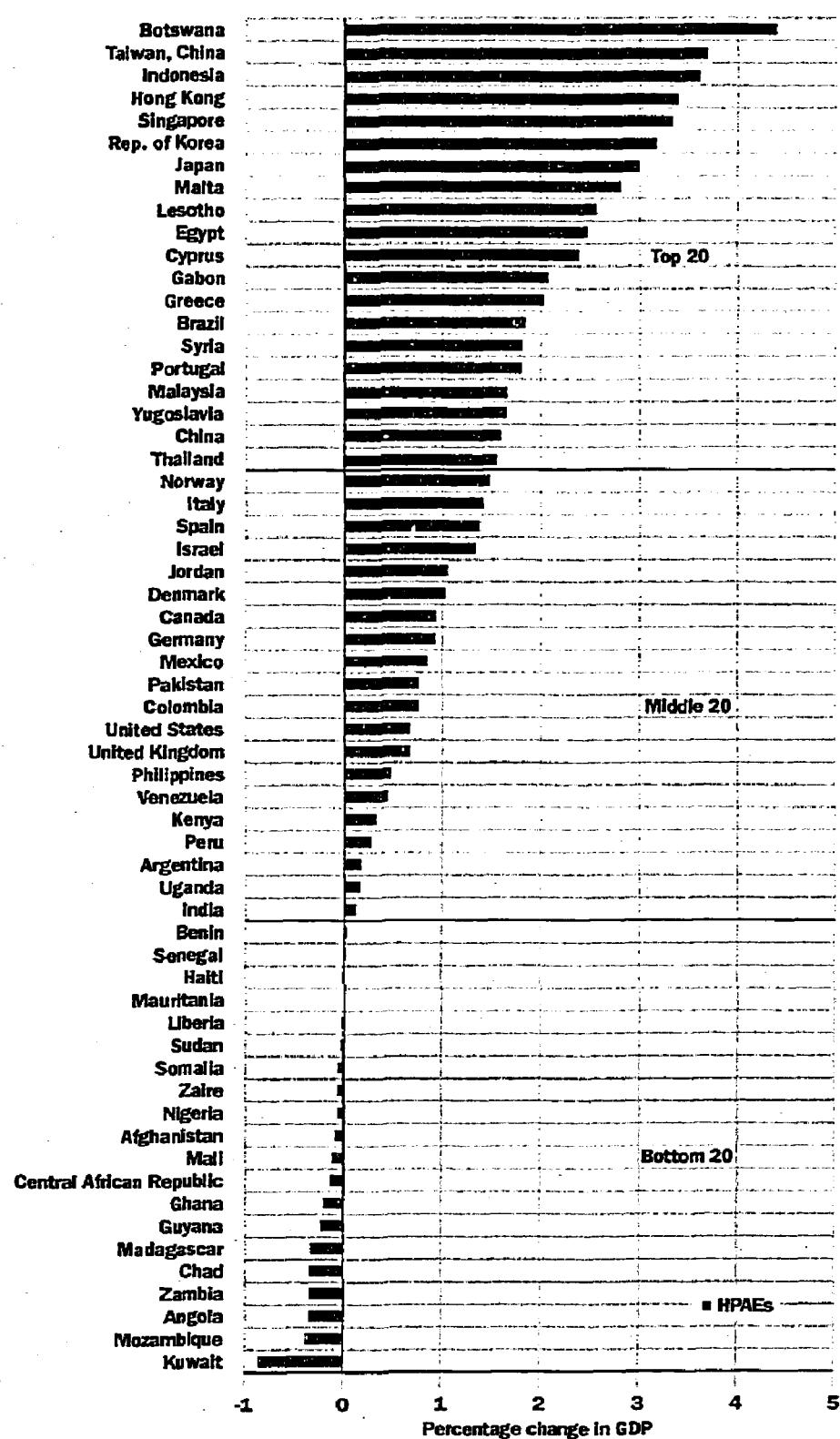
Source: World Bank (1992d).

Singapore, and Taiwan, China—and rapid growth. And in part it reflects the belief of those involved with this study that the eight economies do share some economic characteristics that set them apart from most other developing economies.

Since 1960, the HPAEs have grown more than twice as fast as the rest of East Asia, roughly three times as fast as Latin America and South Asia, and five times faster than Sub-Saharan Africa. They also significantly outperformed the industrial economies and the oil-rich Middle East–North Africa region. Between 1960 and 1985, real income per capita increased more than four times in Japan and the Four Tigers and more than doubled in the Southeast Asian NIEs (see figure 2). If growth were randomly distributed, there is roughly one chance in ten thousand that success would have been so regionally concentrated.

The HPAEs have also been unusually successful at sharing the fruits of growth. Figure 3 shows the relationship between the growth of gross domestic product (GDP) per capita between 1965 and 1990 and changes in the Gini coefficient, a statistical measure of the inequality of income distribution. The HPAEs enjoyed much higher per capita income growth at the same time that income distribution improved by as much or more than in other developing economies, with the exceptions of Korea and Taiwan, China, which began with highly equal income distributions. The HPAEs are the only economies that have high growth *and* declining

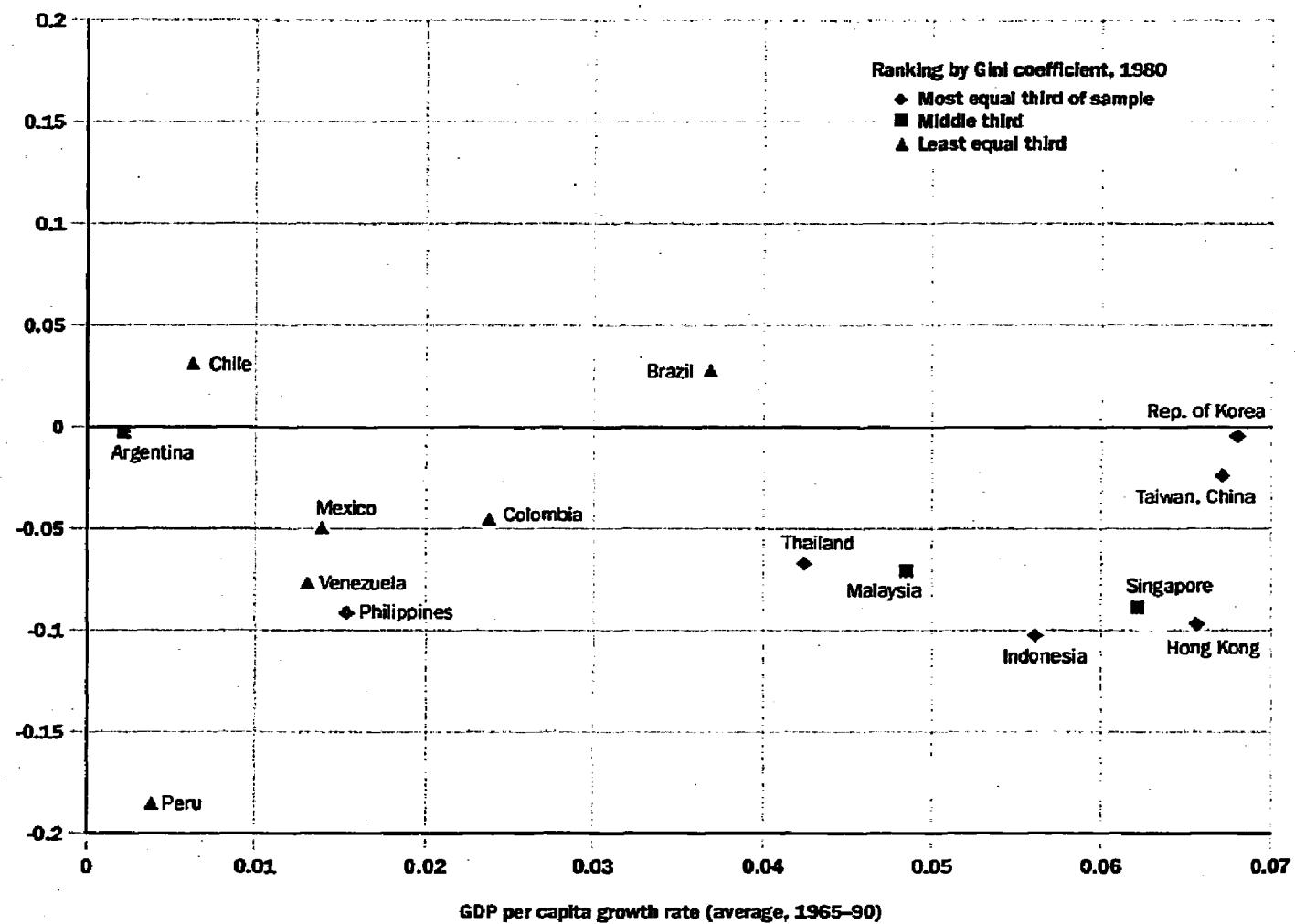
Figure 2 Change in GDP per Capita, 1960–85



Source: Summers and Heston (1988).

Figure 3 Change in Inequity and the GDP per Capita Growth Rate

Change in average Gini coefficient (1980s minus 1960s)



Note: Figure 3 plots the relationship between average per capita income growth and changes in the decade average of the Gini coefficient from the 1960s to the 1980s; a negative number indicates that income became less concentrated. The decade average is used because data are available for different years in different economies; the decade average for the 1960s begins with data from 1965.

Source: World Bank data.

inequality. Moreover, the fastest growing East Asian economies, Japan and the Four Tigers, are the most equal.

As a result of rapid, shared growth, human welfare has improved dramatically. Life expectancy in the developing HPAEs increased from 56 years in 1960 to 71 years in 1990. (In other low- and middle-income economies, life expectancy also rose considerably, from 36 and 49 to 62 and 66 years, respectively.) In the HPAEs, the proportion of people living in absolute poverty, lacking such basic necessities as clean water, food, and shelter, dropped—for example, from 58 percent in 1960 to 17 percent in 1990 in Indonesia, and from 37 percent to less than 5 percent

in Malaysia during the same period. Absolute poverty also declined in other developing economies, but much less steeply, from 54 to 43 percent in India and from 50 to 21 percent in Brazil from 1960 to 1990. A host of other social and economic indicators, from education to appliance ownership, have also improved rapidly in the HPAEs and now are at levels that sometimes surpass those in industrial economies.

What caused East Asia's success? In large measure the HPAEs achieved high growth by getting the basics right. Private domestic investment and rapidly growing human capital were the principal engines of growth. High levels of domestic financial savings sustained the HPAEs' high investment levels. Agriculture, while declining in relative importance, experienced rapid growth and productivity improvement. Population growth rates declined more rapidly in the HPAEs than in other parts of the developing world. And some of these economies also got a head start because they had a better-educated labor force and a more effective system of public administration. In this sense there is little that is "miraculous" about the HPAEs' superior record of growth; it is largely due to superior accumulation of physical and human capital.

Fundamentally sound development policy was a major ingredient in achieving rapid growth. Macroeconomic management was unusually good and macroeconomic performance unusually stable, providing the essential framework for private investment. Policies to increase the integrity of the banking system, and to make it more accessible to non-traditional savers, raised the levels of financial savings. Education policies that focused on primary and secondary schools generated rapid increases in labor force skills. Agricultural policies stressed productivity and did not tax the rural economy excessively. All the HPAEs kept price distortions within reasonable bounds and were open to foreign ideas and technology.

But these fundamental policies do not tell the entire story. In most of these economies, in one form or another, the government intervened—systematically and through multiple channels—to foster development, and in some cases the development of specific industries. Policy interventions took many forms: targeting and subsidizing credit to selected industries, keeping deposit rates low and maintaining ceilings on borrowing rates to increase profits and retained earnings, protecting domestic import substitutes, subsidizing declining industries, establishing and financially supporting government banks, making public investments in applied research, establishing firm- and industry-specific

export targets, developing export marketing institutions, and sharing information widely between public and private sectors. Some industries were promoted, while others were not.

At least some of these interventions violate the dictum of establishing for the private sector a level playing field, a neutral incentives regime. Yet these strategies of selective promotion were closely associated with high rates of private investment and, in the fastest-growing economies, high rates of productivity growth. Were some selective interventions, in fact, good for growth?

In addressing this question, we face a central methodological problem. Since we chose the HPAEs for their unusually rapid growth, we know already that their interventions did not significantly inhibit growth. But it is very difficult to establish statistical links between growth and a specific intervention and even more difficult to establish causality. Because we cannot know what would have happened in the absence of a specific policy, it is difficult to test whether interventions increased growth rates. Other economies attempted similar interventions without success, and on average they used them more pervasively than in the HPAEs. Because the HPAEs differed from less successful economies both in their closer adherence to policy fundamentals and in the manner in which they implemented interventions, it is virtually impossible to measure the relative impact of fundamentals and interventions on HPAE growth. Thus, in attempting to distinguish interventions that contributed to growth from those that were either growth-neutral or harmful to growth, we cannot offer a rigorous counterfactual scenario. Instead, we have had to be content with what Keynes called an "essay in persuasion," based on analytical and empirical judgments.

Our judgment is that in a few economies, mainly in Northeast Asia, in some instances, government interventions resulted in higher and more equal growth than otherwise would have occurred. However, the prerequisites for success were so rigorous that policymakers seeking to follow similar paths in other developing economies have often met with failure. What were these prerequisites? First, governments in Northeast Asia developed institutional mechanisms which allowed them to establish clear performance criteria for selective interventions and to monitor performance. Intervention has taken place in an unusually disciplined and performance-based manner (Amsden 1989). Second, the costs of interventions, both explicit and implicit, did not become excessive. When fiscal costs threatened the macroeconomic stability of Korea and

Malaysia during their heavy and chemical industries drives, governments pulled back. In Japan the Ministry of Finance acted as a check on the ability of the Ministry of International Trade and Industry to carry out subsidy policies, and in Indonesia and Thailand balanced budget laws and legislative procedures constrained the scope for subsidies. Indeed, when selective interventions have threatened macroeconomic stability, HPAE governments have consistently come down on the side of prudent macroeconomic management. Price distortions arising from selective interventions were also less extreme than in many developing economies.

In the newly industrializing economies of Southeast Asia, government interventions played a much less prominent and frequently less constructive role in economic success, while adherence to policy fundamentals remained important. These economies' capacity to administer and implement specific interventions may have been less than in Northeast Asia. Their rapid growth, moreover, has occurred in a very different international economic environment from the one that Japan, Korea, and Taiwan, China, encountered during their most rapid growth. Thus the problem is not only to try to understand which specific policies may have contributed to growth, but also to understand the institutional and economic circumstances that made them viable. Indeed, the experience of the Southeast Asian economies, whose initial conditions parallel those of many developing economies today, may prove to have more relevance outside the region than that of Northeast Asia.

The book is organized as follows: chapter 1 describes the distinguishing characteristics of the East Asian economic miracle, rapid growth with equity, and uses economic models to attempt to account for this growth. Chapter 2 reviews policy explanations for East Asia's economic success and introduces the framework that we will use throughout to explore the relationship between public policy and economic growth. Chapter 3 discusses pragmatism and flexibility in the formulation of policies that led to two important characteristics of the HPAEs' economic performance: macroeconomic stability and rapid growth of manufactured exports. Chapter 4 discusses the role of institutions. Chapter 5 looks at the role of public policy in the HPAEs' unusually rapid accumulation of physical and human capital, while chapter 6 analyzes the means used to achieve efficient allocation of resources and productivity growth. Chapter 7, in conclusion, assesses the success of East Asian polices and their applicability in a changing world economy. The remainder of this

overview parallels the organization of the book, highlighting the central arguments and conclusions.

The Essence of the Miracle: Rapid Growth with Equity

THE EIGHT HPAEs ARE HIGHLY DIVERSE IN NATURAL resources, population, culture, and economic policy. What shared characteristics cause them to be grouped together and set apart from other developing economies? First, as we noted above, they had rapid, sustained growth between 1960 and 1990. This in itself is unusual among developing economies; others have grown quickly for periods but not for decades at such high rates. The HPAEs are unique in that they combine this rapid, sustained growth with highly equal income distributions. They also all have been characterized by rapid demographic transitions, strong and dynamic agricultural sectors, and unusually rapid export growth (see chapter 1).

The HPAEs also differ from other developing economies in three factors that economists have traditionally associated with economic growth. High rates of investment, exceeding 20 percent of GDP on average between 1960 and 1990, including in particular unusually high rates of private investment, combined with high and rising endowments of human capital due to universal primary and secondary education, tell a large part of the growth story. These factors account for roughly two-thirds of the growth in the HPAEs. The remainder is attributable to improved productivity. Such high levels of productivity growth are quite unusual. In fact, productivity growth in the HPAEs exceeds that of most other developing and industrial economies. This superior productivity performance comes from the combination of unusual success at allocating capital to high-yielding investments and at catching up technologically to the industrial economies.

Public Policies and Growth

What was the role of public policy in helping the HPAEs to rapidly accumulate human and physical capital and to allocate those resources to high-yielding investments? Did policies assist in promoting rapid produc-

tivity growth? There are several explanations for East Asia's success. Geography and culture were clearly important; however, they do not entirely account for the high-performing economies' success, as the presence of unsuccessful economies in the same region attests. Among the variety of policy explanations, two broad views have emerged (see chapter 2).

Adherents of the *neoclassical view* stress the HPAEs' success in getting the basics right. They argue that the successful Asian economies have been better than others at providing a stable macroeconomic environment and a reliable legal framework to promote domestic and international competition. They also stress that the orientation of the HPAEs toward international trade and the absence of price controls and other distortionary policies have led to low relative price distortions. Investments in people, education, and health are legitimate roles for government in the neoclassical framework, and its adherents stress the importance of human capital in the HPAEs' success.

Adherents of the *revisionist view* have successfully shown that East Asia does not wholly conform to the neoclassical model. Industrial policy and interventions in financial markets are not easily reconciled within the neoclassical framework. Some policies in some economies are much more in accord with models of state-led development. Moreover, while the neoclassical model would explain growth with a standard set of relatively constant policies, the policy mixes used by East Asian economies were diverse and flexible. Revisionists argue that East Asian governments "led the market" in critical ways. In contrast to the neoclassical view, which acknowledges relatively few cases of market failure, revisionists contend that markets consistently fail to guide investment to industries that would generate the highest growth for the overall economy. In East Asia, the revisionists argue, governments remedied this by deliberately "getting the prices wrong"—altering the incentive structure—to boost industries that would not otherwise have thrived (Amsden 1989).

The revisionist school has provided valuable insights into the history, role, and extent of East Asian interventions, demonstrating convincingly the scope of government actions to promote industrial development in Japan, Korea, Singapore, and Taiwan, China. But, in general its proponents have not claimed to establish that interventions *per se* accelerated growth. Moreover, as we shall show, some important government interventions in East Asia, such as Korea's promotion of chemicals and heavy industries, have had little apparent impact on industrial structure.

In other instances, such as Singapore's effort to squeeze out labor-intensive industries by boosting wages, policies have clearly backfired. Thus neither view fully accounts for East Asia's phenomenal growth.

The Market-Friendly View. In describing the policies associated with rapid growth, *World Development Report 1991* (World Bank 1991b) expands on the neoclassical view, clarifying systematically how rapid growth in developing countries has been associated with effective but carefully limited government activism. In the "market-friendly" strategy it articulates, the appropriate role of government is to ensure adequate investments in people, provide a competitive climate for private enterprise, keep the economy open to international trade, and maintain a stable macroeconomy. Beyond these roles, the report argues, governments are likely to do more harm than good, unless interventions are market friendly. On the basis of an exhaustive review of the experience of developing economies during the last thirty years, it concludes that attempts to guide resource allocation with nonmarket mechanisms have generally failed to improve economic performance.

The market-friendly approach captures important aspects of East Asia's success. These economies are stable macroeconomically, have high shares of international trade in GDP, invest heavily in people, and have strong competition among firms. But these characteristics are the outcome of many different policy instruments. And the instruments chosen, particularly in the northeastern HPAEs, Japan, Korea, and Taiwan, China, sometimes included extensive government intervention in markets to guide private-sector resource allocation. The success of these northeastern economies, moreover, stands up well to the less interventionist paths taken by Hong Kong, Malaysia, and more recently Indonesia and Thailand.

A Functional Approach to Understanding Growth. To explore these varying paths to economic success, we have developed a framework that seeks to link rapid growth to the attainment of three functions. In this view, each of the HPAEs maintained macroeconomic stability *and* accomplished three functions of growth: accumulation, efficient allocation, and rapid technological catch-up. They did this with combinations of policies, ranging from market oriented to state led, that varied both across economies and over time.

We classify policies into two broad groups: fundamentals and selective interventions. Among the most important fundamental policies are those that encourage macroeconomic stability, high investments in

human capital, stable and secure financial systems, limited price distortions, and openness to foreign technology. Selective interventions include mild financial repression (keeping interest rates positive but low), directed credit, selective industrial promotion, and trade policies that push nontraditional exports. We try to understand how government policies, both fundamental and interventionist, may have contributed to faster accumulation, more efficient allocation, and higher productivity growth.

We maintain as a guiding principle that for interventions that attempt to guide resource allocation to succeed, they must address failures in the working of markets. Otherwise, markets would perform the allocation function more efficiently. We identify a class of economic problems, coordination failures, which can lead markets to fail, especially in early stages of development. We then interpret some of the interventionist policies in East Asia as responses to these coordination problems—responses that emphasized cooperative behavior among private firms and clear performance-based standards of success.

Competitive discipline is crucial to efficient investment. Most economies employ only market-based competition. We argue that some HPAEs have gone a step further by creating contests that combine competition with the benefits of cooperation among firms and between government and the private sector. Such contests range from very simple nonmarket allocation rules, such as access to rationed credit for exporters, to very complex coordination of private investment in the government-business deliberation councils of Japan and Korea. The key feature of each contest, however, is that the government distributes rewards—often access to credit or foreign exchange—on the basis of performance, which the government and competing firms monitor. To succeed, selective interventions must be disciplined by competition via either markets or contests.

Economic contests, like all others, require competent and impartial referees—that is, strong institutions. Thus, a high-quality civil service that has the capacity to monitor performance and is insulated from political interference is essential to contest-based competition. Of course, a high-quality civil service also augments a government's ability to design and implement non-contest-based policies.

Our framework is an effort to order and interpret information. We are not suggesting that HPAE governments set out to achieve the functions of growth. Rather, they used multiple, shifting policy instruments

in pursuit of more straightforward economic objectives such as macroeconomic stability, rapid export growth, and high savings. Pragmatic flexibility in the pursuit of such objectives—the capacity and willingness to change policies—is as much a hallmark of the HPAEs as any single policy instrument. This is well illustrated by the great variety of ways in which the HPAEs achieved two important objectives: macroeconomic stability and rapid export growth (see chapter 3).

Achieving Macroeconomic Stability and Export Growth

More than most developing economies, the HPAEs were characterized by responsible macroeconomic management. In particular, they generally limited fiscal deficits to levels that could be prudently financed without increasing inflationary pressures and responded quickly when fiscal pressures were perceived to be building up. During the past thirty years, annual inflation averaged approximately 9 percent in these economies, compared with 18 percent in other low- and middle-income economies. Because inflation was both moderate and predictable, real interest rates were far more stable than in other low- and middle-income economies. Macroeconomic stability encouraged long-term planning and private investment and, through its impact on real interest rates and the real value of financial assets, helped to increase financial savings. The HPAEs also adjusted their macroeconomic policies to terms of trade shocks more quickly and effectively than other low- and middle-income economies. As a result, they have enjoyed more robust recoveries of private investment.

Many of the policies that fostered macroeconomic stability also contributed to rapid export growth. Fiscal discipline and high public savings allowed Japan and Taiwan, China, to undertake extended periods of exchange rate protection. Adjustments to exchange rates in other HPAEs—validated by policies that reduced expenditures—kept them competitive, despite differential inflation with trading partners.

In addition to macroeconomic policies, the HPAEs used a variety of approaches to promoting exports. All (except Hong Kong) began with a period of import substitution, and a strong bias against exports. But each moved to establish a pro-export regime more quickly than other developing economies. First Japan, in the 1950s and early 1960s, and then the Four Tigers, in the late 1960s, shifted trade policies to encourage manufactured exports. In Japan, Korea, and Taiwan, China, govern-

ments established a pro-export incentive structure that coexisted with moderate but highly variable protection of the domestic market. A wide variety of instruments was used, including export credit, duty-free imports for exporters and their suppliers, export targets, and tax incentives. In the Southeast Asian NIEs the export push came later, in the early 1980s, and the instruments were different. Reductions in import protection were more generalized and were accompanied by export credit and supporting institutions. In these economies export development has relied less on highly selective interventions and more on broadly based market incentives and direct foreign investment.

Building the Institutional Basis for Growth

Some economists and political scientists have argued that the East Asian miracle is due to the high quality and authoritarian nature of the region's institutions. They describe East Asian political regimes as "developmental states" in which powerful technocratic bureaucracies, shielded from political pressure, devise and implement well-honed interventions. We believe developmental state models overlook the central role of government-private sector cooperation. While leaders of the HPAEs have tended to be either authoritarian or paternalistic, they have also been willing to grant a voice and genuine authority to a technocratic elite and key leaders of the private sector. Unlike authoritarian leaders in many other economies, leaders in the HPAEs realized that economic development was impossible without cooperation (see chapter 4).

The Principle of Shared Growth. To establish their legitimacy and win the support of the society at large, East Asian leaders established the principle of shared growth, promising that as the economy expanded all groups would benefit. But sharing growth raised complex coordination problems. First, leaders had to convince economic elites to support pro-growth policies. Then they had to persuade the elites to share the benefits of growth with the middle class and the poor. Finally, to win the cooperation of the middle class and the poor, the leaders had to show them that they would indeed benefit from future growth.

Explicit mechanisms were used to demonstrate the intent that all would have a share of future wealth. Korea and Taiwan, China, carried out comprehensive land reform programs; Indonesia used rice and fertilizer price policies to raise rural incomes; Malaysia introduced explicit wealth-sharing programs to improve the lot of ethnic Malays relative to

the better-off ethnic Chinese; Hong Kong and Singapore undertook massive public housing programs; and in several economies, governments assisted workers' cooperatives and established programs to encourage small and medium-size enterprises. Whatever the form, these programs demonstrated that the government intended for all to share the benefits of growth.

Creating a Business-Friendly Environment. To tackle coordination problems, leaders needed institutions and mechanisms to reassure competing groups that each would benefit from growth. The first step was to recruit a competent and relatively honest technocratic cadre and insulate it from day-to-day political interference. The power of these technocracies has varied greatly. In Japan, Korea, Singapore, and Taiwan, China, strong, well-organized bureaucracies wield substantial power. Other HPAEs have had small, general-purpose planning agencies. But in each economy, economic technocrats helped leaders devise a credible economic strategy.

Leaders in the HPAEs also built a business-friendly environment. A major element of that environment was a legal and regulatory structure that was generally hospitable to private investment. Beyond this the HPAEs have with varying degrees of success enhanced communication between business and government. Japan, Korea, Malaysia, and Singapore have established forums, which we call deliberation councils, in which private sector groups are invited to help shape and implement the government policies relevant to their interests. In contrast to lobbying, where rules are murky and groups seek secret advantage over one another, the deliberation councils are intended to make allocation rules clear to all participants.

Using Deliberation Councils. In Japan and Korea technocrats used deliberation councils to establish contests among firms. Because the private sector participated in drafting the rules, and because the process was transparent to all participants, private sector groups became more willing participants in the leadership's development efforts. One by-product of these contests was a tendency to reduce the private resources devoted to wasteful rent-seeking activities, thus making more available for productive endeavors. Deliberation councils also facilitated information exchanges between the private sector and government, among firms, and between management and labor. The councils thus supplemented the market's information transmission function, enabling the HPAEs to respond more quickly than other economies to changing markets.

Institutions of business-government communication have not been static in the HPAEs. The role of the deliberation council is changing in Japan and Korea to a more indicative and consensus-building role, along functional as opposed to industry-specific lines. In Malaysia the councils appear to be increasing in importance and scope. In Thailand the formal mechanisms of communication have generally been used to present businesses' positions to government and to reduce the private sector's suspicion of government. In institutional development, as in economic policymaking, East Asian governments have changed with changing circumstances.

Accumulating Human and Physical Capital

Drawing on the strength of their institutions, East Asian economies used a combination of fundamental and interventionist policies to achieve rapid accumulation of human and physical resources. Fundamentals included such traditional government obligations as providing adequate infrastructure, education, and secure financial institutions. Interventions included mild repression of interest rates, state capitalism, mandatory savings mechanisms, and socialization of risk (see chapter 5).

Building Human Capital. The East Asian economies had a head start in terms of human capital and have since widened their lead over other developing economies. In the 1960s, levels of human capital were already higher in the HPAEs than in other low- and middle-income economies. Governments built on this base by focusing education spending on the lower grades; first by providing universal primary education, later by increasing the availability of secondary education. Rapid demographic transitions facilitated these efforts by slowing the growth in the number of school-age children and in some cases causing an absolute decline. Declining fertility and rapid economic growth meant that, even when education investment as a share of GDP remained constant, more resources were available per child. Limited public funding of post-secondary education focused on technical skills, and some HPAEs imported educational services on a large scale, particularly in vocationally and technologically sophisticated disciplines. The result of these policies has been a broad, technically inclined human capital base well-suited to rapid economic development.

HPEA education policies also contributed to more equitable income distributions. To be sure, initial conditions helped to set up a virtuous circle: initial low inequality in income and education led to educational

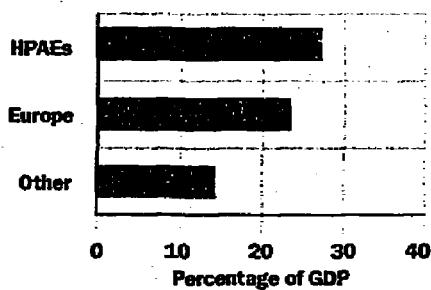
expansion, which reinforced low inequality. In addition, by focusing spending on primary and secondary education, and leaving demand for tertiary education to be largely met by a self-financed private system, governments served large segments of the population that otherwise would have lacked access to education.

Increasing Savings and Investment. The HPAEs increased savings and investment with a combination of fundamental and interventionist policies. Two fundamental policy areas provided a foundation for high and rising savings rates. First, by avoiding inflation, the HPAEs avoided volatility of real interest rates on deposits and ensured that rates were largely positive. As a result, the HPAEs have generally offered higher real interest rates on deposits in the financial system than other developing economies. Second, they ensured the security of banks and made them more convenient to small and rural savers. The major instruments used to build a secure, bank-based financial system were strong prudential regulation and supervision, limits on competition, and institutional reforms. In Japan, Korea, Malaysia, Singapore, and Taiwan, China, postal savings systems lowered transaction costs and increased the safety of saving while making substantial resources available to government. These initiatives promoted rapid growth of deposits in financial institutions (see figure 4).

Some governments also used a variety of more interventionist mechanisms to increase savings. Singapore and Taiwan, China, maintained unusually high public savings rates. Malaysia and Singapore compelled high private savings rates through mandatory provident fund contributions. Japan, Korea and Taiwan, China, all imposed stringent controls and high interest rates on loans for consumer items, and levied stiff taxes on so-called luxury consumption. Whether these more interventionist measures to increase savings improved welfare is open to debate. On one hand, making consumers save when they would not have otherwise imposes a welfare cost. On the other, the benefits are apparent in the rapid growth of these economies. Savings, forced or not, generated high payoffs based on consistently high rates of return to investments. In contrast to other economies that have used compulsory savings, such as the former Soviet Union, welfare costs were clearly offset by substantive benefits.

The HPAEs encouraged investment by several means. First, they did a better job than most developing economies at creating infrastructure that was complementary to private investment. Second, they created an investment-friendly environment through a combination of tax policies

Figure 4 Savings Rates of HPAEs and Selected Economies, 1970-88



Note: Europe includes Austria, Belgium, Denmark, Finland, France, the Federal Republic of Germany before reunification, Greece, Iceland, Ireland, Italy, Luxembourg, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, and the United Kingdom. "Other" includes these developing economies: Argentina, Brazil, Chile, Colombia, Côte d'Ivoire, Egypt, Ghana, India, Mexico, Morocco, Nigeria, Pakistan, Peru, Sri Lanka, Turkey, Uruguay, Venezuela, the former Yugoslavia, and Zaire.

Source: Summers and Heston (1991).

favoring investment and of policies that kept the relative prices of capital goods low, largely by avoiding high tariffs on imported capital goods. These fundamental policies had an important impact on private investment. Third and more controversial, most HPAE governments held deposit and lending rates below market clearing levels—a practice termed financial repression.

Japan, Korea, Malaysia, Thailand, and Taiwan, China, had extended periods of mild financial repression. To be sure, increasing interest rates from negative to zero or mildly positive real rates and avoiding fluctuations (by avoiding unstable inflation) encourages financial savings. But because savings are not very responsive to marginal changes in positive real interest rates, HPAE governments were able to mildly repress interest rates on deposits with a minimal impact on savings and to pass the lower rates to final borrowers. Because savers were mostly households and borrowers were mostly firms, this resulted in a transfer of income from households to firms and in a change in the form in which savings were held, from debt to corporate equity.

Holding down interest rates on loans increases excess demand for credit, which in turn leads to rationing of credit by the government itself or by private sector banks working with government guidance. This heightens the risk that capital will be misallocated. Thus there is a trade-off between the possible increase in investment and the risk that the increased capital will be badly invested. There is some evidence that in Japan, Korea, and Taiwan, China, governments allocated credit to activities with high social returns, especially to exports. If this was the case, there may have been benefits from mild financial repression and government-guided allocation; microeconomic evidence from Japan supports the view that access to government credit increased investment (see chapter 6).

Generally, financial repression is associated with low economic growth, especially when real interest rates are strongly negative. But tests of the relationship between interest rates and growth in Japan, Korea, and Taiwan, China, do not show the negative relationship between interest rate repression and growth found in cross-economy comparative studies (see chapter 5). While we cannot establish conclusively that mild repression of interest rates at positive real levels enhanced growth in northeast Asia, it apparently did not inhibit it.

Finally, some governments, especially in the northeastern Asian tier, have encouraged investment by spreading private investment risks to the

public. In some economies the government owned or controlled the institutions providing investment funds, in others it offered explicit credit guarantees, and in still others it implicitly guaranteed the financial viability of promoted projects. Relationship banking by a variety of public and private banking institutions in Hong Kong, Japan, Korea, Malaysia, Singapore, Thailand, and Taiwan, China, involved the banking sector in the management of troubled enterprises, increasing the likelihood of creditor workouts. Directed-credit programs in Japan, Korea, and Taiwan, China, signaled directions of government policy and provided implicit insurance to private banks.

Efficient Allocation and Productivity Change

Some policies that favored accumulation in the HPAEs, including financial repression and the socialization and bounding of risk, could have adversely affected the allocation of resources. Similarly, industrial targeting could have resulted in extensive rent-seeking and great inefficiency. Apparently they did not. The allocational rules followed by HPAE governments—particularly the devices used to shift market incentives—are therefore among the most controversial aspects of the East Asian success story (see chapter 6).

Like policies related to accumulation, policies affecting allocation and productivity change fall into fundamental and interventionist categories. Labor market policies tended to rely on fundamentals, using the market and reinforcing its flexibility. In capital markets, governments intervened systematically, both to control interest rates and to direct credit, but acted within a framework of careful monitoring and generally low subsidies to borrowers. Trade policies have included substantial protection of local manufacturers, but less than in most other developing countries; in addition, HPAE governments offset some disadvantages of protection by actively supporting exports. Finally, while interventions to support specific industries have generally not been successful, the export-push strategy—the mix of fundamental and interventionist policies used to encourage rapid manufactured export growth—has resulted in numerous benefits, including more efficient allocation, increased acquisition of foreign technology, and more rapid productivity growth.

Flexible Labor Markets. Government roles in labor markets in the successful Asian economies contrast sharply with the situation in most

other developing economies. HPAE governments have generally been less vulnerable and less responsive than other developing-economy governments to organized labor's demands to legislate a minimum wage. Rather, they have focused their efforts on job generation, effectively boosting the demand for workers. As a result, employment levels have risen first, followed by market- and productivity-driven increases in wage levels. Because wages or at least wage rate increases have been downwardly flexible in response to changes in the demand for labor, adjustment to macroeconomic shocks has generally been quicker and less painful in East Asia than in other developing regions. Rapid adjustments helped to sustain growth, which in turn made more rapid real wage growth possible.

High productivity and income growth in agriculture helped to keep East Asian urban wages close to the supply price of labor. In contrast to many other developing economies, where the gap between urban and rural incomes has been large and growing, in the HPAEs the incomes of urban and rural workers with similar skill levels have risen roughly at the same pace; moreover, the overall gap between urban and rural incomes is smaller in the HPAEs than in other developing economies.

In Sub-Saharan Africa, Latin America, and South Asia, where wages in the urban formal sector are often pushed up by legislated minimum wages and other nonmarket forces, urban wage earners often have incomes twice their counterparts' in informal sectors. In contrast, the gap between the formal and informal sectors in East Asia is only about 20 percent. Smaller income gaps contribute to overall social stability, thus enhancing the environment for growth.

Capital Markets and Allocation. Most HPAEs influenced credit allocation in three ways: (i) by enforcing regulations to improve private banks' project selection; (ii) by creating financial institutions, especially long-term credit (development) banks; and (iii) by directing credit to specific sectors and firms through public and private banks. All three approaches can be justified in theory, and each has worked in some HPAEs. Yet each involves progressively more government intervention in credit markets and so carries a higher risk.

Government relationships with banks in the HPAEs have varied widely. In Hong Kong banks are private and regulated primarily to ensure their solvency. In Indonesia, Malaysia, Singapore, and Thailand, banks are privately owned and exercise independent authority over lending. While governments have broadly guided credit allocations through

regulations and moral suasion, project selection is generally left to bankers. In other HPAEs, banks have been subject to direct state control or stringent credit allocation guidelines. For example, Indonesia, Korea, and Taiwan, China, tightly controlled the allocation of credit by public commercial banks.

Each of the HPAEs made some attempts to direct credit to priority activities. All East Asian economies except Hong Kong give automatic access to credit for exporters. Housing was a priority in Singapore and Hong Kong, while agriculture and small and medium-size enterprises were targeted sectors in Indonesia, Malaysia, and Thailand. Taiwan, China, has recently targeted technological development. Japan and Korea have used credit as a tool of industrial policy, organizing contests through deliberative councils to promote at various times the shipbuilding, chemical, and automobile industries.

The implicit subsidy of directed-credit programs in the HPAEs was generally small, especially in comparison to other developing economies, but access to credit and the signal of government support to favored sectors or enterprises were important. In Korea, the subsidy from preferential credit was large during the 1970s, resulting in a large gap between bank and curb market interest rates. This gap has declined sharply in recent years, as Korea has shifted away from heavy credit subsidies to selected sectors. In Japan implicit subsidies were small, and the direction of credit may have been more important as a signaling and insurance mechanism than as an incentive.

Although East Asia's directed-credit programs were designed to achieve policy objectives, they nevertheless included strict performance criteria. In Japan, public bank managers chose projects on basic economic criteria, employing rigorous credit evaluations to select among applicants that fell within government sectoral targets. In Korea, the government individually monitored the large conglomerates using market-oriented criteria such as exports and profitability. In some cases, major enterprises that failed to meet these tests were driven into bankruptcy. Recent assessments of the directed-credit programs in Japan and Korea provide microeconomic evidence that directed-credit programs in these economies increased investment, promoted new activities and borrowers, and were directed at firms with high potential for technological spillovers. Thus these performance-based directed-credit mechanisms appear to have improved credit allocation, especially during the early stages of rapid growth (see chapter 6).

Directed-credit programs in other HPAEs have usually lacked strong, performance-based allocation and monitoring and therefore have been largely unsuccessful. Even in the northern-tier economies, the increasing level of financial sector development and their increasing openness to international capital flows have meant that directed-credit programs have declined in importance, as the economies have liberalized their financial sectors.

Openness to Foreign Technology. The HPAEs have actively sought foreign technology through a variety of mechanisms. All welcomed technology transfers in the form of licenses, capital goods imports, and foreign training. Openness to direct foreign investment (DFI) has speeded technology acquisition in Hong Kong, Malaysia, Singapore, and, more recently, Indonesia and Thailand. Japan, Korea and, to a lesser extent, Taiwan, China, restricted DFI but offset this disadvantage by aggressively acquiring foreign knowledge through licenses and other means.

In contrast, other low- and middle-income economies such as India and Argentina have adopted policies that hindered the acquisition of foreign knowledge. Often they have been preoccupied with supposedly excessive prices for licenses. They have refused to provide foreign exchange for trips to acquire knowledge, been restrictive of DFI, and have attempted prematurely to build up their machine-producing sectors, thus forgoing the advanced technology embodied in imported equipment.

Promoting Specific Industries. Most East Asian governments have pursued sector-specific industrial policies to some degree. The best-known instances include Japan's heavy industry promotion policies of the 1950s and the subsequent imitation of these policies in Korea. These policies included import protection as well as subsidies for capital and other imported inputs. Malaysia, Singapore, Taiwan, China, and even Hong Kong have also established programs—typically with more moderate incentives—to accelerate development of advanced industries. Despite these actions we find very little evidence that industrial policies have affected either the sectoral structure of industry or rates of productivity change. Indeed, industrial structures in Japan, Korea, and Taiwan, China, have evolved during the past thirty years as we would expect given factor-based comparative advantage and changing factor endowments.

It is not altogether surprising that industrial policy in Japan, Korea, and Taiwan, China, produced mainly market-conforming results. While these governments selectively promoted capital- and knowledge-intensive industries, they also took steps to ensure that they were fostering profitable, internationally competitive firms. Moreover, their

industrial policies incorporated a large amount of market information and used performance, usually export performance, as a yardstick. Efforts elsewhere to promote specific industries without better information exchange and the discipline of international markets have not succeeded. This has been the case with the ambitious industrial policy programs in Brazil and India, and with the more limited but also disappointing efforts to build an aerospace industry in Indonesia and to promote heavy industries in Malaysia.

Export Push: A Winning Mix of Fundamentals and Interventions. One combination of fundamental and interventionist policies practiced in the HPAEs has been a significant source of rapid productivity growth: the active promotion of manufactured exports. Although all HPAEs except Hong Kong passed through an import-substitution phase, with high and variable protection of domestic import substitutes, these periods ended earlier than in other economies, typically because of a compelling need for foreign exchange. In contrast to many other economies, which tried to preserve foreign exchange with stricter import controls, the HPAEs set out to earn additional foreign exchange by increasing exports. Hong Kong and Singapore adopted trade regimes that were close to free trade; Japan, Korea, and Taiwan, China, adopted mixed regimes that were largely free for export industries. In the 1980s, Indonesia, Malaysia, and Thailand have adopted a wide variety of export incentives while gradually reducing protection. Exchange rate policies were liberalized, and currencies frequently devalued, to support export growth. Overall, these policies exposed much of the industrial sector to international competition and resulted in domestic relative prices that were closer to international prices than in most other developing economies.

The northern-tier economies—Japan, Korea, and Taiwan, China—halted the process of import liberalization, often for extended periods, and heavily promoted exports. Thus while incentives were largely equal between exports and imports, this was the result of countervailing subsidies rather than trade neutrality; the promotion of exports coexisted with protection of the domestic market. In the Southeast Asian HPAEs, conversely, governments used gradual but continuous liberalization of the trade regime, supplemented by institutional support for exporters, to achieve the export push. In both cases governments were credibly committed to the export-push strategy; producers, even those in the protected domestic market, knew that sooner or later their time to export would come.

East Asia's sectoral policies were usually geared toward export performance, in contrast to the inward-oriented policies of less successful developing economies. Japan, Korea, Singapore, and Taiwan, China, all relied on economic performance criteria, usually exports, to judge success. For example, in Taiwan, China, the government suspended domestic-content requirements that interfered with the exports of foreign investors. In addition, sectoral policies were closely monitored and frequently adjusted. Thus, many of East Asia's "industrial upgrading" programs of the late 1970s and early 1980s were substantially modified or abandoned when they failed to produce satisfactory results. Using the export rule meant that even programs of selective industrial promotion were indirectly export promoting.

Manufactured export growth also provided a powerful mechanism for technological upgrading in imperfect world technology markets. Because firms that export have greater access to best-practice technology, there are both benefits to the enterprise and spillovers to the rest of the economy that are not reflected in market transactions. These information-related externalities are an important source of rapid productivity growth. Both cross-economy evidence and more detailed studies at the industry level in Japan, Korea, and Taiwan, China, confirm the significance of exports to rapid productivity growth.

These experiences suggest that economies that are making the transition from highly protectionist import-substitution regimes to more balanced incentives would benefit from combining import liberalization with a strong commitment to exports and active export promotion, especially in those cases in which the pace of liberalization is moderate.

Policies for Rapid Growth in a Changing World Economy

WHAT ARE THE BROAD LESSONS OF SUCCESS IN THE HPAEs? Their rapid growth had two complementary elements. First, getting the fundamentals right was essential. Without high levels of domestic savings, broadly based human capital, good macroeconomic management, and limited price distortions, there would have been no basis for growth and no means by which the gains of rapid productivity change could have been realized. Policies to assist the financial

sector capture nonfinancial savings and to increase household and corporate savings were central. Acquisition of technology through openness to direct foreign investment and licensing were crucial to rapid productivity growth. Public investment complemented private investment and increased its orientation to exports. Education policies stressed universal primary schooling and improvements in quality at primary and secondary levels.

Second, very rapid growth of the type experienced by Japan, the Four Tigers, and more recently the East Asian NIES has at times benefited from careful policy interventions. All interventions carry costs, either in the direct fiscal costs of subsidies or forgone revenues, or the implicit taxation of households and firms, for example, through tariffs or interest rate controls. Unlike many other governments that attempted such interventions, HPAE governments generally held costs within well-defined limits. Thus, price distortions were mild, interest rate controls used international interest rates as a benchmark, and explicit subsidies were kept within fiscally manageable bounds. Given the overriding importance ascribed to macroeconomic stability, interventions that became too costly or otherwise threatened stability were quickly modified or abandoned.

Whether these interventions contributed to the rapid growth made possible by good fundamentals or detracted from it is the most difficult question we have attempted to answer. It is much easier to show that the HPAEs limited the costs and duration of inappropriately chosen interventions—*itself* an impressive achievement—than to demonstrate conclusively that those interventions maintained for a long time accelerated growth. Our assessment of three major uses of intervention is that promotion of specific industries generally did not work and therefore holds little promise for other developing economies. Mild financial repression combined with directed credit has worked in certain situations but carries high risk. Export-push strategies have been by far the most successful combination of fundamentals and policy interventions and hold the most promise for other developing economies (chapter 7).

But are these approaches feasible in the early 1990s? While limited repression of interest rates may have contributed to overall higher rates of investment in Japan, Korea, and Taiwan, China, these three north-eastern economies undertook their initial growth spurts—and their most sustained and forceful repression of interest rates—during a period when it was possible for a developing economy to close its financial mar-

kets to the outside world. Furthermore, strong bureaucracies and a general climate of government-private sector cooperation meant that their restrictions on capital outflows were more effective than similar restrictions in many other economies. In today's increasingly global economic environment, few governments have the ability or desire to close their financial markets. Indeed, many East Asian governments are in the process of liberalizing restrictions on capital flows. In such circumstances, the scope for repressing interest rates without provoking capital flight is sharply narrowed. However, in some exceptional instances, very mild financial repression of short duration to increase corporate equity remains a viable option. This has been the case in Malaysia, which has wide open financial markets but nonetheless succeeded with very mild financial repression for more than a year.

The export-push strategy appears to hold great promise for other developing economies. But the conditions of market access under the General Agreement on Tariffs and Trade (GATT), and other trading arrangements, will hamper developing economies' use of policies viewed as unfair in major industrial-economy markets. Subsidies to exports and directed-credit programs linked to exports are not generally consistent with the GATT and may therefore invite retaliation from trading partners. Furthermore, like financial repression, these highly directed interventions require a high level of institutional capacity now lacking in most developing economies. Fortunately, many powerful instruments of export promotion are not only within the institutional capacity of many developing economies but remain viable in today's economic environment. Creating a free trade environment for exporters, providing finance and support services for small and medium-size exporters, improving trade-related aspects of the civil service, aggressively courting export-oriented direct foreign investment, and focusing infrastructure on areas that encourage exports are all attainable goals that are unlikely to provoke opposition from trading partners. Indeed, some or all of these have been part of the export push in Indonesia, Malaysia, and Thailand. These three economies, the most recent participants in the "economic miracle," may show the way for the next generation of developing economies to follow export-push strategies.

■ ■ ■

The phenomenal success of the HPAEs is already inspiring attempts at imitation. We have shown that the HPAEs used an immense variety of

policies to achieve three critical functions of growth: accumulation, allocation, and productivity growth. The sheer diversity of these policies precludes drawing any simple lessons or making any simple recommendations, except perhaps that pragmatic adherence to the fundamentals is central to success. These market-oriented aspects of East Asia's experience can be recommended with few reservations. More institutionally demanding strategies have often failed in other settings and they clearly are not compatible with economic environments where the fundamentals are not securely in place. The use of contests in Japan and Korea required competent and insulated civil servants. In parts of Sub-Saharan Africa and Latin America, and elsewhere in Asia where such institutional conditions are lacking, activist government involvement in the economy has usually gone awry. So the fact that interventions were an element of some East Asian economies' success does not mean that they should be attempted everywhere, nor should it be taken as an excuse to postpone needed market-oriented reform.

The success of the HPAEs broadens our understanding of the range of policies that are consistent with rapid development. It also teaches us that willingness to experiment and to adapt policies to changing circumstances is a key element in economic success. In the following chapters we explore more fully the contribution of fundamental and interventionist policies to East Asia's remarkable growth, and the crucial role that institutions have played in their evolution and application. As we shall see, making a miracle is no simple matter.

Note

1. Japan, which has been firmly in the ranks of industrial economies arguably for all of this century, may at first seem to be an inappropriate subject for study. However many of the policy instruments used by the Japanese government during the period of rapid growth, 1950–73,

have been used subsequently by developing economies. Thus, notwithstanding Japan's longer history of modern economic growth, it may provide some useful insights into the relationship between public policy and growth.



Strategies for Rapid Accumulation

ACUMULATION OF PRODUCTIVE ASSETS IS THE foundation of economic growth. It is therefore not surprising that, as shown in chapter 1, the high-performing Asian economies (HPAEs) accumulated both physical and human capital much more rapidly and consistently than other economies and that accumulation accounts for a large portion of their superior performance. More interesting is the question of how the HPAEs were able to achieve these rapid rates of accumulation and, in particular, to what extent policies were responsible. This chapter examines the HPAEs' superior performance in three accumulation-related areas: human capital accumulation, financial savings, and investment. For each area, explanations fall into three broad categories:

- Conditions that were not the direct result of accumulation policy
- Policy fundamentals: areas in which nearly all governments intervene, but in which HPAE governments acted more effectively
- Activist policies: selective interventions undertaken in some HPAEs to increase accumulation.

Rapid economic growth and the attendant changes in economic structure not directly related to accumulation policies were important factors in increasing all three forms of accumulation. For example, the HPAEs' rapid shift from high birth rates to low birth rates increased the resources per child potentially available for education at home and in the classroom. At the same time, the rapid deceleration of population growth increased household savings, in turn creating resources for investment.

In addition, the HPAEs performed well in selecting and implementing fundamental economic policies related to accumulation. Every govern-

ment spends on education, but the HPAEs spent their money more wisely, emphasizing universal primary and, later, secondary education. Similarly, every government tries to control inflation and secure property rights, and most regulate banking institutions to protect savers against default, all of which encourage savings and investment. The HPAEs did these things better than the rest. Moreover, as the HPAEs developed, their governments strengthened the legal and regulatory frameworks for bond and security markets to facilitate investment.

Besides fostering favorable general conditions and getting policy fundamentals right, some HPAEs have deliberately intervened in markets to solve specific coordination problems related to accumulation. These interventions aimed at boosting savings and investment rates are the most controversial of the HPAEs' accumulation policies. Generally, interventions have been more common and more successful in the three northern HPAEs—Japan, the Republic of Korea, and Taiwan, China—all of which have strong governmental institutions. With some notable exceptions, attempts to replicate such efforts among Southeast Asian newly industrializing economies have not been successful.

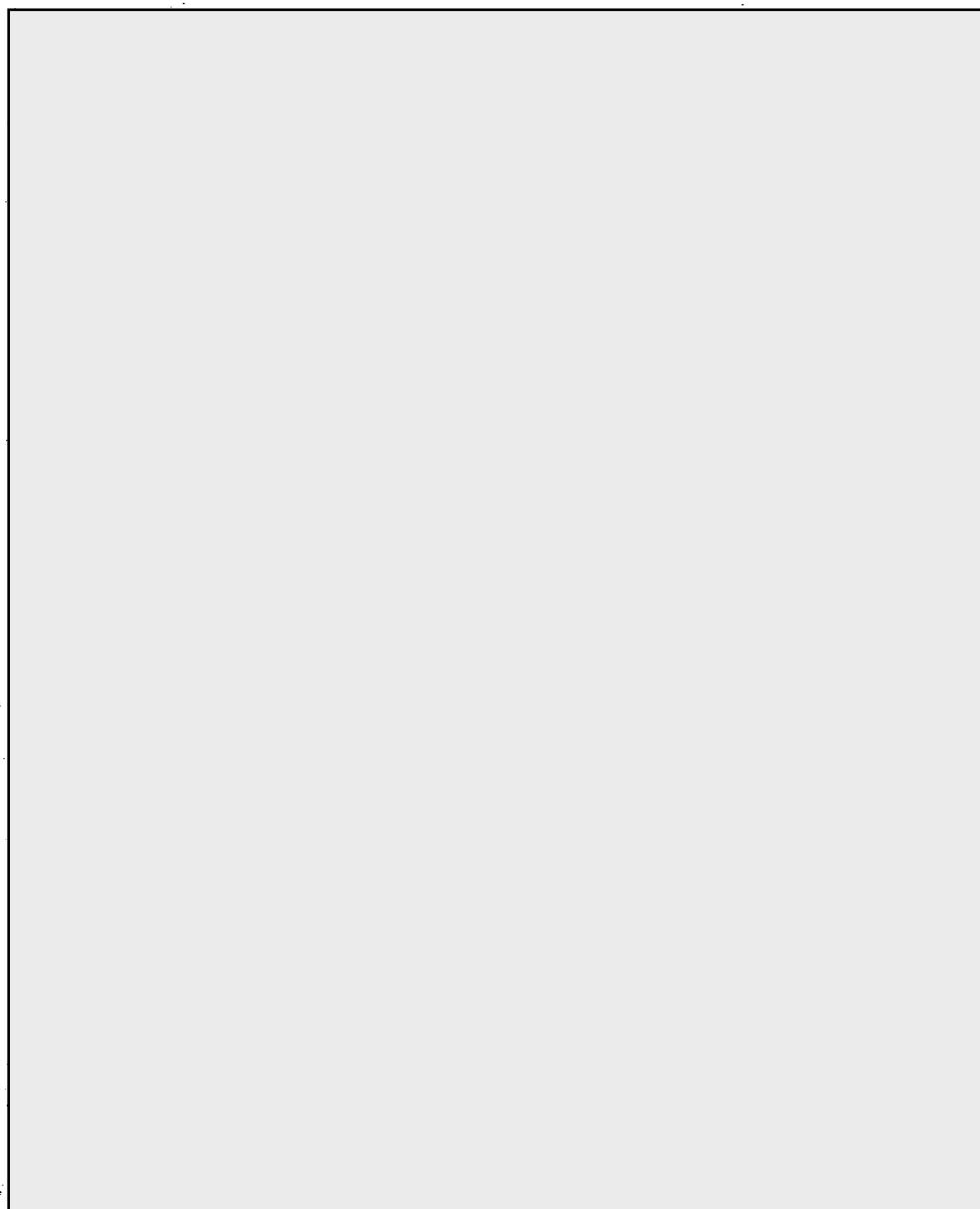
At the outset, we must acknowledge a fundamental methodological difficulty. Since we know the HPAEs had rapid accumulation (and to some extent were chosen as a group on that basis), we also know, even before examining their policies, that they were not inconsistent with rapid accumulation. The challenge is to separate policies that were neutral or perhaps negative but not sufficiently negative to hinder accumulation significantly from those policies that actually facilitated rapid accumulation. We do this, noting that our findings are based on analytic and empirical judgments rather than derived from statistical models.

Explaining East Asia's High Human Capital Formation

EXCEPT FOR IN THAILAND, THE QUANTITY OF BASIC EDUCATION provided to boys and girls of school age has been consistently higher in the HPAEs than in economies with similar levels of income. After having achieved universal primary schooling, thereby eliminating the gap between boys and girls at the primary level a decade or more earlier than most, the HPAEs rapidly expanded secondary edu-

tion and were particularly effective in reducing gender gaps at that level.

What accounts for this extraordinary performance? We focus first on three enabling factors: high income growth, early demographic transitions, and more equal income distributions. Each of these greatly increased the resources available for education. We then shift focus to two policy variables: the overall budgetary commitment to education and the distribution of the education budget. We seek to show that the allocation of public resources to primary and secondary education was the major determining factor in East Asia's successful educational strategies.



Declining Population Growth

East Asia preceded other developing regions in moving through the demographic transition, and the education sector was a major beneficiary. One important outcome of a deceleration of the rate of population growth is a decline in the rate of growth of the school-age population. During the 1980s, the growth rate of the population age 6–11 years was very low in East Asia—so low that the absolute number of schoolchildren in Korea, Singapore, and Thailand actually declined—but was phenomenally high in Sub-Saharan Africa. As a result, from 1965 to 1989 the share of the population up to 14 years old in Singapore fell from 44 to 24 percent, while in Kenya it rose from 47 to 51 percent. Similar contrasts are evident between other HPAEs and Sub-Saharan African economies (see table 5.1).

When the school-age population is growing rapidly, as in Kenya or Pakistan, rising expenditures on basic education are needed just to keep enrollment rates constant. With declining or slowly growing school-age populations, however, similar increases in expenditures can go for more schooling or better quality. Alternatively, expenditures as a proportion of GDP can be cut while current standards are maintained (see table A5.1, in appendix A5.1).

Table 5.1 Size and Growth of School-Age Population

<i>Economy/region</i>	<i>School-age (0–14) population as percentage of total population</i>	<i>1965</i>	<i>1989</i>	<i>Growth rate of primary school-age (6–11) population (percent)</i>	
				<i>1965–75</i>	<i>1980–85</i>
<i>HPAEs</i>					
Hong Kong	40	22		-1.1	0.3
Korea, Rep. of	43	26		0.7	-0.3
Malaysia	46	37		1.9	0.2
Singapore	44	24		-1.2	-2.2
Thailand	46	34		2.9	-0.1
<i>Other selected economies</i>					
Bangladesh	43	44		3.3	2.9
Brazil	44	35		2.0	1.7
Colombia	47	35		2.3	0.9
Kenya	47	51		3.8	4.7
Nigeria	46	48		3.8	3.4
Pakistan	46	45		2.9	1.8

Sources: 0–14 population figures, World Bank data; 6–11 population figures, Lockheed and Verspoor (1991).

Accordingly, declining, stagnant, or slowly growing school-age populations have allowed substantial increases in per pupil expenditure in all of the HPAEs. Table 5.2 shows the magnitude of the savings on expenditure on basic education in East Asia due to the decline in the proportion of the population of school age.⁵ Consider the most striking example: if the share of the school-age population in 1988 were as large in Korea as in Kenya, the Korean government would have had to spend 5.6 percent

Table 5.2 Percentage of GNP Allocated to Education Saved Due to Lower Fertility Rates

<i>Economy</i>	<i>Expenditure on basic education as a percentage of GNP</i>	<i>Percentage of GNP saved due to growth rates of school-age population that were lower than:</i>		
		<i>Kenya</i>	<i>Mexico</i>	<i>Pakistan</i>
<i>Hong Kong</i>				
1975	2.0	1.2	1.0	1.0
1980-81	1.7	1.5	1.7	1.2
<i>Japan</i>				
1975	4.2	4.0	3.8	3.8
1988-89	2.8	4.8	2.8	3.9
<i>Korea, Rep. of</i>				
1975	1.9	0.6	0.4	0.4
1988-89	2.8	2.8	1.4	2.0
<i>Malaysia</i>				
1980-81	4.4	1.3	0.4	0.4
1988-89	4.0	1.6	0.4	0.8
<i>Singapore</i>				
1975	2.1	1.1	0.8	2.0
1980-81	2.2	2.0	1.3	1.3
<i>Thailand</i>				
1975	2.8	0.6	0.0	0.0
1988-89	2.6	1.3	0.3	0.8

Note: Method of calculation: [(Expenditure on basic education as a percentage of GNP) x (percent difference between East Asian and other economies in school-age population)] + (expenditure on basic education as a percentage of GNP) = an estimate of the additional share of GNP that would have been required, had population growth been more rapid. This is an indicator of the savings reaped in the education sector as a result of lower population growth.

Source: For expenditure on basic education, UNESCO (various years); for data on school-age population, United Nations (various years, a).

of GNP on education instead of the 2.8 percent actually spent to achieve Korea's high enrollment rates. This suggests that lower fertility rates saved Korea 2.8 percent of GNP. Conversely, had Pakistan's school-age population grown at the relatively low Korean rate, the government of Pakistan could have increased enrollment rates by as much as 50 percent.

Equality in Distribution of Income

The more equal an economy's distribution of income, the higher primary and secondary enrollments tend to be. In a cross-section of more than eighty economies, there is a strong and statistically significant negative correlation between basic education enrollment rates and the level of income inequality, as measured by the Gini coefficient (Clarke 1992). As we discuss below, educational expansion can have an equalizing impact, so the causality in this relationship could run from enrollment rates to the distribution of income. However, there are a variety of reasons why low income inequality, which we document in chapter 1, might have been a third factor contributing to high enrollment rates in East Asia.

Due to greater income equality, the income of the poorest 20 percent of the population in East Asian economies is higher than in economies with the same average income but greater inequality (see table A5.4, at the end of the chapter). Because of budgetary constraints (and capital market imperfections that preclude their borrowing to invest in education), very poor households are unable to invest in their children even when the returns are high: the pressing need to subsist crowds out high-return investments. This is less likely to occur in East Asia because the incomes of the poor tend to be further above subsistence level.

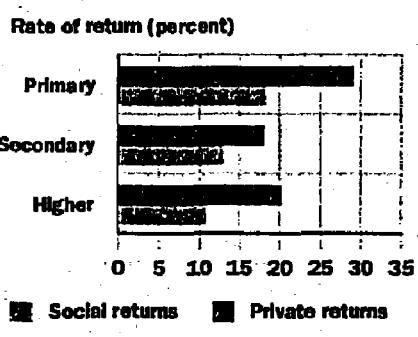
Measures of the income elasticity of the enrollment ratio derived from cross-economy education expenditure equations are 0.31 and 0.43 at the primary and secondary levels (Schultz 1988). This implies that in East Asia the positive effect on school enrollments of lower inequality can be quite large. For example, given an income elasticity of basic education enrollments of 0.40, if the distribution of income was as equal in Brazil as in Malaysia, enrollments among poor Brazilian children would be roughly 33 percent higher. Moreover, the income elasticity of demand for basic schooling among poor families is likely to be substantially higher than average and may exceed 1.0. In this case, enrollments among poor Brazilian children would be 80 percent higher.

Coordination Problems that Hinder Human Capital Formation

Numerous studies show that a person's earnings are higher the higher their human capital, as measured by their education and health status. As shown in chapter 1, the same is true for nations; we know that investments in education contribute significantly to economic growth. But neither of these points necessarily justifies public provision of education. Indeed, if the private returns are as high as social returns on these investments, individuals and households are likely to make adequate (from an economywide point of view) investments in human capital on their own. However, two kinds of problems generate a gap between private and social returns, which—if not countered by government action—will result in families investing less in their children's education than is in society's interest. First, there may be failures in the capital market and in information, discussed above, that reduce parents' ability or interest in investing. Second, educational investments have positive externalities, which imply that families that invest in education are not the sole beneficiaries.⁶

The difficulty of borrowing to send children to school affects the poor especially. Creditors cannot easily stake a future claim on embodied human capital (as they can for other types of collateral). Even poor families who might be willing to borrow, because schooling has high private returns, usually cannot. The poor are also likely to be less aware of future returns on education—and therefore invest less in their children's schooling than would make sense even from a strictly private point of view.⁷ These market failures in principle suggest making loans available and improving information about future returns. A simpler, and more common, alternative is for government to reduce the direct costs of schooling by making public schooling available and free.

The second class of market failure—externalities—has more immediate implications for what type and level of schooling the government should subsidize and for what groups. There are several sources of externalities. An educated person may increase not only her household's income but also the income of other households, because her ideas and innovations spill over to others. Similarly, education may have social benefits not directly compensated monetarily, for example, a reduction in the spread of contagious diseases. In these and other cases, coordination problems exist, and governments acting on society's behalf have reason to choose a higher level of education than families acting alone.

Figure 5.1 Returns on Investment in Education by Level (Latest Year)

Source: Psacharopoulos (1993).

Table 5.3 Public Expenditure on Education as a Percentage of GNP

Economy/region	1960	1989
<i>HPAEs</i>		
Hong Kong	—	2.8
Korea, Rep. of	2.0	3.6
Singapore	2.8	3.4
Malaysia	2.9	5.6
Thailand	2.3	3.2
Indonesia ^a	2.5	0.9
Average ^b	2.5	3.7
<i>Other</i>		
Brazil	1.9	3.7
Pakistan	1.1	2.6
<i>Less developed economies</i>		
Sub-Saharan Africa	1.3	3.1
Africa ^c	2.4	4.1

^a Not available.^b Alternative sources of data indicate that expenditure on public education as a percentage of GDP was 3.0 percent in Indonesia in 1989.^c Low- and middle-income economies.

Source: UNDP (1991).

Policy responses generally consist of making schooling available and free and in some economies compulsory. The difference between social and private returns from education is probably higher at the primary and secondary levels than at the university level (see figure 5.1). Many positive spillovers come from literacy acquired at lower levels of schooling, while the returns from training at the university level are almost fully captured by the higher income of university graduates. Vocational training may also have high social payoffs, if it improves worker productivity not only for the trainee but also for her co-workers. More importantly, evidence suggests that vocational training is most cost-effective if trainees have a solid base of primary and secondary education. All of this argues for universal primary and broadly based secondary education as a means to improve economic efficiency and income distribution.

Policies that Promoted Human Capital Formation

Higher shares of national income devoted to education cannot fully explain the larger accumulation of human capital in the HPAEs. In both 1960 and 1989, public expenditure on education as a percentage of GNP was not much higher in East Asia than elsewhere (see table 5.3). In 1960 the share was 2.2 percent for all developing economies, 2.4 percent for Sub-Saharan Africa, and 2.5 percent for East Asia. During the three decades that followed, the governments of East Asia markedly increased the share of national output they invested in formal education, but so did governments in other developing regions. In 1989 the share in Sub-Saharan Africa, 4.1 percent, was higher than the East Asian share, 3.7 percent, which barely exceeded the average share for all developing economies, 3.6 percent.⁸

Nor were initial conditions, for example the colonial legacy, decisive. While Korea did have much higher enrollment rates in 1950 than most developing economies, subsequent increases in primary and secondary enrollment rates account for Korea's present wide lead in enrollments over other middle-income economies. A comparison of Indonesia, a success story, and Pakistan, a laggard, is also illustrative. In 1987 Indonesia had achieved universal primary enrollment and a 48 percent secondary enrollment rate. By contrast, Pakistan's enrollment rates were 52 percent at the primary level and 19 percent at the secondary level. What proportion of these gaps is due to initial conditions? At the pri-

mary level, Indonesia increased its enrollment rate by nearly 80 percentage points since 1950, while Pakistan managed an increase of only 34 percentage points, implying that most of the current gap is explained by the pace of increase rather than initial conditions. For secondary schooling, Pakistan's enrollment rate in 1950 was actually higher than Indonesia's; all of the current gap is explained by the rates of increase during the past thirty-seven years.

Primary and Secondary Education. The allocation of public expenditure between basic and higher education is the major public policy factor that accounts for East Asia's extraordinary performance with regard to the quantity of basic education provided. The share of public expenditure on education allocated to basic education has been consistently higher in East Asia than elsewhere. Korea and Venezuela provide an extreme example that nicely illustrates the point. Table 5.4 indicates that in 1985 Venezuela allocated 43 percent of its education budget to higher education; by contrast, in the same year Korea allocated only 10 percent of its budget to higher education. Public expenditure on education as a percentage of GNP was actually higher in Venezuela (4.3) than

Table 5.4 Allocation of Education Budgets, 1985

Economy	Public expenditure on education as a percentage of GNP	Public expenditure on basic education as a percentage of GNP	Percentage of education budget allocated to higher education	Percentage of education budget allocated to basic education
Hong Kong	2.8	1.9	25.1	69.3
Indonesia ^a	2.3	2.0	9.0	89.0
Korea, Rep. of	3.0	2.5	10.3	83.9
Malaysia	7.9	5.9	14.6	74.9
Singapore	5.0	3.2	30.7	64.6
Thailand	3.2	2.6	12.0	81.3
Venezuela	4.3	1.3	43.4	31.0

^a Alternative sources of data indicate that in Indonesia public expenditure on education as a percentage of GDP was 3.3 in 1984-85 and 4.3 in 1985-86, and that the percentage of the education budget allocated to basic education was 81 in 1984-85 and 80 in 1985-86.

Row percentages do not add up to 100, since three of the categories into which educational funding is channeled—pre-primary, other types, and not distributed—have not been included in this table.

Sources: Column 1, UNDP (1990); columns 2 and 3, UNESCO (1989).

in Korea (3.0). After subtracting the share going to higher education, however, public expenditure available for basic education as a percentage of GNP was considerably higher in Korea (2.5) than in Venezuela (1.3). Box 5.1 shows how Indonesia's emphasis on primary education, contrasted with Bolivia's relative neglect of primary schooling, is reflected in rural educational opportunities.

The share of public funds allocated to tertiary education in East Asia has tended to be low, averaging roughly 15 percent during the past three decades.⁹ In Latin America the share has been roughly 24 percent.¹⁰ In South Asia, the share is close to the Latin American level. This had been the case in Sub-Saharan Africa as well, but in recent years the share has declined to East Asian levels.

By giving priority to expanding the primary and secondary bases of the educational pyramid, East Asian governments have stimulated the demand for higher education, while relying to a large extent on the private sector to satisfy that demand. In all developing regions the probability of going to university is markedly higher for secondary school graduates from high- than from low-income families. Typically, in low- and middle-income economies government subsidies of university education are not related to need, implying that they benefit families with relatively high incomes that could afford to pay fees closer to the actual cost of schooling.

At the same time, in many economies, Brazil and Kenya being notable examples, low public funding of secondary education results in poorly qualified children from low-income backgrounds being forced into the private sector or entirely out of the education system. Because of the higher concentration on basic education in East Asia, public funds for education are more likely to benefit children of low-income families who might otherwise have difficulty remaining in school.

Vocational Training. Human resources and the training to upgrade them have been important to the HPAEs' successful export drives, despite the high degree of labor intensity in their manufactured exports. High-level skills are essential for such manufacturing-related activities as management and entrepreneurship, information technology, finance, marketing, accounting, and law. Moreover, adaptive innovations on the shop floor, which are responsible for a major share of productivity in manufacturing, demand both higher- and lower-level skills. But while vocational training is widely recognized as important, such training is rarely cost-efficient when provided in the school systems. Firms prefer to do their own training, partly because many skills are firm-specific.

Box 5.1 Spending on the Kids: Primary Education in Bolivia and Indonesia

THE IMPACT OF DIFFERING SPENDING PRIORITIES WITHIN EDUCATION budgets is starkly evident in a comparison of primary schools in Bolivia and Indonesia. Both economies are at roughly similar levels of development, and both have predominantly rural populations, national illiteracy rates of about 20 percent, and social and cultural factors that hinder the education of girls. Moreover, the proportion of national resources devoted to education at all levels is roughly similar. Bolivia has an annual per capita GNP of about \$650; Indonesia, \$610. Both spend 2.3 percent of their GDP on education. But while Bolivia devotes only 41 percent of its education budget to primary schools, Indonesia spends nearly 90 percent on basic education.

The resulting differences are striking. In Bolivia, the education system officially covers only 60 percent of children. But even that low figure overstates educational attainment. Only 45 percent of rural schools provide education through the fifth grade; the remainder, mostly in remote areas, offer only three years of instruction. Repetition and dropout rates are high, especially for girls, and only one in ten children has a textbook. Partly because of inadequate resources, teacher training is poor, and administrative corruption is widespread.

Indonesia, by contrast, has deliberately focused resources on primary education, to good effect. Beginning in 1974 with a massive school construction drive, and continuing in 1978 with the abolition of primary school fees, the government endeavored to make primary education available to all children. By 1987, 91 percent of children in rural areas were enrolled in primary school, only slightly less than the 92 percent enrolled nationwide. With near universal education, the gender gap in enrollments has disappeared. While dropout and repetition rates are higher in the countryside than in the cities, and large regional gaps in enrollment ratios and illiteracy rates persist, the focus on primary education has been an effective way to make the most of limited education resources.

Like other developing economies, Indonesia must balance the desire to fund more intermediate and advanced education against the reality that stretching education budgets means less for the lower grades. In 1987, the government expanded free education, which had previously covered up to the sixth grade, to include up to the ninth grade. Educational quality declined, however, and the government has since identified improvement of primary schooling as a key educational objective.

Sources: World Bank (1990a; internal World Bank reports).

Few studies have been made of training in the HPAEs or other developing economies, in part because of the difficulty of defining training. One large survey of 48,000 manufacturing firms in Taiwan, China, concluded that firm-level training raised productivity by encouraging the efficient use of technology (Aw and Tan 1993). The study also found that returns from training were higher in industries with well-educated workers in an environment of rapid technological change. Another Taiwan, China, study with a smaller survey sample and stricter definition of training found that only 24 percent of firms provided training and only 7 percent of technicians received it. As would be expected, training was positively affected by the level of technology and negatively affected by labor turnover and high opportunity costs of training (San 1990).

Other studies in the HPAEs have reached similar conclusions. Enterprise and preemployment training have produced social rates of return of 20 percent in Malaysia. In-plant training for welders in Korean shipbuilding had a social rate of return of 28 percent, higher than in non-firm training institutions (Middleton and others, forthcoming). On-the-job training was "an extremely systematic and powerful ingredient in the rapid growth of Japanese companies" (Konishi 1989).

In some instances, government efforts to promote training have gone awry. According to one study, Korea's 1974 Special Law for Vocational Training, which required firms to provide six months' training in approved schemes, discouraged firm-level training; firms considered the period too long and opted to pay a fine instead (Kim 1987; van Adams 1989). More narrow government efforts to forecast occupation demand or provide trained workers to fill anticipated jobs have also generally not been successful.

One exception is Singapore's use of training to promote the information technology sector. Singapore has achieved world leadership in information-related services through a concerted program that involved educational institutions (specializing in business and engineering software training), training subsidies to schools and office workers, computerization of the civil service, and establishment of TradeNet, an international information network (Hon 1992). This success illustrates the importance of a government's ability to foresee a major trend and coordinate complementary private investments. At the same time, businesses must stand ready to take advantage of the comprehensive support that the government provides. Other East Asian economies have had similar, if less spectacular, successes in telecommunications (Mody and others 1992).

Has training been more effective or widespread among the HPAEs than other developing economies? The evidence is too limited for a clear conclusion. However, it is clear that returns from training are augmented by economic growth and consequent job creation and are therefore higher in the HPAEs. Moreover, the HPAEs' extensive participation in international markets aided the success of their training programs. International competition encourages firms to train workers and increases the number of skill-intensive jobs, thereby ensuring that new skills do not erode. Training, then, appears to function like many other aspects of development in East Asia. It contributes to rapid, sustained growth but does not, in itself, make such growth possible.

Why East Asia's Educational Policies Worked

In most of the economies of East Asia, public investments in education were not only larger than elsewhere in absolute terms—they were also better. They responded more appropriately to coordination failures in the market for education. Emphasis on universal, high-quality primary education had important payoffs both for economic efficiency and for equity. The excess demand for secondary and tertiary education, generated by rapid attainment of universal primary education, was met largely by a combination of expansion of a public secondary system with meritocratic entrance requirements and a self-financed private system. This stands in stark contrast to many other low- and middle-income economies, which have stressed public subsidies to university education.

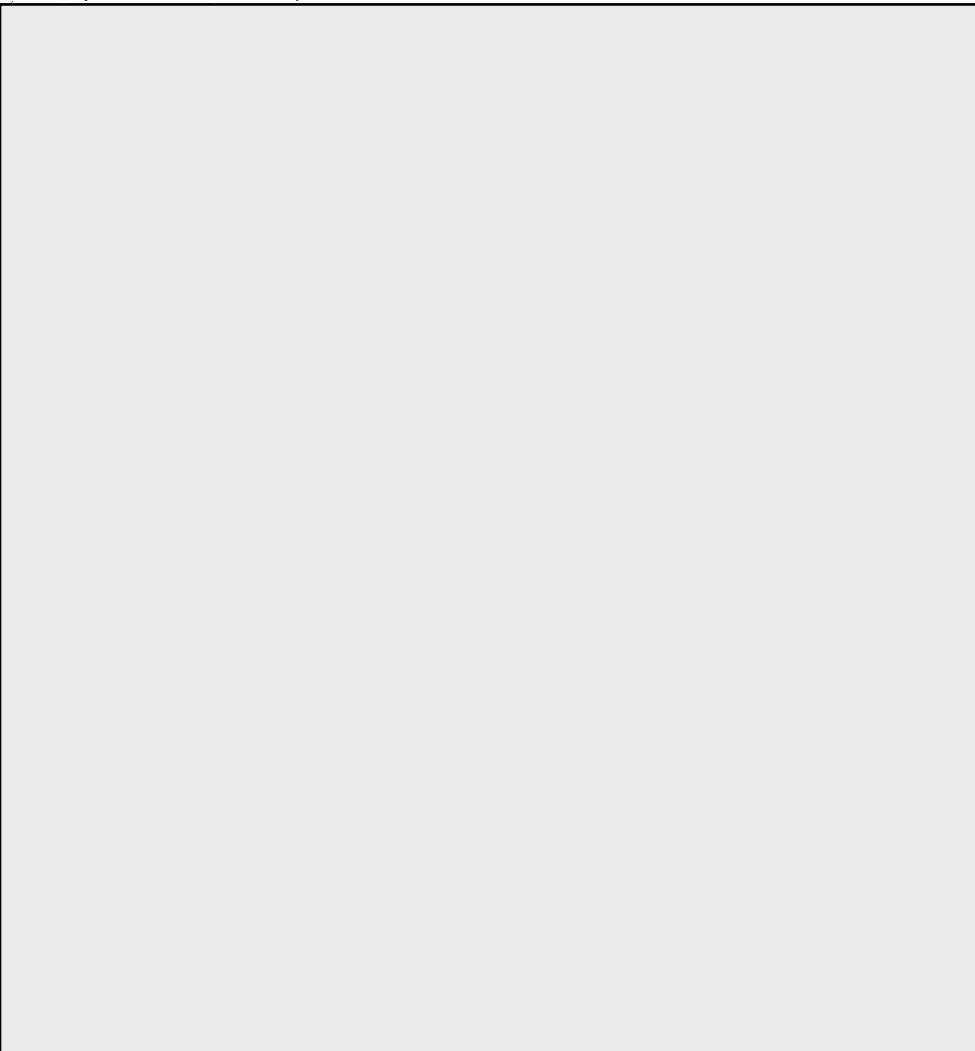
Explaining East Asia's High Savings Rates

AS IS THE CASE WITH EAST ASIA'S RAPID HUMAN CAPITAL formation, the region's high savings rates are in part an outcome of rapid growth and rapid demographic transitions. Government policy also encouraged (and sometimes compelled) increased savings through a variety of means. The most basic of these was the maintenance of macroeconomic stability. In addition, the HPAEs have addressed savings-related coordination problems with numerous measures designed specifically to boost savings rates. These range from policy fundamentals (such as regulatory supervision of banks, which

address an absence of deposit insurance markets), to targeted interventions (such as restrictions on consumer credit and forced savings plans).

Growth and Demographics: The Effect on Savings

Many popular efforts to explain the East Asian miracle have invoked cultural factors to explain high savings rates and used those high savings rates to explain high rates of investment and growth. Neither element of such explanations has received much empirical support. Indeed, studies of the income-savings relationship in a broad cross section of economies indicate that while income and savings growth are highly correlated, incomes often have risen before savings rates rather than after, suggesting that growth drives savings rather than the other way around. Recent econometric studies support the idea that rapid income growth boosts savings rates as households acquire resources faster than they increase consumption (Carroll, Weil, and Summers 1993). According to this view, East Asia's high savings rates since the 1960s are partially an outcome of high growth rates rather than a cause.



The Role of Public Savings. One direct way that any government can address the concern that aggregate savings are too low is to generate public sector savings through a combination of tax and expenditure policies. Although in theory forward-looking private savers should increase consumption (and reduce savings) to match any increase in public savings (because their future obligations are reduced), in practice households are faced with liquidity constraints and are not able to act on expectations. Thus total savings may rise with an increase in public savings (Summers 1985). Empirical evidence shows that government savings does not fully crowd out private savings. Furthermore, the method of raising public savings matters: on average, increasing public savings via reduced expenditures is more effective than raising taxation. For a sample of thirteen developing economies, a transitory increase of a dollar in public savings, made through a cut in expenditures, reduces private savings by only 16–50 cents. If the dollar increase in public savings is achieved

through a current period tax increase, private savings declines by 48–65 cents (Corbo and Schmidt-Hebbel 1991).

Most HPAEs have maintained high public savings compared with other low- and middle-income economies through a combination of tax policy and expenditure restraint. The extent to which HPAE governments have restrained current expenditures relative to other developing and industrial economies is shown in figure 5.2, which gives average public consumption as a percentage of GDP between 1970 and 1988 for a sample of 111 economies. Indonesia, Japan, Korea, Singapore, and Thailand are in the bottom third of the distribution of all economies in terms of the share of public consumption, with public consumption shares below 15 percent of GDP. Malaysia and Taiwan, China, are exceptions, falling in the middle of the distribution. In Malaysia the high levels of public consumption reflected the explicit redistributive objectives of the New Economic Policy. As a group, the average share of public consumption in the HPAEs is below both the OECD economies and all other regional groupings of low- and middle-income economies.

In contrast to the situation in most developing economies, in the HPAEs, rates of public and private savings have been high and growing. For example, Singapore's public savings rose from 5.5 percent of GDP in 1974–80 to 18.5 percent in 1981–90, and private savings rose from 22.6 to 24 percent. Malaysia's public savings increased from an average 3.2 percent of GDP in 1961–80 to 10.3 percent in 1981–90, while its private savings increased slightly. Thailand's public savings was high in the 1980s (8–15 percent of GDP), but declined as a proportion of GDP in the mid-1980s, when the private savings rate rose dramatically (see table 5.6).

Creating Postal Savings Institutions. In addition to effective prudential supervision and regulation of entry and spreads, all of which encouraged savings by ensuring stable banks, Japan, Korea, Malaysia, Singapore, and Taiwan, China, established government-run postal savings systems to attract small savers. Postal savings systems offered small savers greater security and lower transaction costs than the private sector and were therefore particularly effective in attracting to the formal financial sector the savings of low-income and rural households.

Japan established the region's first postal savings program in 1875, with the explicit goal of fostering savings of rural dwellers and people with low to moderate incomes in the cities and towns. Until then, such people were effectively excluded from the financial system, which lacked rural networks and discouraged small depositors by requiring high minimum balances or paying very low interest rates on small deposits. The Japanese government heavily promoted postal savings among low-income households and made the interest income on small postal savings deposits tax free.

Similar institutions with the same savings mobilization goals were established in Korea, Malaysia, Singapore, and Taiwan, China. Like Japan, both Korea and Taiwan, China, have granted tax-exempt status to the interest income from postal savings during long periods. In Taiwan, China, postal savings offices account for about a third of all financial institution offices, and the postal savings service has longer business hours than other financial institutions (Shea, forthcoming). In Malaysia and Singapore, where postal savings have also accounted for a large pro-

portion of domestic deposits, the governments separated management of the savings system from the post office in the early 1970s, when the proportion of postal savings in total savings declined, evidently because postal employees were not enthusiastic promoters of savings. Even so, the savings system continued to utilize the post offices as a deposit-taking branch network.

Postal savings systems can be an effective way of mobilizing household savings, provided that governments take care that the cost of administering the systems does not outstrip the benefits. Generally postal savings systems piggyback on the mail-delivery infrastructure, thus minimizing overhead and fixed costs. In the early years in Japan, the system often operated out of the houses of wealthy landowners that were already serving as postal branches. As postal savings expanded and the administrative burden rose, postal officials demanded wage increases. Overall, however, the postal system's cost of accepting deposits has been much less than that of the private banks (Mukai 1981).

Forced Savings. Besides the above measures, some HPAEs have tried to compel savings through several measures, including mandatory pension schemes and restrictions on consumption and borrowing for consumption. Because these measures constitute more active interventions in markets, their efficacy, even in East Asia, is open to question. Restrictions on consumer choices, including the basic consumption-savings decision, have welfare costs. Moreover, similar efforts in other economies have been spectacular failures. Examples include the widespread deprivation and massive waste associated with forced savings in the now-defunct command economies.

Three economies in East Asia, Japan, Malaysia and Singapore, have well-developed, mandatory pension plans. The impact of these plans on aggregate savings depends on the degree to which they substitute for voluntary savings. Evidence of the impact of pension funds in Japan and Singapore, the only two economies where the issue has been studied, is inconclusive. One study of savings in Japan found pension funds had no significant impact on total savings, although they did channel household savings into financial assets, thereby contributing to financial deepening (Dekle 1988). Another found a small negative effect (Noguchi 1985). This suggests that the Japanese pension fund squeezed out a portion of voluntary savings. Conversely, there is evidence that Singapore's Central Provident Fund boosted aggregate savings by about 4 percent of GDP during the 1970s and 1980s (Monetary Authority of Singapore 1991).

The lack of consumer credit to purchase housing, consumer durables, and other consumer items may have induced increased household savings in some East Asian economies. Bank regulators in Japan, Korea, and Taiwan, China, restricted credit available for consumer durables purchases. Maki (1993) offers evidence that the rapid increase in savings in Japan after World War II was driven by the need to acquire consumer durables, and he shows the same pattern existed in Korea and Taiwan, China. As household incomes and the demand for consumer durables increased, savings as a proportion of income rose rapidly. Once the excess demand for consumer durables was met, savings rates stabilized and even declined.

Development Banks. East Asian governments created a wide range of financial institutions to fill perceived gaps in the types of credit provided by private entities (see table A5.8, at the end of the chapter). They addressed the need for long-term credit for industry by creating development banks. Most have also created specialized institutions that provide credit to agriculture and small firms.

Industrial development banks have been substantial long-term lenders in Indonesia, Japan, Korea, and Taiwan, China, but not in the other HPAEs. In Japan, the development banks—the public Japan De-

velopment Bank (JDB) and the private Industrial Bank of Japan—accounted for about two-thirds of loans outstanding for equipment investment in the 1950s and about half in the early 1960s. Their share in total lending to industry was small, however, and has declined. At its peak in 1953, the JDB accounted for 18 percent of new funds lent. Starting in the mid-1950s, job lending fell to 1–6 percent of new lending; the rest was accounted for by private banks (Kawaura 1991).²¹ The Korean Development Bank made an average of a third of all loans and guarantees in the 1970s, and the development bank of Taiwan, China, the Bank of Communications, holds about half of the assets of the banking system. Conversely, Malaysia's development financial institutions accounted for 2.9 percent of the assets of the financial system in 1980s. Thailand's industrial development bank has only 1 percent of the assets of the financial system. Hong Kong has no development bank.

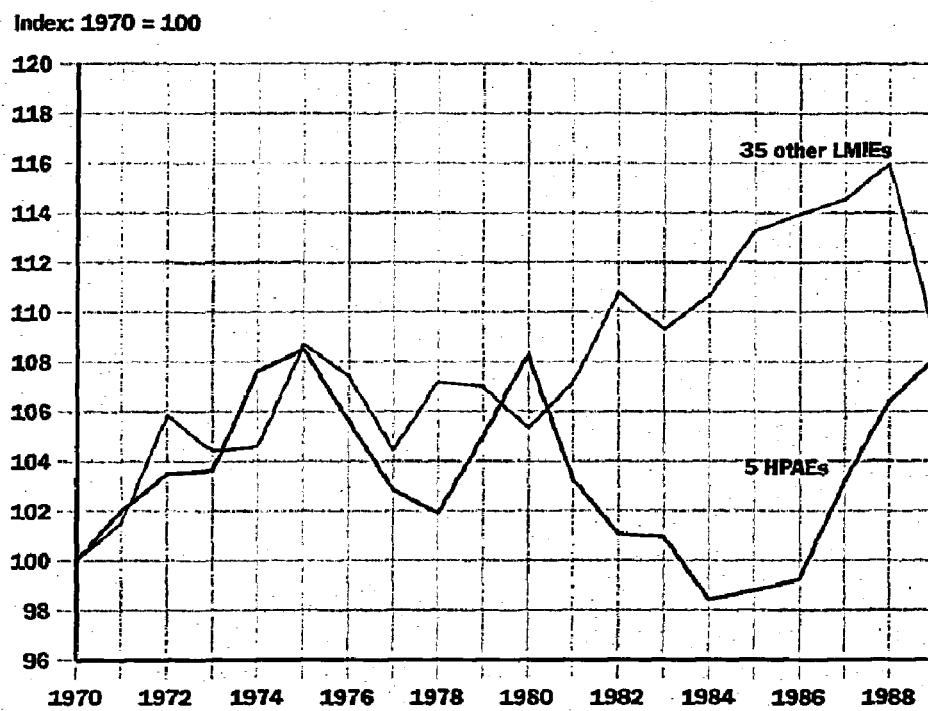
Many other developing economies have also attempted to remedy the perceived failure in long-term capital markets. Nearly all have been unsuccessful in creating development banks. Development banks in South Asia, Latin America, and Sub-Saharan Africa are beset with low repayment rates; a representative sample of eighteen industrial development banks in developing economies had on average nearly 50 percent of the value of their loans in arrears (World Bank 1989c). The most commonly cited causes of development bank failures have been political pressure to finance bad projects and the poor incentives for and capability of financial institutions to screen and monitor projects.

Development banks have performed much better in the HPAEs, especially those banks in the northern tier economies concentrating on industrial finance.²² Financial performance has been adequate to good, and the capacity to evaluate and monitor projects has at least in Japan created spillovers for the rest of the formal financial system (JDB/JERI 1993).²³ Successful development banks in East Asia have applied commercial criteria in selecting and monitoring projects and firms, even within the constraints set by government priority activities. Development banks in Japan and Singapore, for example, must select projects that will repay, since the banks are expected to repay with interest the funds they obtain from the government. Taiwan, China, introduced another mechanism when in the early 1960s it required borrowers receiving funds from the U.S. Agency for International Development to put up matching funds and made lending to a nonperformer a criminal offence, imposed on the loan officer.

Low Relative Prices for Capital Goods. Unlike most other low- and middle-income economies, the HPAEs were able to hold down the relative prices of investment goods, especially equipment, during the 1980s (Battacharya and Page 1993). Figure 5.4 shows the relative price of investment of goods (ratio of the investment deflator to the GDP deflator) for forty economies for which consistent real private investment data are available. For the group as a whole, the price of investment goods increased about 15 percent faster than all other goods during the 1980s, in part because devaluations increased the domestic price of imported and import-intensive investment goods.

The HPAEs are different in several ways. First, the relative price of investment goods remained lower than in other developing economies throughout the global economic expansion of the 1970s and the adjustment period in the 1980s. Second, the relative price of investment goods declined during the early stages of adjustment from 1980 to 1984—a period when they were rising in most other developing economies—and only began to rise in 1985, when the HPAE economies were well on the way to recovery. By 1989, relative prices between HPAEs and other economies were again aligned. Thus in these economies de-

Figure 5.4 Investment Deflator/GDP Deflator



Note: LMIEs = low- and middle-income economies.

Source: Pfeffermann and Madarassy (1992).

clining real prices of investment goods smoothed the impact of adjustment on investment.²⁴

Rising investment goods prices affect the relationship between investment effort and investment outcomes. As the relative price of investment goods rises (over time or across economies), more nominal investment expenditure is needed to achieve the same volume of physical investment. For the HPAEs and the economies of the non-HPAE sample, investment effort and outcomes coincided quite closely during the 1970s when the relative price of investment goods was essentially similar. During the 1980s, the rising relative price of investment goods in non-HPAEs was reflected in an increasing divergence between investment effort and outcomes. By 1989 the difference was nearly 3 percentage points of GDP. By contrast, in the HPAEs, investment outcomes exceeded investment effort (for both public and private investment) for the entire period 1970–89.²⁵

Tax, tariff, and exchange rate policies that kept the relative price of investment goods in the HPAEs below that for other low- and middle-income economies undoubtedly contributed to growth. Since the same volume of nominal investment bought more real capital goods in these economies, output was increased and returns on nominal investments were higher.

Bounding Risks to Private Investors. Some HPAE governments, primarily in the northern tier, have attempted to increase investment by lowering the uncertainty associated with real investment, implicitly or explicitly sharing risks with the private sector. Risk-sharing mechanisms have come in many forms—recession cartels in Japan, firm and bank workouts in Korea, financial repression to recapitalize firms in Malaysia, signaling priorities and policy intentions through the directed-credit systems of Japan, Korea, and Taiwan, China, and credit guarantees to small and medium-size enterprises in Korea and Taiwan, China. Those that were effective all exhibited a common feature: firms benefiting from shared risk were monitored for performance. In this way governments mitigated the problem that has plagued many public sector attempts to share risks with the private sector in other low- and middle-income economies: reducing the risk of failure to the private sector reduces the incentive to avoid failure. This can lead to a political dynamic in which gains are private but losses are socialized.

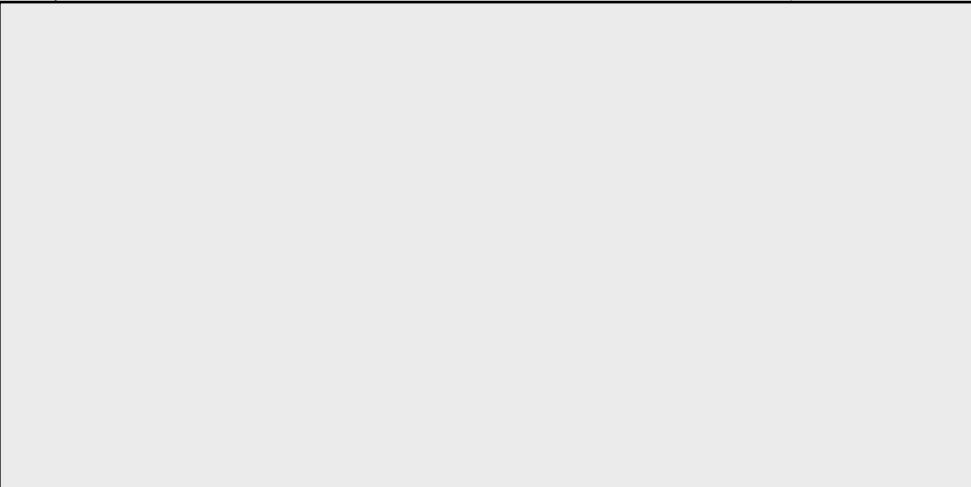
An important feature of Japanese industrial policy was the creation of recession cartels and the use of other forms of adjustment assistance in declining industries. Japanese antimonopoly law has been consistently

lenient in allowing the organization of cartels under the administrative guidance of MITI to ease the exit of firms from declining industries. These cartels were especially common during the rapid growth period when they were used to ease the adjustment problems of declining industries. The cartel allows firms to share losses. They may also be eligible for subsidized loans to upgrade technology or restructure operations. In this way, bankruptcy or massive layoffs by one enterprise may be avoided (Ito 1992).

Japanese adjustment assistance has been especially prominent in mining, textiles, shipbuilding, and aluminum. In general it has succeeded in avoiding the abrupt dislocations that often characterize firm failures in market economies, but this orderly decline has been purchased at the cost of increased prices to consumers and lower returns to investors in firms that would have survived. Moreover, the cartels provide an incentive for firms to overinvest in capacity during good times, since they will be protected during downturns and their adjustment assistance will be related to their existing capacity.

Performance criteria play an important role, even in declining industries. Interaction among firms and between firms and MITI are a means to prevent free riding and to monitor performance. Thus the organization of an industrial adjustment assistance program in Japan conforms to the model of contests presented in chapter 2 and suggests that economies without similarly well-developed institutional capacity may wish to avoid the commitments to orderly exit policies.

In some HPAEs, most frequently in Japan and Korea, troubled priority projects have been bailed out by the government. Often, the financial cost of the bailout was large. In Japan the government took over some losses associated with financing declining industries, such as in coal mining. When government-supported heavy and chemical industry projects in Korea experienced severe excess capacity and financial difficulties in the 1980s, the government provided seventy-eight distressed firms with new, subsidized loans (totaling about 16 percent of commercial bank loans) and rescheduled outstanding ones. The government also provided banks, whose nonperforming loans rose substantially and whose profits declined (partly because lending rates were cut), with subsidized credit from the Central Bank and allowed them entry into attractive areas of financial services. In Indonesia, the government bought 35 percent of the equity of a large cement plant when it became financially troubled while operating only at 50 percent capacity (Kunio 1988).



Moderate Repression of Interest Rates. The final mechanism we discuss—the repression of interest rates on corporate borrowing—is perhaps the most controversial. Financial repression is often used to describe the situation when interest rates are at negative real levels. A more precise definition, the one we use here, is government intervention to hold interest rates below market-clearing levels. Of course, in many developing economies with capital account restrictions, managed exchange rates, and undeveloped capital and money markets, it is difficult to determine a market-clearing interest rate. In the absence of such rates, HPAE governments tended to use international interest rates, such as the London interbank offered rate, as guides for the opportunity cost of domestic savings. Given closed capital accounts or high transactions costs in moving funds abroad, they have sometimes had the latitude to maintain deposit rates below market-clearing levels without provoking capital flight or significant disintermediation into the informal markets, where higher real rates prevail.

Economic theory and empirical evidence agree that if a government holds real interest rates on deposits too low for too long people will have little or no incentive to accumulate financial assets, financial savings will fall, and economic growth will be adversely affected. Financial repression usually occurs when inflation runs ahead of adjustments in government-regulated nominal interest rates. This type of financial repression has often resulted in severely negative real interest rates, for example, in Argentina between 1972 and 1985, in Indonesia between 1973 and 1980, and in the Philippines between 1970 and 1985. Cross-economy regression analyses support a positive association between real interest rates and the rate of growth of economic output; that is, large negative real interest rates result in lower growth (Gelb 1989).



Using Resources Efficiently: Relying on Markets and Exports

IT IS APPARENT THAT THE HIGH-PERFORMING ASIAN economies were unusually successful in strategies to achieve rapid accumulation. But high levels of physical and human capital formation are not a guarantee of economic success, as the modern economic history of the former Soviet Union and Eastern Europe sadly attests. Resources, once accumulated, need to be allocated to high-yielding activities. This chapter first considers the strategies, explicit and implicit, that the HPAEs used to achieve efficient allocation in three areas: the labor market, the capital market, and international trade. It then turns to industrial policy—deliberate, government-sponsored interventions to alter industrial structure—which was an important feature of public policy in some HPAEs, and asks whether these efforts have resulted in superior economic performance. Finally, the chapter considers the role of manufactured exports in promoting the demand for skilled labor and the acquisition and mastery of best-practice technology.

Explaining East Asia's Efficient Resource Use

THE HIGH-PERFORMING ASIAN ECONOMIES HAVE EFFICIENTLY absorbed unprecedented rates of growth of physical and human capital for thirty years. As we showed in chapter 1, all of the HPAEs had total factor productivity growth that exceeded that of more than 70 percent of developing economies between 1960 and 1989, and some—Japan, the Republic of Korea, Hong Kong, Malaysia, and Taiwan, China—had among the highest rates of TFP growth in the world.

This means that factors, once accumulated in the HPAEs, contributed much more to output growth than would be predicted on the basis of the average performance of a broad sample of economies, both developing and industrial.

How have the East Asian economies succeeded in using resources efficiently? Good fundamentals again tell much of the story. Price distortions, while present, were limited, and markets were allowed to work. HPAE governments have relied primarily on market mechanisms to guide allocative decisions in both labor and capital markets. Labor markets in the HPAEs have been remarkably free of the interventions that restrict labor mobility and create small, high-wage elites in other developing regions. While capital markets have been frequently controlled, restrictions on deposit and lending rates have generally distorted markets less than in most other low- and middle-income economies (as we demonstrated in chapter 5). Government efforts to direct credit have generally been undertaken within the framework of moderate interest rate subsidies, and financial institutions have been given the final decision on the creditworthiness of investment projects. This has meant that loans supplied through directed credit have been monitored and generally have been repaid. The relative prices of capital and labor have broadly reflected their relative scarcities.

The HPAEs have also used the international economy more effectively than many other low- and middle-income economies. Each of the HPAEs, except Hong Kong, went through an early phase of protection of import-substituting industries. But these policies were later modified by reductions in import controls and tariffs, combined with strong incentives to export (see chapter 3). This opened up much of the modern economy to international competition and introduced world prices as performance standards, not only for exports but also for the intermediate and capital goods used in export production. As a result, domestic prices for traded goods in the HPAEs are more closely aligned with international prices than in many other developing economies.

Apart from these fundamentals, however, most HPAEs selectively intervened in financial markets and used a combination of policies to promote the development of specific industries. Most HPAEs have directed credit to priority sectors and sometimes to specific firms. Where these programs have been effective in allocating resources to high-yielding investments—for example, automatic credit for exporters—it was because allocation rules were performance-based, and borrowers were ac-

tively monitored; in short, effective contests were created. These conditions have been more common in the three northern HPAEs that have strong governmental institutions.

Indonesia, Japan, Korea, Malaysia, Singapore, and Taiwan, China, have tried to use targeted industrial policy to promote the development of specific knowledge- and capital-intensive industries. We test the relationship between industrial policy and productivity-based catching up and conclude that industrial policy has generally not been successful in changing industrial structure or raising productivity. What, then, has contributed to the HPAEs' apparently superior performance in adopting and mastering international best-practice technologies? We argue that the combination of competitive discipline and well-functioning factor markets with a pro-export orientation—the export-push strategy—employed by all eight of these economies was responsible for their superior productivity performance.

Manufactured exports accelerated the acquisition and mastery of international best-practice technologies in highly imperfect international technology markets. High and rising levels of human capital in the HPAEs, especially the superior educational attainment and cognitive skills of the industrial labor force, helped to ensure that these new processes and equipment were used and adapted effectively. Thus export orientation and high human capital formed a virtuous circle; exports raised the returns from education, and education raised the returns from exporting.

Using the Market: Labor Markets in East Asia

WHILE HUMAN CAPITAL ACCUMULATION MAY BE A NECESSARY condition for sustained rapid growth of output and wages, it certainly is not a sufficient condition. The Philippines, the republics of the former Soviet Union, and Sri Lanka are prominent examples of economies that have had high school-enrollment rates but low rates of growth of per capita income and of wages. Utilizing human capital in activities that yield high returns on the prior investment in education and training is as important to growth as the accumulation of human capital.

How Well Did East Asian Labor Markets Perform?

In East Asia, wages were pulled up by increases in the demand for labor, whereas elsewhere there was a greater tendency for wages to be pushed up artificially. Earnings growth was determined more by the growth of the economy as a whole than by growth in any particular sector (Fields 1992). In economies with highly segmented labor markets, the opposite is the case.

East Asia's Flexible Labor Markets. By not allowing the price of labor in some sectors to rise well above what workers could earn elsewhere in the economy, most HPAEs avoided the creation of a high-wage labor elite. For example, there is evidence for Taiwan, China, of a remarkably integrated labor market; there is no significant correlation between the growth rate of earnings and the growth of output within sectors. Manufacturing wages for unskilled labor are only 20 percent higher than agricultural wages. By contrast, in Colombia and Jamaica, where labor markets are highly segmented, workers with the same level of skill earn nonagricultural wages that exceed agricultural wages by 150 percent.

(Fields 1992). Still larger intersectoral wage gaps have been observed in East Sub-Saharan Africa (Ranis 1992). Another notable feature of the structure of wages in East Asia, as illustrated by Korea and Taiwan, China, is the modest size of the gap between skilled and unskilled wages in the nonagricultural sector (see figure 6.2; also see Ranis 1992). The small gap did not result from minimum wage legislation pushing up unskilled wages. Rather the growth of demand for unskilled labor, in combination with marked increases in the abundance of educated workers, compressed the occupational structure of wages.

One benefit of the compressed wage structure in the HPAEs was that it reduced the incentive for educated workers to conduct a lengthy search for a relatively high-wage job, and thereby remain unemployed, rather than fill a job slot at a lower occupational level. Conversely, a segmented labor market may provide an incentive to workers in low-income employment, and to the unemployed, to lobby the government to provide more high-wage jobs than justified by the derived demand for labor.⁸ Thus, the share of the public sector in the increase in total wage employment in recent decades is a crude indicator of the magnitude of public sector surplus labor, and hence labor market segmentation.⁹ As table 6.3 shows, in all the Sub-Saharan African, Latin American, and South Asian economies for which data were available, employment in the public sector grew more rapidly than wage employment in the private sector. The median share of the public sector in the increase in total employment was between 71 and 87 percent.¹⁰

With the exception of Malaysia, the experience of the East Asian economies is markedly different. Omitting Malaysia, the share of the public sector in the increase in total wage employment in those East Asian economies for which data were available was less than half the median share for other developing economies. The limited growth of public employment in these East Asian economies is evidence that public surplus employment has been kept in check and stronger evidence that the scope for lobbying for make-work jobs has been limited. The need to maintain international competitiveness helped to limit growth of public employment because importers who purchased intermediate inputs from public enterprises lobbied for low prices. Moreover, governments striving for macroeconomic stability strictly limited the size of the public enterprise deficits that they would finance.

How Did Efficient Labor Markets Contribute to Growth?

The benefits of maintaining wages at or marginally below, rather than well above, market-clearing levels were numerous and substantial.¹³ First, because inflated wages were avoided, the profits of firms and, most likely, aggregate savings rates were higher. As a consequence, retained earnings accounted for a higher proportion of investment finance than otherwise would have been the case, reducing reliance on underdeveloped capital markets. The probable net effects, therefore, were higher levels of investment, greater competitiveness in international markets, and faster rates of growth of output, employment, and ultimately earnings.¹⁴

Superior labor market performance in East Asia thus contributed to sustaining the extraordinary dynamics of labor demand we documented above. Moreover, by not allowing the price of labor to become inflated relative to the price of capital, wage restraint encouraged the use of more labor-intensive technology. As a means of avoiding excessive capital intensity, this was particularly important, given that government interventions tended to lower the price of capital.

Efficient use of skilled labor also contributed to the high levels of public sector savings in most of the HPAEs. If the government capitulates to demands for make-work jobs, the subsidies required to finance the re-

sulting gap between the wage and the marginal product of labor are likely to divert scarce savings from productive investments, lowering the rate of capital accumulation and steadily eroding the growth potential of the economy.¹⁵ For a time, Malaysia was an East Asian illustration of this point, but there are many more examples outside the region where governments have been slower to take corrective action.

If the government provides make-work jobs, squandering the productive potential of human capital may be another consequence. In the worst case, which unfortunately is quite common, workers in whom a substantial educational investment has been made are paid the prevailing (relatively) high public sector wage to do jobs in which their marginal productivity is zero or even negative.¹⁶ In this way creation of make-work jobs impedes the process of human capital deepening that is central to education's contribution to economic growth. Had the labor market been allowed to function without intervention, these same workers would have entered lower-paying occupations, and the consequent increase in the educational level in those occupations would have contributed to an increase in labor productivity.

Because wages were responsive to changes in the demand for labor, adjustment to external macroeconomic shocks, such as those induced by the oil crises of the 1970s, was often quicker and less painful in the HPAEs (Mazumdar, forthcoming). If the price of labor does not adjust quickly and smoothly to macroeconomic shocks or to secular changes in the macroeconomic environment, then either the quantity of labor must adjust or the rates of output growth or inflation are likely to. In relation to fluctuations in aggregate demand, employment stability tends to be much greater in East Asia than in other regions, so that East Asian economies generally adjust to downturns without laying off workers (Shah and Mathur 1992).

Using Directed Credit

Like many governments, those in East Asia have gone beyond the indirect guidance described above to target credit directly at priority activities. The categories to which they directed credit have differed little from other developing economies. However, HPAEs, particularly Japan and Korea, have used unusual mechanisms that have helped to increase loan repayment rates and overall success of directed credit. They have limited the size of credit subsidies, and they have applied stringent standards to the selection and implementation of projects.

Criteria for Selecting Directed-Credit Targets. There are three broad types of directed-credit interventions. First, governments can direct credit to specific firms or industries. Second, they can direct credit on the basis of broad functional criteria, such as promotion of exports or small and medium-size enterprises. Third, they can direct credit to accomplish social objectives, such as mass housing or redistribution of assets among ethnic groups. HPAE governments have engaged in all three.

Targeting firms or industries. Japan during its postwar reconstruction and Korea during the 1970s directed substantial credit to specific sectors and firms, mostly in heavy and chemical industries (HCIs) (see table 6.5). Japan's FILP accounted for about a third of new equipment lending in the 1950s. Between 1973 and 1981, Korea's policy loans were about 60 percent of the total loans of its deposit money banks. Most of Japan's priority lending targets through the early 1960s were industries associated with large optimum scales and increasing returns to scale; so were Korea's during the HCI period. Indonesia and Malaysia, conversely, had disappointing experiences with credit interventions targeted to specific industries in the 1970s and early 1980s and abandoned the schemes in favor of more functionally directed credit. Hong Kong and Thailand have not been active in using credit instruments to push selected industries.

In contrast with many other developing economies, where directed credit often went to public and quasi-public enterprises, directed credit in the HPAEs has generally gone to the private sector. Consider the cases

Table 6.5 Proportion of Loans Accounted for by Government's Policy Loans, Japan and Republic of Korea

Year	Japan		Republic of Korea	
	Policy loans as a share of loans/discounts ^a	Policy loans as a share of new industrial equipment funds	Policy loans as a share of outstanding loans ^b	Foreign trade loans as a share of policy loans
1955	13.2	32.1	—	—
1960	11.0	22.8	—	—
1965	9.6	15.9	—	—
1970	9.8	13.8	47.41	11.71
1975	10.6	16.0	52.43	19.05
1980	14.1	17.6	59.78	19.24
1985	13.7	11.5	52.77	24.35
1990	11.8	8.1	—	—

— Not available.

a. Policy loans pertain to all loans made under Japan's Fiscal Investment and Loan Program (FILP). Outstanding loans are of all financial institutions.

b. Policy loans include loans under some kind of explicit preferential credit program, that is, loans extended preferentially in terms of interest rate and availability or supported by the Central Bank's automatic rediscounts. Outstanding loans are the value of all loans and discounts to the private sector made by the Bank of Korea, deposit money banks, and two development institutions. Foreign trade loans include all loans for foreign trade by deposit money banks and all loans by the Korean Export-Import Bank.

Sources: Japan: JDB/JERI (1993). Korea: Stern and others (1992).

of Turkey and Mexico. Loans by the banking system to public enterprises in Turkey in 1975 were 28 percent of bank assets, and to the public administration, 19 percent; those proportions rose to 24.9 and 35.9 percent, respectively, in 1980. In Mexico, the largest development bank provided about 75 percent of its industrial loans to four state-owned enterprises. Unfortunately, these public enterprises often did not perform well, economically or financially. In East Asia, Indonesia, Malaysia, and Singapore have directed credit to state enterprises, but the proportions of total credit were not persistently high, the parastatals tended to perform better financially, and the interest rate subsidies were not large (except in Indonesia).¹⁷ Korea was an exception; its lending to the public steel plant, POSCO, was substantial but is widely considered a success story.

Targeting exporters and small and medium-size enterprises. The broadest functional targeting of credit in the HPAEs has been to exporters. All East Asian economies except Hong Kong and Singapore have subsidized export credits, often through the central bank rediscount system (see table 6.6). Exporters from all industries have had access. Small and medium-size firms, which often had to rely on curb markets, found export financing one of their few ready sources of formal finance. Box 6.1

(Text continues on page 284.)

Institutional Mechanisms for Selection and Monitoring. In contrast to most other economies that have tried but failed to use directed credit, Japan and Korea appear to have strong institutional capacity for project design, appraisal, and monitoring. Because of this, directed credit has generally gone to projects that are creditworthy and viable. More important—and in sharp contrast to many developing economies—funds have usually been utilized for the purpose for which they were allocated. The result has been a high level of loan repayments and a correspondingly low level of loan losses.

In Japan, officials working within government sectoral guidelines operated much like loan officers in private commercial banks, scrutinizing project proposals and the firms involved to ascertain their ability to repay. Once a loan was approved, close cooperation between development and commercial banks ensured continuous monitoring of the performance of the borrower and enabled development banks to take early action if loan repayment was in arrears. Coupled with Japan's overall economic success, effective pre-appraisal and monitoring resulted in very low loan losses. The Japan Development Bank, the main government lender, experienced write-offs of a mere 0.09 percent of average loans outstanding in 1951–55 and just 0.01 percent in 1956–65, lower than commercial and trust banks that focused on short-term lending and had a more diversified portfolio. The JDB's superior performance may be partly explained by its greater reliance on collateral security, particularly equipment purchased with the loans. Fear of losing collateralized equipment gave borrowers a strong incentive to repay their loans.

In Korea, the government, banks, and industrial firms worked together and shared responsibility for the success of directed-credit pro-

jects. Various institutional arrangements such as monthly export promotion meetings and monthly briefings on economic trends, discussed in chapter 4, supported this close consultation (Cho and Hellmann 1993). Enforcement of government goals—primarily the imperative to export—was achieved by rewarding successful firms with continued credit support while reducing credit to less successful firms. Such continual and pragmatic review and adjustment of policy implementation reduced, but did not always eliminate, the moral-hazard costs of government intervention.

Other HPAEs fall along a spectrum between Taiwan, China, which has utilized mechanisms similar to Japan and Korea and has had similar success, and Indonesia, which was plagued by the problems discussed below and has largely discontinued directed credit.

In contrast with Northeast Asia, credit allocation decisions in many developing economies were often motivated by political and noneconomic considerations. Projects were designed with conflicting objectives and lacked proper evaluation. Moreover, the very large rents that could be obtained from subsidized credit were a strong incentive to corrupt practices. In smaller economies, credit allocation to specific sectors became credit to individual firms, because of the limited number of companies involved. Consequently, projects were subject to government-monopoly negotiations and were prone to poor appraisal and disbursements without proper documentation. Credit allocation to large and politically powerful firms or state-owned enterprises were characterized by weak monitoring and follow-up on debt recovery, producing high loan losses and eventually large-scale failure of directed-credit programs.

Using the International Market: Trade and Industrial Policy

WHILE THE LINK BETWEEN INTERNATIONAL TRADE AND economic growth is widely accepted, the precise nature of the relationship is controversial. Early writing on trade policy and growth stressed the benefits of neutral incentives between production for the domestic market and production for export. With neutral incentives, it was argued, resources would flow to sectors in which the economy was most internationally competitive (Corden 1971), and gains in technical efficiency (or "X-efficiency") would result from a more competitive environment (Nishimizu and Page 1991). Studies in the late 1960s and early 1970s convincingly demonstrated the extreme bias in incentive structures against exports and agriculture in most developing economies and the resulting high costs of import-substituting industrialization.²⁴ Recent theoretical work has argued that, where market power, economies of scale, learning, or externalities are significant, departures from neutral incentive regimes (low and uniform tariffs) may improve economic performance (Krugman 1986). This literature, however, unlike the earlier carefully documented studies of the costs of protection, provides very little evidence concerning the importance of these factors or the potential benefits to growth of departures from trade neutrality.²⁵

Proponents of trade neutrality and intervention both cite the records of the high-performing Asian economies as evidence supporting their views. As we noted in chapter 1, international trade is important in all the HPAEs and is the factor most consistently correlated with their success. Balassa (1991), Krueger (1993), Hughes (1992), and others argue that openness to international trade, based on largely neutral incentives, was the critical factor in East Asia's rapid growth. Conversely, advocates of trade interventions, while acknowledging the importance of trade, note that incentives deriving from quantitative restrictions on imports, tariffs, and subsidies were not neutral among sectors (or firms) during their periods of rapid growth. They argue that the HPAE governments successfully intervened to change comparative advantage (Amsden 1989; Wade 1990; Singh 1992).

Industrial policy interventions, which often use trade policy instruments, are motivated by the belief that shifting industrial structures toward newer and more modern sectors increases the opportunities for

capturing dynamic scale economies that result from learning. During their heavy and chemical industries programs, Japan and Korea were the most active HPAEs in promoting individual industries and sectors. Singapore and Taiwan, China, have also actively provided incentives for technological upgrading. Malaysia had an HCI program reminiscent of Japan's and Korea's, while Indonesia has attempted to leapfrog from labor-intensive manufacturing to high-technology industries such as aircraft and electronics.

How have trade and industrial policies affected growth in East Asia? To answer this question we first examine those conditions that might justify government efforts to promote specific sectors. We then describe the trade and industrial policy regimes in the HPAEs and compare their domestic relative prices with international prices to determine the extent of interventions. Finally, we evaluate two approaches to increasing productivity. We find, on the one hand, that government efforts to promote specific industries generally did not increase economywide productivity. On the other hand, the evidence shows that broad government support for exports was a highly effective way of enhancing absorption of international best-practice technology, thus boosting productivity and output growth.

Market Failures, Trade, and Industrial Policies

Why should governments interfere with the level playing field created by the international market? Our discussion of coordination failures in chapter 2 touched on many of the reasons, but it may be useful to review some of the arguments specifically as they apply to trade and industrial policy.²⁶ Among the many reasons for discrepancies between social and private returns cited earlier, four stand out:

- *Interdependent investments and economies of scale.* Increasing returns from scale and capital market imperfections may mean that investments that could be internationally competitive at optimal scales will not be undertaken. This is especially true with large, interdependent projects for which optimum scale depends on simultaneous investment in upstream and downstream industries. The larger the indivisibilities and returns from scale, the more likely that private initiatives will be absent.

- *Strategic negotiations.* In negotiations with other economies and foreign companies, governments can alter the nature of the market environment by intervention. The outcome of any bargaining problem

depends on the strength of competition on both sides. By coordinating the actions of buyers of technology and trying to increase competition among sellers, governments can appropriate more of the surplus associated with the transfer of technology than they otherwise could (Stiglitz 1993a).

■ *Pecuniary externalities.* Pecuniary external economies arise if, as the size of a competitive industry increases, the long-run supply curve falls (Marshallian real externalities). Such gains in productivity are attributable to economies of scope in the use of specialized equipment and greater specialization of individual skills. When economies are small, current prices may not convey adequate information about prospective lower costs of production through larger plant size (Scitovsky 1953; Chenery 1959).²⁷ Externalities can also arise from the interaction between suppliers and buyers about the design or production of a product leading to a better or cheaper good than is available internationally. In this case, the source of the externality is the nontradability of some types of inputs or knowledge—otherwise the improved method or product could be obtained from international suppliers.

■ *Learning.* Externalities related to learning have traditionally been identified as important sources of market failures in developing economies. When firms gain knowledge of production from other firms without incurring costs, real externalities are present.²⁸ Because of incomplete appropriability of knowledge, individual firms may spend less on obtaining production knowledge than is socially optimal.²⁹ Externalities due to learning may also be conferred on other firms by the first entrant. These include the demonstration that the sector is physically and economically feasible and the leakage of information on technology and marketing (Pack and Westphal 1986; Rob 1990).

Economists initially responded to these market failures with arguments supporting the protection of so-called infant industries. Protection was seen as necessary so that firms could gain the experience needed to lower costs and become viable.³⁰ Industrial policy advocates take the argument a step further. Because they associate learning with capital- and knowledge-intensive industries, they advocate a rapid shift in industrial structure toward these activities, even if they are not internationally competitive at present levels of scale, knowledge, and factor prices. In this view, the short-run allocative costs of establishing internationally uncompetitive industries will be outweighed by the long-run benefits of rapid productivity change in the promoted and linked sec-

tors. But as the many infant industries that have never grown up amply demonstrate, protection does not ensure that the promised learning and economies of scale actually materialize.

Trade Policies in the HPAEs

Most HPAEs began industrialization with a protectionist orientation and have gradually moved toward increasingly free trade. Along the way (as we showed in chapter 3), they often tapped some of the efficiency-generating benefits of international competition through mixed trade regimes: they granted exporters duty-free imports of capital and intermediate goods while continuing to protect consumer goods. Export prices were set in the international market and were often substantially less than current marginal or average costs.³¹ Losses on export production offset profits in the protected market, while competition in the international market ensured that the firm would not suffer from loss of cost discipline. More recently, all the HPAEs have reduced their protection of import-substituting industries.

Below we describe the evolving patterns of protection in the HPAEs, with the exceptions of Hong Kong and Singapore, which adopted essentially free trade stances early in their development.

Japan. Japan pursued an early import-substituting industrialization strategy, similar in many dimensions to those of Argentina, India, and other less successful economies. As late as 1968, effective rates of protection (ERPs) in Japan were still quite high and exhibited the cascaded pattern from raw materials (low) to consumer products (high) that is typical of most developing economies (see table 6.8). Unlike many import-substituting economies, however, there was surprisingly high protection of machinery (final producer goods), confirming other research indicating that the Japanese authorities engaged in an intensive effort to develop this sector. ERP levels in the machinery sector were reduced during the 1970s, only after it was evident from export performance that the sector had become internationally competitive (Itoh and Kiyono 1988). Quite high levels of protection were afforded sectors such as iron and steel and nonferrous metals as late as 1970. Protection in capital-intensive sectors such as pulp and paper and chemicals also remained high, to say nothing of the remarkably high levels in textiles.³²

Korea. There is considerable evidence, summarized in Pack and Westphal (1986), that Korea selectively protected sectors that the gov-

**Table 6.8 Effective Rates of Protection in Japan
(percent)**

<i>Type</i>	<i>By type of goods</i>					
	<i>1963</i>	<i>ERP^a</i>	<i>1968</i>	<i>ERP</i>	<i>1963</i>	<i>ERP-NRP</i>
<i>1968</i>	<i>1968</i>	<i>1968</i>	<i>1968</i>	<i>1968</i>	<i>1968</i>	<i>1968</i>
Raw materials	3.1	0.8	3.9	0.9	-2.3	-3.0
Producer goods	13.7	29.6	15.2	22.3	15.9	7.1
Intermediate producer goods	12.3	28.0	14.1	21.7	15.7	7.6
Final producer goods	15.9	32.3	16.9	23.2	15.4	6.3
Consumer goods	21.6	44.6	23.6	35.8	23.0	12.2

<i>Industry</i>	<i>By industry^c</i>		
	<i>1963</i>	<i>1968</i>	<i>1972</i>
Manufacturing	32.3	24.2	14.4
Textiles	54.3	28.2	18.6
Spinning	27.1	12.5	1.0
Weaving	44.6	30.5	15.5
Products	72.8	32.8	22.4
Wood products	14.0	25.6	16.1
Paper and pulp	9.7	18.0	11.0
Publishing	-16.7	1.0	-0.9
Leather and rubber products	30.9	21.8	12.3
Chemicals	33.4	17.7	8.8
Petroleum and coal products	19.5	14.5	7.1
Nonmetallic minerals	22.2	15.7	8.1
Iron and steel	30.1	30.0	17.1
Nonferrous metals	30.4	34.1	22.1
Metal products	13.8	19.9	9.9
Machinery	36.7	20.0	7.7
General machinery	23.0	14.5	8.7
Electrical machinery	30.9	16.5	5.4
Transport equipment	61.5	31.0	9.2
Precision instruments	34.9	22.9	10.4

a. NRP=Nominal Rate of Protection.

b. ERP=Effective Rate of Protection.

c. ERP based on simple averages of tariff rates.

Sources: For top panel, Itoh and Kiyono (1988); for bottom panel, Shouda (1982).

ernment hoped to promote. Protection consisted of both tariffs and nontariff barriers. Table 6.9 presents a summary measure that combines the effect of nominal tariffs and nontariff barriers.³³ The figures span the period 1966–85, and thus include the early efforts at industrial promotion, the HCI drive, and the subsequent liberalization. The 1966 figures show a relatively protectionist stance that becomes somewhat more

**Table 6.9 Overall Degrees of Import Liberalization by Major Industry for the Republic of Korea, Selected Years (Consolidating Both QRs and Tariffs)
(percent)**

Major industry	1966	1970	1975	1980	1983	1985
I. Primary Industry	42.0	56.5	55.1	58.8	65.3	71.2
II. Food, beverages, and tobacco	30.0	32.4	38.4	49.6	49.6	64.1
III. Textiles, clothing, and leather products	34.7	36.6	43.8	74.0	74.3	87.8
IV. Wood and its products	24.2	64.0	69.1	76.5	82.7	92.4
V. Paper, paper products, and printing and publishing	39.5	54.7	54.5	78.4	88.8	90.8
VI. Chemicals, petroleum, coal, rubber, and plastic products	47.9	57.1	58.4	65.9	75.2	80.0
VII. Nonmetallic mineral products	41.0	77.0	76.8	89.1	89.2	91.7
VIII. Basic metal products	44.7	73.3	74.8	86.2	90.1	92.0
IX. Metal products, machinery, and equipment	41.0	59.3	55.4	63.6	69.7	77.8
X. Other manufacturing	31.8	39.5	38.7	58.2	65.4	76.1
All manufacturing (II-X)	37.5	47.7	52.6	66.8	71.3	79.8
Light industry (II-VX)	33.7	38.2	43.7	62.3	63.8	76.8
Heavy and chemical industry (VI-IX)	44.5	62.5	61.2	70.5	76.5	81.7
All-industry average (I-X)	39.6	50.8	52.3	65.6	70.4	78.5

Note: This table gives the degrees of import liberalization by major industry; these are obtained by averaging sectoral data, weighted by the current price value of domestic production for respective years.

Source: Sakong (1993).

liberal by 1975. Nevertheless, even by 1983, when Korea's success had become an established fact, most sectors were still protected by some combination of tariffs and nontariff barriers. While Korea utilized a variety of instruments, especially export targets and rebates, to ensure that exporters faced international prices for their tradeable inputs, there was considerable protection of goods sold on the domestic market.

Taiwan, China. Wade (1990) provides a careful description of the extent of intervention by authorities of Taiwan, China, in product markets. The pattern of protection is not dissimilar from that of Korea. As late as 1972, a significant percentage of items were subject to nontariff barriers, and two-thirds of potential imports were subject to nominal tariffs in excess of 30 percent. As late as 1980, more than 40 percent of imports received nominal protection in excess of 31 percent.

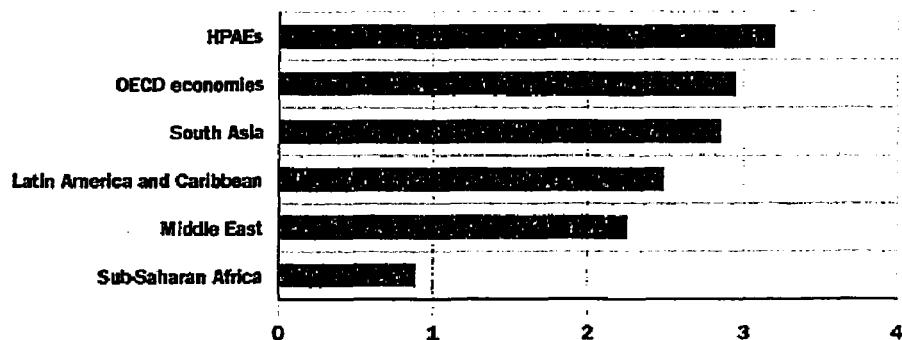
Indonesia, Malaysia, and Thailand. As we described in chapter 3, Indonesia, Malaysia, and Thailand all had import-substitution regimes that while modest by international standards, nevertheless favored production of manufactured goods for the domestic market at the expense of

agriculture and exports. Malaysia was notable for low, if variable, protection of import substitutes, while protection levels in Indonesia and Thailand were higher. All three economies began export-push trade strategies during their periods of protection of the domestic market. Tables 6.10, 6.11, and 6.12 provide recent data on the structure of effective protection for these three economies. Effective protection rates are declining but in Indonesia and Thailand they remain sufficiently high to result in some anti-export bias. The free trade regime for exporters in these economies partially offsets the structure of protection.

Openness to Foreign Technology

An important factor in East Asia's successful productivity-based catching up was openness to foreign ideas and technology. Governments encouraged improvements in technological performance by keeping

Figure 6.4 Index of Outward Orientation



Source: Dollar (1990).

several channels of international technology transfer open at all times, even though some, such as direct foreign investment (DFI), were restricted or closed for varying periods. In contrast to most economies with import-substituting industrialization strategies, even when protection was practiced with respect to the domestic market, the search for and absorption of foreign technology was encouraged. While Japan and Korea set obstacles to DFI, they were hospitable to licensing, though even here the Japanese attempted to ensure that they did not incur excess costs. Singapore was exceptionally welcoming to direct foreign investment, and a major task of the economic planning agency was to locate appropriate foreign investors. Malaysia has aggressively sought export-oriented DFI, particularly from Japan (see box 6.2). None of the HPAEs was hostile to the establishment of local buying offices by international purchasers, an important source of production and marketing knowledge. This selectively permissive attitude toward the acquisition

Box 6.2 Foreign Investment Brings Export Technology to Malaysia

IN THE 1970S AND EARLY 1980S, DIRECT FOREIGN investment was welcome in Malaysia. Government policy encouraged foreign investors, yet the effect was inhibited by the conflicting goal of increasing local participation in corporate ownership. Then, the recession of 1985–86, large fiscal and trade deficits, and declining investment brought an all-out push for DFI, especially for export. New policies offered greater tax incentives and relaxed domestic equity participation requirements for potential investors, bringing technology and export and employment opportunities.

The new flexibility had a dramatic effect on foreign investment. DFI approvals in Malaysia, which averaged US\$300 million a year in 1983–85, jumped to US\$2 billion by 1988. The investments became more dynamic. In 1988 a quarter of the DFI originated from Japan, followed by Taiwan, China, and the United States—in contrast to the previous ten years, when the greatest source of DFI had been Singapore, naturally attracted by historical ties and physical proximity. New investments were directed

toward electrical and electronic products, chemical products, rubber products, basic metal products, and petroleum. More of the investments were dedicated to exports than ever before.

The benefits to Malaysia of DFI have been substantial, particularly in generating foreign exchange and employment. However, some critics argue that linkages with the local economy have not been strong—at least, not as strong as in neighboring recipients of DFI. Two important reasons for that are the young age of many of the investments in Malaysia and the relative scarcity of management capacity, skilled labor, and high-quality suppliers, a result of Malaysia's late start as an HPAE. But the foreign investment projects themselves have contributed to building know-how in the economy. In 1985 the thirteen American semiconductor manufacturers in Malaysia spent more than \$100 million in training Malaysian workers, mostly engineers and technicians. Local value added has been rising as established firms upgrade their technology to keep up with world markets, and firms have added testing of

of knowledge of international best practice was a reflection of the view that the world market for goods and services provided an opportunity, not a threat.

In contrast, many other developing economies that tended to emphasize the dangers of opening to world markets were equally suspicious of open policies with respect to knowledge acquisition. Suspicion of external trade was often reflected in a mistrust of DFI and licensing. The absence of exports reinforced the suspicion. Even where DFI was permitted in inward-oriented economies, it was not viewed as providing access to international best practice but rather as a source of additional domestic production. Thus some economies in Latin America that were hostile to licensing nevertheless allowed DFI in production for the domestic market. The basic difference between these economies and Singapore, which was much more heavily dependent on DFI, is that the multinational corporations locating in the latter could only do so to export,

semiconductors to their assembly activities. There is also no doubt that DFI has created a lot of employment—often for poor rural Malay women—to the tune of 85,000 in electronics alone in the late 1980s.

Malaysia has found that, as investments mature and local and regional linkages are fortified, multinationals that are often thought of as "footloose" stay, and the positive spillovers created by successful ventures encourage more investment. For example:

- Since the 1970s, DFI has made Malaysia the world's third largest producer of semiconductors, garnering almost US\$3 billion in net exports in 1986. In the late 1980s, Siemens built in Malaysia its fourth plant in the world to manufacture megachips (the other three were in Germany, Japan, and the United States). But foreign companies have not kept to semiconductors—investments in electronics have spread both backward and forward. National Semiconductor recently built Malaysia's first wafer fabrication plant to supply its local semiconductor plants; Motorola and Hitachi have followed suit. Seagate has expanded production of disk drives from Singapore

to Malaysia. The expertise Malaysia has built up in electronics is considerable. Nixdorf Computer AG, which recently established a US\$3 million software center to create applications for UNIX-based workstations, was attracted to Malaysia by the fact that its software engineers cost one-fifth of Germany's. Intel called in its Malaysian experts to help set up a chip assembly line in Arizona.

- Malaysian plants produce a range of products, from color TVs, radio cassette players, and toasters to computer peripherals. Many companies that started small in Malaysia have stayed and expanded. Sharp has become involved in several joint ventures in Malaysia, where it assembles color televisions and computer monitors. Sony began to manufacture in-house some of the components for its new color TV plant in Malaysia in the late 1980s. Matsushita's Malaysian operations, which grew in the mid-1980s as expenses rose in Japan, have come to supply 10–15 percent of the world market for room air conditioners.

Source: Lim and Fong (1991).

given the small internal market. Korea and Taiwan, China, with larger domestic markets, created a similar situation by encouraging DFI in production for export and in those sectors where substantial technology transfer could be anticipated. In contrast, the large import substitution economies, such as Argentina, Brazil, and Mexico lured investment of foreign firms by offering access to protected domestic markets.

Industrial Policies

We define industrial policies, as distinct from trade policies, as government efforts to alter industrial structure to promote productivity-based growth. Productivity-based growth may derive from learning, technological innovation, or catching up to international best practices. All the HPAEs, except Hong Kong, have employed industrial policies as defined above. Japan and Korea had the most systematic set of policies to alter industrial structure. Efforts in Taiwan, China, were less systematic but were nonetheless widespread. Industrial policy in Singapore was more functionally directed at the rapid upgrading of technology by direct foreign investors, regardless of type of output. Indonesia, Malaysia, and Thailand have all used industrial policies but much less systematically than the northeastern HPAEs.

Industrial Growth and Productivity Change. HPAE industrial growth patterns differ from the patterns in most other low- and middle-income economies in the relative size and growth rates of two important industrial subsectors: metal products, electronics, and machinery; and textiles and garments. Table 6.14 shows the share of value added in nine International Standard Industrial Classification (ISIC) subsectors as a percentage of the total value added of manufacturing. Among the HPAEs, metal products, electronics, and machinery (ISIC subsector 38, or MPM) have grown unusually fast. The sector's share of manufacturing value added doubled in Japan and Singapore, nearly tripled in Indonesia and Korea, and quadrupled in Malaysia. More surprising than the importance of growth in MPM, which provides vital inputs to numerous other manufacturing subsectors, is the continued importance of textiles and garments even as the rapidly developing Asian economies shifted from labor- to capital-intensive production.

Appendix 6.1 describes our method for determining the projected relative importance of specific industrial subsectors in cross-economy comparisons. As can be seen in table 6.15, both capital-intensive sectors

Table 6.14 Current Price Value Added as a Share of Manufacturing Value Added

Economy/ region	Food, beverages, and tobacco	Textiles and clothing	Wood and wood products	Paper and printing	Chemicals and rubber	Non- metallic minerals	Metal basic metals	Metal products and machinery	Other	Total manu- facturing
HPAEs										
Hong Kong	0.05	0.48	0.02	0.05	0.12	0.01	0.01	0.23	0.03	1.00
1973	0.06	0.38	0.01	0.08	0.10	0.01	0.01	0.33	0.04	1.02
1988										
Indonesia										
1973	0.59	0.14	0.01	0.01	0.16	0.03	0.00	0.05	0.01	1.00
1988	0.26	0.15	0.11	0.03	0.15	0.03	0.09	0.14	0.01	0.99
Japan										
1953	0.09	0.16	0.04	0.10	0.16	0.03	0.12	0.24	0.02	0.98
1969	0.09	0.05	0.03	0.08	0.16	0.04	0.07	0.46	0.01	0.99
Korea, Rep. of										
1956	0.23	0.19	0.03	0.06	0.21	0.06	0.04	0.13	0.02	1.00
1988	0.11	0.15	0.02	0.05	0.18	0.04	0.07	0.36	0.02	1.00
Malaysia										
1960	0.16	0.05	0.07	0.11	0.27	0.01	0.06	0.06	0.23	1.02
1988	0.18	0.07	0.07	0.04	0.27	0.06	0.03	0.27	0.01	1.00
Singapore										
1969	0.14	0.05	0.07	0.06	0.30	0.03	0.03	0.29	0.02	0.99
1989	0.05	0.04	0.01	0.05	0.20	0.01	0.01	0.61	0.01	0.99
Thailand										
1968	0.26	0.17	0.13	0.04	0.09	0.16	0.02	0.12	0.01	1.00
1986	0.42	0.22	0.03	0.03	0.09	0.08	0.02	0.11	0.01	1.01
South Asia										
India										
1970	0.12	0.21	0.01	0.05	0.18	0.04	0.12	0.25	0.01	0.99
1986	0.12	0.15	0.01	0.04	0.24	0.05	0.10	0.29	0.01	1.01
Pakistan										
1970	0.24	0.34	0.00	0.03	0.20	0.04	0.02	0.08	0.04	0.99
1986	0.30	0.21	0.00	0.02	0.26	0.07	0.04	0.09	0.00	0.99
Latin America										
Brazil										
1970	0.17	0.13	0.05	0.06	0.19	0.06	0.12	0.20	0.02	1.00
1985	0.14	0.12	0.03	0.05	0.24	0.04	0.08	0.27	0.03	1.00
China										
1970	0.17	0.12	0.02	0.02	0.10	0.03	0.34	0.16	0.00	0.96
1986	0.25	0.08	0.03	0.10	0.16	0.04	0.28	0.07	0.00	1.01
Colombia										
1970	0.34	0.19	0.02	0.06	0.17	0.04	0.03	0.14	0.01	1.00
1988	0.30	0.15	0.01	0.07	0.19	0.06	0.06	0.15	0.01	1.00
Mexico										
1970	0.31	0.08	0.01	0.07	0.15	0.06	0.24	0.09	0.00	1.01
1984	0.28	0.05	0.00	0.05	0.17	0.11	0.19	0.15	0.00	1.00

Source: Pack (1993b).

(MPM) and labor-intensive sectors (textiles) play a greater-than-predicted role in manufacturing in most of the HPAEs (except Indonesia and Malaysia). Besides the unexpected prominence of textiles and garments, the analysis yields another surprise. Chemicals and nonmetallic minerals, two sectors often associated with industrial modernization, are not large in the HPAEs by international standards.

Detailed sectoral growth rates of total factor productivity are available for Japan, Korea, and Taiwan, China. There are now sufficiently long time-series data to conclude that in these economies, TFP growth has accounted for a substantial fraction of the growth of constant price value added in manufacturing. Table 6.16 shows a variety of estimates of long-

term TFP growth rates. Given the length of time of the observations, it seems unlikely that the measured growth rates of TFP could be attributable to cyclical phenomena or growing capacity utilization of initial large investments.³⁶

Strategies of Selective Promotion. Here we describe the strategies of selective promotion that have evolved in the HPAEs as they developed their industrial policies.

Japan. Early Japanese industrial policy aimed to encourage sectors that faced income-elastic demands in the international market and exhibited economies of scale, large fixed costs, and the potential to learn from experience. This purely economic rationale was supplemented by a sense that some sectors were critical to national morale and the

Table 6.15 Actual/Predicted Share of GDP Originating in Manufacturing Sectors

Economy/ region	Food, beverages, and tobacco	Textiles and clothing	Wood and wood products	Paper and printing	Chemicals and rubber	Non- metallic minerals	Basic metals	Metal products and machinery	Other	Total manu- facturing
<i>HPAEs</i>										
Hong Kong										
1973	0.31	10.31	0.89	0.53	0.78	0.14	0.37	2.86	0.35	1.25
1988	0.43	118.95	0.36	0.65	0.67	0.14	0.17	1.96	0.38	1.26
Indonesia										
1973	1.63	0.75	0.30	0.18	0.40	0.20	0.00	0.44	0.06	0.62
1986	0.75 ^a	0.25 ^a	1.42	0.06	0.54	0.95	0.62	0.11	0.01	0.57
Japan										
1963	0.75	2.98	2.42	1.36	0.73	0.63	1.00	2.41	0.67	1.23
1989	0.98	13.52	0.88	0.66	0.69	0.52	0.71	1.69	0.14	0.97
Korea, Rep. of										
1968	0.99	1.75	2.03	1.04	0.94	0.73	0.52	2.07	0.20	1.04
1988	0.85	2.74	0.71	0.64	0.99	0.62	1.13	2.76	0.32	1.26
Malaysia										
1969	0.35	0.25	1.55	0.89	0.80	0.05	0.69	1.03	1.43	0.64
1981	0.94	0.68	3.28	0.57	0.89	0.70	0.57	2.44	0.07	0.97
Singapore										
1973	0.31	2.14	2.40	0.49	2.09	0.75	1.53	12.56	0.15	1.41
1989	0.26	11.32	0.51	0.47	1.72	0.27	0.61	5.10	0.14	1.38
Thailand										
1968	0.90	1.21	4.89	0.70	0.36	1.69	0.22	3.16	0.09	0.95
1986	0.34	3.33	1.85	0.71	0.65	1.39	0.33	1.82	0.22	1.68
<i>South Asia</i>										
India										
1963	0.50	6.00	0.54	2.33	0.33	0.37	0.80	3.74	0.32	1.10
1986	0.56	2.39	0.18	1.02	0.89	0.35	0.68	2.51	0.09	0.92
<i>Latin America</i>										
Brazil										
1963	0.91	1.80	1.34	1.03	0.69	0.51	1.31	2.28	0.00	1.02
1985	0.94	1.70	1.21	0.78	1.12	0.48	0.91	1.92	0.36	1.09
Chile										
1963	1.12	3.04	1.21	1.07	0.79	0.73	1.63	2.65	0.24	1.21
1980	1.18	1.06	1.25	0.94	0.67	0.48	4.36	0.88	0.03	1.01
Mexico										
1965	1.37	0.49	0.41	1.08	0.76	0.84	2.37	0.64	0.00	0.95
1984	1.57	0.64	0.15	0.60	0.70	1.05	1.94	0.92	0.00	0.92

a. Predicted value was negative; calculated here as positive.

Source: Park (1993b).

Table 6.16 Long-Term TFP Growth Rates by Sector

<i>Sector</i>	<i>TFP growth rate</i>		
	<i>Korea</i>	<i>Japan, 1960-79</i>	<i>Taiwan, China, 1966-86</i>
Food	7.30	-1.76	2.0 ^a
Beverages	7.90	0.0	—
Tobacco	13.40	—	—
Apparel	—	1.98	10.5
Textiles	10.70	0.47	7.6
Leather	12.60	1.03	—
Shoes	—	1.03	—
Wood	9.40	2.81	0.3 ^b
Furniture	12.10	1.74	—
Paper	8.20	1.44	2.3 ^c
Printing	10.70	-0.18	—
Chemicals	13.10	3.36	3.3
Petroleum	-0.30	-3.55 ^d	0.0 ^b
Rubber	11.40	1.02	6.3 ^b
Nonmetallic minerals	2.80	—	2.4
Basic metals	—	—	7.2
Iron and steel	3.70	1.34	—
Metal products	7.60	3.41	4.4
Nonelectrical machinery	8.00	2.30	6.7 ^e
Electrical machinery	10.70	5.37	—
Electrical equipment	—	—	7.1
Transport equipment	11.20	4.32	2.7
Precision instruments	—	—	11.0
Plastic products	—	0.92 ^f	0.0
Other manufacturing	7.50	-1.76	—
Average	8.8	1.2	4.6

—Not available.

a. Food and beverages.

b. Rubber, petroleum, and wood products.

c. Paper and paper products.

d. petroleum ref. and coal.

e. All machinery.

f. Plastic.

Source: Pack (1993b).

achievement of international respect.³⁷ In later years, industrial policy had a narrower technological focus, for example, promoting establishment of the technological base for very large-scale integrated circuits (Borrus, Tyson, and Zysman 1986). Among the sectors carefully nurtured were steel, automobiles, textiles, shipbuilding, and aluminum refining in the earlier years and then electronics and semiconductors in

later years.³⁸ (Effective rates of protection in these industries can be seen in table 6.8.)

Japanese industrial policy until the early 1970s had several strands (Yamamura 1986; Yamamura and Yasuba 1985). The government directed credit to large firms and protected the domestic market to help the firms realize static and dynamic economies of scale. MITI allocated foreign exchange to favored large firms and tried to ensure that technology payments to foreign firms were neither excessive nor duplicated, often forcing licensees to share their information with other Japanese firms. Relatively high levels of protection were used as part of a strategy to help firms to export successfully. As late as 1978, the average of effective rates of protection across the manufacturing sector was 22 percent.³⁹ Such rates may have been responsible for the very low level of manufactured imports, an issue widely discussed in the scholarly literature (Balassa and Noland 1988).

Korea. Korea's policies were similar to Japan's with respect to selected credit, protection, and limitation of entry into specific sectors (Pack and Westphal 1986). However, the Korean government promoted individual firms more often to rectify perceived entrepreneurial and skill deficiencies, using export performance to determine whether firms deserved continued promotion. Other policies to encourage industrial growth and exports included making direct and indirect inputs to exports available at world prices. In Korea, the selectively promoted sectors were the heavy and chemical industries: iron and steel, metal products, machinery, electronics, and industrial chemicals. The motivation for these appears to have been both strategic—to increase defense capability—and economic—to shift to capital- and technology-intensive sectors in anticipation of a loss of competitive advantage in labor-intensive sectors.⁴⁰ The costs of the HCI drive are still not fully known, but they were high (see box 6.3). Although there are no recent estimates of Korean rates of effective protection, there is considerable anecdotal information suggesting that the government afforded these sectors relatively high protection.

Taiwan, China. The intervention of Taiwan, China, in manufacturing has been similar to Japan's and Korea's, though less important quantitatively. Wade (1990) has documented tariffs, quantitative restrictions, and selective credit policies, maintaining that the success of Taiwan, China, was at least partly attributable to an intensive government effort to direct the economy's sectoral evolution. This conflicts with the standard neoclassical view that its development was primarily attributable to

low protection, the availability of inputs to exporters at international prices, a conservative macroeconomic policy reflected in low inflation, and competitive factor markets (Little 1979).

Unlike the situation in Japan and Korea, in Taiwan, China, it is difficult to discern a pattern of economic incentives. Wade (1990) notes that a guiding principle in the 1960s may have been the existence of

gaps in the domestic input-output table that revealed potential areas of import substitution. The autobiography of a major architect of the island's development supports this view (Li 1989). Although anecdotal evidence summarized by Wade demonstrates considerable intervention in many sectors, there are no studies of effective rates of protection or subsidy after the early 1970s. The more recent intentions of the government may be discerned directly from two infrastructural efforts, namely, the Hsinchu Science Park and the Industrial Technology Research Institute. Both were major investments undertaken by the government to provide the basis for a rapid shift toward higher-technology sectors.

Rates and Patterns of Productivity Change in Industry. There is both good news and bad news for advocates of industrial policy in the productivity performance of East Asian industry. The good news is that, on average, rates of productivity change in industry in Japan (before 1973), Korea, and Taiwan, China, which are the only economies for which we have detailed sectoral estimates of TFP growth, were high by international standards; productivity-based catching up was taking place (Page 1991). The bad news is that, in general, productivity change has not been higher in promoted sectors. Japan may be an exception. Between 1960 and 1979 chemicals and the metalworking machinery complex have unusually good TFP performance (Jorgenson, Kuroda, and Nishimizu 1987). Japan's industrial structure differs from international norms in these sectors and exhibits quite high values of the share of value added in total manufacturing. These industries are those that observers usually point to as having received significant government support, including efforts to stimulate productivity growth.

A number of calculations of TFP have been carried out for Korea for a variety of periods (Dollar and Sokoloff 1990; Lim 1991). From these studies a number of patterns can be identified that are broadly consistent with one another. Most striking are the high values of TFP change in most sectors by international standards (Nishimizu and Page 1991). Although the Korean government selectively promoted chemicals and iron and steel (included in basic metals), the large growth in the share of iron and steel was accompanied by quite low TFP performance between 1966 and 1985; textiles and clothing, conversely, had very high rates of TFP growth. The promoted chemical sector, whose relative size was decreasing, was characterized by considerably higher-than-average TFP growth during this same period.

The government in Taiwan, China, did not attempt to influence sectoral evolution as strongly as the government of Korea. Nevertheless, there was more than a small effort devoted to encouraging specific sectors, particularly those viewed as either capital- or technology-intensive.

The three sectors that exhibited the greatest expansion in the share of value added—apparel, electrical equipment, and metal products—are all characterized by below-average wages, capital-labor ratios, and labor product. Moreover, there is no statistical relationship between wage or capital intensity and productivity change at the sectoral level. In fact, the highest sectoral rates of TFP change are recorded in textiles and apparel.

Recent sectoral TFP growth rates for industry in Malaysia from 1973 to 1989 show a similar pattern of great variability in the TFP growth rates in promoted sectors, from high in nonelectrical machinery and paper and paper products to low in iron and steel and transport equipment. Textiles and apparel, a nonpromoted sector, are among the TFP leaders (Maisom 1992). In short, there is no apparent relationship between the sectors promoted under the HICOM drive and rapid productivity growth.

Overall, the evidence that industrial policy systematically promoted sectors with high productivity change is weak. In Japan there is some support for the assertion that TFP growth was higher in selected sectors, while in Korea and Taiwan, China, activities that were not promoted (for example, textiles) had TFP performance as impressive as those that were. Moreover, attempts to determine whether high rates of TFP growth combined with rapid growth of promoted sectors can plausibly explain the very high overall rates of TFP change in manufacturing yield mostly negative results (see appendix 6.1). The main reasons for manufacturing's success in Japan, Korea, and Taiwan, China, lay in the high general rates of TFP growth, including those in labor-intensive, nonpromoted sectors.

How Manufactured Exports Increased Productivity

DOES THIS MEAN THAT PUBLIC POLICY HAD NO ROLE IN THE rapid rates of TFP change found for many of the HPAEs? We believe not. In chapter 1 we described how rapid TFP change in developing economies can be a result of the ability to move quickly closer to international best practices. We termed this "productivity-based catching up." We believe that rapid growth of exports, a result of the export-push policies of the HPAEs, combined with the superior performance of these economies in creating and allocating human capital, provided the means by which they attained high rates of productivity-based catching up and TFP growth.

How did the unusually high rates of growth of exports and human capital contribute to the productivity performance of the East Asian economies? Most explanations of the link between TFP growth and exports emphasize such static factors as economies of scale and capacity utilization. While these may account for an initial surge of productivity soon after the start of an export push, they are insufficient to explain continuing high TFP growth rates. Rather, the relationship between exports and productivity growth may arise from exports' role in helping economies adopt and master international best-practice technologies. High levels of labor force cognitive skills permit better firm-level adoption, adaptation, and mastery of technology. Thus, exports and human capital interact to provide a particularly rapid phase of productivity-based catching up.

Of course, it is possible that the move to a higher production function occurred before the growth in exports—that TFP growth caused export growth rather than the reverse.⁴¹ But even if exports began on the basis of productivity change due to such domestic efforts as plant reorganization, the cumulative magnitude of productivity growth over many years is most unlikely to have been a result of purely domestic efforts.⁴² It stretches credibility to suggest that the large cumulative effects of TFP growth in Japan, Korea, and Taiwan, China, could have been achieved by the plant floor innovations proposed as important sources of productivity growth at lower TFP growth rates (Pack and Page 1993). Were that the case, it would be difficult to explain why these gains far outstrip productivity increases in the industrial economies during their own rapid-growth periods, when TFP growth was attributable largely to domestic factors. Clearly, then, an increased ability to tap world technology has been an important benefit of exports.⁴³

Exports' Role in Imperfect Knowledge Markets

Why do exports facilitate the move toward international best-practice technologies? The knowledge that permits this shift is available only in quite imperfect markets. Often the markets do not exist—some knowledge is simply not sold, because its owners fear that licensing or direct foreign investment will eventually leak the knowledge to future competitors. Even where markets exist, they are likely to be characterized by bilateral monopoly, so that a variety of difficulties confront firms trying to purchase such knowledge (Arrow 1969).

In markets with imperfect knowledge, mechanisms that help an economy or firm obtain technology can confer an externality—a pecuniary one if knowledge is obtained at a lower cost, a real externality if the knowledge transfer is more efficient. For example, the transfer may be more beneficial if knowledge is obtained as a result of the self-interest of purchasers of exports in the OECD economies, rather than through arm's-length purchase.

Exporting helps to overcome some imperfections in the market for knowledge and permits its acquisition through a variety of mechanisms. These include:

- *Purchase of new equipment.* The purchase of new equipment is a straightforward method of obtaining new technology insofar as it is embedded in equipment. The two main impacts of exports in this case are in providing the competitive pressure for firms to make such purchases (if the equipment is used to produce exports), and, more generally, in earning the foreign exchange to finance the purchase of machinery.

- *Direct foreign investment.* The firms that generate much of the world's new technology are reluctant to part with it. They perceive that the best use of their new knowledge with respect to developing economies often is through exports of products to them. In East Asia, however, most of the incoming DFI has been intended for production of exports rather than as a strategy for domestic sales. An economy's recent export performance frequently signals whether it is a desirable location for export-oriented DFI. Economies with rapid export growth are preferred in part because such growth often reflects good macroeconomic management. Moreover, economies with significant export growth have generally provided more infrastructure useful to exporters than internally oriented economies.⁴⁴ DFI makes crucial production and marketing knowledge available to developing economies. It permits them to begin manufacturing along the world's best-practice production function by substituting foreign physical and human capital for absent local factors.⁴⁵ As local labor learns from the presence of best-practice knowledge and equipment, knowledge tends to become diffused through labor mobility and informal contacts among managers. Even when the investing firm attempts to hinder such diffusion, significant knowledge transfers are inevitable.⁴⁶

- *Technology licensing.* Licensing existing technologies, both rights to proprietary equipment and details about production processes, offers developing economies substantial opportunities for improving their levels of best practice. During the 1950s and 1960s, Japan benefited considerably from licensing (see, for example, Nagaoka 1989). The net gains were

large, as the licenses were obtained at relatively low cost compared with the domestic research expenses avoided. However, there is some evidence, and a growing subjective sense, that arm's-length licensing is decreasing as an option for closing technology gaps. Technology developers, the licensors in the OECD economies, have become wary of helping potential competitors, even if contracts preclude exports to other economies for the duration of the license. Particularly in R&D-intensive sectors such as chemicals, machinery, and electronics, firms are increasingly unwilling to license technology; they believe royalties provide an inadequate return for actions that may impair their own long-term competitiveness. This creates an imperfect or nonexistent market for critical technology transfers.

Exporting economies have an advantage in coping with this situation. Licensing firms prefer cross-licensing agreements in which they obtain access to the licensee's own technology or to its manufacturing skills. Given asymmetries in knowledge, the best test of the potential partner's abilities is its performance in export markets. Moreover, the fact that a firm has exports and the requisite technical and commercial skills to produce them improves the bargaining position of the licensee. Sales of licenses contain a significant element of rent (Pack 1993c), so the cost of licenses will be lower where the seller perceives the strengths of the purchaser as signaled by exports. Finally, where a market does exist for technology licenses, the foreign exchange to pay for fees is more likely to be available in economies experiencing rapid growth in exports.

- *Transfer of nonproprietary technology.* The free or inexpensive transfer of nonproprietary knowledge is easier if an economy begins its industrialization effort in labor-intensive sectors using relatively old machine designs and production technology. When exports are based on comparative advantage, precisely these conditions are met. Hong Kong, Korea, Singapore, and Taiwan, China, all began rapid industrialization in labor-intensive and low-technology manufacturing. The equipment was readily purchased, and the production knowledge was available at low cost from engineering publications, trade literature, and independent consultants.⁴⁷ The simpler equipment was conducive to local productivity-enhancing improvements, often on the part of blue collar workers (Ranis 1973). Moreover, in labor-intensive industries it was easier to acquire and absorb information from customers without a large stable of educated engineers.

- *Information from customers.* In the presence of imperfectly traded information, knowledge provided by purchasers of an economy's ex-

ports can be quite important. This has been shown by Westphal, Rhee, and Pursell (1985) in Korea and independently corroborated in Taiwan, China, by a number of researchers (see, for example, Gee 1989). Buyers want low-cost, better-quality products from major suppliers. To obtain this, they transmit tacit and occasionally proprietary knowledge from their other, often OECD-economy, suppliers. Such knowledge transfers are more common in simple production sectors such as clothing and footwear and with older technologies that are either in the public domain or are not closely guarded.

■ *Knowledge from returning nationals.* Drawn partly by the high wages made possible by exports, many residents of Korea and Taiwan, China, trained abroad, particularly in new sectors such as electronics and computing, have returned home to work. Many returning nationals have received education in OECD economies and then worked for OECD-economy firms.⁴⁸ Their return has provided significant transfer of best-practice methods. For example, foreign-educated nationals account for all the postgraduates employed in the industry of Taiwan, China (Pack 1993a). This source of knowledge of international best practices becomes more important as changing factor prices dictate a shift to more capital- and technology-intensive sectors in which higher-level skills are needed to unlock knowledge that may be embodied in patents, licenses, or the use of specialized nontraded equipment.

■ *Domestic research.* In both Korea and Taiwan, China, a considerable proportion of R&D has been devoted to improving exports and reducing production costs. There is no evidence that the gap between R&D and commercial needs frequently seen in the import-substituting economies has been a problem.

How Exports and Human Capital Increase Productivity

Access to international best-practice technology and rapid formation of human capital supplement and reinforce one another. It is doubtful that the HPAEs could have made as productive use of foreign knowledge and imported capital without highly skilled domestic engineers and workers. Conversely, without foreign knowledge it is very unlikely that total factor productivity growth would have been as large. Intensive efforts by highly skilled managers and technicians in individual plants in inward-oriented Latin American economies to improve the productivity of existing capital stock with internal innovations did not generate high-productivity growth.⁴⁹

The HPAEs' rapid export growth has often generated positive interaction between human capital, physical capital, and knowledge. The externalities generated by manufactured exports in the high-performing Asian economies in the form of cheaper and more effective knowledge transfers would have undoubtedly been less productive had there been fewer skilled workers to facilitate their absorption, while the HPAEs' rapid increase in education levels reflected in part rising private rewards for greater education made possible by exports and export income.⁵⁰ Thus labor force skills, flexible markets for labor, low domestic distortions, and export incentives all interacted to promote high rates of technological upgrading and productivity change.

We can use the cross-economy regression framework developed in chapter 1 to look at the impact of trade and industrial policies on growth (see table 6.17). We introduce two variables into the basic cross-economy regression: the index of openness (as described above, the degree to which domestic prices conform to international prices) and measures of export performance.⁵¹ Openness to the world economy captures not only efficiency gains induced by the need to remain globally competitive but also the likely allocative benefits of having relative prices close to international prices.

Introducing these two trade-related variables substantially increases the explanatory power of the cross-economy regression. The effect of openness is positive. Economies with limited relative price distortions grew more rapidly.⁵² We choose as our measure of export performance two indicators—the average share of manufactured exports in total exports and the share of manufactured exports in GDP.⁵³ Manufactured export performance is strongly correlated (at the 1 percent level) with high rates of per capita income growth. When the share of manufactured exports in total exports is introduced together with the openness index, only the latter is significant. Conversely, when the share of manufactured exports in GDP is used, the openness index remains positive and significant. One possible interpretation of these results is that a high concentration of manufactured exports relative to total exports, rather than openness, contributes relatively more to productivity change in a cross-economy framework, which would be consistent with our reasoning concerning export externalities.⁵⁴

Estimates of the sources of total factor productivity growth (described in appendix 6.2) confirm the results of the cross-economy regressions and add some insights into possible interactions between exports

Table 6.17 Output, Growth, and Investment

(dependent variable: rate of growth of real GDP per capita, 1960–85)

<i>Number of observations:</i>	92	86	69	97	79
Intercept	-0.4237 *	-0.0124	-0.2324	-0.0055	-0.3943 *
	(0.1650)	(0.0083)	(0.1550)	(0.0085)	(0.1748)
GDP relative to U.S., 1960	-0.1033 **	-0.0459 **	-0.0837 **	-0.0381 **	-0.0892 **
	(0.0268)	(0.0108)	(0.0256)	(0.0123)	(0.0280)
Primary enrollment, 1960	0.0259 **	0.0210 ***	0.0216 **	0.0221 **	0.0230 ***
	(0.0081)	(0.0064)	(0.0079)	(0.0069)	(0.0085)
Secondary enrollment, 1960	0.0317	0.0211	0.0218	0.0206	0.0156
	(0.0203)	(0.0134)	(0.0210)	(0.0148)	(0.0210)
Growth of population, 1960–85	0.1322	0.2693	0.2054	0.1856	0.1222
	(0.2699)	(0.2346)	(0.2806)	(0.2376)	(0.2870)
Average investment/GDP, 1960–85	0.0568 *	0.0659 **	0.0625 *	0.0444	0.0436
	(0.0259)	(0.0232)	(0.0291)	(0.0242)	(0.0276)
Dollar openness index	0.0042 *		0.0023		0.0040
	(0.0017)		(0.0016)		(0.0018)
Average manufactured exports/total exports, 1960–85		0.0002 **	0.0003 **		
		(0.0001)	(0.0001)		
Average manufactured exports/GDP, 1965–85				0.0011 **	0.0011 **
				(0.0003)	(0.0004)
Adjusted R ²	0.3947	0.4912	0.5217	0.3530	0.3938
RMSE	0.0159	0.0124	0.0132	0.0147	0.0155

** Statistically significant at the 0.01 level.

* Statistically significant at the 0.05 level.

Note: Coefficient is top number. Standard error is bottom number in parentheses.

Source: World Bank staff estimates.

and human capital. We attempt to explain variations across economies in TFP growth rates in terms of relative income, educational attainment (as measured by the average stock of education per person), openness, and our measures of manufactured export performance (see table 6.18). The education stock variable, while positive, does not explain variations in TFP growth among economies. This is appropriate, since we have measured TFP growth net of human capital's contribution. Openness is consistently

associated with superior TFP performance, controlling for other variables. Both indicators of export performance are also consistently and positively correlated with higher rates of TFP growth.

We also find some evidence of a positive interaction between the share of manufactured exports in total exports and in national income and the stock of education. The coefficient of the interaction term between these two variables is positive but not significant at conventional levels, and the export share variable becomes insignificant. When we consider the contribution of the variables taken together to explaining the variation in TFP growth rates, however, it is statistically positive. We conclude that export

Table 6.18 Determinants of Total Factor Productivity Growth, 1960–89
(dependent variable: rate of growth of real GDP per capita, 1960–89)

Number of observations:	67	67	51	51
Intercept	-64.9123 ** (14.0585)	-71.1186 ** (14.8657)	-72.0692 ** (15.6104)	-70.8604 ** (15.4608)
GDP relative to U.S., 1960	-4.8047 * (1.9771)	-5.5757 ** (2.0637)	-2.3509 (2.3225)	-2.1562 (2.3008)
Educational attainment, 1960	0.1471 (0.0874)	0.0680 (0.1082)	0.1574 (0.1064)	0.0738 (0.1207)
Dollar openness index	0.6493 ** (0.1417)	0.7154 ** (0.1508)	0.7225 ** (0.1574)	0.7134 ** (0.1558)
Average manufactured exports/total exports, 1960–85	0.0314 ** (0.0066)	0.0159 (0.0142)		
Interaction term: Educational attainment 1960 times manufactured exports/total exports, 1960–85		0.0032 (0.0026)		
Average manufactured exports/GDP, 1965–85				0.0686 (0.0966)
Interaction term: Educational attainment 1960 times manufactured exports/GDP, 1965–85			0.0625 * (0.0269)	0.0284 (0.0201)
Adjusted R ²	0.6333	0.6376	0.4507	0.4628

** Statistically significant at the 0.01 level.

* Statistically significant at the 0.05 level.

Note: Coefficient is top number. Standard error is bottom number in parentheses.

Source: World Bank staff estimates.

performance and education interact positively; higher levels of education raise the contribution of manufactured export concentration to TFP growth.⁵⁵ This is consistent with our hypotheses that manufactured export orientation and high labor force skills interact to facilitate the acquisition and mastery of technology with attendant spillovers.

The evidence from our cross-economy estimates is supported by a number of recent microeconomic studies that attempt to test the link between exports and productivity growth. Pack and Page (1993) present evidence from Korea and Taiwan, China, that at the sectoral level rapid export growth is correlated with the pattern of productivity change; exporting sectors have higher sectoral rates of TFP growth. Wei (1993) uses city data from China and finds a statistically significant relationship between export growth and productivity growth. Perhaps most compelling, Aw and Hwang (1993), using firm microeconomic data from Taiwan, China, find a statistically significant relationship between productivity differences among manufacturing firms and export orientation.

How Have Trade and Industrial Policies Contributed to Growth?

The early admirers of HPAE trade policy clearly overstated the neutrality of incentives between domestic and foreign sales and understated the variation across sectors. But the revisionists who see in the HPAEs' success evidence that highly targeted industrial policy worked overlook the fact that the calculations on which both relied were static, that firms based their decisions not only on current levels of protection and factor prices but on the certain knowledge that they would need to compete in the future. Effective rates of protection may shape short-term tactics but the long-term strategies of currently protected firms are more likely to reflect their expectations of the future.

Thus, the emphasis on exports was decisive for the entire manufacturing sector; promotion of individual sectors was less important, since all but the very dull knew that their turn to export would come sooner than they would have preferred. Given the widespread national understanding established by government statements and actions in Japan, Korea, and Taiwan, China, that exporting was the standard by which all economic activity would be judged, even firms benefiting from higher-than-average rates of protection in the domestic market understood that in the near future they would be forced to compete in world markets. Sustained reduction in import protection sent a similar message to pro-

ducers in the Southeast Asian newly industrializing economies. Governments were credibly committed to export competition. Exports were important because they ensured that, given the HPAEs' high human capital base, productivity growth would be facilitated by the improved ability to tap international knowledge.

■ ■ ■