

Chapter 1

Growth, Structural Change and Technology

The Laws of Nature are such that things at their peak must decline and those at their lowest point must rise up, just as the sun and moon follow one another ceaselessly through the skies. Man also follows these laws. ... It is an inexorable Law of Nature that bad must follow good, that decline must follow a rise. To feel that we can rest on our achievements is a dangerous fallacy.

— *I Ching* (1150 BC)

Introduction

According to the *I Ching*, known as one of the greatest classics of the Chinese and dating back to the origins of the Chinese civilization, only change is constant¹. The *I Ching* attempts to explain current situations in terms of its natural laws, and so provide some guidance for the future. The natural pattern of law stated in the *I Ching* is for all things to experience a cycle of growth and decline, and the rise and fall of nations have been well-documented and analyzed by historians, politicians and economists.

In this book we concentrate on the recent rise in the fortunes of Asian economies and analyze future prospects for a continuation of this growth cycle. Will decline follow this cycle of growth? Why has

¹*I Ching* is also known as Book of Change in the West. It has its origins from Tao and some say commentaries from Chinese philosopher Confucius to explain the 64 inter-related hexagrams regarding state of the things in the universe. *I Ching* has been said to be used by modern Japanese corporate leaders such as founder of Panasonic, Matsushita Konosuke, for corporate successes (Cleary, 1995).

Asia been successful? Can Asia continue to grow and prosper in the future? Can Asia make the successful transition from low and middle levels of income to the status of the wealthy? Or will some countries be left behind, caught in the awkward middle-income trap between manufacturing and the knowledge economy (Gill and Kharas, 2006)?

To begin to provide some analysis and answers to these questions, we look at the pattern of economic growth and development in Asia. We first look at the major regions of East Asia, Southeast Asia, and South Asia. At the end of the section on income growth we will have a further look at the Central Asian Republics, a region that had a distinctly different historical experience from the rest of the Asian region.

For East Asia, Southeast Asia, and South Asia the period prior to 1997 has been extensively studied by the World Bank, the Asian Development Bank (ADB), and many academic researchers (for example, see World Bank, 1993; Dowling and Valenzuela, 2004, Chapter 3; and Quibria, 2002). In this chapter we focus on subsequent developments in the past decade as well as the underlying factors that will contribute to growth trajectories in the next two decades.

Income Growth

Within the last decade the Asian region has recovered well from the financial crisis of 1997. Structural reforms have been undertaken in the three crisis countries and also in other economies that were affected by the crisis. Stronger growth in South Asia has been a new feature of the last decade. Rapid growth in China and sustained performance in the rest of East Asia and Southeast Asia has resulted in higher incomes, expanded international trade, and reductions in the level and incidence of poverty. Decade-by-decade growth figures show an appreciable slowdown in growth in East Asia outside of China, particularly in Taiwan and Korea. Hong Kong has been buoyed up in the past few years by continued rapid growth in China (Figure 1.1).

In Southeast Asia (Figure 1.2) Indonesia picked up a bit compared with the previous decade although still lower than growth achieved before the Asian financial crisis in the 1970s and 1980s.

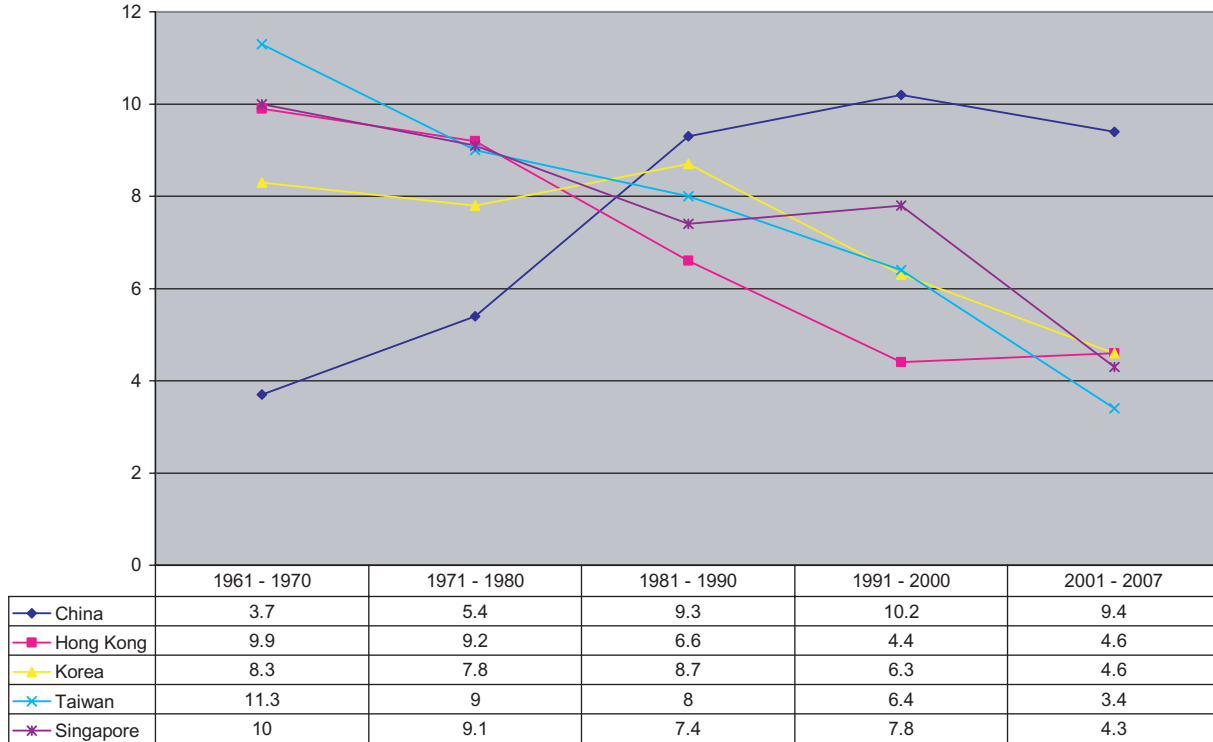


Figure 1.1 Decade Growth — NIE

Source: Data from Naya (2002) and ADB (2006).

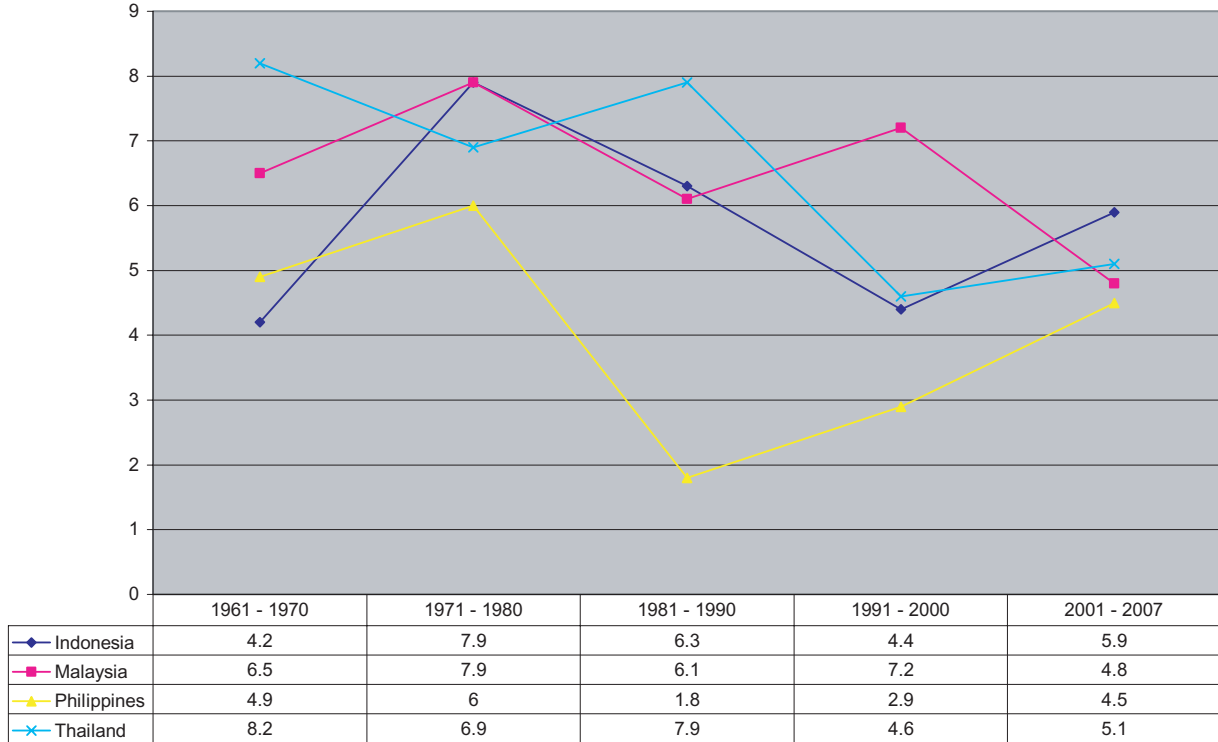


Figure 1.2 Decade Growth — SE Asia

Source: Data from Naya (2002) and ADB (2006).

In Malaysia and Singapore, growth slowed somewhat from the 1990s while it picked up somewhat in the Philippines and Thailand. On balance, overall growth in Southeast Asia was still lower in the new millennium than in the 1970s and 1980s with the exception of the Philippines.

In South Asia (Figure 1.3), growth picked up across the board compared with the historical performance in Bangladesh and India, while improving on the 1990s in Pakistan and Sri Lanka.

Comparing the decade leading up to the financial crisis and the decade since the crisis, the main point to be made is that growth has not slowed appreciably except in a few countries in Southeast Asia and even that slowdown has not been so dramatic. This performance is even more surprising when we note that 2001 was characterized by negative growth in Indonesia, Malaysia, Philippines and Thailand. These negative growth numbers were partly in response to the general global export slowdown which followed the recession in the United States.

Furthermore, performance in India has been much stronger in recent years as liberalization measures have proved beneficial for growth in the services industry and have also revitalized industrial sector growth. Export growth for the Asian region has also been rapid, far exceeding the rate of growth in income. In 2004 and 2005 exports grew even faster than they did in the decade leading up to the crisis for the region as a whole even when India and China were excluded.

Looking at longer term trends, there has been a slowdown in growth compared with that in the 1970s and 1980s in East Asia and less dramatically in Southeast Asia. No such trend is evident in South Asia, where growth has generally accelerated since 1980. This upward trend is particularly striking for Bangladesh, a country which was considered a basket case in the 1970s. This trend in South Asia demonstrates the power of good policies to bring about a renaissance in growth and development.

Further details of the Asian growth experience by region are displayed in Tables 1.1 and 1.2. Over the period 1970 to 2003 the countries of East Asia grew more rapidly than Southeast Asia or South Asia. Even giving the rest of the region a decade head start in the reform process, China outstripped the other regions.

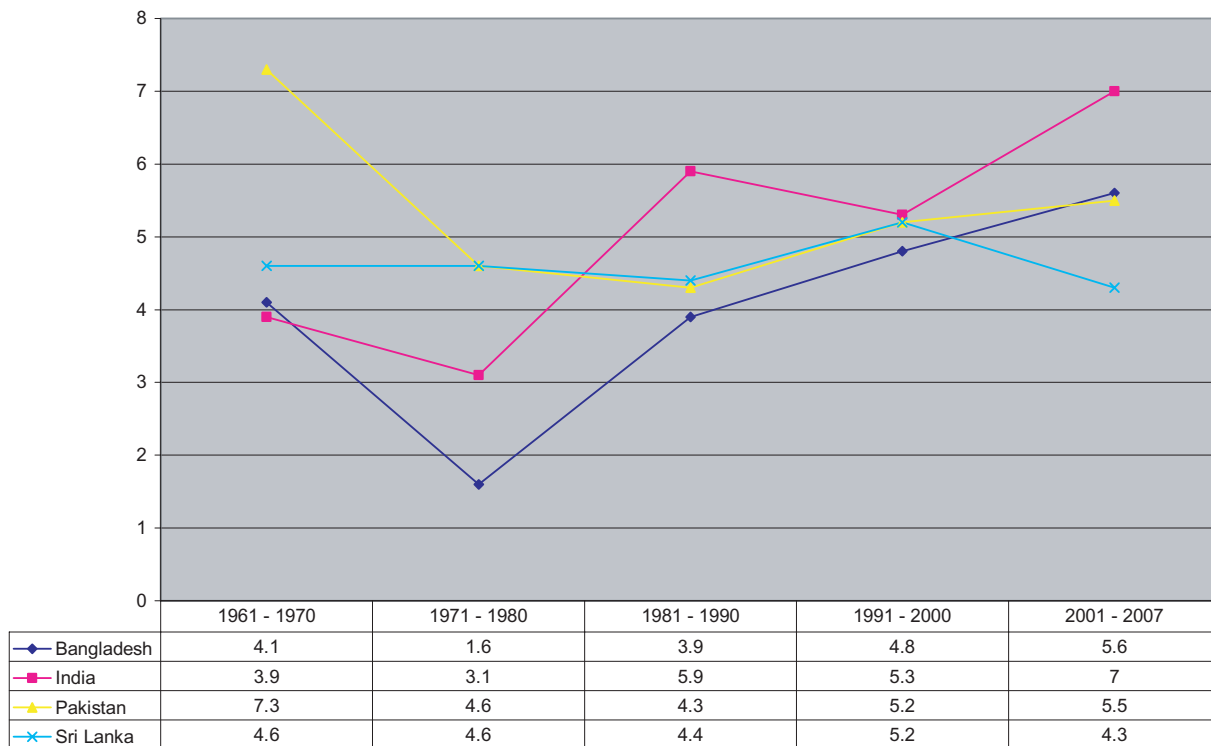


Figure 1.3 Decade Growth — South Asia

Source: Data from Naya (2002) and ADB (2006).

Table 1.1 Annual Growth Rate of GDP Per Capita, 1970–2003

East Asia excluding China	5.8
China	6.7
Southeast Asia	3.7
South Asia	2.5

Source: United Nations database.

Table 1.2 Real GDP Growth in Developing Asian Economies (%)

Country or Region	1988–1997	1998–2007	2004–2005
Developing Asia	7.9	7.3	8.7
China	9.9	8.9	10.0
India	5.9	6.5	7.8
Excluding India and China	6.3	4.1	5.8

Source: IMF (2006), Table 6; 2006 and 2007 are forecasts.

Overall growth in per capita income since 1970 show that the typical regional growth hierarchy of East Asia first, followed by Southeast Asia and South Asia manifests in these longer series (see Table 1.1). For shorter periods separated by the Asian financial crisis, there has been a modest slowdown in growth in developing Asia and even more so when India and China are excluded (Table 1.2). Singling out the recent past (2004–2005) there has been a further acceleration in growth in all regions.

In the Central Asian Republics (CARs), economic growth was adversely affected by the transition after the breakup of the Soviet Union in the early 1990s². After several years of negative growth there was a turnaround in the mid-1990s and the economies of this region began to grow again (Figure 1.4). It is only recently that their economies have recovered to the levels of output attained before the transition.

There are five basic reasons for the CARs revival — (i) higher international commodity prices and their impact on investment, fiscal

²The section on the economic performance of the CARs draws heavily on Dowling and Wignaraja (2006).

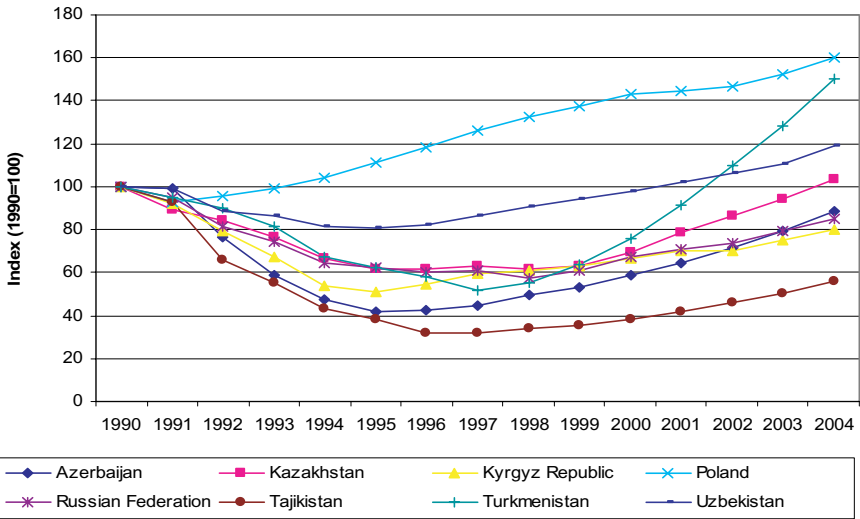


Figure 1.4 Changes in Real GDP Index, 1990–2004 (1990 = 100)

Source: World Bank (2006).

performance, income and consumption; (ii) an upturn in agriculture due to good weather, high world commodity prices and several agricultural reforms; (iii) an acceleration in foreign direct investment (FDI) inflows, particularly in oil and gas, and in manufacturing to a lesser extent; (iv) better macroeconomic management; and (v) improved political stability (Dowling and Wignaraja, 2006).

The CARs are the major producers and exporters of oil, natural gas and also cotton, gold, and other minerals. Prices for these commodities began increasing in the latter part of the 1990s and have continued upward since then, particularly for oil and natural gas in the last two years and even beginning in 2002. Export earnings from these commodities, and the associated revenues flowing into the government coffers gave CARs the ability to begin addressing social issues, develop and improve infrastructure, and increase economic efficiency.

Since the late 1990s, agriculture was a major driver of growth in the non-oil-exporting CARs — particularly the Kyrgyz Republic and Uzbekistan. This derived from generally favorable weather conditions,

high world prices for cotton and wheat, along with several agricultural reforms. Some productivity gains were also achieved from the collective farms producing cotton and wheat. Privatization in Kyrgyz Republic also lifted productivity. However, state control remains pervasive in Uzbekistan for agricultural purchasing, pricing, subsidies, distribution, and provision of inputs.

Average annual FDI inflows in the oil and gas exporting CARs of Kazakhstan, Azerbaijan and Turkmenistan have also increased dramatically as foreign investors have taken stakes in the oil and gas industry. In Kazakhstan FDI doubled to \$2.3 billion between 1997 and 2004 and also increased in Azerbaijan and Turkmenistan. FDI in Kazakhstan and Azerbaijan is rapidly approaching foreign investment levels in Central and Eastern Europe and the Baltic States. Substantial raw material deposits along with high international prices, favorable corporation tax rates for foreign investors, a strengthening of supply lines to export, improvements in the energy infrastructure, and low cost technical manpower attracted much of the investment.

Macroeconomic stability — helped by declining inflation — has improved. Inflation rates have fallen significantly throughout the region over the past few years indicating improved macroeconomic management. Average inflation for the CARs as a group declined from 20.4% to 6.9% between 1997 and 2001 and further to 6.3% in 2005.

Improved political stability in the late-1990s was also a significant factor contributing to the region's economic revival. The most notable developments were (i) the ending of the civil war in Tajikistan in 1997 and (ii) the 1994 signing of a ceasefire resolving the conflict between Armenia and Azerbaijan. Tajikistan is remarkable among the post-conflict economies for its speed in forming a functioning government, its focus on implementing an economic development agenda and in seeking aid from multilateral institutions. The ceasefire enabled Azerbaijan to reduce defense expenditures, invest in infrastructure, and concentrate more on attracting FDI into oil and gas. The ceasefire, booming oil, and gas industry, and a high growth environment also stimulated domestic investment in industries closely linked to oil and gas.

One of the keys to more rapid growth in Asia over the past decades is the rising importance of entrepreneurial talent and the

spread of new technologies and innovation throughout the region and from industrial countries through foreign direct investment. New theories of economic growth stress the importance of education and new ideas as they contribute to the development and dissemination of new products. Such innovations are responsible for the rapid development of new products and export dynamism of Asian economies. Hummels and Klenow (2005) find that around 60% of export growth takes place through new products rather than through exporting more of the same old goods. Institutional developments are an important input into developing and sustaining innovation and product development. These include competition policy, trade liberalization, industrial licensing, good governance and control of corruption. These are all important components of an innovative economy (see Gill and Kharas, 2006 and Chapter 5 for further discussion).

Growth in Trade

There were several reasons for the recent strong performance in income growth including import demand growth in the United States and Europe, continued structural adjustment, financial market normalization as nonperforming loans have been reduced, and continued rapid growth in industrial production. These developments have been reflected in export growth in developing Asia (see Table 1.3). In the last 2 years, exports have grown over 25% per year with China and India included and a very healthy 16% even without China and India. Both international trade and intra-regional trade have been on the dramatic rise, particularly the latter. In the case of East Asia, its share of intra-regional trade has risen from 42% in 1990 to over 50% of intra-regional trade. This is highly comparable to the European Union's 60% share. NAFTA has only 45% share of intra-regional trade and MERCOSUR has only 15%. The story goes that it is due largely to China which has sourced more than half of its imports from East Asia (World Bank, 2006).

This high degree of intra-regional trade between countries of similar factor endowments runs contradictory to the Heckscher–Ohlin trade theory, which postulates that countries should trade more with

Table 1.3 International Trade in Goods — Growth in Value of Exports in US dollars (%)

Country or Region	1988–1997	1998–2007	2004–2005
Developing Asia	15.7	14.2	25.3
Excluding India and China	14.9	8.0	16.2

Source: IMF (2006), Table 23; 2006 and 2007 are forecasts.

countries that have different factor endowments in order to best gain advantages from trade using the classic principle of comparative advantage. Modern international trade theory relaxes many of the classical assumptions of perfect competition by introducing the concept of monopolistic competition and product differentiation. This explains why rich countries at similar levels of income and with similar factor endowments trade more than the countries with very different levels of income and factor endowments. Aside from product differentiation, modern trade theory stresses the importance of scale economies and technology as additional factors in determining the pattern of international trade. Globalization has intensified the importance of new product development and innovation as well as the size of the global market as key determinants of the growth in trade and the ability of countries to compete in world markets.

There is now greater trade in intermediate goods as outsourcing has increased. Yeats (2001) reports that 30% of world trade in manufactures is in intermediate goods. This is particularly true in Southeast Asia and East Asia. Trade in parts and components, particularly in sectors like electrical machinery has been on the rise. The Philippines exports comprise a much larger share of parts and components now (over 50% of exports in 2003) compared to that in 1990 (17.8% of exports). Other Asian economies like Malaysia, Taiwan, Korea, and Thailand face a similar doubling of exports in parts and components over the same period (see Okamoto, 2005 for more details). Greater vertical integration between production processes in different countries in Asia has probably raised total factor productivity (see next section for further discussion on total factor productivity) and has combined with more foreign direct investment to provide further impetus to the surge in exports.

Table 1.4 Growth Rate of Merchandise Exports, 2001–2007

	2001	2002	2003	2004	2005	2006	2007
China	6.8	22.4	34.6	35.4	28.4	20	17
Hong Kong	-5.8	4.9	12.1	15.9	11.2	11	9
Korea	-14	7.9	20.7	30.6	12.1	11	8
Taiwan	-17.3	6.4	10.5	20.7	8.8	9	7.4
Indonesia	-12.3	3.1	8.4	12.6	20.1	12.1	11.9
Malaysia	-10.6	7.2	11	20.9	12	17.8	15.1
Philippines	-16.2	9.9	2.7	9.8	3.7	5.1	8
Singapore	-10.5	5.2	15	24.3	15.7	9.5	6
Thailand	-7.1	4.8	18.2	21.6	15	15.3	12
Vietnam	6.5	7.4	20.4	30.3	20.5	18	15
Bangladesh	12.6	-7.6	9.5	15.9	14	13	12
India	-1.6	20.3	23.3	23.9	15.8	17	17
Nepal	11.7	-20.3	-13.8	14.8	10.3	10.2	12.5
Pakistan	9.1	2.3	20.1	13.5	16	20	13
Sri Lanka	-12.8	-2.4	9.2	12.7	8.9	8	8

Source: ADB (2006); 2006 and 2007 are projections.

As an example of trade growth consider the combined exports of the economies of China, Taiwan, and Korea. The combined exports of these three countries in July 2006 were 2.3 times those in July 2002, an annual growth rate of 24% over the four years. The value of China's exports is now only a few percentage points less than that of the United States and it is likely that China will surpass the United States as the world's biggest exporter by 2007 (see Morgan Stanley's website www.morganstanley.com/gef/team.html for further analysis).

For the decade up to 2007, export growth in developing Asia has been more volatile than income growth. It has been rather susceptible to external shocks. The slowdown in the United States in 2001 had a negative impact on export growth in all three regions. Most countries had negative export in 2001 or 2002 with the exception of China, Pakistan and Vietnam. After recovering, export growth accelerated to double digit rates in many countries, although by 2005, export growth had begun to slow down again (refer to Table 1.4).

Total Factor Productivity (TFP)

While individual estimates of TFP may vary significantly because of different assumptions and time period of estimates, it is now widely accepted that TFP adds to output by developing new production processes that adopt new technology and adds additional output with the same amount of labor and capital. TFP also lifts output by achieving better industrial organization and management, more effective inventory control, greater efficiency in subcontracting, and more efficient marketing and distribution.

Total factor productivity became a more significant contributor to overall growth in developing Asia in the second half of the 1980s and 1990s. The information technology (IT) revolution that began in the early 1990s in the United States contributed to the growth in innovation as enhanced technology came into use. Information technology facilitated a new industrial structure which featured the positioning of production platforms for a variety of inputs and components in many different countries in order to lower costs and increase economic efficiency.

In the view of many observers, TFP and the transfer in technology and increased productivity in East and Southeast Asia through the contribution of such an industrial organizational development were facilitated primarily by multinational firms that began to operate in the region in the 1970s and 1980s and with greater intensity in the second half of the 1980s. Foreign direct investment increased throughout the Asian region in the decade following the Plaza accord of 1985. At the same time, much of the increase in output was the result of rapid growth in the labor force and large increments in investment during the rapid growth phase that ended in 1997 with the Asian financial crisis.

The period directly following the 1985 Plaza Accord resulted in appreciation of the yen and a significant rise in foreign direct investment by Japan in Korea and Southeast Asia, increasing competitiveness and economic efficiency as well as further integrating the industrial sectors of Japan with Indonesia, Korea, Malaysia, Philippines and Thailand. While the impact on overall growth is hard to measure, the

inflow of FDI over the next decade did result in an increase in technological transfer and in the contribution of TFP to overall economic growth. Estimates of the contribution of TFP to overall growth in Southeast Asia and Korea are shown in Table 1.5.

Table 1.5 Growth Accounting — Contribution of Capital, Labor, and TFP to Overall Growth

Country and Period	Growth in GDP	Contribution of Capital	Contribution of Labor	Contribution of TFP
Indonesia				
1968–1976	6.7	2.7	1.7	2.2
1976–1986	6.5	3.4	1.9	1.2
1986–1996	7.3	2.6	1.8	2.9
1968–1996	6.9	3.0	1.9	2.1
Korea				
1968–1976	10.3	4.3	2.1	3.9
1976–1986	7.7	3.7	1.8	2.2
1986–1996	8.0	3.3	1.4	3.3
1968–1996	8.6	3.7	1.8	3.1
Malaysia				
1968–1976	7.0	3.1	2.3	1.6
1976–1986	5.6	3.2	2.1	0.3
1986–1996	8.1	2.4	1.9	3.8
1968–1996	6.9	2.9	2.1	1.9
Philippines				
1968–1976	5.5	2.0	2.0	1.6
1976–1986	1.8	2.1	2.0	-2.3
1986–1996	3.6	0.8	1.9	0.9
1968–1996	3.5	1.6	2.0	-0.1
Thailand				
1968–1976	6.7	3.3	2.2	1.3
1976–1986	6.1	2.5	2.0	1.6
1986–1996	9.1	3.2	1.3	4.6
1968–1996	7.4	3.0	1.8	2.6

Source: Berthelemy and Chauvin (2000).

Note: Contribution of capital, labor and TFP may not sum to total growth due to rounding-up. Period of highest contribution of TFP highlighted.

These results suggest that the contributions of TFP to output growth is highest in the decade following the Plaza Accord (1986–1996) in three countries and second highest in the other two. The contribution of TFP is particularly strong in Thailand, Korea and Malaysia, where it contributed 50%, 41% and 46% respectively to overall growth in that decade.

There are other studies of TFP which shed additional light on the contribution of TFP to output growth. The results are dependent on several factors including the share of labor and capital in the production process and how changes in the quality of labor are reflected in terms of the improvements in education and skill. Some of these studies find differences in the contribution of TFP to growth for other time periods. For example, Bosworth and Collins (2003), whose results are recorded in Table 1.6, find no TFP for Indonesia from 1975 to 2000, negative TFP for Philippines, and TFP of between 0.9 and 1.8 for other countries in the region. Weerasinghe and Fane (2005) provide a summary of other estimates for various time periods in Table 1.7.

Considering all these estimates of TFP for Asia together, we conclude that TFP is low in Philippines, around 1% in Malaysia, as much

Table 1.6 Sources of Growth in East Asian Economies (1975–2000) — Average Annual Percentage Change

Country	Output	Contribution of Physical Capital	Contribution of Education	TFP
China	8.8	2.5	0.4	3.9
Indonesia	5.8	2.4	0.5	0.0
South Korea	7.3	3.0	0.7	1.1
Malaysia	6.9	2.2	0.6	0.9
Philippines	3.0	0.8	0.4	-0.9
Singapore	7.7	2.1	0.5	1.8
Thailand	6.5	2.1	0.5	1.4
Taiwan	7.8	2.6	0.4	2.4

Source: Bosworth and Collins (2003).

Note: Last three columns do not add up to output growth column because labor input is not included.

Table 1.7 Estimates of TFP per Year for East Asian Economies; Various Years

Country	World Bank 1960–1980 regressions	Kim and Lau regressions	Young (1960–1987) Growth accounting	Collins and Bosworth (1960–1994) Growth accounting	Weerasinghe (1960–1990) Growth accounting	1968–1996 from Table 6.3
Indonesia	1.5			0.8	0.9	2.1
Korea	3.4	1.0	1.7	1.6	2.0	3.1
Malaysia	1.5			1.0	0.1	1.9
Philippines				−0.4	−0.3	−0.1
Singapore	2.1	1.9	0.2	1.6	−0.1	
Taiwan	3.9	1.6	2.6	2.0	2.6	
Thailand	2.6			1.9	1.8	2.6

Source: Weerasinghe and Fane (2005) and Berthelemy and Chauvin (2000).

as 2% in Singapore and Thailand, and between 2% and 3% in Korea and Taiwan. It also appears that TFP increased in the late 1980s and early 1990s, although the evidence for this acceleration is not conclusive. Another explanation for the acceleration in TFP after the Plaza Accord is that earlier estimates of TFP by Young (1995) and popularized by Krugman (1994) were biased downward. Although increases in output were primarily a result of high rates of growth in capital investment and labor force growth there were also few signs of diminishing returns. This suggests that there were also gains in output as a result of TFP.

TFP also increases as labor moves from low productivity jobs in agriculture to higher productivity jobs in industry. Bosworth estimates that the bulk of TFP in Thailand resulted from these sectoral shifts in output (Bosworth, 2006). Although not documented as rigorously as the findings for Thailand, it is possible that similar gains in output from TFP also occurred in other countries in Southeast Asia that experienced substantial shifts out of agriculture, including Indonesia, Malaysia and the Philippines. These TFP gains are possibly reflected in higher TFP estimates for China, Korea, Taiwan, and to a lesser extent Thailand, where industrial sector growth was very strong in the 1980s and 1990s. These shifts were less pronounced in the Philippines and Malaysia, while Singapore had always had a strong industrial sector. Finally, Ferreira *et al.* (2005) remind that TFP measured as a contribution to the percentage growth in output for Asian economies is much higher than the TFP for other developing countries and regions.

While the Plaza Accord was instrumental in attracting Japanese investment to Southeast Asia, other multinational investors were also attracted to the region, particularly to China where policies were being liberalized to attract foreign firms beginning in the late 1970s and continuing in the next two decades (see Chapter 7 for details). In the years following World War II, the United States also began to invest in Taiwan and Korea, partly as a response to the political threats of communism in the region. As interest in Asia increased in the 1980s, the United States invested more heavily in Southeast Asia, beginning in the Philippines, where it had been

well established for many years and then in other countries in the region.

Shifting Comparative Advantage

The process of industrialization in Asia has been discussed thoroughly (see Dowling and Valenzuela, 2004 for references). The flying geese paradigm of development first suggested by Akamatsu (1961, 1962) has served as a model for the spread of technology from Japan to the rest of the region. This model explains how Japan served as the leader in technology, beginning with labor-intensive industries and moving over the years to higher skill and capital-intensive industries. The spread of technology then extended to the rest of the region either by foreign direct investment or by imitation of Japanese practices.

However, as the process of technological transfer takes place tensions arise between recipient and investing countries as production becomes more dependent upon highly skilled workers. The investing country has concerns about losing jobs to the recipient country and the recipient country has difficulties in implementing better supply systems and providing skilled workers. As industrialization becomes more sophisticated, tensions increase further as the host country needs to upgrade its technological base and investing countries become more protective of its specialized high technology (Hobday, 1995; Praussello, 2005). Furthermore, as the NIEs have become more developed they have also begun to transfer technology to other countries in the region, particularly Southeast Asia. Despite these limitations and shortcomings, the flying geese model provides some basic and useful insights.

The operation of the flying geese model can be understood in detail by following the shift in production of exports as comparative advantage shifted over time. These shifts are reflected by changing international competitiveness as a result of what Balassa (1965) calls revealed comparative advantage. To follow these shifts we make use of a database constructed by the United Nations (2006, Chapter 3). A commodity trade matrix was constructed drawing on the commodity trade statistics database of the United Nations for two periods — 1962–1980 and

1980–2000. Exports were divided into five categories according to natural resource and technological content use, a classification scheme developed by Lall (2000). The five categories are:

- Primary products (PP), consisting of food, live animals and non-oil minerals such as silver, copper, nickel, aluminum, lead, zinc and tin.
- Natural resource-based manufacturers (NRB) consisting of processed food, wood products, leather, refined petroleum products, dyes, precious stones and organic chemicals. Products can be simple and labor-intensive such as foods and leather or capital-intensive. In any case they depend for the most part on locally available materials.
- Low-technology manufacturers (LT) consisting of textiles, garments, footwear and other leather products, toys, simple metal and plastic products, furniture and glassware. These products have stable and well-known technologies, and cost structures are usually dominated by labor. Products tend to be undifferentiated at the mass produced level.
- Medium-technology manufacturers (MT) consisting of heavy industry products such as automobiles, industrial chemicals, machinery and standard electrical products. These products depend on complex but slowly changing technologies.
- High-technology manufacturers (HT) consisting of more complex electronics including telecommunications, precision instruments, fine chemicals and pharmaceuticals. Products have advanced and rapidly changing technologies, with large research and development spending, and advanced technological infrastructure. High value to weight ratios (as opposed to automobiles) allow many segments of value chain to be located in different countries or regions.

The United Nations looked at the trade specialization pattern over time with reference to these five categories. The diversification in production and exports over time was examined. Diversification is defined as the decline in the share of primary products combined with

an increase in the share of manufactured products in total merchandise exports. The category of dynamic products was examined further. These dynamic goods are defined as products which exhibited an increase in market share of global exports in a given period of time. Using these data for all five categories, they compiled a trade specialization indicator (TSI) which shows the change in share of the category of exports as a proportion of total exports for a given country multiplied by the share of the country in total developing country exports of that particular export category.

This TSI, defined in Equation (1.1), is a variation of a measure of revealed comparative advantage. It combines changes in the structure of exports of a particular country with that country's share of world exports. The indicator for a category may be small if changes in the structure of exports of the country have been large but the country has not gained market share relative to other developing countries in that category of products. Countries are put into one of the five classifications of products according to the size of the TSI indicator. For example, if TSI in a country is high for PP this means that primary products were the category where specialization was most significant relative to total merchandise exports of developing countries.

$$TSI = [(X_{ij}/\Sigma X_{ij})_{t+1} - (X_{ij}/\Sigma X_{ij})_t] \times [(X_{ij}/\Sigma X_{ij})_{t+1}] \times 100, \quad (1.1)$$

where X is the value of exports, i = goods, j = country, and t = period.

Σ in the first two terms on the right-hand side of the equation, is over the total number of goods. This term shows the change in share of the commodity in total exports of the country concerned between period t and $t+1$. Σ in the last term on the right-hand side of the equation is over the total number of developing countries. This term shows the country share of total developing country exports in that particular product category.

Comparison of TSI values for the five different categories of exports for developing Asian economies over the two time periods 1962–1980 and 1980–2000 provides an index of shifting comparative advantage over time for each country and also a ranking of the countries in the region.

These calculations are compiled in Tables 1.8 and 1.9. If a country does not appear in the table, it means that it did not exhibit any changing diversification of exports over the period.

The countries in East Asia and Southeast Asia all developed trade specialization in HT industries in the latter period from 1980 to 2000. Furthermore, the large values for the index in many countries reflect not only a shift in specialization within the country but also a growing share of country exports as a proportion of world exports. Only Hong Kong has a relatively low index, reflecting its failure to

Table 1.8 Trade Specialization Index for 1960–1980 — Category of Specialization and Value of Index

High Technology (HT)	Low Technology (LT)	Medium Technology (LT)	Natural Resource Base (NRB)
Singapore (2.77)	Korea (1.06)	Hong Kong (0.19)	Malaysia (0.80)
Philippines (0.11)			Indonesia (0.94)
			Sri Lanka (0.008)
			Vietnam (0.005)

Source: United Nations (2006), Chapter 3, and Annex, Statistical Table A5.

Note: Specialization index shown in brackets.

Table 1.9 Trade Specialization Index for 1980–2000 — Category of Specialization and Value of Index

High Technology (HT)	Low Technology (LT)	Medium Technology (LT)	Natural Resource Base (NRB)
Korea (1.93)		India (0.11)	
China (1.61)		Indonesia (0.53)	
Taiwan (2.54)		Pakistan (0.26)	
Thailand (1.13)		Sri Lanka (0.17)	
Singapore (3.09)		Vietnam (0.29)	
Hong Kong (0.59)			
Malaysia (3.23)			
Philippines (1.82)			

Source: United Nations (2006), Chapter 3, and Annex, Statistical Table A5.

Note: Value of specialization index shown in brackets.

increase market share in high technology exports. This reflects the growing importance of services in the Hong Kong economy and its role as a marketing and distribution center for Chinese exports. The importance of medium technology in South Asia reflects the growth of manufactured exports to other developing countries and the emphasis that India, Pakistan and Sri Lanka have been placing on these types of manufactured goods which have been promoted by the governments of these countries. Other things equal, we would have expected them to develop comparative advantage in low technology industries.

Another approach to comparative advantage is to look at shifts in import demand in industrial countries and to explore whether Asian exporters were following this pattern. Dowling and Ray (2000) constructed an index of export growth for the Asian economies that is heavily influenced by the changing structure of exports. If changes in export structure are closely aligned with changes in the import demand of industrial countries, then this index will be large and conversely the index will be small if the export structure is not responding. Analyzing the export movement between 1970 and 1995, Dowling and Ray (2000) found that almost all of the countries in East and Southeast Asia moved quickly to take advantage of the growing world demand in the three key industrial categories — electronics, computers and pharmaceuticals. Table 1.10 shows the pattern of export growth in those industries where the share of OECD imports increased between 1970 and 1995. Working with local and Taiwanese companies, Hong Kong did not respond to the shifts in OECD import demand because it was in the process of becoming a service economy. Its share of manufactured exports and industry fell in the 1990s. Indonesia was slow to respond because of a large petroleum economy and also because its industrial sector was slow to evolve and had difficulty making the transition to higher value-added electronics and computer products. Other countries have been making the shift quickly including NIEs outside Hong Kong and Malaysia. Thailand has been less nimble in adapting to shifting demand and China's export base was still primarily focused on labor-intensive products in 1995.

Table 1.10 Share of Asian Manufactured Exports in Sectors Where the Share of OECD Imports Increased, 1970–1995

Country or Region	1970	1985	1995
Indonesia	3.0	9.3	34.2
Malaysia	5.9	36.2	66.2
Thailand	4.2	23.4	53.9
China	19.4	23.9	49.8
Singapore	22.6	40.5	74.5
Taiwan	34.5	50.6	67.8
Korea	29.8	44.7	62.5
Hong Kong	45.6	48.7	49.2
World	43.2	50.6	57.5

Source: Dowling and Ray (2000).

Note: The products considered were computers, electronics, pharmaceuticals, instruments, motor vehicles, chemicals, electrical machinery, other manufacturing and fabricated metal products.

Modern Comparative Advantage

Economic growth has been closely aligned with the speed in which Asian countries were able to pick up demand in fast growing sectors like the three key industrial categories — electronics, computers and pharmaceuticals industry. Interestingly, according to new growth theory, these are exactly sectors which exhibit considerable economies of scale in production. They have elasticity of scale above 1 (World Bank, 2006).

Such economies of scale allow for vertical specialization where production can be spliced into different components and later combined to form a final product, say the assembly of semiconductor chips for use in handphones and computers. East Asia had been among the fastest to take advantage of such a trend. No country monopolizes the production chain but rather each country specializes in niche markets within the sector, and participates in the final assembly of the good through well-developed transport and service networks.

According to Antweiler and Trefler (2002), East Asia exports have been growing most rapidly in electrical machinery, followed by

non-electronics machinery, instruments, iron and steel, and pharmaceutical products. Indeed, it has been said the growth of Singapore was not due so much to policy factors but due to the popularity of computer chips, which allowed Singapore to expand exports and raise economic growth. With the recent increase in regional agreements that allows for greater integration in the Asian region (see Chapter 2 for more details), deeper tariff cuts will be pursued to promote trade, and obstacles to FDI will be lessened.

The Role of Investment

Investment played a key role in the growth of Asian economies and this has been highlighted as a key ingredient of the sustained performance that became known as the Asian miracle. As outlined above, structural change and economic dynamism were strongest in East Asia and China. And investment rates also increased more rapidly in these regions. In the forty 3-year periods from 1960 to 2003, average gross fixed capital formation per person increased over 15-fold in East Asia, over 12-fold in China, and a much lower 3-fold in Southeast Asia, and just over 2-fold in South Asia (see United Nations, 2006, Chapter 2). The average investment rates also increased dramatically in East Asia and China and more modestly in Southeast Asia and South Asia (see Table 1.11).

Capital accumulation not only fuels growth through the production function but it also facilitates the rapid implementation of new technology and structural changes which resulted in the growth in industry and services and the decline in agriculture mentioned

Table 1.11 Average Investment Rate for Selected Periods and Regions, 1960–2003

Region	1960s	1970s	1980s	1990–2003
East Asia (without China)	13	21	27.5	33.5
China	22	27	28.5	34
Southeast Asia	17	22.5	2.5	27
South Asia	18.5	18	19	21

Source: United Nations (2006), interpolated from Figure II.3.

earlier. Investment in financial and business services helps to support industrial growth. Investment in machinery and equipment is also more conducive to sustained growth than construction. In the NIEs the shares of manufacturing and financial intermediation, transportation, real estate, and business investment increased as shares of total investment over time at the expense of agriculture. In Korea, for example, gross fixed capital formation in transportation increased from 2% to 12% between 1970 and 2003 while investment in agriculture fell from 14% to 2%. Manufacturing and mining investment increased from 16% to 24%. Investment in Taiwan followed a similar pattern.

Foreign Direct Investment

There is a still unresolved controversy regarding the impact of foreign direct investment on economic growth among academics. This controversy is difficult to resolve because so many other variables such as trade openness, industrial policy, government regulations, and the general external environment are all changing as multinationals begin to invest in a country. One position is that FDI brings with it a host of advantages including dynamic externalities; innovation and technological transfer; production, marketing and distribution expertise (crowding in). These allow countries to increase exports, raise productivity, and serve as role models for domestic firms. Many countries in Asia have lifted export growth substantially with the help of FDI (see Chapter 7 for details of the China experience). Opponents of the importance of FDI stress the displacement of domestic firms and bidding resources away from them (crowding out) and squeezing out domestic suppliers as foreign firms bring more integrated supply chains with them featuring suppliers in other locations.

Whatever the relative merits of these two positions, the historical evidence in Asia suggests that FDI, acceleration in growth, openness to trade, and human resource development have increased in tandem over the past few decades. Where trade regimes have been open and competition encouraged, inward FDI has been strong, growth has accelerated and exports have shifted toward higher value-added industrial

products. This has been the experience of Korea and the major countries of Southeast Asia. Where the trade regimes have been closed and international trade and competition not encouraged, growth and development have been slower. This was the case of India and other countries in South Asia in the 1980s and early 1990s. However, changes in policies in the 1990s resulted in a gradual acceleration of growth. In the early years of this century growth in South Asia exceeded that of Southeast Asia. The details of these relationships can be found in the work of a number of authors including Dollar and Cray and many others.

The pattern of FDI inflows are displayed in Table 1.12 and Figure 1.5. China has dominated FDI inflows in the past decade, rising from \$14 billion per annum in the early 1990s to over 40 billion by the end of the decade and close to 60 billion by 2006. Greater China, including Taiwan and Hong Kong, has also benefited. There has been a moderation of inflows to Southeast Asia and growth has slowed somewhat. Nevertheless, these countries are also benefiting from the growth of China as trade has increased. Five year averages of FDI from 1980 to the present in Figure 1.5 for the three subregions show a dramatic increase in FDI in East Asia, with FDI tripling between the 1985–1990 and the 1990–1995 period, and then more than doubling again in the next period from 1995–2000. A similar pattern is observed in Southeast Asia although at much lower levels of FDI inflow and lower growth between 1990–1995 and 1995–2000.

FDI in South Asia was close to zero in the early periods and has been growing slowly over time. In the period since 2000, FDI inflows have fallen from their peak levels in the previous 5 years in both East and Southeast Asia, partly as a result of a general slowdown in overseas investments by the United States and European countries in 2000 and 2001 as growth in these countries slowed down (see Table 1.13). Greater China continues to dominate inflows into developing Asia. Richer developing countries with the capacity to absorb high technology FDI and China have benefited the most from outward flows to developing countries from industrial countries. When Singapore is added to the usual greater China countries of Hong Kong, Taiwan and China, the rest of Asia, particularly Southeast Asia, is left with a

Table 1.12 Foreign Direct Investment in Developing Asia (1991–1993 and 2004) — Annual Averages in US billion dollars

	1991–1993	Rank in 1991–1993	1998–2000	Rank in 1998–2000	2004	Rank in 2004
China	14.3	1	41.6	1	54.9	1
Malaysia	5.0	2	3.5	6	4.6	6
Hong Kong	3.9	3	33.8	2	34.0	2
Singapore	3.9	4	11.1	3	16.0	3
Thailand	2.0	5	5.6	5	1.4	8
Indonesia	1.8	6	Not in top 10		1.0	10
Taiwan	1.0	7	2.7	7	n.a.	
Philippines	0.9	8	1.6	9	0.5	Not in top 10
Korea	0.8	9	8.0	4	8.2	4
Kazakhstan	0.7	10	Not in top 10		4.1	7
India	Not in top 10		2.4	8	5.3	5
Vietnam	Not in top 10		1.5	10	1.6	8
Pakistan					1.1	9
All of developing Asia	35.4		111.6		72*	
High income	179 (1990)					413

*Not strictly comparable with previous years.

Source: UNCTAD (2006).

Table 1.13 Averages of Foreign Direct Investment (1981–2004) in US billion dollars

Region	1981–1985	1986–1990	1991–1995	1996–2000	2001–2004
East Asia	1	9	30	75	71
South Asia	Negligible	0.3	1	4	5
Southeast Asia	3	7.5	19	27	18

Source: Adapted from UNCTAD (2006).

shrinking share of total FDI flows to Asia that has been growing slowly over the past few years.

FDI inflows have been stimulated by the development of export processing zones EPZs or special economic zones. These zones have grown in importance since they were first introduced in Southeast Asia and China in the 1980s. These zones are discussed further in Chapters 2 and 7.

Production Platforms and Patterns of Technological Transfer

Physical and human infrastructure, FDI, technology transfer, telecommunications, transportation all interact to create a dynamic high productivity atmosphere in several Asian economies over the past several decades. To achieve international competitiveness in particular, product lines, firms and countries have focused on developing regional centers which specialize in particular products or components of products. These highly specialized production platforms are interrelated through efficient transport and telecommunications networks where products are produced and shipped to different assembly locations and scheduled to reduce inventory according to just-in-time arrival scheduling. Often these firms are set up in special economic zones where governments have granted special privileges, reduced red tape, built infrastructure, and worked to create a physical environment that will increase firm efficiency as much as possible. A wide range of technologies and industrial specialties have been developed including simple labor-intensive industries like food processing, wood

products, and simple textiles and apparel to highly skilled engineering, chemicals, and pharmaceutical processes. We cover these special economic zones further in Chapter 2. Here we discuss the manner in which countries obtained access to foreign technology and the specific role played by foreign direct investment.

*Patterns of technological transfer*³

In the NIEs there were four distinct patterns of government intervention and openness to foreign investment. Hong Kong and Singapore pursued policies to actively attract foreign direct investment including low taxes, full ownership, access to modern infrastructure, and a well-educated labor force. There was limited innovation by local firms. In Hong Kong, industrial policy was limited and market forces were generally allowed to dictate the pattern of trade and industrial development. In Singapore, the government was more proactive by training the workforce and providing industrial infrastructure. In Korea and Taiwan, governments were less open to foreign direct investment. Rather than encouraging foreign firms to locate in the country, they preferred arrangements where foreign companies hired local subsidiaries to subcontract. These arrangements took one of several forms. Subsidiaries could produce to exact specifications set out by the foreign firm and were accordingly called original equipment manufacturing (OEM). Alternatively, the local subsidiary could be given more input into the production process, where the final product was a combination of foreign and local design inputs called own design manufacturing (ODM). Later on, in the industrialization process, local firms began to produce their own products under their own labels or brands (OBM). Firms in Korea and Taiwan did not generally enter into joint ventures although they did sometimes use licensing arrangements and eventually formed strategic alliances with overseas firms to access technology.

Despite these differences in approach to industrialization in all the NIEs, and eventually the countries in Southeast Asia, four factors underpinned their success: (i) Firms benefited from a stable macroeconomic

³The next two sections draw on Dowling and Valenzuela (2004, Chapter 5).

environment including low inflation and interest, high saving rates, and prudent macroeconomic policies; (ii) governments followed outward looking export strategies that were beneficial to export-oriented manufacturing; (iii) human resource development strategies supplied a wide range of needed skills through an education system that included technical and vocational schools as well as engineering and management training; (iv) government policies were supportive and stimulating as appropriate. In Korea, large conglomerates (*chaebol*) were formed along the Japanese model (*kaireitsu*). In Taiwan, some state-owned enterprises were set up although small and medium scale enterprises were typical. Hong Kong did not adopt an explicit industrial policy but focused more on establishing good relations with China and Taiwan to facilitate the flow of commerce.

In many countries the industrialization drive was coupled with the development of export processing zones (EPZs) or special economic zones (SEZs) to facilitate the growth of exports by increasing the efficiency of export platforms⁴. EPZs in India and China are discussed in greater depth in Chapter 7. Generally SEZs provide tax exemptions on raw materials, duty-free imports of key materials, and cheap, accessible and reliable support infrastructure services including transport (roads, sea, air), power and water. They may also include site rental at reduced rates and tax holidays or other tax breaks. In addition to the SEZs, countries also offer other support to stimulate exports and FDI including duty compensation and duty drawbacks for exporters which exempt imports from import duties and business taxes, bonded warehouses and other promotions (see for example the Thailand example cited by Radelet (1999)).

Experience in electronics

The electronics industry has played a prominent role in the industrialization of Asia. In a world export market of over \$800 billion in 2000, the major Asian exporters captured nearly \$300 billion (see Table 1.14).

⁴EPZ and SEZ are used interchangeably in the text.

Table 1.14 Ranking of Major Electronics Exporters in Asia (in US billion dollars)

County or Region	1997	2000	Global Rank in 2000
World exports	644.1	876.8	
South Korea	33.9	58.7	3
Taiwan	38.6	57.8	4
Malaysia	36.3	52.4	5
China	21.5	43.5	8
Singapore	41.6	41.6	9
Thailand	14.1	21.6	14
Philippines	14.2	9.7	20
Indonesia	2.9	7.3	21
Hong Kong	5.2	4.0	25

Source: Singapore Ministry of Trade and Industry (2002) and Dowling and Valenzuela (2004).

Specializations in particular products differ from country to country. Singapore attracted foreign companies by offering political stability, good infrastructure including telecommunications, transport, and energy as well as liberal ownership terms. By the early 1990s, more than 300 foreign firms had established a presence in Singapore from many companies in Europe, North America and Japan. Singapore developed a focus on disc drives and was the world's largest producer in the 1990s. Recently it has been challenged by China, Taiwan and Korea.

Korea became a leader in the chip industry and in the production of household appliances, particularly TVs and cassettes, and small computers and peripherals. Much of this output was originally undertaken through licenses and OEM subcontracting. Production moved to ODM and there was more research and development spending. The large chaebols, including Samsung, Daewoo and Lucky Goldstar are the major electronics companies and have become an established presence in the global electronics industry. Korea is one of the leaders in the production of dynamic random access memory (DRAM) devices.

Like Korea, Taiwan also discouraged direct foreign investment and focused on subcontracting by local firms under OEM and ODM

arrangements. It did not build large conglomerates; instead it relied on small- and medium-sized firms that were able to innovate quickly and hire skilled technicians and engineers from the growing number of graduates from domestic universities. Taiwan became a specialist in the production of desktop and laptop computers as well as disk drives peripheral, monitors and other computer components. Eventually, Taiwanese firms moved to (OBM) and developed a network of suppliers both in Taiwan and elsewhere. Acer is a good example of how Taiwanese companies were able to build a global presence in this way.

Malaysia, the Philippines and Thailand followed the Singapore path of industrialization. They attracted FDI, initially from Japan, and later on from Europe and North America. By the end of the 1990s electronics accounted for the bulk of total exports and manufacturing output. All three countries began by attracting investment in the chip assembly sector and eventually Malaysia diversified into the production of consumer goods including computers and television sets with Japanese investment. The Philippines and Thailand have emphasized lower level simple electronics; the Philippines focused on chips and Thailand on computers, particularly hard-disc drives. By relying on investment by transnational companies, the three economies of Malaysia, Philippines and Thailand have not developed local expertise and extensive linkages with other sectors of the economy.

Production platforms and international division of labor

Global competition and acceleration in the pace of new innovations have created continuous pressure on exporters to respond quickly to changes in taste, new innovations and new technology. This has created added incentives to tighten the linkages between suppliers through the production chain and give them more responsibility for developing products and new technologies. In the lexicon of subcontracting they are moving from OEM to ODM and in some cases to OBM. In the electronics industry outsourcing has increased rapidly and has given rise to consolidation into several large contract manufacturers who are responsible for much of the production of electronics products for the main computer and information technology

Table 1.15 Revenue and Growth of Major Electronics Contract Manufacturers (1994–2001) in US billion dollars

Company	1994	2001	Annual Growth (%)
Flextronics	0.2	12.1	78
Solectron	1.6	18.7	42
Celestica	2.0	10.0	26
Sanmina/SCI	2.4	11.2	25
Jabil Circuit	0.4	4.3	40
Total	6.6	56.4	36

Source: Sturgeon and Lester (2003).

firms such as IBM, Nortel Apple, Hewlett Packard, Sun Microsystems, Cisco Systems and Lucent Technology. These firms have been growing at more than double digit rates for the past decade and have spread to European information technology firms such as Ericsson, Nokia and Alcatel (see Table 1.15).

Each of these large contract manufacturers has established a global network of plants of various sizes and specializations. In Asia they have large-scale investments for high volume production in Southeast Asia and China (see Table 1.16 for Solectrons sites in Asia).

Leading firms such as IBM, Hewlett-Packard, and other US high-technology giants maintain their focus aspects that are essential to being on the cutting edge of technology and maintaining their dynamic comparative advantage. These would include innovation, product development marketing, and advertising that relate directly to brand development. For the other so-called non-core functions, they have come to rely more on specialized suppliers such as contract manufacturers who take care of organizing a whole range of these activities. By divesting themselves of non-core activities lead firms can take advantage of new innovations while spreading risk. This type of vertical de-integration or reverse integration are now being widely employed in the textiles/apparel, motor vehicles and electronics industries. As a part of this process, subcontracting suppliers have become more capable of providing better products, some of them completely designed and finished (ODM) and others made to specification

Table 1.16 Solectrons Sites in Asia

Asian location	HQ	Mfg	Mat	NPI	Serv	Tech
Taipei, Taiwan	X					
Singapore		X	X	X		
Johor, Malaysia		X	X	X		
Penang, Malaysia		X	X	X		X
Suzhou, China		X	X			
Penang, Malaysia		X	X			
Wangaratta, Australia		X				
Singapore			X			
Liverpool, Australia				X		
Bangalore, India						X
Tokyo, Japan	X					X
Kanagawa, Japan			X	X	X	

Source: Sturgeon and Lester (2003).

Note: HQ: Global or regional headquarters; Mfg: Manufacturing facilities; Mat: Materials purchasing and management centers; NPI: New product introduction centers (R&D); Serv: After sales service and repair center; Tech: Technology centers (R&D).

(OEM). According to the surveys carried out by Sturgeon and Lester, fewer firms have been able to proceed to the OBM stage and begin marketing their own products — there are exceptions such as the Korean automobile firms Hyundai, Kia, and the Taiwanese computer companies including Acer.

As globalization strengthened, leading firms are looking for suppliers who also have a global reach. This enables them to provide supplier logistics beyond the local scale and to build an international position, perhaps through mergers and acquisitions. So far Asian firms have not developed this vision or capacity. Only 16% of ASEAN manufacturing firms replying to a World Bank survey employed managers with any foreign experience (reported by Sturgeon and Lester, 2003). Lead firms with a global orientation are also looking for subcontractors that can become partners in developing new products and are able to supply ODM and perhaps OBM rather than just OEM.

Table 1.17 Lead Firm and Contractor Profitability

Firms	Country	Sectors	Five-year Average Profit Growth (%)	Sales Growth 4-year Average (%)
Johnson Electric	Hong Kong	Motors	19	10
Black and Decker	USA	Tools	10	-1
Quanta	Taiwan	Laptop	11	73
Dell	USA	Laptop	9	45
Techtronics	Hong Kong	Tools	7	23
Home Depot	USA	Retailer	8	25
Hon Hai	Taiwan	Cables	11	57
Intel	USA	Microprocessors	34	24
TSMC	Taiwan	Microprocessors	0	28
Phillips	Holland	Electronics	44	6
Hung Hing	Hong Kong	Printing	16	16
Bertelsmann	Germany	Publishing	7	6
Li&Fung	Hong Kong	Trading	3	25
The Limited	USA	Retailing	8	6

Source: Sturgeon and Lester (2003), Table 7.

This is not to say that the marriage between lead firms and Asian suppliers has not been profitable for both the lead firm and the supplier (see Table 1.17). It has been and will continue to be profitable. Nevertheless, there is a challenge for Asian subcontractors to develop a wider focus outside Asia. There are several strategies for doing this which will be discussed in the section on Future prospects.

Shifting Sectoral Income Shares

The sectoral shares of income broken down by agriculture, industry and services are displayed in Figures 1.5–1.7. The typical shift in the pattern of income shares observed in a number of countries is for agriculture to decline monotonically over time and for services to increase monotonically.

Agriculture share of GDP per Region

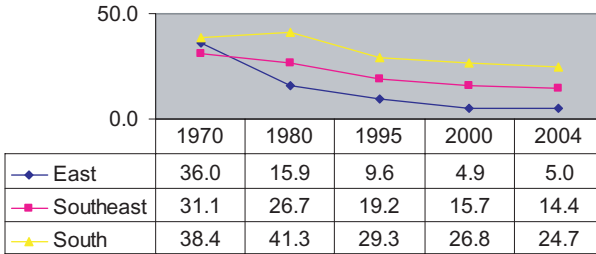


Figure 1.5 Agriculture Share of GDP (1970–2004) by Region

Source: ADB (2006).

Industry share of GDP per Region

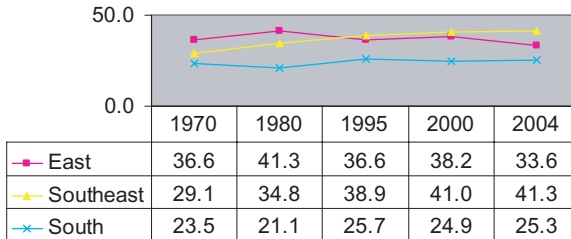


Figure 1.6 Industry Share of GDP (1970–2004) by Region

Source: ADB (2006).

Service share of GDP per Region

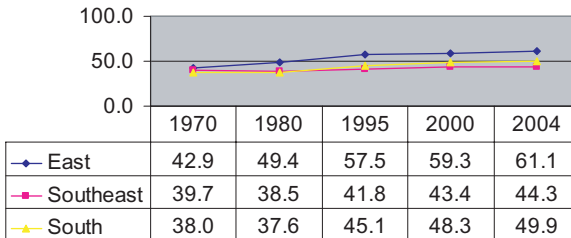


Figure 1.7 Service Sector Share of GDP (1970–2004) by Region

Source: ADB (2006).

Industry

Industry tends to increase, level off, and then decline. This pattern of structural shifts in shares results from the initial spurt in manufacturing output during the initial phases of the industrialization process. As industry matures and production processes become more complex and additional support services are required, the services sector becomes more and more important. This pattern tends to hold in Asia with a few interesting exceptions. In East Asia the share of the industrial sector peaked in the 1980s. If we consider Singapore as a member of the NIEs then its industrial sector peaked a bit later, sometime in the 1990s. Hong Kong began specializing in services in the 1980s as its role as a financial and management center for southern China grew. By the early years of this century, the industry's share fell to under 10% of the total output. The pattern in China has been somewhat different. The industry sector share has continued to grow and now has nearly two-thirds of output, a much higher proportion than any other country in the region, and perhaps even globally.

In Southeast Asia, industry's share peaked in the 1980s in the Philippines and by the mid-1990s in Malaysia. In the remaining countries of the region, Thailand, Vietnam and Indonesia, industry's share is still increasing. Partly this is a reflection of the lower level of income in the region and the underlying structure of the industrial sector. Thailand, like Malaysia and the Philippines, began to open up its economy in the 1970s producing agricultural products for exports while importing manufactured goods. In the 1980s, Southeast Asia began to develop labor-intensive manufactured products for domestic use and for export. By the end of the 20th century it had become a major exporter of high-technology manufactured goods as reflected by its comparative advantage. Exports of electronics, computer peripherals and parts, automobiles, and agricultural products continue to grow and domestic investment in infrastructure has boosted industrial efficiency and growth in output. Vietnam started later and from a lower base, and is still expanding its industrial sector. Indonesia was also a late starter in the industrialization process and was the most adversely affected by the 1997 financial crisis. As a result, it is still

catching up with the rest of the region, although the share of industry has been leveling off at around 44% for the past decade.

In South Asia, the pattern of industrialization followed a different model. Initially, the region followed a Soviet autarchic model with emphasis on heavy industry. A period of slow growth followed and industry languished. By the early 1990s there was some opening up of international trade and a modest quickening of industrial sector output. Industrial output has been rising as a share of income although still very modest when compared with more open economies in Southeast Asia. Industry share of output is less than 25% on average, a full 15% lower than the average in Southeast Asia. Furthermore, industry share of output peaked in 1995 in India, Pakistan and Sri Lanka. This means that industry sector has been below the average for the country for more than a decade and strongly suggest that industry has not yet played a key role in the South Asian growth experience. This is not typical of the growth pattern in Southeast Asia and East Asia where the industrial sector spear-headed growth. Unless further structural reforms are made, it is unlikely that the industrial sector will play a key role in the development of South Asia in the future (see Chapter 7 and future section of this chapter for more details).

Services

Service sector income shares have been increasing in East Asia since the 1970s. Services now dominate the output mix of Hong Kong (91%), Singapore (69%) and Taiwan (70%) serving to complement the high-technology industrial sectors of these mature economies. Korea is also moving toward a higher service sector component as is China. In the latter case the contribution of services is probably still being underestimated. Adjustments from the Soviet accounting system, where services' contribution to income were not recorded, are still being made. Furthermore, there are large informal service sectors in most Asian economies that attract low-skilled workers, where hours are long, wage rates are low, and working conditions are substandard.

In Southeast Asia, service sector shares are clustered closely between 40% and 50% of output. This suggests a similar pattern of service sector growth, composed mostly of high technology support services although tourism also plays a role in most of these economies, particularly in Thailand. Service sector shares have not changed much in the past 6 years aside from Malaysia. Generally, in Southeast Asia service sectors are still considerably smaller than the service sectors in East Asia. This could be because agriculture is still important in all the countries.

In South Asia, the service sector has a surprisingly large fraction of output, larger on average than in Southeast Asia. Recent growth in high technology service in Bangladesh and India may account for some of this strength in services but the overall contribution of this subsector to GDP is minor. A more likely explanation is that internal migrants from rural to urban areas are increasingly being employed in the informal sector and in low-paid entry level jobs in a variety of service industries. This is the direct result of slow growth in industry and an inability of the manufacturing sector to absorb new entrants into the labor force.

Sectoral Employment Trends

Breakdown of employment by sector is more difficult than output breakdowns. Labor market information is often unreliable and incomplete. We do know that shifts in employment lag shifts in output, and as a result a large fraction of the labor force remains in agriculture even after agriculture's output share has declined. This is particularly true in countries where overall growth is slow and the industrial sector has not emerged as the engine of growth.

As an example of these trends, consider countries in Asia where more than 40% of the labor force is still employed in agriculture. Table 1.18 lists these countries. Not surprisingly, most of them are in South Asia. What is surprising is that Thailand is also in this group of countries. Industrialization has resulted in a dramatic shift in output in Thailand but there has not been a commensurate shift in employment.

Table 1.18 Share of Employment in Agriculture, Industry, Services, and Not Adequately Defined — Latest Date between 2000 and 2004

Country	Employment Share of Agriculture (%)	Employment Share of Industry (%)	Employment Share of Services (%)	Not Adequately Defined
Bangladesh	62	12	22	4
China	47	17	13	23
India	66	13	20	0
Indonesia	44	18	36	2
Nepal	75	5	20	0
Pakistan	49	19	32	0
Sri Lanka	42	22	33	3
Thailand	49	18	33	0
Vietnam	69	0	0	31

Source: Estimated from ILO (2005), Figure 3.2.

Compared with the Philippines, the result for Thailand is even more puzzling. The Philippines has been deindustrializing since the 1980s as reflected by a decline in industrial sector share in output. Yet, the Philippines does not appear on the list of countries with more than 40% employed in agriculture. Is this because of faster growth in services in the Philippines than in Thailand? The service sectors in the two countries were the same size relative to total income in 2000. However, the Philippine service grew faster over the 35-year period between 1970 and 2004. Another explanation is that the Philippines has a much higher rate of international migration. Workers that otherwise might have been employed in agriculture have left the country to work in the service sector overseas and this has reduced the agricultural labor force.

The data in Table 1.18 show that despite the growing industrial sector in most countries, agriculture still employs the bulk of the labor force in poorer countries and even in a relatively high-income country like Thailand. All countries in South Asia fall in the over 40% category, and Bangladesh, India and Nepal still have more than 60% of

the workforce employed in agriculture. Furthermore, the employment share of industry in South Asia is small. Averaging the five countries' share, only 14% of the workforce is employed in the industrial sector. The picture is not much better in Thailand and Indonesia, where only 18% of the workforce is employed in industry. What is even more startling is the figure for China. In a country where two-thirds of output is now generated by the industrial sector, only 17% of the workforce is employed in the sector. Either the industrial sector workforce is super-efficient and working in a highly capital-intensive environment — two assumptions that are inconsistent with the image of China as a labor-intensive economy — or else there are data inconsistencies, illegal hiring or undocumented workers.

Foreign Aid

The impact of foreign aid on economic growth and poverty reduction has been studied extensively (United Nations, 2006, Chapter 1). When aid is broken down into different components such as bilateral aid and multilateral aid, several tentative conclusions are possible. When aid which is geopolitically motivated and aid which is designed to address human resources and other developmental issues are separated, Reddy and Minoiu (2006) conclude that aid that flows through multilateral aid agencies and a group of Nordic countries, and other developmentally motivated donors (Austria, Canada, Luxembourg and the Netherlands) had a positive impact on development with a time lag. An increase of 1% of GDP in multilateral aid receipts in the 1960s was associated with a half a percent increase in the average growth rate of GDP in the 1990s. Results were for a panel of developing countries where several other variables were included in the regressions including level of per capita income, terms of trade, government corruption, life expectancy, and government consumption among others. The other component of aid, termed geopolitical aid, was negatively associated with growth. Aid from two bilateral donor groups also had a positive effect on growth with a lag. Average growth between 1980 and 2000 was over 1% higher for countries that received an additional 1% of GDP as aid transfers from these Nordic

countries in the 1970s and 1980s. These results were obtained from regression analysis for a number of countries, not just in Asia.

In recent years, aid in Asia has been confined to China, South Asia, a few countries in the Mekong region, Philippines and Indonesia, and Central Asia. These aid flows are summarized in Table 1.19. Flows have been generally falling since 1998 both absolutely and as a percentage of Gross National Income (GNI). In a few countries, aid makes a highly significant contribution to the investment flow when measured as a percentage of gross capital formation. In Cambodia, Kyrgyz Republic, Lao PDR and Tajikistan, they comprise more than 50% of gross capital formation in 2003 and an even higher proportion in 1998. In these countries aid is indispensable, providing a crucial complement to domestic resource mobilization, which is often small and inadequate.

In the rest of the region, foreign aid is a minor component of capital formation. Richer countries now go to commercial sources for funds or borrow from multilateral institutions at market rates of interest rather than relying on concessional aid from multilateral or bilateral donors.

Issues and Prospects for Growth and Structural Change

Income growth

In this section, we explore the prospects for future growth and structural change. There are many possible approaches from simple growth, to back of the envelope, to computable general equilibrium to elaborate econometric models. We adopt a simple growth framework with structural parameters estimated from historical experience. We begin with some simple growth models and growth accounting.

Growth models such as the Harrod (1939), the Solow model (1956), and the new growth theories of Romer (1986), Mankiw *et al.* (1992), and Lucas (1988) highlight the importance of the rates of saving, investment and the capital stock, the capital output ratio, labor force growth, and technological change and innovation as the primary factors determining long-term growth rates.

Table 1.19 Aid Flows — 1998 and 2003

Country	1998	2003	1998	2003	1998	2003	1998	2003
	Aid in million \$	Aid in million \$	Aid per capita in US\$	Aid per capita in US\$	Aid as % of GNI	Aid as % of GNI	Aid as % of gross capital formation	Aid as % of gross capital formation
Bangladesh	1158	1393	9	10	2.5	2.5	12.1	11.5
Cambodia	337	508	28	38	11.1	12.5	91	54
China	2456	1325	2	1	0.3	0.1	0.7	0.2
Kazakhstan	223	268	14	18	1.0	1.0	6.4	3.4
Kyrgyz	240	198	50	39	15.3	10.7	94	64
India	1610	942	2	1	0.4	0.2	1.8	0.7
Indonesia	1266	1743	6	8	1.4	0.9	7.9	5.2
Lao PDR	276	299	55	53	22.1	14.3	88	69
Malaysia	208	109	9	4	0.3	0.1	1.1	0.5
Nepal	402	467	18	19	8.3	8.0	33.3	30.9
Pakistan	1053	1068	8	7	1.7	1.3	9.6	7.8
Philippines	618	737	8	9	0.9	0.9	4.7	4.9
Sri Lanka	425	672	24	35	2.7	3.7	10.7	16.5
Tajikistan	161	144	26	23	12.7	9.9	78.9	51.4
Turkmenistan	24	27	5	6	0.9	0.4	2.0	1.7
Uzbekistan	158	194	7	8	1.1	2.0	5.1	9.8
Vietnam	1177	1769	15	22	4.4	4.5	14.9	12.8

Source: World Bank (2006).

If we refer to a production function there are several components of growth. In a Solow model, growth in income equals the rate of growth of education adjusted labor force (h) times labor's share in income (l_s) plus the rate of growth of capital times capital's share in income ($1 - l_s$) plus a residual (a) which we call total factor productivity, (TFP).

$$y = (l_s) h + (1 - l_s) k + a, \quad (1.2)$$

where y is the rate of change in income, h is the rate of change in education adjusted labor input, k is the rate of growth in capital, l_s is labor's share in income, $(1 - l_s)$ is capital's share in income, and a is TFP. If we assume that the capital to output ratio is fixed in the short run, then we can substitute y for k on the right-hand side of Equation (1.2) and rearrange so that

$$y = h + a/l_s. \quad (1.3)$$

This is the simple growth model framework suggested by Bosworth (2006), where income growth (y) is a function of the growth of the labor force adjusted for improved quality by higher education and better health (h), the share of labor in total income (l_s), and a measure of output growth resulting from innovation and technological change designated as TFP (a).

By looking at the historical values for h , a , and l_s we can establish a benchmark rate of growth that seems plausible for the future. This growth in income has to be matched by enough investment on the supply side to sustain growth. Consider a simple Harrod–Domar model where income growth is a function of the saving rate (s), the capital output ratio (k), and the rate of depreciation (d)

$$y = (s/k) - d. \quad (1.4)$$

Looking at the Asian economies for the last couple of decades, making a few assumptions about a , d , and using average historical data, a range of future income growth trajectories can be derived. These

hypothetical growth scenarios can then be compared with projections made by forecasters such as consensus economics, the IMF, the ADB, and Deutsche Bank Research.

From this analysis, a broader consensus forecast emerges and is discussed. To begin, consider the values of h , a , and l s for Asia. Unadjusted labor force estimates are shown in Table 1.20 for the period from 1980 to 1995 and 1995 to 2005.

Estimates of labor force growth (h) are displayed in the final two columns of Table 1.20. Labor's share in income is more difficult to measure. Bosworth (2006) uses an estimate of 56% from production function estimates of labor and capital share. Many others, including

Table 1.20 Labor Force (in millions)

Country	1980	1995	2005	Implied Annual Change — 1980–1995 (%) (h)	Annual Changes from 1990–2003 (h)
China	539	709	784	2.0	1.1
Hong Kong	2	3	3.5	3.0	1.9
South Korea	16	22	23	2.0	1.8
Indonesia	59	89		3.2	2.4
Malaysia	5	8		3.3	2.9
Philippines	19	28		2.9	2.8
Singapore	1.2	1.7		0.3	2.3
Thailand	24	34	37	2.6	1.1
Vietnam	26	37		2.6	1.9
Bangladesh	41	60		2.9	2.1
India	300	398		2.0	2.1
Nepal	7	10		2.7	2.6
Pakistan	29	46	52	3.7	2.7
Sri Lanka	5	8	10	3.7	2.0
Japan (for comparison	57	66	65	1.0	

Source: 1980 and 1995 from World Development Indicators (WDI) and quoted by ILO; 2005 from ILO database of total active population between 15 and 65 and spliced with 1995 labor force estimate from WDI. Data for 1990–2003 are taken from world development indicators, Table 2.2.

Sarel (1995) and Young (1995) have used higher values of 65% in estimating the value of TFP.

By looking at discrepancies in different estimates of TFP, Weerasinghe and Fane (2005) suggest that Singapore and Malaysia may have lower labor shares. In the exercise below, we use the 65% share of labor in income assumed by Young and many others. An upward adjustment in labor force growth of 1% is made in East and Southeast Asia to reflect upgrading of skills and education. A lower figure of 0.5% is used for South Asia under the assumption that skill and educational upgrading are generally lower in South Asia than in East and Southeast Asia. TFP estimates vary widely and we have elected to combine the results displayed in Table 1.20 and summarized there. TFP is low in Philippines (0.3%) and Indonesia (0.5%), around 1% in Malaysia, as much as 2% in Singapore and Thailand, and between 2% and 3% in Korea and Taiwan. There are few reliable estimates for TFP in South Asia. We assume it to be 1%.

Putting these estimates of TFP, h , and l_s together, we obtain the following estimates of income growth from Equation (1.3), which are displayed in Table 1.21.

These estimates of growth potential or long-term growth from the demand side have to be balanced against the saving and investment rates. Will there be enough productive capacity to produce these growth rates? Looking at Equation (1.4) we need the depreciation rate of capital, the saving rate, and the capital/output ratio. A depreciation rate of 5% is often used and the average saving rate for the past decade is shown in Table 1.22. The capital/output ratio will have a tendency to increase over time as the capital stock grows and diminishing returns set in. This will be offset to some extent by technical progress. Estimates of the capital/output ratio for Asian countries are difficult because the capital stock is essentially unknown. For argument's sake we will compute several different estimates with different capital/output ratios and growth rates in income to see what that implies for the rate of saving and investment needed to sustain growth rates shown in Table 1.21. Recall

$$s = yk + d \quad (1.5)$$

Table 1.21 Estimated Long-Run Growth Using Equation (1.3)

Country	l_s (Labor Share in Income)	h (Augmented Labor Force Growth)	a (TFP)	y (Income Growth)
China	0.65	2.1	3.9	8.1
Indonesia	0.65	3.4	0.5	4.2
Korea	0.60	2.8	2.0	6.1
Hong Kong	0.65	2.9	1.5	5.2
Malaysia	0.65	3.9	1.0	5.4
Philippines	0.65	3.8	0.3	4.2
Singapore	0.60	3.3	2.0	6.6
Taiwan	0.65	2.8*	2.0	5.9
Thailand	0.65	2.1	2.0	5.2
Bangladesh	0.65	3.1	1.0	4.6
India	0.65	2.6	2.0	4.1
Nepal	0.65	3.1	0.5	4.5
Pakistan	0.65	3.2	1.0	4.7
Sri Lanka	0.65	2.5	0.5	3.3

*Assumed to be same as Korea's augmented labor force growth h is derived as final column in Table 6.13 plus 1%.

Source: Table 1.6, Table 1.7 and Table 1.20.

These estimates are displayed in Table 1.22.

How do these figures for the saving rates compared with historical saving rates? Saving rates for the NIEs of Korea, Singapore and Taiwan have been averaging between 30% and 35% for the past two decades according to the IMF (see Dooley *et al.*, 2005, Charts 2 and 3) while saving rates for emerging Asia outside of the NIEs have been rising from around 25% in the late 1980s to nearly 40% in 2004. Much of this is because of increased saving in China although savings in other countries have also been steady or rising. Savings rates for selected countries are also displayed in Table 1.23.

Comparing the final column of Table 1.21 with Table 1.23 we see that actual domestic saving rates are usually higher than the saving rates implied by fitting historical values to Equation (1.3) in East Asia and Southeast Asia. If the capital to output ratio was lower than the ratio of 4 assumed in the second column of Table 1.21, the implied

Table 1.22 Estimated Saving and Investment Rates Implied from Growth Rates in Table 1.21

Country	y from Table 1.14	k	d (in %)	$S = yk + d$ (in %)
China	8.1	4	5	36.4
Indonesia	4.2	4	5	21.8
Korea	6.1	4	5	29.4
Malaysia	5.2	4	5	25.8
Philippines	5.4	4	5	26.6
Singapore	4.2	4	5	21.8
Taiwan	6.6	4	5	31.4
Thailand	5.9	4	5	27.6
Bangladesh	5.2	4	5	25.8
India	4.6	4	5	23.4
Nepal	4.1	4	5	21.4
Pakistan	4.5	4	5	23.0
Sri Lanka	4.7	4	5	23.8

Source: Table 1.14.

saving rate would be even lower⁵. This information suggests that resource mobilization has not been a problem in these two regions of Asia. This is confirmed by the build up in foreign exchange reserves over the past few decades and the increase in outward foreign investment by Singapore, China, and other countries in recent years.

For South Asia the results are not as clear. Saving rates are not as high as they are in Southeast Asia and East Asia. Comparisons between investment rates and implied saving rates from Equation (1.3) show a particularly large shortfall in Pakistan. The volume of domestic saving may have been a constraint on growth in South Asia and foreign aid has served to fill some of the gap. More needs to be done to raise saving rates in the region and to transfer surpluses from the richer Asian economies. See Chapter 2 for details of some possibilities for doing this.

Given that saving has not been a constraint on growth in Southeast Asia and East Asia, and also assuming that constraints in South Asia will be removed by resource transfers, we can compare the final column in

⁵IMF estimates of capital output ratios for Asian economies reported in IMF (2006, Table 2.6) suggest a ratio closer to the range of 2.5–3.0.

Table 1.23 Saving and Investment Rates

Country	Domestic Saving Rate as Percent of GDP (1993)	Gross Domestic Investment Rate as Percent of GDP (Average of 2001–2005)	Saving Rate Implied by Equation (1.3)
China		38.0	36.4
Indonesia	31	20.8	21.8
Korea	35	29.7	29.4
Malaysia	38	22.3	25.8
Philippines		17.2	26.6
Singapore	47	20.8	21.8
Taiwan		19.0	31.4
Thailand	36	26.3	27.6
Bangladesh		23.6	25.8
India		26.4	23.4
Nepal		25.2	21.4
Pakistan		17.0	23.0
Sri Lanka		23.7	23.8

Source: IMF (2006) and ADB (2006). Domestic saving rates in South Asia are proxied by gross domestic investment, which will be higher than saving because of positive capital inflows.

Table 1.21 with the actual and projected growth rates in Table 1.24 for the decade ending in 2010. These are displayed in Table 1.25.

The residuals are systematically positive in South Asia. The model underpredicts actual growth. In East Asia, the model systematically overpredicted growth except in the case of China. In Southeast Asia there were no apparent systematic errors. In two of the three financial crises countries, Korea and Thailand, the model overpredicted growth. In Thailand, lower than expected growth could also be the result of the adverse impact of the 2001 recession in the United States, some residue from the 1997 financial crisis, and political uncertainties in recent years. In Taiwan, structural adjustment to the growing strength of China, combined with political uncertainties has kept growth rates subdued.

Growth was much stronger in India and to a lesser extent in the other South Asian countries, perhaps because TFP was higher than the assumed 0.5%. If we raise TFP to 1% this would raise growth by

Table 1.24 Income Growth in Developing Asia (2001–2010)

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	Average
China	8.3	9.1	10	10.1	9.9	9.5	8.8	8.8	8.9	8.7	9.21
Hong Kong	0.6	1.8	3.2	8.6	7.3	5.5	5	5.5	6	5.5	4.9
Korea	3.8	7	3.1	4.6	4	5.1	4.9	5	5	4.8	4.73
Taiwan	-2.2	4.2	3.4	6.1	4.1	4.4	4	4	4.5	4.4	3.69
Singapore	-2.3	4	2.9	8.7	6.4	6.1	4.6	5.8	6	5.8	4.8
Indonesia	3.8	4.3	5	4.9	5.6	5.4	6	5.5	6	5.5	5.2
Malaysia	0.3	4.4	5.4	7.1	5.3	5.5	5.8	5.6	5.7	5.6	5.07
Philippines	1.8	4.4	4.5	6	5.1	5	5.3	5	5.4	5	4.75
Thailand	2.2	5.3	7	6.2	4.5	4.7	5.5	5.1	5.3	5	5.08
Bangladesh	5.3	4.4	5.3	6.3	5.6	6.5	6	5.7	5.9	5.6	5.66
India	5.8	3.8	8.5	7.5	8.1	7.6	7.8	8	8	7.7	7.28
Pakistan	1.8	3.1	4.8	6.4	8.4	6.5	7.3	7	7.2	6.9	5.94
Sri Lanka	-1.5	4	5.9	5.5	5.7	5.3	5.2	5.5	5.7	5.5	4.68

Source: Figures 1.1–1.3, and author's projections.

Table 1.25 Comparison of Historical Growth with Model Growth Rates

Country	(2) Average Growth — 2001 to 2010	(3) Income Growth from Table 1.21	(2) – (3). When Value is Positive, Actual Growth Exceeds “Long-Run” Projected Growth
China	9.2	8.1	1.1
Hong Kong	4.9	5.2	-0.3
Korea	4.7	6.1	-1.4
Taiwan	3.7	5.9	-2.2
Singapore	4.8	6.6	-1.8
Indonesia	5.2	4.2	1.0
Malaysia	5.1	5.4	-0.3
Philippines	4.7	4.2	0.5
Thailand	5.1	5.2	-0.1
Bangladesh	5.7	4.6	1.1
India	7.3	4.1	3.2
Pakistan	5.9	4.7	1.2
Sri Lanka	4.7	3.3	1.4

Source: Tables 1.21 and 1.24.

about 0.8% per annum for all of South Asia. Yet it would still not remove the underprediction completely. TFP may be even higher or adjusted labor force growth should be higher.

Consensus Economics prepares forecasts for the Asian region based on inputs from a number of different forecasters including commercial banks, financial houses and government agencies. These inputs are averaged to give a consensus view of prospects for these economies for East Asia and Southeast Asia. Comparisons of country forecasts for 2006–2009 by Consensus Economics are compared with Table 1.24 values and displayed in Table 1.26. (Consensus Economics does not publish forecasts for Bangladesh, Pakistan or Sri Lanka.)

Consensus Economics forecasts are somewhat lower than our forecasts for China, Hong Kong and Singapore. For other countries the forecasts are close, although Consensus Economics forecasts are also a little lower for the Philippines and India.

Table 1.26 Growth Forecast Comparisons

Country	2006 Table 1.24	2006 Consensus Economics	2007 Table 1.24	2007 Consensus Economics	2008 Table 1.24	2008 Consensus Economics	2009 Table 1.24	2009 Consensus Economics
China	9.5	7.9	8.8	7.8	8.8	8.3	8.9	7.8
Hong Kong	5.5	4.5	5	4.2	5.5	4.5	6	4.6
Korea	5.1	4.7	4.9	4.9	5	4.9	5	5
Taiwan	4.4	4.3	4	4.5	4	4.5	4.5	4.5
Singapore	6.1	4.9	4.6	4.8	5.8	4.6	6	4.3
Indonesia	5.4	5.5	6	5.8	5.5	5.4	6	5.4
Malaysia	5.5	5.5	5.8	5.7	5.6	5.6	5.7	5.7
Philippines	5	5	5.3	4.6	5	4.8	5.4	4.8
Thailand	4.7	5.7	5.5	5.0	5.1	4.9	5.3	5.2
Bangladesh	6.5		6		5.7		5.9	
India	7.6	6.9	7.8	7.3	8	7.2	8	7.3
Pakistan	6.5		7.3		7		7.2	
Sri Lanka	5.3		5.2		5.5		5.7	

Source: Table 1.24 and Consensus Economics (2006) projections made in July.

Factors contributing to growth

The exercise conducted in the previous section is designed to raise the readers' awareness of the major factors contributing to growth. Analysis of these factors can give us clearer insight into Asian growth prospects for the next decade and a half. Over time, labor force growth declines and TFP also slows as the leverage from shifting from agriculture to industry and services dissipates. As the size of industry and services growth diminishes along with the growth in the labor force, there is a natural reduction in the sustainable long-term rate of growth in output and output per capita. There will also be diminishing returns to scale as the amount of capital per worker continues to grow. To offset these tendencies, economies have to become more efficient in the use of resources, technology and manpower. We look at a few aspects of these challenges to raise output and productivity.

Investment

The rate of investment is crucial. Historically, Asia has been the highest saving region in the world and this is projected to continue. However, some developments may slow the rate of investment. Consumer credit is a growing feature of the Asian economies. In industrial countries the spread of consumer credit has been negatively correlated with saving and there is a possibility that this could develop in developing Asia. However, Japan is a case where saving rates remain high despite the widespread access to credit. Investment is particularly critical for funding of physical infrastructure in South Asia to increase economic efficiency and international competitiveness and to facilitate the ongoing transformation of industry into a higher technology orientation.

Total factor productivity

Total factor productivity in all of its different aspects is important. TFP reflects innovation and technical transfer as well as the movement to higher value-added goods and gains in labor productivity. Countries that continue to transform their mix of products from

low-value agricultural products and labor-intensive manufacturers to higher value industrial products and services benefit from the additional output generated and also from TFP that raises the skill levels of the entire labor force. In Southeast Asia, for example, United Nations (2006, Chapter 2) shows that nearly all of the annual growth in labor productivity from 1991 to 2004 in Southeast Asia came from gains from relocation of labor from low productivity jobs in agriculture or services to high productivity manufacturing or service sector jobs. Fewer reallocation gains were made in China and the rest of East Asia, and also in South Asia. Labor productivity in Asia outpaced all other developing regions during this period. According to some observers, there has been a trend toward a slowing of TFP growth in developing Asia over the past decade (Bosworth, 2006).

Labor force growth

The demographic transition has taken place at different rates in the different regions. Fertility and population growth are still relatively high in South Asia and this will help the region raise growth levels if productive jobs can be found for new entrants into the labor force. Increases in labor force participation rates for women will also increase the labor force in countries where women's opportunities continue to expand. In other countries, tradition and custom could constrain the entry of women into the labor force (see Chapter 4 for additional discussion).

Education and health

The augmented labor force variable h is a crucial variable in the growth equations reviewed in the previous section. The rate of increase in educational attainment and improvements in health and sanitation are equally important as absolute increases in the size of the labor force. In East Asia and Southeast Asia, raising the highly skilled and professional components is critical. In many of these countries, universal primary and secondary education have been achieved and it is time to widen access to higher and professional education, particularly in business and engineering. In the poorer countries emphasis should be

on secondary and technical training as well as tertiary education in business and engineering. These skills also have an important positive impact on poverty (see Chapter 4 for further discussion).

Governance and corruption

Corruption and good governance do not enter directly into the growth models. However, they enter indirectly by raising or lowering the economic efficiency of the economy through the capital to output ratio and the productivity of labor. Honesty and trust bring greater efficiency and stronger growth with them while inefficiency and corruption result in misallocation of resources and economic inefficiencies. We discuss these factors in greater depth in Chapter 5.

Foreign direct investment and export promotion

We saw in the review of the past that FDI and export processing zones played a crucial role in the growth experience of the Asian region. They will continue to be crucial in the future. China is continuing to develop processing zones along the Yangtze River, and India is also developing export processing as a strategy (see Chapter 7). Other countries in the region, including Singapore, Vietnam, and Bangladesh are also focusing more on developing export zones that can compete internationally. As these zones spread their influence and increase industrial efficiency, entire economies will become more capable of manufacturing products for international sale.

Growth Projections to 2020

What will the growth profile for the region look like for the decade from 2010 to 2020? Current population growth provides a rough indication of comparative labor force growth between countries in 20 years. Table 1.27 displays gross population growth rates from 1950 to 1975, 1975 to 2000, and 2000 to 2025 for developing Asia. (see East–West Center, 2002, Appendix Table 2). Growth in the latter period from 2000 to 2025 is substantially lower than in the earlier periods.

Table 1.27 Population Growth, 1975–2000 and 2000–2025 (%)

Country	1950–1975	1975–2000	2000–2025	2000–2025 Implied Annual Population Growth Rate (in %)
China	67	37	15	0.58
Hong Kong	122	56	26	0.98
Korea	73	39	16	0.63
Indonesia	69	57	28	1.15
Malaysia	100	81	70	2.25
Philippines	110	80	41	1.40
Singapore	121	77	24	0.90
Thailand	109	52	23	0.88
Bangladesh	80	82	53	1.80
India	73	62	34	1.16
Pakistan	77	100	77	2.40
Sri Lanka	80	49	19	0.75
USA			19*	1.00

*US figure is for 2000–2020 and source is US population census.

Source: East–West Center (2002).

Actual employment growth in the forecast period from 2010 to 2010 will depend upon a host of other factors as well as lagged population growth, including mortality in the labor force, labor force participation rates for men and women, years of education, and changes in retirement age. What is important to note, however, is the decline in the number of new entrants into the labor force. Those numbers are closely related to population growth a couple of decades earlier; and those numbers are declining. Nevertheless, population growth toward the end of the 20th century and in the early years of the 21st century will largely determine the rate of labor force growth between 2011 and 2020.

The working age populations of the three largest countries in Asia are shown in Figure 1.8. It is clear that Japan's working age population peaked in the late 1960s and leveled off until the 1990s when it began to decline rapidly. China will reach its peak soon and

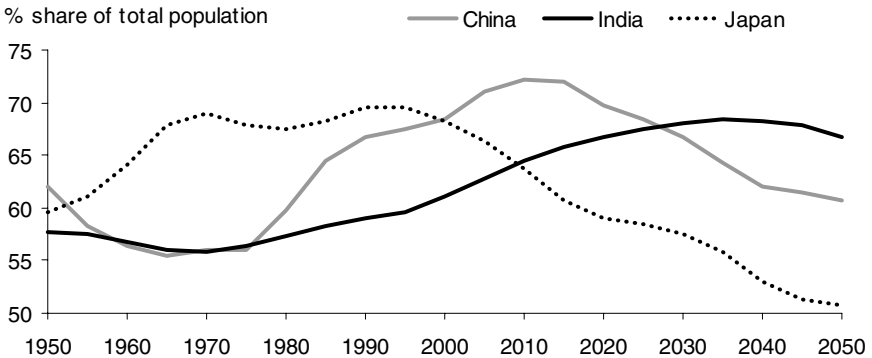


Figure 1.8 Working Age Populations in China, India and Japan

Source: UN Population Statistics.

Table 1.28 Change in Working Age Population (15–59) in China by Decade by Millions of People

1975–1985	163
1985–1995	124
1995–2005	107
2005–2015	33
2015–2025	–29
2025–2035	–77

then begin to decline while India's will not peak until 2030 or thereabouts.

Economic growth projections for the decade from 2011 to 2020 are displayed in Table 1.29 and compared with the growth in the previous decade and with the ADB (1997) forecast. In China, a moderation in growth in the 2011–2020 period is projected. This results from slower growth in the labor force (Table 1.28) and a reduction in the level of TFP. If TFP is 3% and the augmented labor supply, l , falls to 1.5% as additions to the labor force fall dramatically⁶ and

⁶ The decade addition to the labor force from 2005 to 2015 displayed in Table 1.28 is less than one-half of 1% of the Chinese labor force of around 740 million in 2005.

Table 1.29 Projected Growth from 2011–2020 Compared with the Previous Decade

(1)	(2)	(3)	(4)	(5)	(6)
Country	2001–2010 Growth in GDP	2001–2010 Growth in GDP per capita	2011–2020 Growth in GDP	2011–2020 Growth in GDP per capita	1995–2025 Growth in per capita income in ADB (1997)
China	9.2	8.6	7.0	6.4	6.0
Hong Kong	4.9	3.9	4.0	3.0	2.1
Korea	4.7	4.1	4.0	3.4	3.5
Taiwan	3.7	3.1	3.5	2.9	3.1
Singapore	4.8	3.9	4.0	3.1	2.4
Indonesia	5.2	4.2	5.0	4.2	5.0
Malaysia	5.1	2.9	5.0	2.8	3.9
Philippines	4.8	3.4	4.6	3.2	5.3
Thailand	5.1	4.2	5.0	4.1	3.8
Bangladesh	5.7	3.9	6.0	4.2	3.9
India	7.3	6.2	7.6	6.5	5.5
Pakistan	5.9	3.5	5.9	3.5	4.4
Sri Lanka	4.7	4.0	4.8	4.1	3.9
Azerbaijan	10	9	8.2	7.2	na
Kazakhstan	7.2	6.2	6	5	na
Turkmenistan	9.1	8.1	5.2	4.2	na
Kyrgyz Republic	6.1	5.1	5.9	4.9	na
Tajikistan	7.2	6.1	5.9	4.9	na
Uzbekistan	5.7	4.7	5.8	4.8	na

Source: Author's projections, historical growth to 2005 from ADB (2006) and Table 1.13. For Central Asia, Dowling and Wignaraja (2006) and author's projections from 2015–2020.

labor's share remains at 65%, then $y = b + a/l_s$ is $1.5 + 3.0/0.65 = 1.5 + 4.6 = 6.1\%$. Even if TFP remains very high and the augmented labor supply grows a bit faster, growth will still slow to around 7%.

For the other countries in East Asia and Singapore, growth will also slow but not as rapidly as in China. The major reason for the slowdown in East Asia and Singapore is more moderate labor

force growth and diminishing returns to capital as TFP slows. Also growth in greater China (including Hong Kong, Taiwan and Singapore) will be adversely affected by slower performance in mainland China.

In Southeast Asia growth is projected to fall slightly, although not as much as East Asia. Much will depend upon how effectively Southeast Asian economies respond to the challenges of industrial growth presented by China. Somewhat slower labor force growth will also have a negative impact on economic prospects although the full impact of the demographic transition on these economies will not occur until the later part of the forecast period and beyond. We also have to recognize that the first decade of the new millennium started with very slow or negative growth in these countries as they were adversely affected by the downturn in the United States. Keeping this in mind the forecast for 2011 to 2020 is only slightly lower than the earlier period growth.

Economic prospects in South Asia depend more upon policy adjustments than in the other regions. Liberalization measures have not yet been fully implemented in South Asia and bureaucratic restrictions are still in place in many countries. India has yet to come to grips with restrictions in labor movements, particularly hiring and firing, that have been an impediment to rapid growth in manufacturing. These issues are taken up in some depth in Chapter 7.

The labor force in South Asia will continue to grow rapidly through the decade. The challenge will be to find gainful employment for new entrants and to upgrade skills to take advantage of new opportunities for industrial sector growth in labor-intensive and some skill-intensive occupations. Infrastructure bottlenecks will also restrain output growth unless more resources are made available to improve and increase the efficiency of transportation, power, water, telecommunications, and other services critical for the growth of industry. These issues are discussed in more depth in Chapter 2. Keeping these factors in mind and assuming that bottlenecks will be removed and appropriate policies undertaken, the region should be able to grow at the same or even higher rates than in the previous decade.

In the Central Asian Republics, growth will remain robust for most of the forecast assuming that needed policy reforms are introduced. In the three oil producing economies (Azerbaijan, Kazakhstan and Turkmenistan), an implementation schedule for WTO membership is being developed and trade reforms will continue. Progress will be made in large-scale privatization, corporate governance, and financial sector liberalization. In the three non-oil economies (Kyrgyz Republic, Tajikistan, and Uzbekistan), exports will be promoted, financial sector reforms carried out, particularly of state-owned banks, and privatization of the productive sectors will deepen. In the non-oil CARs, progress in reform will be especially visible in the agricultural sector including removal of quantity and price controls, dismantling of public monopolies, increased investment in rehabilitation of irrigation systems, and rationalization of agricultural subsidies (Dowling and Wignaraja, 2006).

There will be a coherent and cohesive development of the CARs as a region through a number of initiatives in regional cooperation including transport, trade, and energy. These are described more fully in Chapter 2. An integrated rail and road network system will be implemented. Customs codes will be harmonized, border procedures will be streamlined, and best practices information and inspection systems will be adopted. The prevalence of non-tariff measures on regional trade will be significantly reduced as a result of improvements in institutions. An efficient regional energy market and system will emerge through implementation of structural reforms, tariff reforms, and significant investments in regional energy infrastructure. This will be accompanied by greater transparency and more rational pricing in line with market conditions.

Comparing the differences in projected growth rates by subregion we notice a strong tendency toward convergence in per capita income. For the 2011–2020 average growth in East Asia outside of China is just over 3% (column 5 in Table 1.29), in Southeast Asia the average growth in per capita income is about 3.6. Rates in South Asia are a full percentage point higher at 4.6. In the Central Asian Republics the energy boom in the three oil producers and continued market reforms is projected to lift per capita income at the rate of 5.2, the highest of all the regions. These differential growth rate

projections in per capita income reflect the maturation of the East Asia economies which will have standards of living comparable to the United States by 2020. They also reflect the gains that will continue to be made by transition economies in Central Asia as well as China and Vietnam as they move from central planning to the market economy.

Export Growth

Export growth is generally dependent upon the rate of growth in income in export markets and the degree of additional market penetration made possible by better products and lower prices. Exports are also more volatile than income, particularly if the import demand elasticity of destination countries is high. From historical experience Asian exports are particularly prone to downturns in the US market.

Keeping these factors in mind, we have constructed a simple model relating projected income growth with export growth over the past few decades and derived an export growth elasticity with respect to income growth. This is a reduced form estimate and not a behavioral model of export behavior

$$\text{Log (export growth)} = a + b \text{ log (income growth)} + \sum c_i (\text{country dummy variables}), \quad (1.6)$$

where b is the constant elasticity of export growth with respect to income growth. The estimates of b from (1.6) are displayed in Table 1.30 for a pooled regression of several Asian economies. The elasticity is large and significant, reflecting a strong response of exports to changes in income.

These results suggest that exports and economic growth are positively related. Most regression coefficients are positive. However, only a few are statistically significant. To gain more degrees of freedom a pooled regression with intercept dummy variables was performed as suggested in Equation (1.6). These results showed that the export elasticity was positive and significant at the 1% level. A one percent increase in income leads to a 0.566% increase in exports.

Table 1.30 Elasticity of Export Growth with Respect to Income Growth, 1985–2004

Country	Elasticity of Export Growth with Respect to Income Growth
China	-0.06
Hong Kong	0.36*
Korea	0.12
Singapore	1.77
Taiwan	-0.01
Indonesia	0.82
Malaysia	0.26
Philippines	0.47
Thailand	0.20*
Bangladesh	0.88
India	-0.01
Pakistan	1.25
Sri Lanka	1.13*

Source: Data from World Development Indicators CD-ROM 2002 and WDI Online.

Note: Significant *t*-statistics are denoted with an asterisk.

Standard of Living in 2020

In the ADB forecast for the future contained in its forward looking publication published in 1997 (ADB, 1997) a table showed the GDP per person relative to the United States in 2025. It might be useful to undertake a similar exercise a decade later. We can do this in one of two ways — either by projecting income per capita in US dollars using current exchange rates or by projecting growth in GDP using purchasing power parity. Both sets of figures are displayed in Table 1.31 for 2005. Since purchasing power parity is supposed to give a better indication of relative standards of living since all goods enter into the calculation, we make projections based on this way of measuring income. However, since purchasing power changes over time the projections are only a rough guess as to the relative standards of living in 2020.

For the projections we take the growth rates from Tables 1.29 and 1.21. We begin the forecast from the last actual figure in 2005. The forecast for US growth depends upon the time period used. GDP growth

Table 1.31 GDP in 2005 in PPP and Exchange Rate Terms from ADB (1997)

Country	GDP per capita in PPP terms US\$	GDP in exchange rate US\$
China	6800	1256
Hong Kong	32,900	24,515
Korea	20,400	16,538
Taiwan	27,600	15,531
Singapore	28,100	26,777
Indonesia	3600	1112
Malaysia	12,100	4812
Philippines	5100	1091
Thailand	8300	2794
Bangladesh	2100	na
India	3300	693
Pakistan	2400	na
Sri Lanka	4300	na

Source: ADB (1997) and CIA Factbook (2006).

has slowed down over the past decades, from 3.46 in 1959 to 2005, 3.01 in 1980 to 2005, and 2.97 in 1990 to 2005 (United States Government, 2006, Table B5). Assuming that growth will slow somewhat further over the next 15 years, we assume US growth of 2.9% per annum from 2006 to 2020. Using PPP for the United States of \$41,800, this gives a PPP value of \$64,181 for the United States in 2020. In per capita terms we assume a population growth rate of 0.75% based on Census Bureau estimates of population growth between 2010 and 2020. This results in a PPP per capita in the United States of 54,827 in 2020.

According to our projections, the Asian region will grow faster than the United States. By 2020, Hong Kong, Singapore and Taiwan will have achieved higher per capita income than the US level in 2005. Other countries have also improved in their performance relative to the United States, as displayed in Table 1.32. The catch up to the United States is not as dramatic as the forecasts contained in ADB (1997). Taking into account that we have 10 more years of data, this result is somewhat surprising, particularly since our per capita growth rates are somewhat higher than the ADB (1997) forecasts for East Asia.

Table 1.32 Income per Capita in 2005, 2020 and 2025

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Country	2005 PPP Income per capita	2005 PPP Income per capita as % of US per capita income in 2005	2020 PPP Income per capita	2020 PPP Income per capita as % of US per capita income in 2020	2025 PPP Income per capita	2025 PPP Income per capita as % of US per capita income in 2025	2025 Income per capita as % of US per capita income from ADB (1997), Table 2.11
United States	41,800		54,827		60,016		
China	6800	16	18,874	34	25,738	43	38
HongKong	32,900	79	57,550	105	68,022	113	117
Korea	20,400	49	35,278	64	41,697	69	83
Taiwan	27,600	66	43,540	79	49,987	83	88
Singapore	28,100	67	48,063	88	55,990	93	107
Indonesia	3,600	9	6602	12	7994	13	36
Malaysia	12,100	29	18,786	34	21,515	36	71
Philippines	5100	12	8396	15	9829	16	29
Thailand	8300	20	15,252	28	18,646	31	47
Bangladesh	2100	5	3919	7	4814	8	17

(Continued)

Table 1.32 (*Continued*)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Country	2005 PPP Income per capita	2005 PPP Income per capita as % of US per capita income in 2005	2020 PPP Income per capita	2020 PPP Income per capita as % of US per capita income in 2020	2025 PPP Income per capita	2025 PPP Income per capita as % of US per capita income in 2025	2025 Income per capita as % of US per capita income from ADB (1997), Table 2.11
India	3300	8	8575	16	11,749	20	24
Pakistan	2400	6	5911	11	7021	12	18
Sri Lanka	4300	10	8082	15	9880	16	25
Azerbaijan	4800	11	15,242	28	19,177	32	Na
Kazakhstan	8200	20	18,281	33	21,713	36	Na
Kyrgyzstan	2100	5	4384	8	5257	9	Na
Tajikistan	1200	3	2652	5	3242	5	Na
Turkmenistan	8000	19	14,969	27	17,865	30	Na
Uzbekistan	1800	4	3724	7	4596	8	Na

Source: Author's projections and ADB (1997).

Part of the difference between our forecasts and the ADB (1997) forecasts is due to the financial crisis in Southeast Asia which occurred just after ADB (1997) was published. This crisis moderated performance for several years and is also evident from the forecasts of 2020 and 2025 as well. Differences may also be the result of differences in the forecasts of the US growth rate and the rate of population growth.

In any event, both sets of results suggested show some convergence toward the US growth rate. This can be seen by comparing the ratio of PPP per capita income in 2005 and 2020 as displayed in columns (3) and (5) in Table 1.32.

Policy Challenges and Responses

The growth assumptions from Equations (1.2) and (1.3), and the data assembled to compare saving rates with growth rates were designed to explore the plausibility of continued growth without significant bottlenecks. In order to achieve sustained growth in per capita income of the magnitudes displayed in Table 1.29, continued reforms and proactive government policies in a number of areas will be required. These aspects are explored in more detail in the remainder of this book.

The trajectory of growth will be subject to a number of challenges. Briefly, aside from China, East Asia faces similar challenges to those confronting industrial countries in Europe, North America and Japan. These include slower population growth and greater burden to support an aging population; technological challenges to maintain competitiveness in a global environment; maintaining growth at a sustainable pace while containing inflation, and avoiding recessions. Capital accumulation has been high for the past few decades. As a result, future opportunities for productivity growth from shifts from low productivity to high technology jobs are limited.

In China, regional income imbalances between rural and urban areas have grown rapidly and need to be addressed along with environmental protection. Restrictions on migration have been relaxed to some extent, but more needs to be done to encourage those willing

to migrate. At the same time the government has to develop policies that stimulate the western provinces and rural areas in general. EPZs along the upper reaches of the major rivers are a move in this direction. Government plans are in the works to raise subsidies for farmers and for education in rural areas. Manufacturing has grown rapidly and has created imbalances that need to be addressed. The government needs to develop the service sector and introduce policies that help to support industry. Insurance, banking, telecommunications, and other services will expand. Slower growth in industry and investment will be accompanied by faster growth in consumption and greater emphasis in the quality rather than the quantity of investment. Macroeconomic management is complicated by the role of local governments, which are responsible for the bulk of investment and are not easily controlled by the central government. Ultimately, any bad debts that arise from poor investments by local governments are the responsibility of the central government. This creates a moral hazard problem and a risk of overheating that has not yet been effectively dealt with. Independent local governments that also control spending make fiscal policy difficult to implement at the country level, leaving monetary policy as the only effective macroeconomic management tool.

In Southeast Asia, Thailand and Malaysia have begun to pull away from the rest of the region. By 2020, their per capita income will be nearly as high as Korea's in 2000. They could begin to qualify as high income developed countries by 2020. Thailand will have to deal with growing income inequality created by the rapid growth of the Bangkok metropolitan area and the continued slower growth of the northeast and southern provinces, and the political uncertainties that surfaced in 2006 may continue to slow growth. Malaysia has to deepen its services sector by encouraging greater foreign participation and reducing restrictions on foreign participation in professional service, banking and telecommunications (ADB, 2006). Continued upgrading of human resources for the electronic age are critical. Indonesia and Philippines will face a different set of challenges. Governance issues are a paramount concern in both countries. Bureaucratic procedures and corruption are reducing efficiency and constraining the investment environment and political volatility has

deterred investors. These must be addressed if growth momentum is to be maintained. Failure to complete the demographic transition has been moderated by continued out-migration and increasing remittances in the Philippines. This is not a long-term solution and greater efforts need to be made to restrict population growth. Government revenue needs to be increased to meet growing infrastructure bottlenecks, particularly in the power sector, and to improve efficiency and international competitiveness. In Indonesia, manufacturing sector growth has lagged, particularly since the financial crisis. Particular attention is needed to attract new investments in the oil and gas sector and to improve the general investment climate, including a better legal framework and reform of customs and the tax structure. Infrastructure, particularly in transportation, has to be upgraded to increase competitiveness. Throughout Southeast Asia, internationally competitive manufacturing will depend to a great extent on the efficiency of export platforms and the ability to meet the challenges of China and India, either by establishing niche markets or integrating into the supply chains of these larger economies. Many of these issues are examined in Chapters 2, 4 and 5.

In South Asia, India has the challenge of boosting industrial sector growth and reducing poverty. In 2005, agriculture employed nearly two-thirds of the labor force while providing less than 25% of GDP. These ratios will change over time but not quickly enough unless bottlenecks to industrial growth can be removed. It is particularly important to increase labor market flexibility, streamline bureaucratic procedures, and promote efficient production platforms such as SEZs to facilitate exports of manufactured goods. Infrastructure investment is also crucial for lowering the costs of power, transport and communications. In Bangladesh, fiscal effort has to be improved to address a number of development challenges. FDI inflows that have already increased in recent years have to be further encouraged by appropriate policies and complementary investment to increase efficiency. This should be part of a general program to increase spending on necessary infrastructure in power, telecommunications, and ports that are required to increase efficiency. Governance and corruption issues must also be addressed to strengthen the business environment

and attract both domestic and foreign investment. In Pakistan, improved relations with India are important to maintaining an attractive investment environment and economic stability. Textiles and clothing are a key sector comprising about 70% of total exports and 40% of industrial employment. To maintain export share after the opening up of the global market at the end of the quota system will require further increases in labor productivity and efficiency. Diversification to other product lines is also possible. Deregulation and privatization in banking and services should continue to lift efficiency and facilitate investment. In Sri Lanka a resumption of civil conflict is the biggest risk. The forecast assumes this will not happen. Infrastructure spending is critical for future improvements in efficiency and ability to compete in global markets. The policy environment is being improved to provide incentives for investment which would rise in tandem with improved land transport and a cheaper, more reliable power source. Exports of tea and clothing could be threatened by new regulations imposed by the European Union. Competition from other producers could also threaten clothing exports, which currently accounts for almost 50% of export earnings and the bulk of employment in the manufacturing sector. EPZs are being upgraded to improve efficiency to meet these competitive threats. Many of these issues are explored further in Chapters 2 and 7.

New growth theories advance that internationally competitive firms (exporters) are driving industrial growth, and hence the importance of innovation in the manufacturing sector (Gill and Kharas, 2006). So it depends on which country can innovate most effectively. Korea has fostered its own local brand like Samsung and Daewoo, and Singapore has focused on electronics, which proved to be beneficial for achieving rapid economic growth. However, some criticize that such growth in Singapore has been devoid of local content, depending mostly on foreign MNCs.

It remains to be seen how Singapore and other Asian countries develop their own talents, continue to innovate, and compete globally. In any event, a premium will be placed on innovation, better quality new products and lower prices from greater economies of scale, and higher production volumes. China has insisted on joint ventures and

alliances in the past so as to imitate technology and foster new innovations. Due to its inherent advantage of a large domestic market MNCs are generally more willing to accept greater risks in China than in smaller countries that cannot offer the same domestic market advantages. But that does not mean that the transfer of technology is necessarily smoother in China. Whether MNCs will indeed transfer high quality technology to China firms is a question yet to be answered as is the question of whether the local labor force has the capacity to absorb skills. South Asian countries like India face a number of challenges, including continued infrastructure bottlenecks and labor market rigidities. Many of these issues are discussed further in Chapters 2 and 7.

Risks to the Forecast

There are two kinds of risks to the forecast. The first risk is that the assumptions regarding domestic reforms and policy initiatives will not be realized. The forecasts assume that the reform process will continue where needed in the region. A major risk is that these reforms will stutter or stop. If this happens, growth trajectories to 2020 will have to be adjusted downward. Adjustments will be greater where policy implementation is critical — primarily in South Asia, China, Philippines and Indonesia — and less critical in the richer economies that are already in the high income categories. In these countries the major risks are that domestic macropolicies will be misdirected, resulting in either excessive inflation or recession.

There are also external risks to the global environment. Linkages between developing Asia and industrial countries through foreign trade are strong. Analysis of variations in growth in developing Asia suggests that recessions or slowdowns in the United States and developing Asia are closely related. The last recession in the United States in 2001 was the major cause for slower growth in developing Asia. We have not factored a slowdown in growth in the United States into the forecast. Our growth projections for the 2005 to 2010 are based on forecasts of international financial institutions such as the IMF, World Bank and the ADB, central banks, planning and finance ministries in

developing Asian and commercial banks and financial houses. Some of these forecasts were compiled by consensus economics. These forecasts were generally made under the assumption of a smooth future trajectory of income growth in the global economy. For the 2010–2020 decade, our forecasts were based on assumed longer term structural changes in the Asian economies including trends in labor force growth, technological change, and foreign trade. Relationships between the United States and Europe and developing Asia are examined in Chapter 3.

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