3

Trade Dynamics in China and India

No observer of China in the 1980s or even in the mid-1990s foresaw how rapidly China would industrialize, the scale of the industrialization, and the market penetration of China's manufactured exports. In the mid-1990s, even those observers who noted the acceleration of India's growth over the preceding decade did not anticipate that India would become the poster child of business process outsourcing (BPO), or that it would turn into a powerhouse of information technology–enabled services (ITES). Now the conventional wisdom is that China could become the preeminent economy within two decades, and India could be in third or fourth place a decade later. All such forecasts must be treated with skepticism, because extrapolation based on a reading of the recent past—and "recent" could capaciously embrace 20 to 30 years—can be highly questionable. It was virtually unimaginable in the 1970s that the Soviet Union would be economically crippled and begin unraveling just a few years later. When Japan was viewed as "Number One,"[1] when Japan's manufacturing firms seemed invincible and Japanese banks towered over their Western counterparts, informed observers were convinced that the Japanese century was about to dawn. By the same token, in the early 1960s, informed observers favored Ghana and Pakistan over Korea. Now, following the hobbling of the United States by wars, indebtedness, industrial hollowing,[2] and a financial

[1]The title of a widely cited book by Ezra Vogel (1979).

[2]Almost 55 percent of industrial production in the United States is accounted for by manufacturing. This sector produced less in 2008 than it did a decade earlier, highlighting the retreat of manufacturing. Even as industry recovers from the financial crisis and attempts to ramp up exports, auto and machinery manufacturers are making plans to transfer production abroad, where labor costs are lower and markets more likely to expand.

crisis,[3] the economic optimists are pinning their hopes on the world's two most populous countries and banking on their becoming the engines of growth for the global economy. However, some soothsayers, aware of missteps by earlier divines, are hedging their bets. They doubt that China can maintain its breakneck rate of growth, pointing to resource and environmental constraints, rising wages, the likely waning of U.S. and global demand for Chinese exports, higher energy prices, the declining potential contribution of capital to growth, and the challenge of attempting to make China into a highly innovative economy in a short time. A few go farther and claim that without an overhaul of the political system, China is headed toward an upheaval precipitated by endemic corruption, worsening income inequality, and the suppression of civil liberties by an authoritarian one-party state.

India's naysayers—conscious of India's infrastructural frailties, the shortages and uneven quality of labor skills, the still-powerful remnants of the "License Raj," and the tortuousness of the reform process—are skeptical that the country can push ahead forcefully with urban and industrial development. The worldwide economic crisis of 2008–10, external account imbalances, and the deadlocked Doha Round[4] have also reduced the likelihood of another spell of export-led growth for industrializing countries. All too often, analysts are drawn toward polar extremes. Either the prospects of China and India are painted in the rosiest of hues, or the future for both countries is presented in bleak terms as if their best economic times were behind them.

Our intention is to explore the middle ground and extract what insight we can from a close analysis of the information—quantitative and qualitative—on industry and trade. This information is "noisy"; but many trends, patterns, behaviors, and developments do persist and provide a window on a plausible future. Leavening speculation about the future industrial geography of Asia with a searching analysis of relevant past information perhaps is more likely to identify potential outcomes than is speculation loosely tethered to the empirical past.

In chapters 1 and 2, we examined the contrasting experiences of China and India with regard to industrial development and compared them with those of Japan, Germany, and the Republic of Korea. We also presented indicators to illuminate the performance of China and India and to situate the industrial capacity

[3]Sharp commentaries on the humbling of the overextended superpower, seemingly unable to respond adequately to a major crisis, are reminiscent of similar commentaries in the mid-1970s and again in the first half of the 1980s. This time around, the situation might be more desperate.

[4]The likelihood of a ratification of the Doha Round of Trade negotiations remains distant because the Organisation for Economic Co-operation and Development (OECD) countries want greater access to the markets for services in developing countries, which in turn are seeking a reduction in the barriers to imports of agricultural commodities imposed by developed countries (Hoekman 2010).

of the two countries and their trade in an international context. In this chapter, we assess the indicators of industrial competitiveness and trade, which can reveal how China and India are affecting each other's industrial development and those of neighboring Asian economies.

Asian Intraregional and Intra-industrial Trade

Casual empiricism based upon the growth statistics of industry and exports would suggest that China, if not India, is beginning to exert intensifying competitive pressures on Asian countries, both in their domestic markets and in the global market. But to date, the casual impression has proven to be deceptive. Competitive pressure exerted by China, and to a lesser degree by India, has increased; however, the pressure on the exports of other Asian countries has thus far proven tolerable and has been counterbalanced by China's imports of raw materials, components, and capital equipment.[5] Global production networks have continued sourcing from Southeast Asian countries even as the participation of Chinese firms in these networks has risen. Reflecting this, intraregional trade (including exports and imports) within East Asia now accounts for 60 percent of the total trade of the region—of which China accounts for 20 percentage points (see table 3.1) as compared to 3.8 percent in 1980. In contrast, Japan's share has diminished during this period, even though its trade with East Asia has increased—mainly as a result of growing trade with China. The intraregional trade data also show that China's trade with East Asia (and Japan) as a share of its total has decreased between 1985 and 2006, suggesting that Japan and other East Asian countries are supplying intermediate inputs to China to be assembled there and exported from China to the rest of the world.

An examination of intra-industry trade within East Asia, South Asia, and Asia as a whole also sheds light on the interrelationship among these countries.[6] Since 1980, intra-industry trade within Asia (East and South Asia) has been on a rising trend.[7]

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[5] A number of studies have estimated the impact of China on the trade of other Asian countries during the recent past and arrived at reassuring results. Overall, the diversion of trade to Chinese exporters was limited. Asian exporters of labor-intensive light manufactures have suffered more than others, while suppliers of sophisticated components and equipment have gained from import demand triggered by China's processing exports. See Haltmaier and others (2007); Hanson and Robertson (2008); Ravenhill (2006); Asian Development Bank (2009); and Roland-Holst and Weiss (2005).

[6] In this section, the Grubel-Lloyd Index (GLI) of intra-industry trade is calculated at the bilateral level. See Brülhart (2009) for an extensive review of the intra-industry trade methodologies and the global trend since 1962.

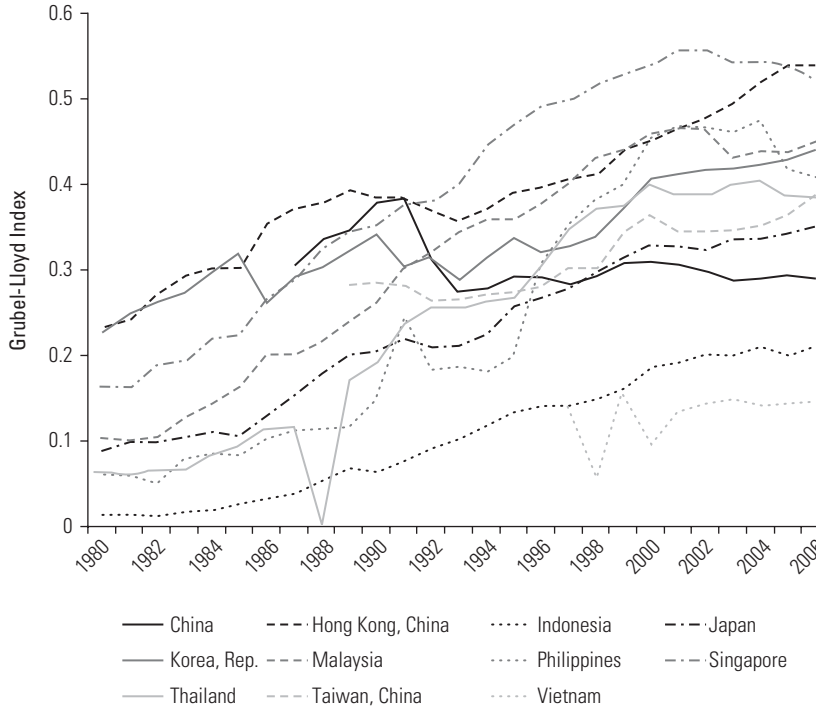
[7] Zebregs (2004) also notes the increase in intra-industry trade in East Asia as production has dispersed geographically under the pull of cost gradients, although the United States and the European Union remain the primary destinations of final products.

Table 3.1 Intraregional Trade in East and South Asia, 1980–2006

Country/region	Year	Share of East Asia, including China and Japan (%)	Share of China (%)	Share of Japan (%)	Share of South Asia, including India (%)	Share of India (%)
East Asia (excluding China and Japan)	1980	44.4	3.8	22.0	1.5	0.7
	1985	46.6	7.7	19.6	1.8	0.9
	1990	47.9	8.4	18.9	1.3	0.7
	1995	53.8	11.1	17.4	1.3	0.8
	2000	54.9	13.0	14.9	1.4	0.9
	2006	59.0	20.4	11.3	2.0	1.6
Japan						
	1980	24.0	3.5		1.3	0.7
	1985	24.8	6.2		1.5	0.9
	1990	28.4	3.5		1.2	0.7
	1995	39.1	7.4		1.1	0.7
	2000	40.2	10.0		0.9	0.6
	2006	44.4	17.2		1.0	0.7
China						
	1985	53.3		30.5	0.8	0.2
	1990	59.4		14.4	0.8	0.2
	1995	55.7		20.5	1.1	0.4
	2000	50.7		17.5	1.1	0.6
	2006	43.9		11.8	2.0	1.4
South Asia						
	1980	30.6	5.1	10.8	9.0	3.9
	1985	27.8	2.6	11.8	3.8	1.4
	1990	28.9	3.2	9.6	3.9	1.7
	1995	31.9	4.0	7.9	4.6	2.7
	2000	27.6	5.0	4.5	4.1	2.7
	2006	25.4	9.1	4.1	5.9	4.8
India						
	1980	12.4	0.2	6.7	0.9	
	1985	16.8	0.6	9.6	0.9	
	1990	17.9	0.1	8.3	1.3	
	1995	22.0	1.7	6.8	2.5	
	2000	19.5	2.5	3.8	2.1	
	2006	25.5	8.3	2.4	2.0	

Source: Authors' calculations based on UN Comtrade data.
Note: Blank cell = not applicable.

Figure 3.1 Changes in Intra-industry Trade of East Asian Economies



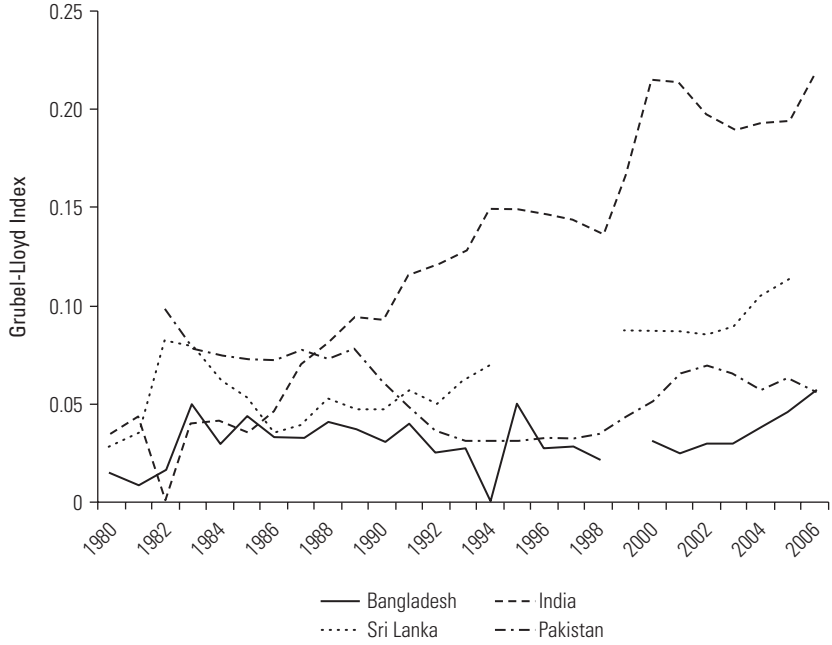
Source: Authors' calculations using UN Comtrade data.

Intra-industry trade rose rapidly among the East Asian economies but then plateaued after 2000 (see figure 3.1). Among the South Asian countries, only India experienced a growth in intra-industry trade (see figure 3.2). Even so, participation of India in intra-industry trade is considerably lower than that of all but two East Asian countries—Indonesia and Vietnam.

Consistent with the industrialization of East Asian economies, the fragmentation of production,[8] and an increase in vertical specialization, the composition of goods with higher intra-industry trade is shifting from primary products and resource-based products toward medium- and high-tech products (see table 3.2). In South Asia, meanwhile, commodities with the highest intra-industry trade ratios are resource-based and low-tech products (see table 3.3). Since 2000, products and machinery related to information and communication technology (ICT) have entered the list of the top five traded commodities.

[8]See Deardorff (2001) on fragmentation and production networking.

Figure 3.2 Intra-industry Trade by South Asian Economies



Source: Authors' calculations using UN Comtrade data.

Given the differing stages of development and industrialization, trade within Asia is dominated by East Asia. This is reflected in the data for intra-industry trade in Asia as a whole and is apparent from a comparison of table 3.4 with table 3.2. They are identical except for 1980, when more primary products were among the top five products for all of Asia than for East Asian economies alone.

For the East and South Asian regions combined, intra-industry trade is most active in auto parts, electronics and electronic equipment, furniture, and garments and textiles. Auto parts are traded mostly among the East Asian economies (see figure 3.3).

The same goes for electronics and electrical machinery although, since the late 1990s, intra-industry trade in electronics within South Asia has increased (see figure 3.4).

Intra-industry trade in furniture was on a declining trend between 1980 and 2002 but has been on an upswing since. In South Asia, intra-industry trade in furniture increased from the late 1990s but slumped after 2004 (figure 3.5).

Intra-industry trade in garments and textiles in East Asia peaked in 1986 and has oscillated between a GLI of 0.12 and 0.14 since 1988. Starting from a lower

Table 3.2 Commodities with the Highest Intra-industry Trade in East Asia

Year	Rank	GLI	Description	Technology class
1980	1	0.63	Furskins, Raw (Including Furskin Heads, Tails, and Other Pieces or Cuttings Suitable for Furriers' Use)	PP
	2	0.56	Thermionic, Cold Cathode, or Photocathode Valves and Tubes; Diodes, Transistors, and Similar Semiconductor Devices; Integrated Circuits, etc.; Parts	HT1
	3	0.54	Alcohols, Phenols, Phenol-Alcohols, and Their Halogenated, Sulfonated, Nitrated, or Nitrosated Derivatives	MT2
	4	0.44	Pearls, Precious and Semiprecious Stones, Unworked or Worked	RB2
	5	0.43	Engines and Motors, Nonelectric (Other Than Steam Turbines, Internal Combustion Piston Engines, and Power-Generating Machinery); Parts Thereof, N.E.S.	MT3
1990	1	0.71	Electric Power Machinery (Other Than Rotating Electric Plant of Power-Generating Machinery) and Parts Thereof	HT1
	2	0.66	Furskins, Tanned or Dressed (Including Pieces or Cuttings), Assembled or Unassembled without the Addition of Other Materials, Other Than Apparel, etc.	LT1
	3	0.62	Watches and Clocks	MT3
	4	0.60	Parts and Accessories Suitable for Use Solely or Principally with Office Machines or Automatic Data Processing Machines	HT1
	5	0.59	Barley, Unmilled	PP
2000	1	0.67	Furskins, Tanned or Dressed (Including Pieces or Cuttings), Assembled or Unassembled without the Addition of Other Materials, Other Than Apparel, etc.	LT1
	2	0.67	Telecommunications Equipment, N.E.S.; Parts, N.E.S., and Accessories of Apparatus Falling within Telecommunications, etc.	HT1
	3	0.66	Rotating Electric Plant and Parts Thereof, N.E.S.	HT1
	4	0.66	Electric Power Machinery (Other Than Rotating Electric Plant of Power-Generating Machinery) and Parts Thereof	HT1
	5	0.63	Parts and Accessories Suitable for Use Solely or Principally with Office Machines or Automatic Data Processing Machines	HT1
2006	1	0.69	Rotating Electric Plant and Parts Thereof, N.E.S.	HT1
	2	0.65	Electric Power Machinery (Other Than Rotating Electric Plant of Power-Generating Machinery) and Parts Thereof	HT1
	3	0.64	Parts and Accessories Suitable for Use Solely or Principally with Office Machines or Automatic Data Processing Machines	HT1
	4	0.64	Manufactures of Base Metal, N.E.S.	LT2
	5	0.63	Equipment for Distributing Electricity, N.E.S.	MT3

Source: Authors' calculations using UN Comtrade data. Technology classification is based on Lall (2000).
Note: N.E.S. = not elsewhere specified; HT1 = electronic and electrical products; HT2 = other high-technology products; LT1 = textiles, garments, and footwear; LT2 = other low-technology products; MT1 = automotive products; MT2 = process industry; MT3 = engineering products; PP = primary products; RB1 = agro-based products; RB2 = other resource-based products.

Table 3.3 Commodities with the Highest Intra-industry Trade in South Asia

Year	Rank	GLI	Description	Technology class
1980	1	0.55	Aircraft and Associated Equipment; Spacecraft (Including Satellites) and Spacecraft Launch Vehicles; and Parts Thereof	HT2
	2	0.53	Spices	PP
	3	0.40	Essential Oils, Perfume, and Flavor Materials	RB2
	4	0.30	Paper and Paperboard, Cut to Size or Shape, and Articles of Paper or Paperboard	LT2
	5	0.19	Textile Yarn	LT1
1990	1	0.65	Petroleum Oils and Oils from Bituminous Minerals (Other Than Crude), and Products Thereof Containing 70% (By Wt) or More of These Oils, N.E.S.	RB2
	2	0.57	Electrical Apparatus for Switching or Protecting Electrical Circuits or for Making Connections to or in Electrical Circuits (Excluding Telephone, etc.)	MT3
	3	0.47	Metal Containers for Storage or Transport	LT2
	4	0.35	Essential Oils, Perfume, and Flavor Materials	RB2
	5	0.26	Materials of Rubber, Including Pastes, Plates, Sheets, Rods, Thread, Tubes, etc.	RB1
2000	1	0.60	Fish, Fresh (Live or Dead), Chilled or Frozen	PP
	2	0.59	Aircraft and Associated Equipment; Spacecraft (Including Satellites) and Spacecraft Launch Vehicles; and Parts Thereof	HT2
	3	0.52	Pulp and Waste Paper	RB1
	4	0.51	Crude Vegetable Materials, N.E.S.	PP
	5	0.50	Ships, Boats (Including Hovercraft), and Floating Structures	MT3
2006	1	0.86	Copper	PP
	2	0.81	Electrical Machinery and Apparatus, N.E.S.	HT1
	3	0.71	Floor Coverings, etc.	LT1
	4	0.71	Lime, Cement, and Fabricated Construction Materials, Except Glass and Clay Materials	RB2
	5	0.69	Paper and Paperboard, Cut to Size or Shape, and Articles of Paper or Paperboard	LT2

Source: Authors' calculations using UN Comtrade data. Technology classification is based on Lall (2000).
Note: See the note to table 3.2.

base, South Asia's intra-industry trade has climbed since 2000, pointing to greater participation of producers from the region in global value chains (see figure 3.6).

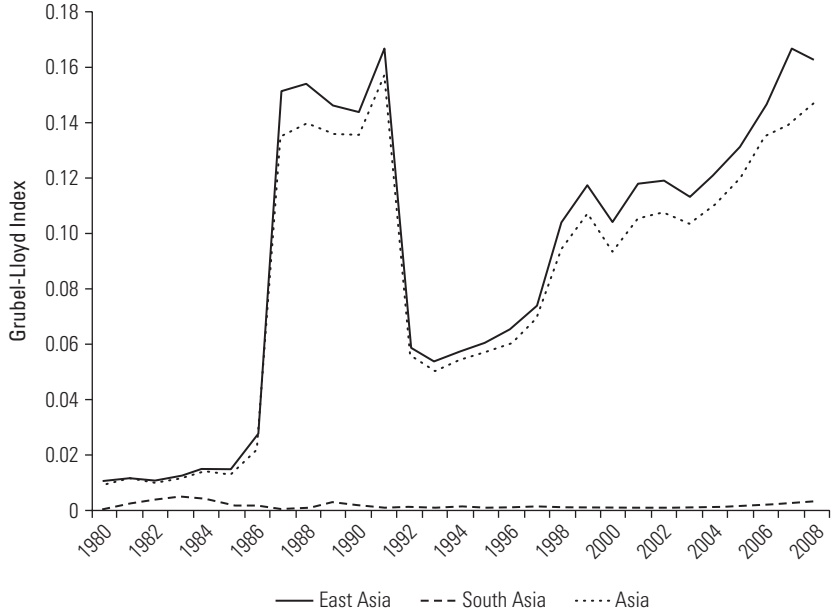
The overall impression from these figures confirms the information from industry sources indicating that intra-industry trade in major product groups is more active in East Asia than in South Asia. Evidence of production networking is most apparent in electronics and electrical machinery, rising in auto parts, and

Table 3.4 Commodities with the Highest Intra-industry Trade in Asia

Year	Rank	GLI	Description	Technology class
1980	1	0.63	Furskins, Raw (Including Furskin Heads, Tails and Other Pieces or Cuttings Suitable for Furriers' Use)	PP
	2	0.56	Thermionic, Cold Cathode, or Photocathode Valves and Tubes; Diodes, Transistors and Similar Semiconductor Devices; Integrated Circuits, etc.; Parts	HT1
	3	0.52	Alcohols, Phenols, and Phenol-Alcohols; and Their Halogenated, Sulfonated, Nitrated, or Nitrosated Derivatives	MT2
	4	0.42	Parts and Accessories Suitable for Use Solely or Principally with Office Machines or Automatic Data Processing Machines	HT1
	5	0.42	Lead	PP
1990	1	0.70	Electric Power Machinery (Other Than Rotating Electric Plant of Power Generating Machinery) and Parts Thereof	HT1
	2	0.66	Furskins, Tanned or Dressed (Including Pieces or Cuttings), Assembled or Unassembled without the Addition of Other Materials, Other Than Apparel, etc.	LT1
	3	0.61	Watches and Clocks	MT3
	4	0.60	Parts and Accessories Suitable for Use Solely or Principally With Office Machines or Automatic Data Processing Machines	HT1
	5	0.59	Barley, Unmilled	PP
2000	1	0.67	Furskins, Tanned or Dressed (Including Pieces or Cuttings), Assembled or Unassembled without the Addition of Other Materials, Other Than Apparel, etc.	LT1
	2	0.66	Telecommunications Equipment, N.E.S.; and Parts, N.E.S., and Accessories of Apparatus Falling Within Telecommunications, Etc.	HT1
	3	0.65	Electric Power Machinery (Other Than Rotating Electric Plant of Power Generating Machinery) and Parts Thereof	HT1
	4	0.65	Rotating Electric Plant and Parts Thereof, N.E.S.	HT1
	5	0.63	Parts and Accessories Suitable for Use Solely or Principally with Office Machines or Automatic Data Processing Machines	HT1
2006	1	0.67	Rotating Electric Plant and Parts Thereof, N.E.S.	HT1
	2	0.64	Electric Power Machinery (Other Than Rotating Electric Plant of Power Generating Machinery) and Parts Thereof	HT1
	3	0.63	Parts and Accessories Suitable For Use Solely or Principally with Office Machines or Automatic Data Processing Machines	HT1
	4	0.61	Manufactures of Base Metal, N.E.S.	LT2
	5	0.60	Equipment for Distributing Electricity, N.E.S.	MT3

Source: Authors' calculations using UN Comtrade data. Technology classification is based on Lall (2000).
Note: See the note to table 3.2.

Figure 3.3 Intra-industry Trade in Auto Parts by Asia Region



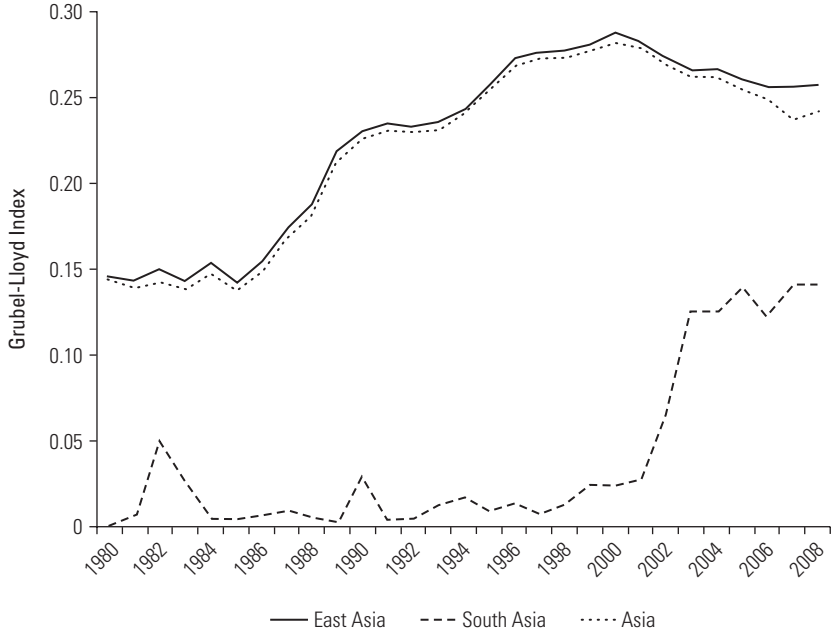
Source: Authors' calculations using UN Comtrade data.

moderately intense in garments and textiles. From among the South Asian countries, India is engaging in auto parts trade as well as in electronics trade, thereby distancing itself from its neighbors and beginning to position itself as an industrial economy that—in time—could resemble China's (figure 3.7 and figure 3.8).[9]

East Asian economies can be divided into two groups. One group comprises Hong Kong, China; Japan; Korea; Malaysia; the Philippines; Singapore; and Thailand. A sizable portion of their trade in electronics can be classified as intra-industry trade, and, until recently, the trend has been upward. A second group consists of China and Vietnam, whose engagement in intra-industry trade appears to be waning. Most notable are the changes in China's intra-industry trade. It was increasing until 1999 and has declined rapidly since. Given that China is now the largest exporter of electronics, the diminishing import intensity of its products suggests that backward integration is gathering momentum through the multiplication of local suppliers (although some or most of these may be foreign-owned). Increasingly, China's intra-industry trade is with Japan and Korea, countries that

[9]A brief spurt of intra-industry trade in electronics between India and Sri Lanka dissipated after 1990 (see figure 3.8).

Figure 3.4 Intra-industry Trade in Electronics and Electrical Machinery by Asia Region



Source: Authors' calculations using UN Comtrade data.

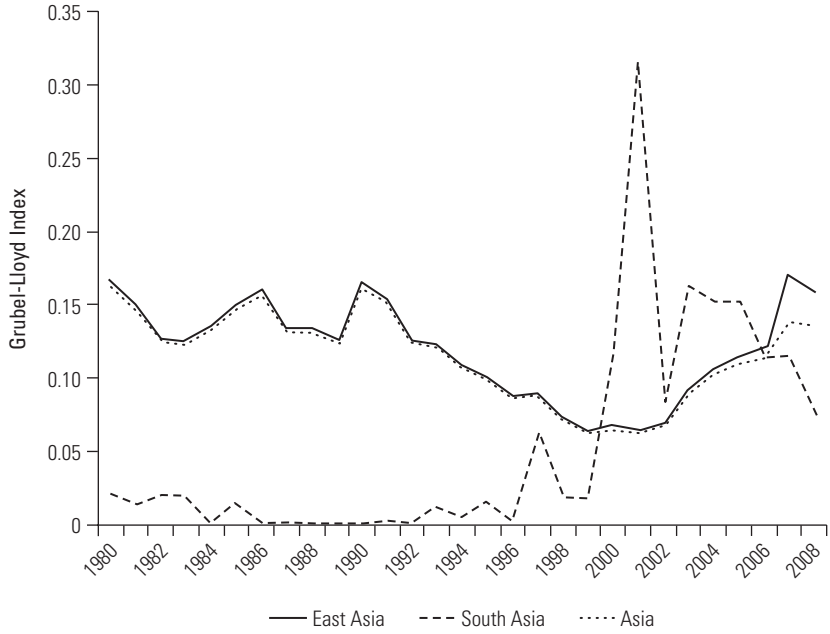
supply sophisticated components and production equipment.[10] Other parts and components are being sourced from within China (see Haltmaier and others 2007). The persistence of such a trend would spell trouble for other economies in East Asia, especially for Southeast Asian economies that rely on exports of electronic parts to China to balance their trade (see also Ravenhill 2006).

The inability of South Asian economies to sustain the trade in furniture was a setback for the region, and the East Asian countries have been quick to seize the opportunities this has presented (figure 3.9). Several countries have been riding an upward trend since 2000, although Hong Kong, China; Indonesia; Japan; and Vietnam do not engage in intra-industry trade in this particular product group.

Pakistan and Bangladesh are participating more actively in the intra-industry trade in garments and textiles. Participation by India has stabilized, but that of Sri

[10]China's rising intra-industry trade with Japan, primarily in the machinery and electrical engineering and electronics subsectors, is linked to Japan's foreign direct investment (FDI) in China. Growth of such trade with the United States is seemingly unrelated to U.S. FDI in China and is mainly in food products and chemicals (Xing 2007).

Figure 3.5 Intra-industry Trade in Furniture by Asia Region



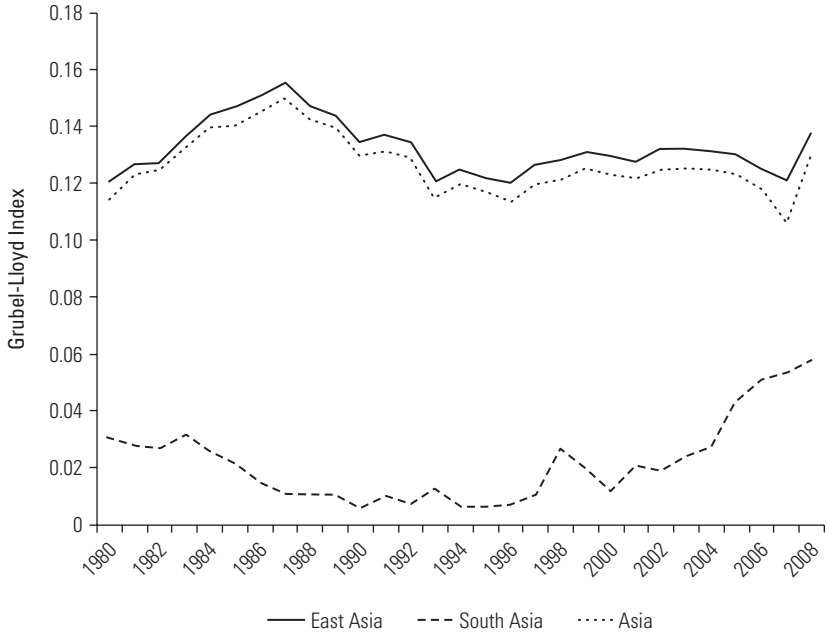
Source: Authors' calculations using UN Comtrade data.

Lanka remains low (see figure 3.10). Among East Asian economies, Hong Kong, China; Thailand; Malaysia; Korea; Singapore; and Indonesia are also active. China; Taiwan, China; Vietnam; Japan; and the Philippines saw the proportion of their trade in garments and textiles classified as intra-industry trade decrease. This is expected for Japan and Taiwan, China, as they have largely exited from this industrial segment and now are mainly importers of these goods (some produced by multinational corporations (MNCs) in other East Asian countries). What is striking is the large trade balance in textiles favoring China, reflecting the rapid decline in China's intra-industry trade in garments and textiles and, since global quotas were abolished in 2005, China's export success in the United States, where it now holds a one-third share. This shows that China is deepening the domestic supplier base for this industry and relying less on other Asian suppliers—most notably those in Association of Southeast Asian Nations (ASEAN) countries, which are being squeezed between Chinese exporters and those from low-income South Asian countries ("South-East Asia: Shake-up Looms" 2009).

Investing to Export

A better understanding of the industrial realities underlying the intra-industry trade statistics can be garnered from data on investment in manufacturing capacity in the

Figure 3.6 Intra-industry Trade in Garments and Textiles by Asia Region



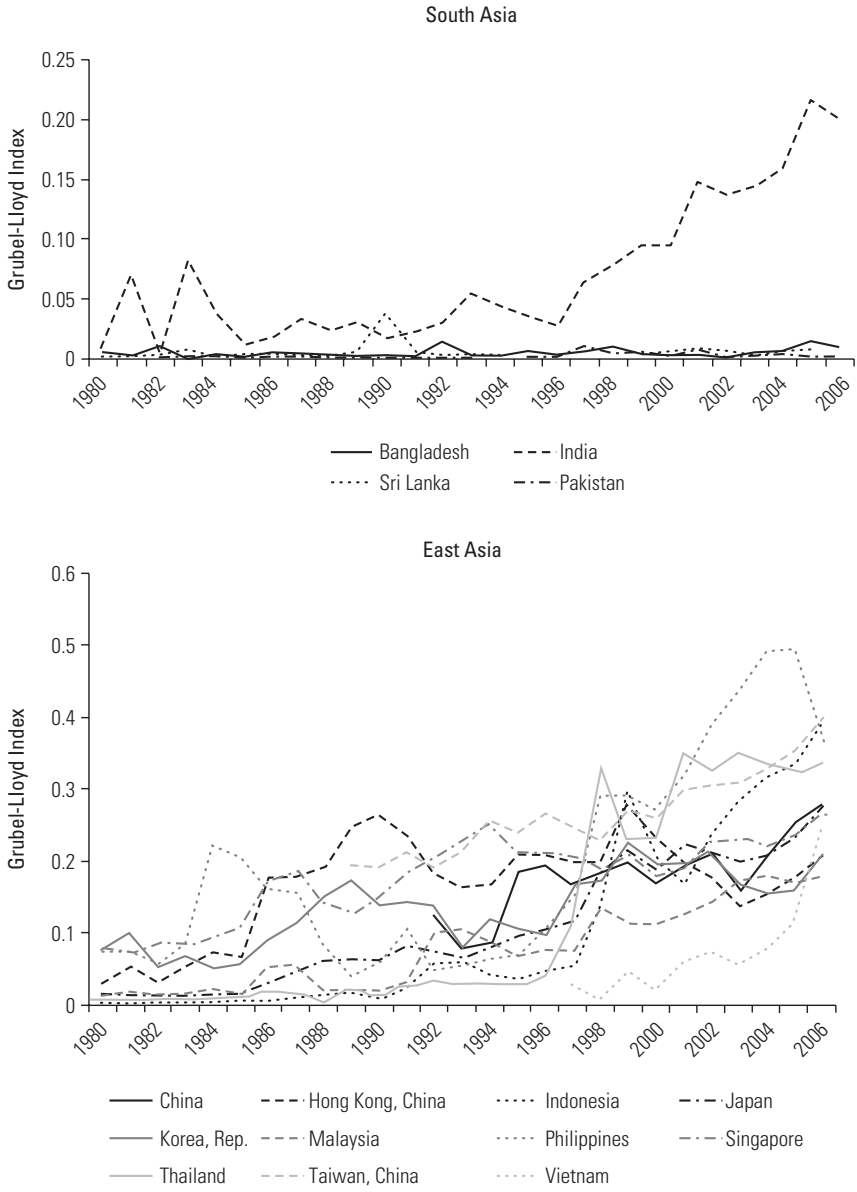
Source: Authors' calculations using UN Comtrade data.

Asian countries. Unfortunately, information on subsectoral investment is not readily available. One indicator, admittedly a crude one, is gross investment. Ideally, one would want a time series of investment disaggregated by manufacturing subsectors, but e ven the aggregate data can provide insights on growth and competitiveness. First, the data point to market expectations regarding returns from investment. Second, the volume of expenditure on productive assets is a gauge of entrepreneurship and access to financing from various sources. Third, investment in productive assets introduces new embodied technology. The higher the level of investment, the younger the vintage of the capital stock in the manufacturing sector[11] and the more modern the infrastructure. In other words, countries with high rates of investment are likely to have more advanced and productive technologies in place.

(continued on page 86)

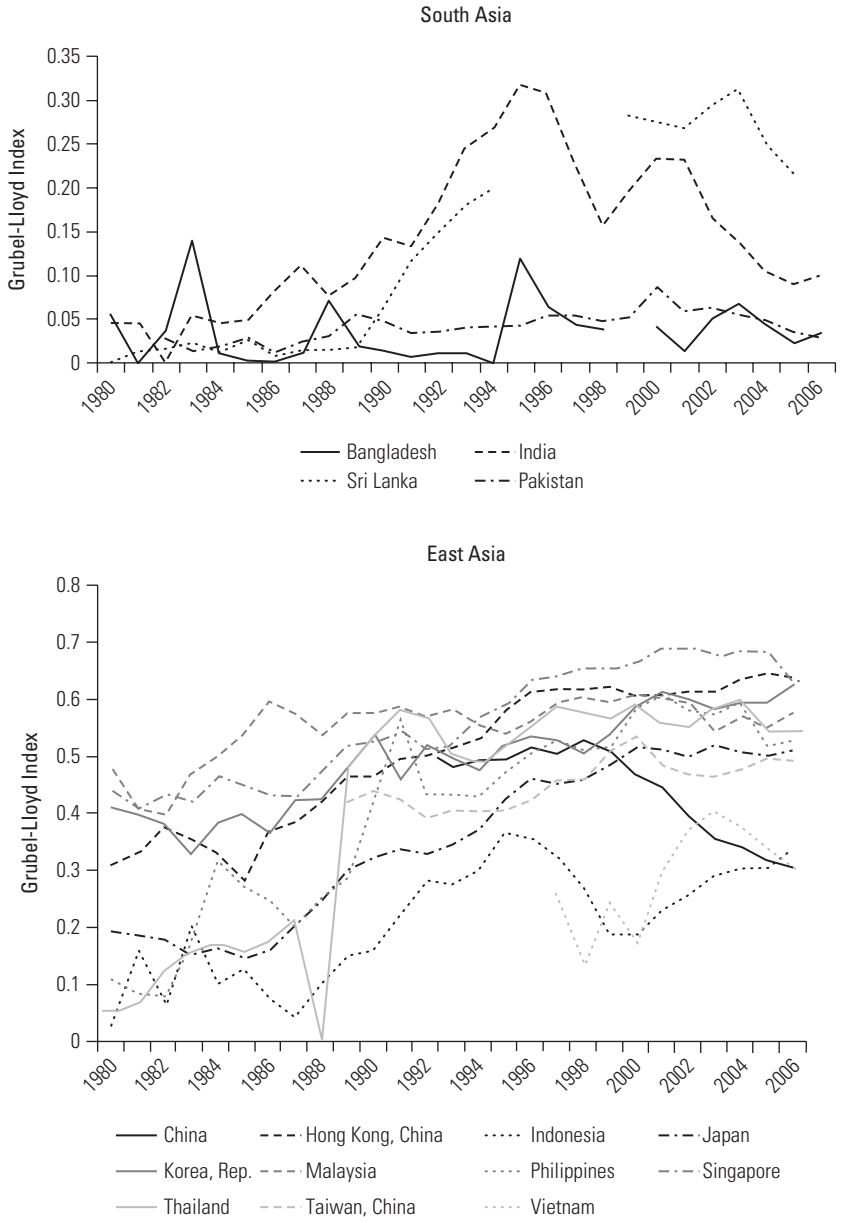
[11]This is vital in industries subject to rapid turnover of technologies. The production of DRAMs (dynamic random access memory) and thin-film transistor LCDs (liquid crystal displays) evolves in cycles of two years or less, and to remain competitive, producers must continuously be investing in the latest generation of product design and process technologies. Taiwanese producers may have lost ground to Korean ones by cutting investment during 2009, when demand briefly slumped.

Figure 3.7 Intra-industry Trade in Auto Parts within the Region by Asian Economy



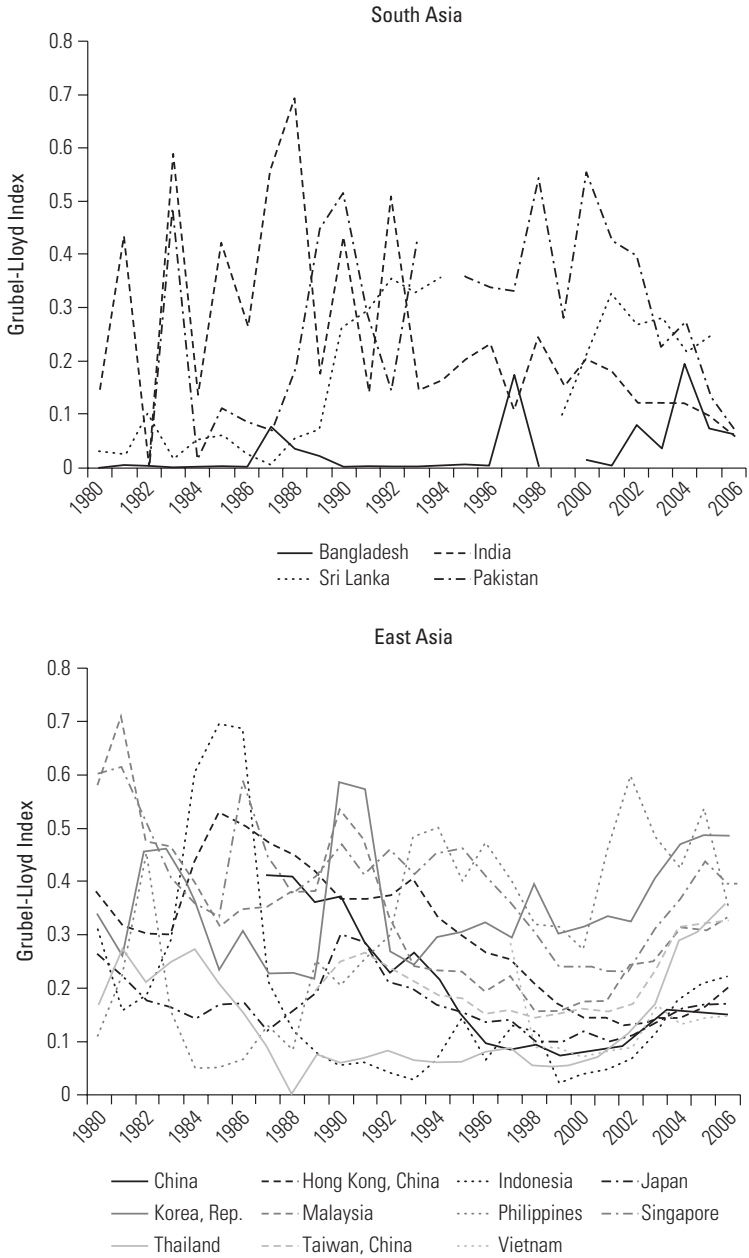
Source: Authors' calculations using UN Comtrade data.

Figure 3.8 Intra-industry Trade in Electronics within the Region by Asian Economy



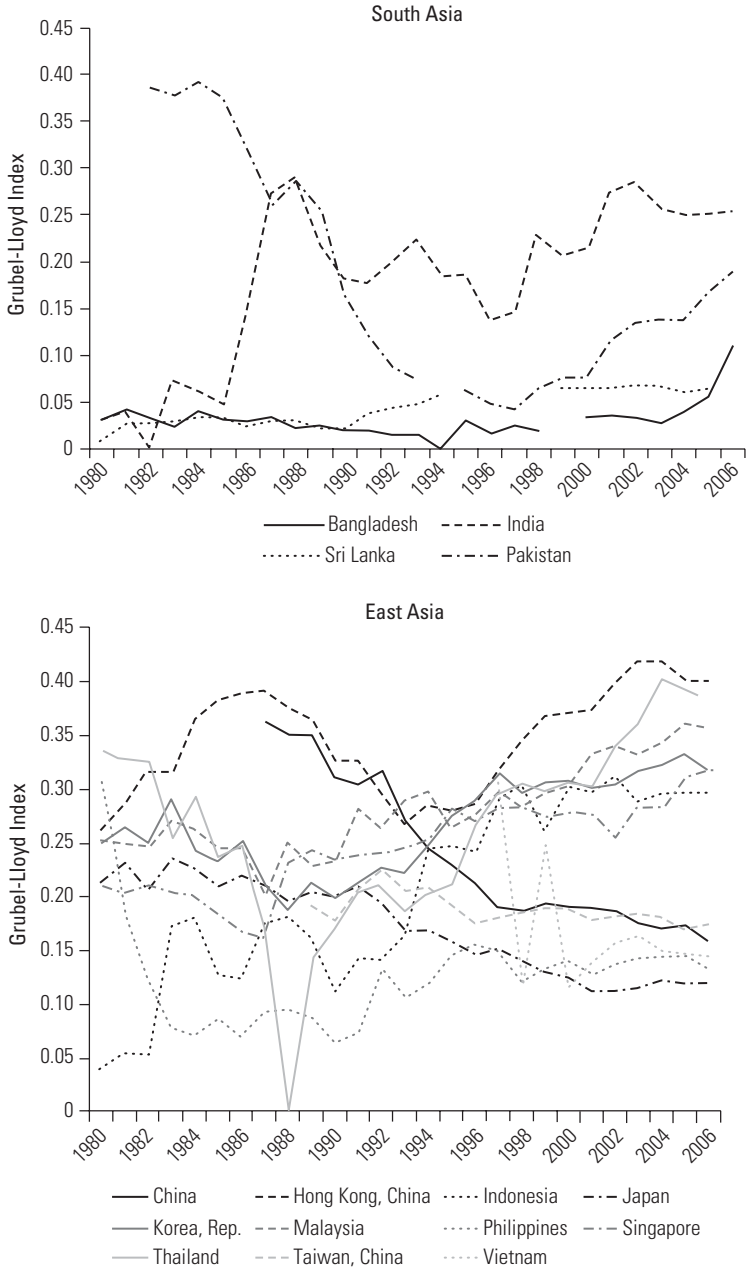
Source: Authors' calculations using UN Comtrade data.

Figure 3.9 Intra-industry Trade in Furniture within the Region by Asian Economy



Source: Authors' calculations using UN Comtrade data.

Figure 3.10 Intra-industry Trade in Garments within the Region by Asian Economy



Source: Authors' calculations using UN Comtrade data.

Fourth, investment builds capacity and positions producers to respond quickly to market opportunities while exploiting scale economies, if present, to quote lower prices. When demand from the United States rose after 2005 as the consequence of a policy-induced demand shock, investment in productive capacity by China in the preceding years allowed a matching supply response that massively increased exports to the United States. Fifth, investment not only can serve as a transmission mechanism for the latest technologies and as a means of achieving optimal scale—which is a big advantage in industries where technological change is rapid and production units must be of a certain minimum size in order to be cost competitive—but also is a good proxy for learning by doing. Learning is one of the key sources of productivity gains and represents the accumulation of tacit knowledge, the intangible asset that underpins productivity in complex industries. Sixth, high investment also supports the growth and quality of business services such as finance and insurance, which are among the biggest users of ICT. Finance, insurance, and real estate (FIRE), engineering, and consulting services contribute substantially to the growth and upgrading of manufacturing.[12]

Table 3.5 shows how investment-to-GDP ratios have trended in Asian countries since 1995. In China, the ratio has averaged 42 percent. In several of the formerly high-investing countries in Southeast Asia—such as Singapore, Malaysia, and Thailand—investment ratios declined following the 1997–98 crisis. Investment rates have also diminished in Japan and Korea. Only Vietnam has bucked the trend. Its investment rose from 27 percent in 1995 to 42 percent in 2007. In South Asia, the level of investment re mains modest or moderate, with the exception of India. This is the one instance where investment has risen sharply since the late 1990s—from 24 to 39 percent of GDP in 2008.

Countries with high levels of investment, such as China, India, and Vietnam, are sinking significant resources into manufacturing; the shares range from one-quarter to one-third of the total. In countries where investment has been shrinking, the share of manufacturing has declined, and more of the investment is in real estate, infrastructure, and services. This is also the case in the low-investing South Asian economies. These trends are likely to reinforce China's industrial strength and could add to the relative industrial heft of India and Vietnam, if higher levels of investment in these two countries are sustained and favor manufacturing. The three countries stand to benefit from the gains associated with rapid industrialization via exports, productivity, and technological change, the latter two being related to export competitiveness. Moreover, this practice of

[12]See Jorgenson, Ho, and Stiroh (2007) on the role of capital in promoting the growth of FIRE in the United States.

Table 3.5 Gross Capital Formation
share of GDP (%)

Country/economy	1995	2000	2005	2007
China	41.9	35.1	44.0	43.3
Vietnam	27.1	29.6	35.6	41.7
India	26.6	24.2	34.8	38.7
Korea, Rep.	37.7	31.0	30.1	29.4
Sri Lanka	25.7	28.0	26.1	27.2
Thailand	42.1	22.8	31.4	26.9
Indonesia	31.9	22.3	25.1	24.9
Bangladesh	19.1	23.0	24.5	24.5
Japan	28.4	25.4	23.6	24.1
Pakistan	18.6	17.2	19.1	22.9
Singapore	34.5	33.3	19.9	22.6
Malaysia	43.6	26.9	20.0	21.9
Taiwan, China	25.2	23.3	21.4	21.1
Philippines	22.5	21.2	14.6	15.3

Source: World Development Indicators Database.

investment by deepening industrial capacity should also steadily raise domestic value added. There remains, however, the looming problem of excess capacity in many industries worldwide, which we will address in chapter 5.

Wages and Labor Productivity

All of the successful East Asian economies have relied to varying degrees on export-led growth, and cost has been one of the key determinants of competitiveness. The cost advantage weighed more heavily during the early stages of industrialization, when the countries concerned were mainly producing and exporting standardized light manufactures that were labor-intensive, generally low-cost items. They competed on the basis of price, meeting specifications set by buyers, measuring up to a variety of international production and product standards, and building the capacity to fulfill volume and delivery requirements. For standardized manufactures that are assembled or processed, price can be decisive; where these products are labor intensive, labor costs are a prime consideration. Such costs are a function of wages adjusted for productivity. The former is relatively straightforward. The latter, however, is the product of a number of factors, including the organization and management of

Table 3.6 Average Annual Wages
constant 2000$

Country/economy	1981	1990	2002
China	478	423	—
India	853	1,155	1,363
Japan	31,091	36,012	31,255
Korea, Rep.	5,508	10,054	17,472
Philippines	1,713	2,287	2,510
Singapore	8,503	13,078	22,134
Taiwan, China	5,323	10,222	13,366
Thailand	2,534	2,328	2,542
Vietnam	—	—	802
Pakistan	1,320	2,214	2,139
Bangladesh	654	656	447
Sri Lanka	729	741	756

Source: UNIDO INDSTAT3.
Note: China (1981, 1986); Indonesia (1981, 1990, 2003); Philippines (1981, 1990, 1997); Singapore (1981, 1990, 2003); Taiwan, China (1981, 1990, 1997); Thailand (1982, 1990, 1994); Vietnam (2000); Pakistan (1981, 1990, 1996); Bangladesh (1981, 1990, 1998); Sri Lanka (1981, 1990, 2001). — = not available.

production;[13] the level of education and training; advances in communication; teamwork and noncognitive skills; acculturation, which predisposes the worker to adapt quickly to the discipline of factory work routines; minimum wage and labor laws, which can impose requirements that increase the costs for employers (including the costs of laying off workers); and unionization, which also can put upward pressure on wage rates. Virtually all of the East Asian countries adopted exchange rate policies, especially in the earlier stages of industrialization, to enhance their competitiveness—although the benefits these conferred are not easy to disentangle. Wage rates in constant dollars are the most convenient and readily available metric, but not for all countries or for all years.

In table 3.6, we can see one reason why China established such a commanding lead over other Asian countries. China's low wage rates relative to other Asian countries (with the exception of Bangladesh), reinforced by the trainability and discipline of the workforce, meant that factories operating in China could quote a price for labor-intensive standardized products that other producers in Asia had difficulty matching, much less undercutting. When China moved into the assembly

[13] The role of management and the importance of well-structured organizations and efficient work routines have been stressed by Nick Bloom. See Bloom and Van Reenen (2010).

Table 3.7 Chinese Productivity, Wages, and RULC Compared to Selected Countries, 2002

as a share of comparator country levels (%)

	Relative productivity	Relative wage	RULC
a. UNIDO-based estimates (narrow definition of manufacturing)			
United States	7.9	3.4	42.8
Japan[a]	10.3	4.3	41.6
India	160.3	100.3	62.6
Indonesia	107.9	118.0	109.3
Malaysia[a]	43.6	27.5	62.9
Korea, Rep.[a]	12.2	8.6	70.2
Singapore[a]	17.5	6.3	35.9
b. World Bank/Chinese/BLS–based estimates (broad definition of manufacturing)			
United States	7.7	2.1	27.0
Japan	8.7	2.6	30.3
India	152.1	61.8	40.6
Indonesia	102.4	72.6	70.9
Malaysia[a]	41.4	16.9	40.8
Korea, Rep.[a]	11.6	5.3	45.5
Singapore[a]	16.6	3.9	23.3

Source: Ceglowski and Golub 2007.
a. 2001.

and testing of high-tech electronic products—and more recently into the assembly of autos—the lower wages and high productivity of Chinese workers have translated into a solid competitive advantage.[14] The so-called China price[15] (see Harney 2008) became the competitive benchmark by 2005; together with aggressive marketing, it explained the penetration of Chinese goods into markets throughout Asia and the rest of the world. Table 3.7, on relative wages and relative unit labor costs (RULC),[16] provides additional evidence of China's cost advantage relative to East Asian comparators.

[14]These firms are able to offer customers a wide range of choices at prices their competitors are unable to match. Chinese firms prefer a cost innovation high volume strategy preferring to target the lower tiers of a product market—which is the approach of most disruptive innovators—before attacking the higher tiers (Williamson and Zeng 2008).

[15]China has competed on the basis of cost innovation rather than product innovation.

[16]Relative unit labor costs are the ratio of relative wages to relative labor productivity. RULC values reflect currency fluctuations as well as differences in wages and labor productivity, and provide a compact measure of international competitiveness (Ceglowski and Golub 2007).

With low labor costs being juxtaposed with heavy investment in up-to-date plant and equipment, and manufacturers making every effort to achieve scale economies, it is little wonder that China moved to the forefront. Other producers in South Asia such as Pakistan, Bangladesh, and Sri Lanka also had relatively low wage rates; but Chinese firms enjoyed a lead in manufacturing capacity combined with a large domestic market. They also integrated much faster and more fully with Pacific-spanning global value chains, initially through their overseas Chinese connections and later also through the avenues opened by FDI.

As demand for workers has risen in China's principal industrial regions from 2001 onward, wages have also risen; however, productivity also has generally climbed faster than wages, and this has largely offset the increase in labor costs. Wages have trended upward in other Asian countries as well without a commensurate increase in productivity, so the competitiveness of China's labor-intensive manufactures is not necessarily eroding relative to its competitors in South and Southeast Asia.[17] Only India, Bangladesh, and Vietnam can compete on equal or better terms with respect to efficiency and wage rates in certain labor-intensive industries.

The crisis of 2008–09 could make the competition more fierce by curtailing trade flows, forcing the closure of factories in China and throughout Asia, and easing the demand for factory labor. Slower-growing domestic and international markets will ease the upward pressure on wages.[18] Most likely, though, it will favor the bigger, more capital-intensive firms with deeper pockets and a longer presence in the global value chains.[19] More Chinese and Indian firms fit this profile than

[17]With China's labor productivity growing at close to 9 percent in the aggregate and at higher rates in the manufacturing sector (well in excess of China's competitors), most industries, including relatively labor-intensive ones, are able to absorb the demand for higher wages and make decent profits in the industrialized coastal regions. Looking ahead, labor productivity should continue growing at these rates for at least the next five years and, with aggregate employment in manufacturing virtually flat, it is unlikely that wage pressures could become so acute that Chinese firms would be forced to move out of textiles, garments, footwear, leather goods, and other light manufactures (Kuijs 2010 and "China: New Generation" 2010). Some of the labor-intensive manufacturing in the Pearl River Delta (PRD) and the Changjiang Basin urban regions is beginning to migrate in two directions: shifting to lower-cost urban regions in interior provinces such as Jiangxi and Henan, and moving to neighboring Asian countries with cost structures and longer-term trends in costs more favorable than in the PRD (see, for instance, Cheung and Qian 2009, on China's FDI and exports).

[18]This remains to be seen, as reservation wages in China have been rising; and some of the workers who left Guangdong in 2009 appear reluctant to return, which will lead to localized shortages.

[19]European experience indicates that exporters compose a small subset of firms—on average those that are larger, more skill- and capital-intensive, and more productive (Mayer 2007).

firms from the lower-middle- and low-income Asian countries. Looking ahead, cost competition could be complemented by greater competition in the areas of design, process innovation, and quality, among others. Larger firms with ties to the MNCs could widen their advantage over others, because they enjoy more technology spillovers and are better prepared to introduce process improvements and to ascend product quality ladders. China has the greatest concentration of such firms—particularly in consumer durables, electronics, telecommunications equipment, and electrical equipment—clustered in a few urban regions. India is strong in textiles and apparel, pharmaceuticals, petrochemicals, and engineering products. Other Asian countries have fewer firms in this category, and their cluster densities and technological capabilities are lower.[20]

Competitive Advantage and Its Evolution

What is the likely direction of industrial change in China and India, and how will it affect the industrial geographies of these countries and that of the region? One factor that will influence change is the competitive advantage of various products and how this manifests itself by way of export performance relative to other countries. One frequently employed indicator of product competitiveness is revealed comparative advantage (RCA). This mechanically identifies products whose share in the country's export mix is greater than their share in global exports. The higher the ratio, the greater the RCA. By itself, the RCA casts a narrow beam of light on comparative advantage, but it can usefully complement other indicators that illuminate additional facets of industry and trade. The group of export commodities with the highest RCAs in China has remained fairly constant since the 1980s: raw silk, plaited products, and pyrotechnic articles have always been near the top (see table 3.8). India, on the other hand, has seen a shift in its high-ranking commodities. Textiles and leather products were topmost in the 1980s; since then, castor oil has moved ahead and has consistently been the commodity with the highest RCA (see table 3.9).

The trouble with the RCA measure is that it can identify only products in which a country has a static comparative advantage; it overlooks other important products and products with high growth potential in the future. Therefore, in table 3.10 we list the 10 fastest-growing manufacturing industries in China and India, and in table 3.11 we list the 10 fastest-growing manufactured exports between 2000 and 2007. These tables together provide a better sense of how the composition of industry is changing and point toward commodities with the most promising growth prospects. Data on the largest manufactured exports by value for the two countries (see tables 3.12 and 3.13) offer another perspective,

[20]See, for instance, Yusuf and Nabeshima (2010) on the state and capabilities of industrial clustering in the Bangkok urban region.

Table 3.8 Top 10, Four-Digit-Level Commodities with the Highest RCA in China, 1985 and 2006

Short description	RCA	PRODY	Technology class
1985			
Raw silk (not thrown)	218.83	826	PP
Plaits, plaited products for all uses; straw envelopes for bottles	150.05	1,343	LT1
Goat and kid skins, raw, whether or not split	121.74	2,541	PP
Sheep's or lambs' wool, or of other animal hair, carded or combed	114.74	2,188	PP
Articles of leather for use in machinery or mechanical appliances, etc.	114.01	1,210	LT1
Pile and chenille fabrics, woven, of man-made fibers	109.13	1,191	MT2
Pyrotechnic articles	91.77	3,347	MT2
Yarn of regenerated fibers, put up for retail sale	85.08	2,387	LT1
Fabrics, woven, of silk, noil, or other waste silk	79.03	3,189	LT1
Natural honey	66.20	4,784	RB1
2006			
Raw silk (not thrown)	8.70	5,554	PP
Personal adornments and ornaments; articles of plastic	8.23	9,348	LT2
Pyrotechnic articles	7.92	4,658	MT2
Plaits, plaited products for all uses; straw envelopes for bottles	7.89	1,858	LT1
Umbrellas, canes, and similar articles and parts thereof	7.15	9,697	LT2
Silk yarn and yarn spun from noil or waste; silkworm gut	6.76	4,387	LT1
Traveling rugs, blankets (nonelectric), not knitted or crocheted	6.61	4,709	LT1
Silkworm cocoons and silk waste	6.31	3,145	PP
Complete digital data processing machines	6.26	11,648	HT1
Baby carriages and parts thereof, N.E.S.	5.91	12,150	LT2

Source: Authors' calculations using UN Comtrade data. Technology classification is based on Lall (2000).
Note: PRODY is calculated by taking a weighted average of the GDP per capita of countries exporting that product; Commodities with larger PRODY are thought as more "sophisticated" goods. See the note to table 3.2.

while tables 3.14 and 3.15 show the fastest-growing global exports during 1997–2007 and the most rapidly expanding exports for the Asia region. By comparing these tables, we are able to see the intersection between the high-flying global exports and the fastest-growing and most significant exports of China and India. The production data indicate how manufacturing capacity is evolving in the two countries in relation to the trends in global exports.

From tables 3.10 and 3.13, transport equipment, electrical equipment, chemicals, and machinery emerge as the leading industries that are also contributing the largest exports, although the fastest-growing exports (table 3.11)

Table 3.9 Top 10, Four-Digit-Level Commodities with the Highest RCA in India, 1985 and 2006

Short description	RCA	PRODY	Technology class
1985			
Fabrics woven of jute or other textile bast fibers of heading 2640	57.69	278	LT1
Leather of other hides or skins	51.47	852	LT1
Pepper; pimento	42.90	1,824	PP
Tea	40.55	536	PP
Natural gums, resins, lacs, and balsams	35.73	1,236	PP
Carpets, carpeting, and rugs, knotted	35.33	1,256	LT1
Parts of footwear of any material, except metal and asbestos	35.13	3,866	LT1
Manganese ore and concentrates	31.72	2,455	RB2
Bags, sacks of textile materials, for the packing of goods	26.61	603	LT1
Spices, except pepper and pimento	25.85	1,272	PP
2006			
Castor oil	79.71	2,246	RB1
Coal gas, water gas, and similar gases	41.14	11,166	PP
Fabrics, woven of jute or other textile bast fibers of heading 2640	38.55	842	LT1
Vegetable textile fibers, N.E.S., and waste	31.29	2,518	RB1
Organic chemicals, N.E.S.	30.16	13,085	RB2
Sesame seeds	27.52	443	PP
Goat and kid skins, raw, split or not	25.30	1,190	PP
Building and monumental (dimension) stone, roughly squared, split	22.55	5,518	PP
Carpets, rugs, mats of wool or fine animal hair	22.48	7,651	LT1
Carpets, rugs, mats, of other textile materials, N.E.S.	21.68	8,567	LT1

Source: Authors' calculations using UN Comtrade data. Technology classification is based on Lall (2000).
Note: See the note to table 3.2.

are a heterogeneous mix, including some transport equipment, equipment for power plants,[21] food products, chemicals, and newsprint.

India's industrial mix is shifting mainly toward low- and medium-tech products, including chemicals and plastics, furniture, textiles and footwear, and industrial raw materials. The top exports in 2006 were mostly industrial materials, diamonds, and jewelry, and the fastest-growing ones were food products and industrial materials. From these results, it appears that China as a

[21] China and Korea have acquired the capacity and specialized skills to build nuclear power plants because of their large homegrown programs.

Table 3.10 Fastest-Growing Manufacturing Industries, China and India
percent

China, 1996–2003		India, 1996–2002	
Industry	**Average growth rate**	**Industry**	**Average growth rate**
Transport equipment	505.3	Furniture, except metal	49.0
Iron and steel	496.4	Petroleum refineries	20.0
Industrial chemicals	476.8	Other manufactured products	14.0
Machinery, except electrical	474.0	Footwear, except rubber or plastic	9.2
Food products	464.8	Beverages	8.3
Machinery, electrical	352.8	Plastic products	7.9
Professional and scientific equipment	17.6	Professional and scientific equipment	6.9
Petroleum refineries	16.0	Glass and products	6.2
Furniture, except metal	14.4	Wearing apparel, except footwear	6.0
Non-ferrous metals	14.1	Iron and steel	5.7

Source: UN Comtrade.

Table 3.11 Fastest-Growing Manufactured Exports, China and India

China Exports, 2000–06		India Exports, 2000–07	
Product name	**Average growth rate**	**Product name**	**Average growth rate**
Other rail locomotives; tenders	342.7	Barley, unmilled	399.9
Other wheat and meslin, unmilled	200.3	Gold, nonmonetary	342.1
Nuclear reactors and parts	188.3	Ash & residues, contain metals/	286.2
Lard, other pig fat & poultry, rendered	147.5	Coal gas, water gas, producer gas & similar gases	249.1
Newsprint	126.1	Other fresh, chilled, frozen meat or other edible meat	211.9
Coin (other than gold) not being legal tender	123.0	Petroleum gases and other gaseous hydrocarbons	189.2
Road tractors and semi-trailers	122.9	Zinc and zinc alloys, unwrought	179.1
Copolymers of vinyl chloride and vinyl acetate	115.5	Ground nut (peanut) oil	173.4
Steam & other vapor power units	110.4	Tugs, special purpose vessels, floating structures	167.3
Wire rod of iron or steel	110.1	Mineral tars and products	155.1

Source: UN Comtrade.

Table 3.12 India's Top 10 Exports, 2006

Short description of export	Trade value (in millions of dollars)
Diamonds (nonindustrial), not mounted or set	10,573
Precious jewelry, goldsmiths' or silversmiths' wares	4,948
Iron ore and concentrates, not agglomerated	3,860
Medications (including veterinary medications)	2,934
Undergarments, knitted or crocheted; of cotton, not elastic or rubberized	2,115
Copper and copper alloys, refined or not, unwrought	1,866
Organic chemicals, N.E.S.	1,830
Other sheets and plates, of iron or steel, worked	1,778
Cotton yarn	1,676
Rice, semimilled or wholly milled	1,546

Source: UN Comtrade.

Table 3.13 China's Top 10 Exports, 2006

Short description of export	Trade value (in millions of dollars)
Complete digital data processing machines	43,384
Peripheral units, including control and adapting units	37,594
Television, radio broadcasting; transmitters, etc.	35,776
Parts, N.E.S. of and accessories for machines of headings 7512 and 752	32,786
Parts, N.E.S. of and accessories for apparatus falling in heading 76	31,474
Electronic microcircuits	21,306
Other sound recording and reproducer, N.E.S.; video recorders	21,266
Footwear	21,015
Children's toys, indoor games, etc.	18,011
Outerwear, knitted or crocheted, not elastic nor rubberized; other clothing accessories, nonelastic, knitted or crocheted	14,892

Source: UN Comtrade.

competitive trading nation is advancing much more than India, which has been slow to wean itself from a variety of low-tech primary products and processed commodities.

Further insight into the relative comparative advantage of China and India can be gleaned from measures of dynamic revealed competitiveness (DRC), which indicate how their exports are faring relative to those of competitors in third-country markets (Gallagher, Moreno-Brid, and Porzecanski 2008). DRC is based

Table 3.14 Fastest-Growing Global Manufactured Exports, 1997–2007

Product name	Average growth rate (%)
Optical instruments and apparatus	77.0
Platinum and other metals of the platinum group	74.0
Glycosides; glands or other organs	50.7
Other nitrogen-function compounds	49.0
Other articles of precious metal	48.4
Nickel and nickel alloys, unwrought	46.4
Nickel and nickel alloys, worked	40.3
Cyclic hydrocarbons	40.0
Orthopedic appliances	39.2
Medicaments (including veterinary	39.2

Source: UN Comtrade.

Table 3.15 Fastest-Growing Manufactured Exports in Asia, 1997–2007

Product name	Average growth rate (%)
Dishwashing machines, household	1,703.0
Other articles of precious metal	198.7
Radiotelegraphic and radiotelephonic	147.8
Cellulose acetates	135.5
Silver, unwrought, unworked, or semimanufactured	135.1
Aircraft	126.1
Optical instruments and apparatus	122.1
Reaction engines	111.4
Nickel and nickel alloys, unwrought	109.5
Drawn or blown glass, unworked	104.6

Source: UN Comtrade.

on the changing market (import) shares of a commodity *i* between two time periods. Using this measure, we can examine the changing import share of Chinese and Indian products in three important markets: the United States, Japan, and the EU15. These represent the major importing markets globally. A positive DRC means that the share of Chinese (or Indian) products has increased in the importing country/region. Furthermore, by comparing the DRC measures for two countries, it is possible to determine which products are in direct competition. For instance, if the DRC is negative for a commodity exported by India but is positive for China, then the commodity is said to be in "direct threat." However, if the DRC is positive for both India and China, then it is in "partial threat."

Table 3.16 DRCP by Technology Level in U.S. Market: China and India

	China			India		
	1991–96	1997–2000	2001–07	1991–96	1997–2000	2001–07
HT1	3.54	3.04	23.75	0.08	–0.08	0.25
HT2	2.29	0.16	0.55	0.04	0.04	0.70
LT1	4.80	–1.11	18.31	0.70	0.17	1.11
LT2	9.46	4.58	12.97	0.31	0.18	0.95
MT1	0.23	0.32	1.76	0.04	0.01	0.13
MT2	0.32	2.46	6.63	0.31	0.58	0.97
MT3	3.46	2.97	8.28	0.07	0.01	0.40
PP	–0.36	–0.21	0.26	0.18	–0.05	–0.30
RB1	0.83	1.04	6.66	0.11	0.02	0.09
RB2	1.48	0.41	0.25	0.12	0.23	–0.46

Source: Authors' calculations using UN Comtrade data. Technology classification is based on Lall (2000).
Note: See the note to table 3.2. DRCP = dynamic revealed competitiveness position.

Looking at the changing market share of Chinese and Indian products in the United States during three different time periods reveals that China has increased its U.S. market share in the majority of technology classes. China enlarged its market share in the United States in low-technology products by 18 and 13 percentage points during the 2001 and 2007 period, respectively, and in electronics and electrical products by 24 percentage points (see table 3.16). India also increased its market share in several technology classes; but compared to China, the increase is much smaller. The largest increase was in textiles, garments, and footwear.

A similar trend is apparent in the Japanese market—China's market share in Japan has risen consistently for most technology classes. The only product groups in which China is losing market share are primary products and resource-based products (see table 3.17). In low-technology products, China increased its market share by 47 and 35 percentage points between 1990 and 2007, while India's market share in Japan barely grew.

The European Union (EU) market is where the competitive pressure from exporters in China is rather muted. Even though China has raised its market share in a broad spectrum of products, the magnitudes of the increase are smaller than those in the Japanese and U.S. markets. For instance, China's market share in electronics and electrical products increased by 13 percentage points during 2001–07—small compared to its 24 and 20 percentage point increases in the U.S. and Japanese markets, respectively (see table 3.18). India also increased its market share in most products in the EU market, although by smaller magnitudes than for China. A glance at the changes in market shares of Chinese and Indian exports suggests that for Chinese firms, U.S. and Japanese markets have been the major

Table 3.17 DRCP by Technology Level in Japan's Market: China and India

	China			India		
	1990–96	1997–2000	2001–07	1990–96	1997–2000	2001–07
HT1	6.32	1.79	19.92	0.03	0.03	0.07
HT2	2.64	1.35	3.93	0.00	0.00	–0.01
LT1	28.92	11.76	6.42	–0.04	–0.08	–0.12
LT2	12.87	5.52	16.49	0.00	–0.08	0.00
MT1	1.49	2.38	8.13	0.01	0.00	0.23
MT2	1.99	–0.48	8.84	0.46	–0.23	0.68
MT3	9.35	4.88	15.61	0.04	0.02	0.11
PP	0.21	–0.60	–2.39	0.24	–0.18	–0.25
RB1	6.07	3.24	5.26	0.04	0.06	0.08
RB2	4.95	1.03	–0.34	–0.74	–0.30	–0.82

Source: Authors' calculations using UN Comtrade data. Technology classification is based on Lall (2000).
Note: See the note to table 3.2. DRCP = dynamic revealed competitiveness position.

Table 3.18 DRCP by Technology Level in EU15 Countries' Markets: China and India

	China			India		
	1990–96	1997–2000	2001–07	1990–96	1997–2000	2001–07
HT1	1.41	2.22	12.76	0.04	0.00	0.14
HT2	0.54	0.04	–0.04	0.09	–0.06	0.23
LT1	1.91	3.05	11.40	0.74	0.18	0.81
LT2	1.74	2.66	5.69	0.21	0.11	0.42
MT1	0.00	0.10	0.47	0.09	–0.02	0.16
MT2	0.16	0.55	1.56	0.14	0.03	0.40
MT3	1.02	1.44	4.15	0.16	0.01	0.19
PP	0.11	0.05	0.07	0.21	–0.09	–0.03
RB1	–0.04	0.30	1.30	0.17	0.03	0.12
RB2	0.73	–0.18	0.69	0.77	–0.11	0.36

Source: Authors' calculations using UN Comtrade data. Technology classification is based on Lall (2000).
Note: See the note to table 3.2. DRCP = dynamic revealed competitiveness position.

targets; they have had somewhat less success in penetrating the EU market.[22] India, by comparison, has made greater headway in the U.S. and EU markets than in the Japanese market. These differences partly reflect differences in FDI flows to India and China and in their trade orientation. China's exports have been facilitated

[22]The EU is China's largest export market but should the Euro remain weak, market penetration by Chinese exports could become even tougher.

by large inflows of FDI from the United States and Japan. Hence, exports from China are geared toward the U.S. and Japanese markets through production networks managed by lead firms from these countries and by contract manufacturers. So far, India has not attracted as much FDI in manufacturing from these two sources, and this is reflected in the smaller increase in its market shares in the United States and Japan.

Apart from competing in third-country markets, China and India are also actively trading with each other. In fact, China is now India's biggest trading partner. Chinese producers have penetrated Indian markets in a broad range of products, primary products being the exception. China has commanding shares in electronics and electrical products, textiles, garments, and footwear in the Indian market (see table 3.19). In contrast, India has not been able to expand its market share in China, except in resource-based products (see table 3.20).

From India's standpoint, competitive pressures from China are greatest in the EU market, where 95 percent of its products are either directly or partially threatened by Chinese imports. The Japanese market is where Indian firms are not facing much competitive pressure from China (see table 3.21) because of differences in the composition of exports.

Among other Asian countries, Bangladesh, an exporter of textiles and garments, is feeling the competitive pressure from China. However, compared to the situation in 1990, the degree of competition seems to have abated. Nonetheless, more than half of all commodities exported by Bangladesh are threatened by Chinese exports in the EU market (see table 3.22). The distribution between

Table 3.19 DRCP of China in India's Market, by Technology Level

	China		
	1990–96	1997–2000	2001–07
HT1	3.28	2.22	29.46
HT2	5.05	1.00	3.18
LT1	9.12	1.09	29.00
LT2	1.47	0.00	6.26
MT1	—	1.56	13.25
MT2	2.32	–0.35	17.88
MT3	1.39	1.33	11.56
PP	1.06	0.09	–1.45
RB1	0.29	0.25	5.22
RB2	2.22	0.57	4.54

Source: Authors' calculations using UN Comtrade data. Technology classification is based on Lall (2000).
Note: See the note to table 3.2. DRCP = dynamic revealed competitiveness position; — = not available.

Table 3.20 DRCP of India in China's Market, by Technology Level

	India		
	1992–96	1997–2000	2001–07
HT1	0.02	0.03	0.03
HT2	–0.03	0.09	–0.25
LT1	0.79	0.32	0.06
LT2	0.56	0.01	0.03
MT1	0.01	–0.02	0.03
MT2	0.08	0.38	0.25
MT3	0.01	0.05	0.18
PP	1.06	–0.93	0.66
RB1	0.27	0.07	0.17
RB2	0.41	–0.93	4.55

Source: Authors' calculations using UN Comtrade data. Technology classification is based on Lall (2000).
Note: See the note to table 3.2. DRCP = dynamic revealed competitiveness position.

Table 3.21 The Degree of Competition between Indian and Chinese Exports
percent

	Country/region	1990–91	2000–01	2006–07
Direct threat	EU15	23.1	38.2	44.2
Partial threat	EU15	20.1	33.9	50.7
Total	EU15	43.2	72.1	94.9
Direct threat	Japan	9.0	15.9	18.2
Partial threat	Japan	8.2	12.9	14.0
Total	Japan	17.2	28.8	32.2
Direct threat	U.S.	19.7*	28.7	35.8
Partial threat	U.S.	19.8*	26.7	32.7
Total	U.S.	39.5*	55.4	68.5

Source: Authors' calculation. Data are from the UN Comtrade database.
Note: * = 1991–92.

direct and partial threat is almost even. In the U.S. market, the proportion of goods threatened by Chinese products is lower (23 percent); and it is lower still in the Japanese market, where the competitive pressure from China is least, again because of the low-tech mix of products exported by Bangladesh. The threat posed by India's exports to Bangladeshi exports mirrors that of China. Bangladeshi producers are under the greatest threat in the EU market, followed

Table 3.22 The Degree of Competition between Bangladeshi and Chinese Exports
percent

	Country/region	1990–91	2000–01	2006–07
Direct threat	EU15	23.0	29.2	27.4
Partial threat	EU15	37.0	26.6	27.9
Total	EU15	60.0	55.8	55.3
Direct threat	Japan	9.3	10.2	4.3
Partial threat	Japan	5.8	9.2	3.9
Total	Japan	15.1	19.4	8.2
Direct threat	U.S.	18.1*	17.3	13.1
Partial threat	U.S.	25.8*	10.6	9.8
Total	U.S.	43.9*	27.9	22.9

Source: Authors' calculation. Data are from the UN Comtrade database.
Note: * = 1991–92.

by the U.S. market; whereas in Japan, Bangladesh is not facing much challenge from Indian exports (see table 3.23). It appears, however, that the competitive pressure on Bangladeshi exports from Chinese and Indian producers are generally decreasing over time. This is suggestive of product upgrading by both China and India and stagnation in the product quality and product mix of the low-income Asian countries and a widening wage gap between Bangladesh and China.[23]

Among the middle-income countries in Southeast Asia, Malaysia is a typical case. Its export structure is dominated by electronics and resource-based products owing to its rich natural resource endowment. Unlike Bangladesh, Malaysia (like other Southeast Asian economies) faces much stiffer competition from China in all three markets. In the EU market, 70 percent of Malaysia's exports are threatened, and in the U.S. and Japanese markets, 43 percent and 33 percent, respectively (table 3.24). The competition Malaysian products confront in the European Union is comparable to what Bangladeshi exporters are encountering, but in the U.S. and Japanese markets, Malaysian producers are under intense pressure, mainly from Chinese producers. Relative to the pressure exerted by Chinese manufacturers, India's exports are less of a threat to Malaysia's exports (see table 3.25). Unlike Bangladesh, Malaysia is subject to intensifying pressures from China and India in the EU and U.S. markets, but competition is diminishing in the Japanese market. This decrease can be explained with reference to

[23] As in China, Bangladeshi workers are also demanding higher minimum wages ("China: New Generation" 2010).

Table 3.23 The Degree of Competition between Bangladeshi and Indian Exports
percent

	Country/region	1990–91	2000–01	2006–07
Direct threat (%)	EU15	13.0	26.4	22.0
Partial threat (%)	EU15	22.2	21.9	21.3
Total (%)	EU15	35.2	48.3	43.3
Direct threat (%)	Japan	8.2	7.3	3.4
Partial threat (%)	Japan	7.1	5.3	3.3
Total (%)	Japan	15.3	12.6	6.7
Direct threat (%)	U.S.	20.7*	14.9	7.6
Partial threat (%)	U.S.	16.1*	7.5	6.5
Total (%)	U.S.	36.8*	22.4	14.1

Source: Authors' calculation. Data are from the UN Comtrade database.
Note: * = 1991–92.

Table 3.24 The Degree of Competition between Malaysian and Chinese Exports
percent

	Country/region	1990–91	2000–01	2006–07
Direct threat	EU15	10.0	28.6	35.7
Partial threat	EU15	12.9	22.2	33.7
Total	EU15	22.9	50.8	69.4
Direct threat	Japan	8.3	22.9	19.3
Partial threat	Japan	10.0	12.7	14.1
Total	Japan	18.3	35.6	33.4
Direct threat	U.S.	12.7*	20.0	22.4
Partial threat	U.S.	11.8*	15.5	20.2
Total	U.S.	24.5*	35.5	42.6

Source: Authors' calculation. Data are from the UN Comtrade database.
Note: * = 1991–92.

Malaysia's place in the production network spanning East Asia. Malaysia is transitioning from being a final assembler to becoming a supplier of intermediate products[24] within East Asia, to networks associated with Japanese multinational corporations (MNCs).

[24]Rising costs of production in Malaysia are responsible for this shift away from assembly (see Yusuf and Nabeshima 2009).

Table 3.25 The Degree of Competition between Malaysian and Indian Exports
percent

	Country/region	1990–91	2000–01	2006–07
Direct threat	EU15	7.5	23.6	29.0
Partial threat	EU15	7.8	16.1	20.3
Total	EU15	15.3	39.7	49.3
Direct threat	Japan	6.5	15.8	15.7
Partial threat	Japan	9.2	10.4	9.8
Total	Japan	15.7	26.2	25.5
Direct threat	U.S.	10.3*	16.4	15.4
Partial threat	U.S.	8.0*	8.5	11.6
Total	U.S.	18.3*	24.9	27.0

Source: Authors' calculation. Data are from the UN Comtrade database.
Note: * = 1991–92.

Among the three country income groupings (low, middle, and high), higher-income countries are exposed to the most competitive pressure from China and India. Korea, for instance, faces competitive pressure from China in 93 percent of the products that it exports to the EU market. Corresponding figures for the Japanese and U.S. markets are 69 percent and 78 percent, respectively (see table 3.26). Even India, which is by no means in the same league as China, is starting to exert pressure on Korea in all three major markets; the E.U. market is the one most contested, followed by the U.S. and Japanese markets (see table 3.27). And the evidence suggests that Korean manufacturers will have more to worry about from their competitors in China and India in the future.

Competition faced by exporters from high-income East Asian countries is intensifying in the EU market and, to a lesser extent, in the U.S. market. Many MNCs from Western and East Asian economies now produce and export similar products from China—as well as from other Southeast Asian economies—to the EU15. For example, MNCs in Malaysia and China are both exporting to the EU15 market. Similarly, the competition in the United States is most likely competition among MNCs located in East Asia.[25]

Close inspection of the data reveals that Korea is facing direct competition from India mainly in textiles, garments, and footwear (LT1); other low-technology

[25]In this, we include indigenous MNCs located in their own country, such as Samsung in Korea. For instance, the degree of competition between Korea and China can be high in television sets in the EU or U.S. market because of the exports by Samsung in Korea and Sony in China, or when Samsung in Korea exports higher-quality products and Samsung in China exports similar lower-quality products to the same market.

Table 3.26 The Degree of Competition between Korean and Chinese Exports
percent

	Country/region	1990–91	2000–01	2006–07
Direct threat	EU15	29.2	43.0	51.0
Partial threat	EU15	21.6	26.8	42.4
Total	EU15	50.8	69.8	93.4
Direct threat	Japan	39.8	46.4	46.7
Partial threat	Japan	20.0	23.3	22.4
Total	Japan	59.8	69.7	69.1
Direct threat	U.S.	39.2*	38.4	47.3
Partial threat	U.S.	18.5*	27.3	30.9
Total	U.S.	57.7*	65.7	78.2

Source: Authors' calculation. Data are from the UN Comtrade database.
Note: * = 1991–92.

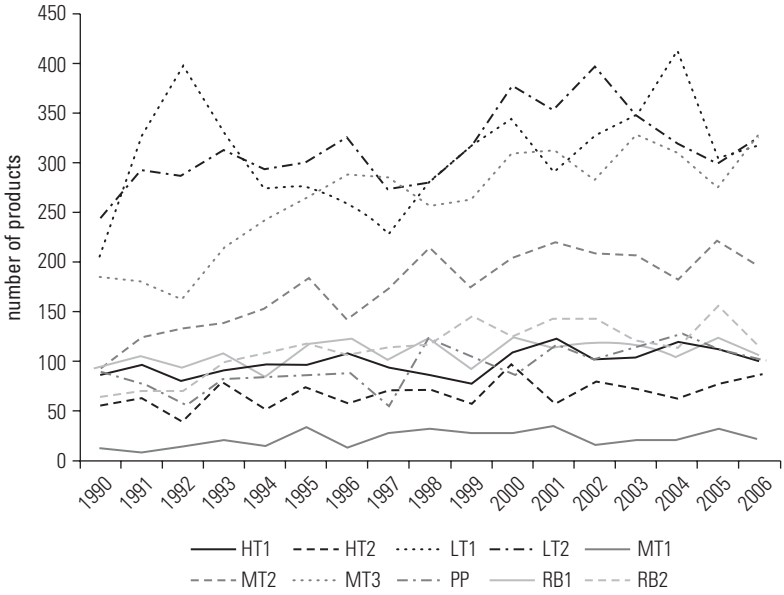
Table 3.27 The Degree of Competition between Korean and Indian Exports
percent

	Country/region	1990–91	2000–01	2006–07
Direct threat	EU15	21.9	37.8	40.7
Partial threat	EU15	16.1	18.6	26.2
Total	EU15	38.0	56.4	66.9
Direct threat	Japan	30.4	34.9	36.8
Partial threat	Japan	21.9	22.8	20.7
Total	Japan	52.3	57.7	57.5
Direct threat	U.S.	31.2*	32.2	36.4
Partial threat	U.S.	15.7*	17.7	17.7
Total	U.S.	46.9*	49.9	54.1

Source: Authors' calculation. Data are from the UN Comtrade database.
Note: * = 1991–92.

products (LT2); process industry (MT2); and engineering products (MT3) (see figure 3.11). Similarly, Korea is facing partial threat from India in primary products (PP) and resource-based products (RB2) in addition to the goods facing direct threat (see figure 3.12). To a certain degree, facing more competition from India in the light manufactures is understandable, given the fact that Korea's comparative advantage is shifting away from them. What could be more troublesome in the future is the competition in the medium-tech products. While Korea is not threatened by India in the automotive sector (MT1), it is starting to feel the pressure in other medium-tech products, reflecting the emerging comparative advantage of India in these areas.

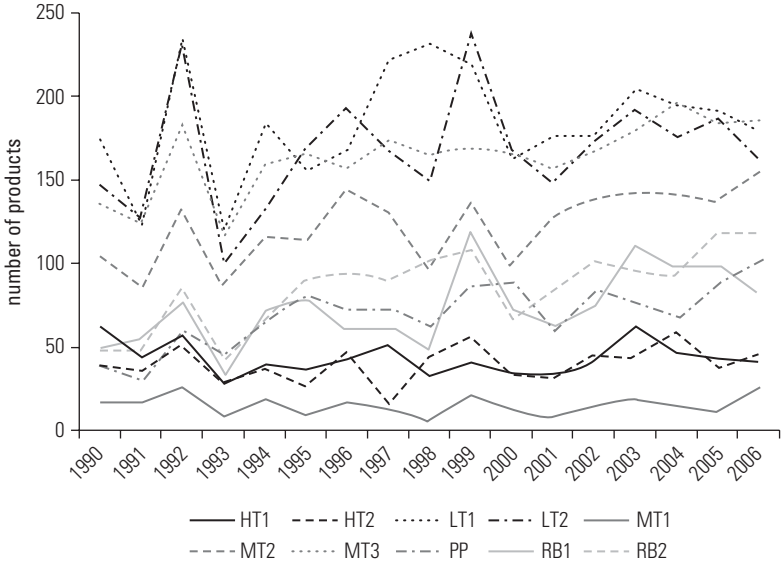
Figure 3.11 Trends in Direct Threat Faced by the Republic of Korea in EU15 Market from India



Source: Authors' calculation. Technology classification is based on Lall (2000).
Note: The vertical axis measures the number of products at the 6-digit level. See the note to table 3.2.

The preceding analysis suggests that China and India will remain competitive producers of labor-intensive light manufactures, as well as assembled or processed medium- and high-tech manufactures for which market share depends upon price competitiveness (although other factors also count). For the next decade and beyond, both countries will benefit from a relatively elastic supply of rural labor for labor-intensive manufacturing. It is worth noting that because of ongoing capital- and skill-based technological change, manufacturing is absorbing small numbers of workers, and new technologies are skill biased. Hence, it is unlikely that the anticipated growth in manufacturing activities in China will absorb more than a small fraction of the workforce, and—except in one or two urban regions such as the Pearl River Delta—labor demand from the manufacturing sector will not be driving the wages of semiskilled or unskilled workers. In India also, employment in manufacturing will most likely peak at between 25 percent and 30 percent of GDP and involve a smaller fraction of the labor force, assuming (somewhat optimistically) that industry is the leading sector with double-digit growth rates over the next two decades. The scope for productivity gains in all manufacturing activities (which are between 40 and 60 percent of U.S. levels),

Figure 3.12 Trends in Partial Threat Faced by the Republic of Korea in EU15 Market from India



Source: Authors' calculation. Technology classification is based on Lall (2000).
Note: The vertical axis measures the number of products at the 6-digit level. See the note to table 3.2.

including labor-intensive ones, means that both countries would be able to accommodate rising wages without compromising their competitiveness relative to other Asian countries (barring unforeseen changes in exchange rates).[26]

Comparative advantage in cost-sensitive manufacturing will be complemented in India and China by continuous diversification into technology, skill- and design-intensive products, and product differentiation in a variety of product groups. Peter Schott has shown that China's exports already span the entire spectrum of products traded by the OECD countries (Schott 2006). The only difference is that, on average, the unit value of China's exports is less because many of the products are of lower quality (see Edwards and Lawrence 2010), although this finding has been questioned (see Feenstra and Wei 2010; Wang and Wei 2010). Overall, China will lead; but India also is poised to become an active competitor in the automotive, engineering, and resource-based industries.

[26]An appreciation of China's real effective exchange rate would most directly affect the fortunes of its labor-intensive exports—in particular, clothing, footwear, and furniture, all of which have been stimulated in recent years by the depreciation of the renminbi with

(*continued on next page*)

Prospects for Export Diversification

Export diversification to enhance revenue growth and profitability is an important objective for developing countries. A number of studies show that countries with a narrow range of exports typically experience slower overall growth (Hesse 2009; Lederman and Maloney 2009).[27] Methodologies developed by Hausmann and Klinger (2006) and Hausmann, Hwang, and Rodrik (2007) enable us to map a country's potential for progressing up the value chain and identify the scope for product diversification. By comparing the product maps for China and India with those of other countries, it is possible to take the analysis of evolving competitive advantage of Asian countries vis-à-vis China and India a step further. Their methodology assumes that each commodity produced gives rise to specific opportunities for future diversification based on its technological complexity and its input-output relationships. That is, some products offer easier (and multiple) diversification paths to related products compared with others. In general, primary and resource-based products offer fewer opportunities for diversification. Manufactured goods—such as electronics and auto parts—generate skills, technological competencies, and assets that are similar to those required for the production of other manufacturing commodities; hence, they are classified as high-value products. Thus, the product space–mapping technique notionally identifies the potential diversification opportunities arising from each of a country's exports.[28] The

(*continued from previous page*)

respect to the euro. As the European Union is a major exporter of products in each of these categories, China's enhanced competitive position has tended to crowd out European exports. An appreciation of the renminbi, while arguably constraining low-value, labor-intensive exports, would most likely induce Chinese producers to emphasize high-value items. Furthermore, the implications even for the low-end exports of light manufactures by China will depend upon how the exchange rates of its Asian competitors adjust relative to the renminbi. That China will lose its advantage in certain types of apparel and footwear is by no means a given (Thorbecke and Zhang 2009).

[27]Lederman and Maloney (2009) find that it is not the dependence on resource-based exports (such as oil) that is detrimental per se, but the concentration of such commodities in the export basket.

[28]Brenton, Pierola, and von Uexkull (2009) find that while developing countries search for and discover new exports and new overseas markets, they struggle to sustain exports, and many of them exit these new export markets quickly. They offer a number of reasons as to why this is the case, such as the higher-than-expected fixed costs of exporting, high search costs of potential buyers (or suppliers from the importing countries' point of view), and erratic business climate and policy inconsistency. Their analysis suggests that exporters starting out with large export volumes have a higher probability of surviving. This suggests that larger firms have better prospects when it comes to exporting than small firms. In addition, an existing trading relationship between the exporting and importing

(*continued on next page*)

measure of each commodity's density gives the probability that a country will export two separate goods, conditional on its already exporting at least one of the goods. The more a country specializes in high-value goods (with the highest densities), the greater is its potential for diversification into other high-value products. The *x*-axis is the inverse of the density (that is, a value closer to the origin indicates higher density); the *y*-axis measures the difference between PRODY and EXPY. PRODY is a measure calculated by taking a weighted average of the GDP per capita of countries exporting that product; the underlying assumption is that products exported mainly by high-income countries are of higher quality and more sophisticated technology. EXPY is calculated as a weighted sum of PRODY and signifies the sophistication of a country's export basket. Table 3.28 lists the changes in EXPY for selected economies in East and South Asia. It shows that middle-income countries in East Asia and China doubled their EXPY over a period of 20 years, and the average level of sophistication of their exports is approaching that of high-income countries in East Asia. Relative to East Asia, the average sophistication of exports from countries in South Asia is lower, although Bangladesh was able to increase the sophistication of its exports faster than many others starting from the lowest base. Pakistan, by comparison, has upgraded the least. The difference between PRODY and EXPY signifies whether a commodity is an "upgrade"; that is, a positive difference means "upgrading" in the sense of exporting more sophisticated commodities relative to the overall export basket.

Figures 3.13 and 3.14 show the product spaces for China in 1987 and 2006, respectively. In 20 years, China has significantly expanded its production capabilities and export competitiveness and, compared to the product mix in 1987, there are more commodities located closer to the origin (signifying ease of diversifying), with approximately half of all products classified as "upgrades."

Similarly, India's product mix has shifted closer to the origin, and the distribution of products tightened between 1987 and 2006, suggesting that India also is strengthening its manufacturing capabilities (see figures 3.15 and 3.16).

Upon closer inspection of the products in China's export basket with the highest densities that are upgrades, the degree of China's rapid industrial progress becomes clear. In 1987, the top 10 commodities with the highest densities (implying more sophistication) were mainly low-tech items offering minimal opportunities for diversification (see table 3.29). By 2006, the composition of the high-density products had altered radically. China was now presented with

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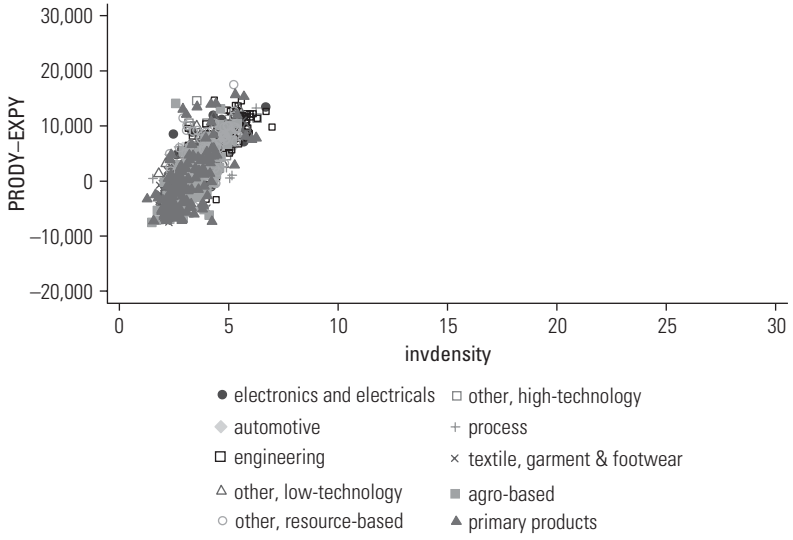
(*continued from previous page*)
countries is conducive to sustaining exporting activities. However, it is still the case that developing countries export to fewer countries compared to developed countries, and that much of export growth comes from intensive margin (increase in exports to existing markets) (Brenton and Newfarmer 2009).

Table 3.28 EXPY by Economy

Exporter	1980	1985	1990	1995	2000	2006
Bangladesh	1,483	2,772	3,347	4,097	3,773	5,927
China	—	5,009	8,231	8,152	9,296	11,743
Indonesia	4,897	4,721	6,481	6,242	8,543	8,291
India	5,783	6,337	7,028	6,335	6,694	9,329
Japan	14,019	14,689	14,449	12,842	13,484	14,532
Korea	9,803	10,180	10,258	10,557	11,681	13,719
Malaysia	4,433	5,137	7,912	9,577	10,875	11,897
Pakistan	—	4,181	4,084	3,944	4,480	5,323
Philippines	5,242	5,093	6,317	7,457	11,297	11,813
Singapore	8,311	9,113	11,248	12,449	12,912	15,079
Thailand	4,954	5,673	7,660	8,559	9,666	11,099
Taiwan, China	—	—	10,874	11,107	12,364	14,481
Vietnam	—	—	—	—	5,806	7,190
Sri Lanka[a]	2,888	3,423	4,261	4,561	4,749	5,148

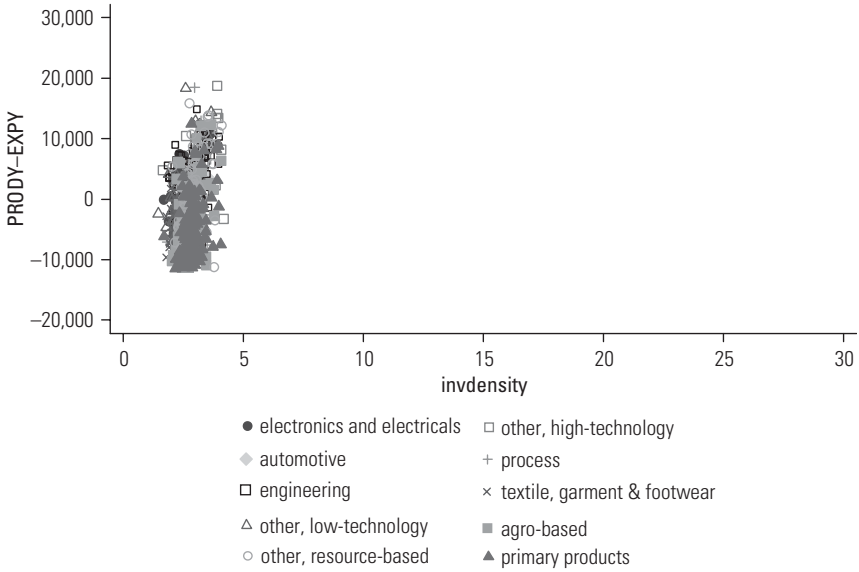
Source: Authors' calculations
a. Data are for 1980, 1985, 1990, 1994, 1999, and 2005.
Note: — = not available

Figure 3.13 Product Space of China, 1987



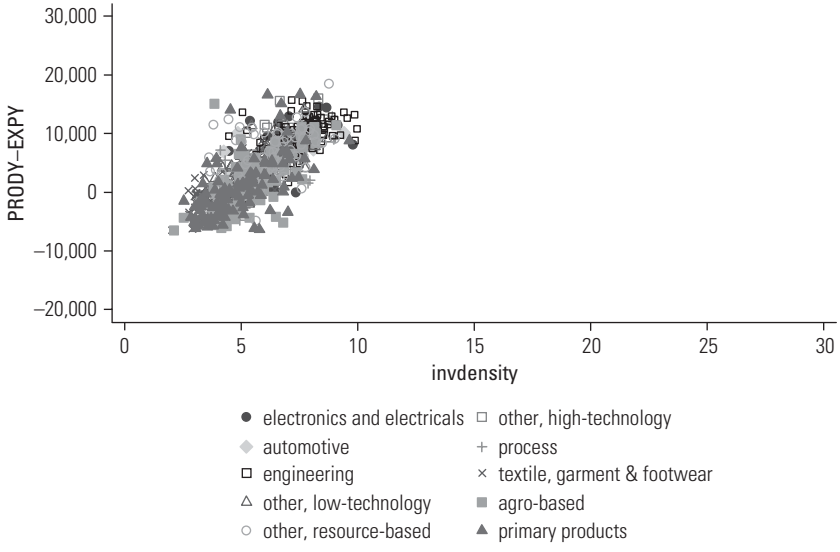
Source: Authors' calculations based on UN Comtrade data.

Figure 3.14 Product Space of China, 2006



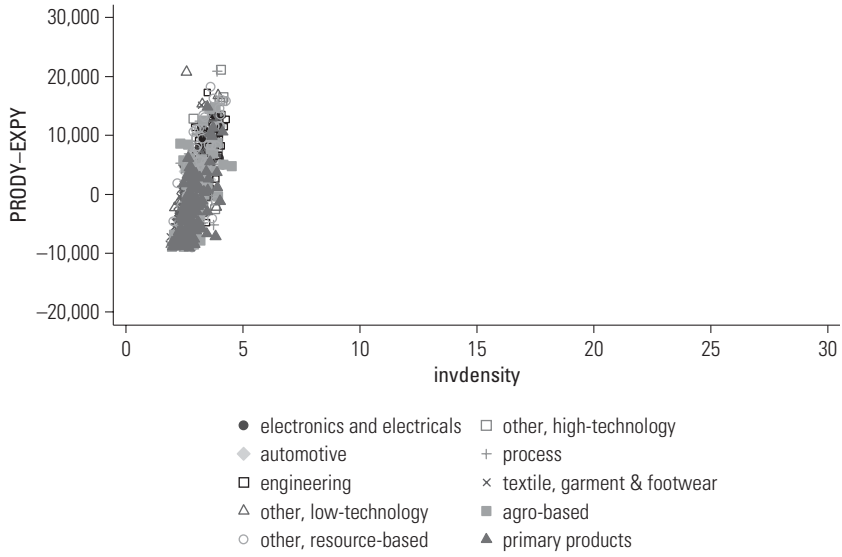
Source: Authors' calculations based on UN Comtrade data.

Figure 3.15 Product Space of India, 1987



Source: Authors' calculations based on UN Comtrade data.

Figure 3.16 Product Space of India, 2006



Source: Authors' calculations based on UN Comtrade data.

Table 3.29 Top 10 "Upscale" Commodities with the Highest Density in China, 1987

Short description	Density	Technology class	PRODY–EXPY
Pyrotechnic articles	0.655046	MT2	451
Manufactured goods, N.E.S.	0.558615	LT2	1,325
Children's toys, indoor games, etc.	0.474168	LT2	3,163
Traveling rugs, blankets (nonelectric), not knitted or crocheted	0.461357	LT1	1,934
Umbrellas, canes, and similar articles, and parts thereof	0.458874	LT2	891
Base metal domestic articles, N.E.S., and parts thereof, N.E.S.	0.455813	LT2	981
Other materials of animal origin, N.E.S.	0.451113	PP	447
Fabrics, woven, of sheep's or lambs' wool or of fine hair, N.E.S.	0.449691	LT1	4,309
Soybeans	0.439272	PP	534
Hydrocarbon derivatives, nonhalogenated	0.436489	RB2	4,983

Source: Authors' calculations based on UN Comtrade data. Technology classification is based on Lall (2000).
Note: See the note to table 3.2.

opportunities for upgrading into far more technologically advanced products with greater market prospects, and a higher potential for increased sophistication (see table 3.30). Thus, China's capacity to compete with higher-income countries was growing.

Table 3.30 Top 10 "Upscale" Commodities with the Highest Density in China, 2006

Short description	Density	Technology class	PRODY–EXPY
Optical instruments and apparatus	0.607906	HT2	4,818
Portable radio receivers	0.542989	MT3	5,612
Children's toys, indoor games, etc.	0.528838	LT2	4,149
Other radio receivers	0.525168	MT3	3,470
Printed circuits, and parts thereof, N.E.S.	0.523646	MT3	3,574
Knitted, not elastic or rubberized, of fibers other than synthetic	0.510308	LT1	1,775
Pins, needles, etc. of iron or steel; metal fittings for clothing	0.509124	LT2	219
Peripheral units, including control and adapting units	0.506912	HT1	506
Fabrics, woven, of continuous synthetic textile materials	0.497133	MT2	2,840
Pearls, not mounted, set, or strung	0.49101	RB2	5,397

Source: Authors' calculations based on UN Comtrade data. Technology classification is based on Lall (2000).
Note: See the note to table 3.2.

The baseline for India was lower; however, it too is on an ascending trend. In 1987, India could easily upgrade only into low-tech products, mainly garments (see table 3.31). By 2006, the composition of products within reach included more medium-tech, textile, engineering, and resource-based items (see table 3.32), enabling India to eventually compete across a broader range of products.

Role of FDI and Processing Trade

An important facet of China's industrialization and its trade relates to the contribution of FDI in building its processing and assembly activities. These are mostly located in special industrial zones or technology parks that provide access to serviced land and a variety of incentives. Table 3.33 shows how the stock of FDI in China between 1990 and 2008 rose from $20 billion to $378 billion. Figure 3.17 compares China with other East Asian countries. Although the increase is breathtaking, a careful analysis suggests that China's share of FDI is not unusually large, given its market size and the low base from which it started. Relatively little FDI was diverted to China from elsewhere in East Asia (Eichengreen and Tong 2005).[29]

[29]Branstetter and Foley (2007) find that FDI in China by American MNCs was not displacing investment elsewhere; instead firms increasing investment in China were also raising employment in other places.

Table 3.31 Top 10 "Upscale" Commodities with the Highest Density in India, 1987

Short description	Density	Technology class	PRODY–EXPY
Undergarments of textile fabrics, not knitted or crocheted; men's, boys' undergarments other than shirts	0.36857	LT1	221
Kelem, Schumacks, and Karamanie rugs and the like	0.334449	LT1	2,450
Outerwear, knitted or crocheted, not elastic or rubberized; jerseys, pullovers, slipovers, cardigans, etc.	0.33149	LT1	597
Other materials of animal origin, N.E.S.	0.299071	PP	1,443
Traveling rugs, blankets (nonelectric), not knitted or crocheted	0.297307	LT1	2,930
Base metal domestic articles, N.E.S., and parts thereof, N.E.S.	0.291553	LT2	1,977
Sheep- and lambskin leather	0.287327	LT1	729
Other natural abrasives	0.283956	PP	4,902
Women's, girls,' infants outerwear, textile, not knitted or crocheted; coats and jackets	0.28179	LT1	197
Hydrocarbon derivatives, nonhalogenated	0.276444	RB2	5,979

Source: Authors' calculations based on UN Comtrade data. Technology classification is based on Lall (2000).
Note: See the note to table 3.2.

Table 3.32 Top 10 "Upscale" Commodities with the Highest Density in India, 2006

Short description	Density	Technology class	PRODY–EXPY
Iron ore and concentrates, not agglomerated	0.456043	RB2	1,843
Fabrics, woven, of continuous synthetic textile materials	0.433029	MT2	5,254
Crustaceans and mollusks, prepared or not prepared, N.E.S.	0.430432	RB1	8,600
Outerwear, knitted or crocheted, not elastic or rubberized; jerseys, pullovers, slipovers, cardigans, etc.	0.42895	LT1	861
Yarn, 85% synthetic fibers, not for retail; monofil, strip, etc.	0.412938	LT1	835
Discontinuous synthetic fibers, not carded or combed	0.410214	MT2	1,108
Tires, pneumatic, new, for motorcycles and bicycles	0.409602	RB1	5,753
Coal gas, water gas, and similar gases	0.409145	PP	1,837
Machinery for the grain milling industry; working cereals, parts	0.409017	MT3	5,143
Tulle, lace, embroidery, ribbons, trimmings, and other small wares	0.407986	LT1	702

Source: Authors' calculations based on UN Comtrade data. Technology classification is based on Lall (2000).
Note: See the note to table 3.2.

Table 3.33 Inward FDI

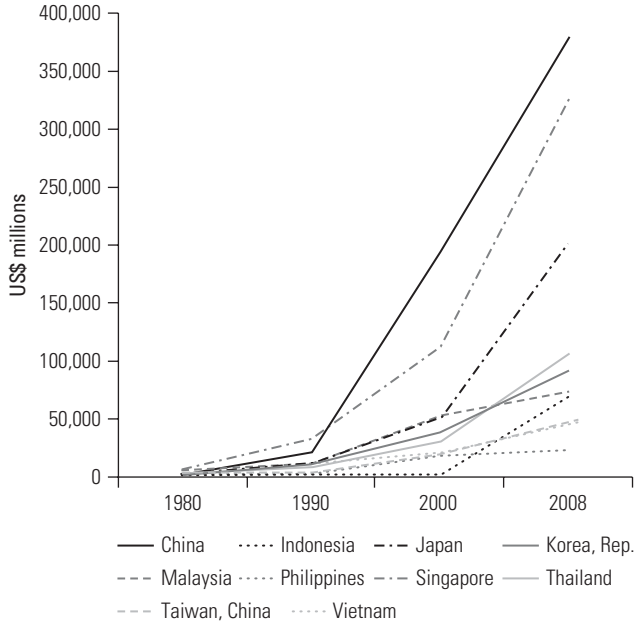
Country/economy	1980	1990	2000	2008
Hong Kong, China	177,755.3	201,652.9	455,469.0	835,764.0
China	1,074.0	20,690.6	193,348.0	378,083.0
Singapore	5,350.7	30,468.0	110,570.3	326,142.4
Japan	3,270.0	9,850.0	50,322.0	203,371.9
India	451.8	1,656.8	17,517.1	123,288.0
Thailand	980.6	8,242.2	29,915.0	104,849.5
Korea, Rep.	1,138.6	5,185.6	38,109.8	90,693.0
Malaysia	5,168.7	10,318.0	52,747.5	73,262.1
Indonesia	—	—	—	67,044.0
Vietnam	1,415.7	1,649.6	20,595.6	48,325.3
Taiwan, China	2,405.0	9,735.0	19,521.0	45,458.0
Pakistan	691.3	1,891.7	6,918.6	31,059.0
Philippines	914.2	4,528.2	18,156.2	21,470.0
Bangladesh	461.1	477.5	2,162.0	4,817.0
Sri Lanka	230.5	679.3	1,596.2	4,282.6

Source: UNCTAD.
Note: — = not available

Many of the manufacturing activities that have migrated from the advanced industrial countries to East and Southeast Asia are labor-intensive, low-value-added activities. China has been a major attractor of such migratory activities since the 1980s, and its processed exports have risen steeply. By 1992, 47 percent of total commodity exports were processed goods, mostly low-tech, such as textiles, leather goods, and toys. Processed exports climbed to a peak of 57 percent in 1997 before falling to 53 percent in 2007. However, during this period the composition of the exports changed; electronics parts, office equipment, computers, and telecommunications equipment displaced some of the low-tech light manufactures. Processed exports generated demand for imports of raw materials and intermediate products. These peaked at 49 percent in 1998 before settling at 41 percent in 2007. Trade in processed goods (exports plus imports) in 2007 accounted for 45 percent of total trade (see table 3.34). It is the processing industry in China that has been responsible for much of the export growth from Southeast Asian countries.

Foreign-invested enterprises inevitably dominate the processing trade, accounting for 55 percent of imports and approximately the same share of exports, but Chinese producers are rising fast. Indigenous firms in particular are making determined efforts to upgrade their products and raise the domestic share

Figure 3.17 East Asia Inward FDI



Source: UNCTAD.

Table 3.34 Share and Value of Trade by Customs Regime, China, 2007

Customs regime	Share (%)	Total value (US$ 100 millions)
Processing	45.4	9,860.36
Ordinary	44.5	9,670.69
Other	10.1	2,206.21

Source: National Statistical Bureau of China 2008.

of value added. This ongoing effort to break out of the "processing" end of the value chain and to design and produce more complex items domestically is reflected in the findings from the product space analysis and from the trends in intra-industry trade noted in chapter 2. A few Chinese firms such as Huawei, BYD, Geely, ZTE, CIMC, and Wanxiang are also building the potential to innovate through in-house research, supplemented by collaboration and the acquisition of technology from providers throughout the world, taking full advantage of the 'open innovation' system that spans the globe.

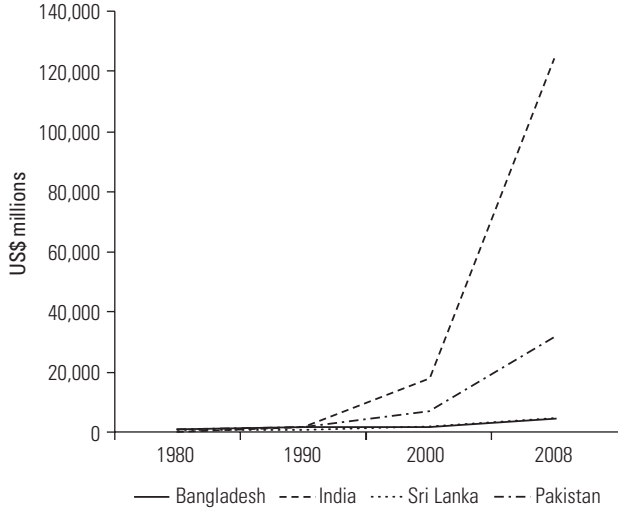
The preceding empirical rendition of the manufacturing and trading sectors casts light on how recent trends in capacity building and the acquisition of capabilities are shaping industrial development and the international competitiveness of China and India. Although some observers hold the view that services deserve more attention—and that the weaknesses of the financial sector undermine allocative efficiency and threaten macroeconomic stability—we maintain that lower- and middle-income countries must give primacy to the real sector, and that a premature financialization of an economy can be disadvantageous for growth. Advanced economies might also be forced to reconsider their own growth strategies, which lately have leaned heavily on finance, real estate, and business and IT-related services, to the neglect of manufacturing.[30]

What we surmise from these results is that China has constructed an exceedingly broad manufacturing base. With the help of FDI, it has built up a strong competitive advantage in the processing industries, ranging from textiles to electronics to chemicals to pharmaceuticals. It has embarked on the process of industrial deepening and is achieving mastery in the design and production of complex capital goods and high-tech components. This will help raise domestic value added as well as the returns from exporting. This stage could take a decade or more, but it is a necessary achievement if China is to realize its ambition to become a world-class industrial nation combining sophisticated manufacturing with innovation capabilities. How China is attempting to achieve these objectives—and the implications for other Asian countries—is the topic of chapter 5. This could ratchet up the pressure on other Asian countries, which thus far have been able to sustain an uneasy symbiosis with China in the sphere of global trade. We will discuss this in the following chapter.

India's industrial base is smaller and narrower, and this is partly because India attracted only a trickle of FDI until almost 2000. Between 2000 and 2008, FDI rose dramatically and far in excess of investment in other South Asian countries (see table 3.33 and figure 3.18). As observed earlier, India is less export oriented, and the bulk of its exports are primary products or low-tech manufactures. However, the Indian industrial establishment also includes firms that can boast manufacturing excellence in the engineering, automotive, petrochemical, pharmaceutical, green energy, and ferrous metal industries (Kumar 2009). There is a vast scope for industrialization in India, and the domestic market potentially can soak up a major chunk of the growth in output. If past experience of manufacturing development is a guide, however, India's future industrialization will be a function of exports—not only of engineering and resource-based products, but also of light and processed manufactures as with China. The likelihood of this in

[30]There is an increasing awareness in the United States and the United Kingdom that the declining role of manufacturing and the salience of services may have gone too far and that some reversal is desirable in the interests of rebalancing, growth, and employment.

Figure 3.18 South Asia Inward FDI



Source: UNCTAD.

view of the slower growth of the U.S. and EU markets and the implications for the rest of Asia are covered in chapter 5.

India has a processing industry as well, but it is largely homegrown because very little FDI flowed into export-oriented light manufacturing and, until recently, virtually none found its way into medium- and high-tech activities. Primarily for this reason, India's imports of raw material and of parts and components for processing are far smaller than China's, and domestic value added in light manufacturing is higher. This situation will change if there is another surge of FDI, but at present it appears that this is not in the cards. It would take a decade or more to create a processing sector on the scale of China's, even if India should attempt to do so, MNCs were prepared to invest, and the global economy could absorb this additional capacity.

China and India as Importers

A focus on exports needs to be complemented by a closer look at China and India's imports. Imports must be given due consideration for a number of important reasons. Although mercantilist policies are attractive to governments of industrializing countries pursuing export-led growth, globally trade must balance. Exports must equal imports. The trade surpluses of some countries must be offset by the deficits of others. That is, if some countries consume more than they produce, others must consume less. A few countries, including China, could run large export surpluses because the United States could consume far more than it produces

and could accumulate huge deficits by virtue of its unique status as the supplier of a reserve currency, the attractiveness of U.S. government paper as a gilt-edged, interest-bearing store of value, and the scale and liquidity of its financial system. Other, less fortunate countries cannot do so—and looking ahead, the United States will also be forced to adjust, and its adjustment will reverberate through the global trading system. But to return to China and India, sustaining the demand for their exports has depended in part on the volume of their imports from other countries, especially their neighbors in Asia. The rising intraregional trade reported in table 3.1 vividly underscores the increasing interdependence in the region and the importance of China and Japan in the regional trading regime.

This multiplying of trade linkages, which has been mutually fruitful for the countries in the East Asian region more than in South Asia, has been significantly facilitated by the dismantling of trade barriers as a result of the Uruguay (and earlier) Rounds[31] and the free trade agreements (FTAs) that proliferated starting in the mid-1990s (Desker 2004; "Free Trade Pacts" 2006; "Asia: Bilateralism to Trump 'Alphabet Soup' Diplomacy" 2010). Falling tariff and nontariff barriers, by further promoting production networking in Asia, pushed the growth of trade to double-digit rates between 1995 and 2007. The expanding appetite for imports—not just in the United States, but in the EU and Asia as well—is the flip side of the export-led growth phenomenon for which East Asia is famous.

Imports have a wider economic significance that is sometimes obscured by the emphasis given to exports. A part of China's technological progress and rising productivity is traceable to its greater openness relative to India. Imports of plant and equipment are the leading channel for transferring technology to late-industrializing countries.[32] Of course, importers have to learn how to use the technology, but that is the easy part; the hard work of inventing, innovating, developing, testing, debugging, refining, and codifying is mostly already done. Imports are one of the keys to catching up to the leaders and compressing the stages of development. Some countries have been more adept at extracting the growth potential from imports by deepening their manufacturing capability through more effective business leadership, organizational skills, and human capital; but in principle, the lever of imports has been available to all comers. In this respect, China and other East Asian countries are the stars, and South Asian countries the laggards.

Imports do more than just transfer codified technologies; they also diffuse the findings of research and upgrade technology in the importing countries

[31]Following the signing of the General Agreement on Tariffs and Trade in 1948, the eight rounds of trade negotiations reduced the average tariff level on industrial products levied by industrial countries from 40 percent to 4 percent and contributed to the gains in trade related globalization (Baldwin 2010).

[32]See Ding and Knight (2008) on the contribution of imports to China's growth.

(Coe, Helpman, and Hoffmaister 2008). This confers two advantages: it can enhance productivity if the new technology is fully utilized through local adaptation and the effort of assimilation; and when it brings a country closer to the technological frontier, this raises the returns to domestic R&D—which in turn feeds productivity down the road.[33] How best to access R&D via imports, and from which countries, continues to be debated. Current evidence suggests that imports are an effective mechanism of research and development (R&D) transfer from the United States, but not necessarily from other countries. From Germany, for example, FDI is a more efficacious means of achieving such a transfer.

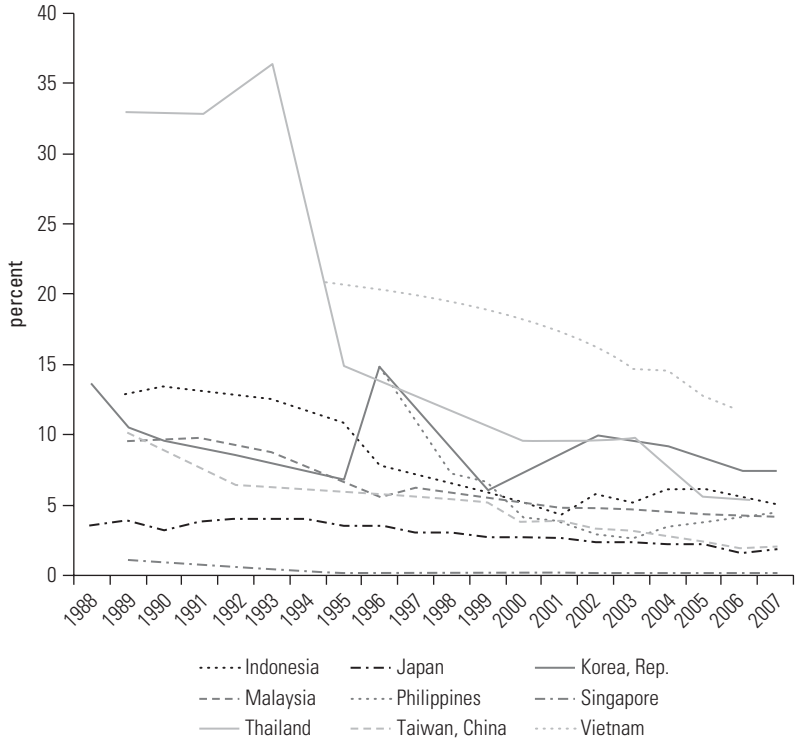
The transformative power of imports does not stop here. By exposing domestic producers to competition from imports, a country can initiate a cycle of productivity enhancement and innovation. Firms that can compete survive and grow. Less productive and technologically weaker firms are driven out of business. Apart from raising the average level of productivity for industries subjected to competition, this also frees up resources to be absorbed by activities generating higher returns (Lawrence and Weinstein 2001). Imports also identify opportunities for local producers by delineating markets. This challenges firms to go the extra mile by inventing better substitutes through a careful analysis of the imports, their clientele, and the requirements of that clientele.

Having made the case for imports, it is important to temper it with a dose of East Asian experience. Borrowing from infant industry–strategic trade theories, the success stories in the region, including China, have proven to be selective in liberalizing imports—preferring to start with capital equipment, intermediate products, and raw materials, which fueled their industrial development but did not compete against nascent domestic firms. It was only when domestic industries were demonstrating their competitiveness that tariff and, even more critically, nontariff barriers were scaled down (see figure 2.13, figure 3.19, and figure 3.20) (see Amsden 1989; Chang 2003). What differentiates the East Asian economies from the South Asian economies is the speed with which they were able to develop a competitive export sector. This helped diffuse manufacturing skills through to the rest of the economy and bolstered productivity throughout the industrial system.

China and India are both large countries, and their size creates the conditions for industries that can span the entire spectrum. China already exports a diverse basket of goods, similar to other large advanced countries. India, with a less developed manufacturing industry, exports a much narrower range of goods; but in the future, it is not inconceivable that India will start to export a

[33] Aghion (2006) shows that R&D intensity increases the closer an industry is to the technological frontiers, because once the gains from catching up are nearing exhaustion, one's own innovation becomes increasingly important as the basis for competitiveness and profitability.

Figure 3.19 Average Tariff Rates, East Asia

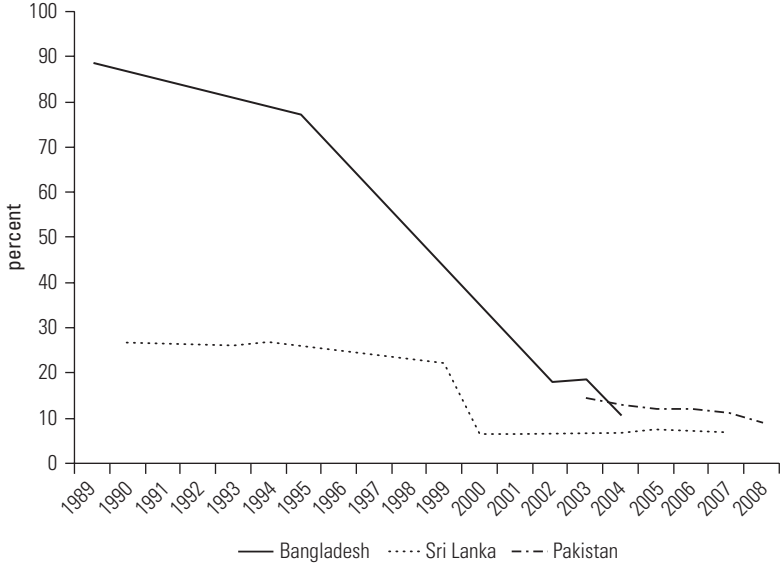


Source: UN Comtrade.

variety of products similar to the case for China. Although no country can have comparative advantages in all the products it exports, the integration of these two large economies into the global trade will exert substantial pressures on other countries.

Indeed, the review of the recent trade performance of China and India in this chapter showed that it is in fact putting pressure on other countries in Asia. China's impact is felt most in the U.S. and Japanese markets, while India's presence is more pronounced in the EU15 and U.S. markets. In addition, China and India are still at intermediate stages of development in terms of their domestic manufacturing capabilities, although China is well ahead of India in this regard. Both are investing heavily in infrastructure and manufacturing capabilities. This domestic investment is complemented by a large inflow of FDI. Even as they ramp up their manufacturing output, China and India could maintain their cost

Figure 3.20 Average Tariff Rates, South Asia



Source: UN Comtrade.

competitiveness for a few more decades, owing to the ample supply of unskilled and semiskilled workers[34] and the increased productivity that would partially mitigate the potential rise in wages.

So far, countries in Asia have been able to cope with the emergence of these two giants. East Asian economies had a head start, and they have used their participation in the global production network judiciously to accommodate the rise of China. These economies in East Asia are key network participants in many industrial products. Economies in South Asia were less prepared for the rise of China and India, but they are holding their ground in their traditional low-skill manufactured and resource-based products so far. However, what about the future, when China and India have deepened manufacturing capabilities sufficiently to span the entire product chain domestically? Which manufactured goods offer the best prospects for these economies in Asia to sustain their export momentum? These are the questions that we explore in the next chapter.

[34]Half of China's workforce and two-thirds of India's are largely engaged in rural production activities, and at least half or more of these workers will be available for urban-industrial employment.

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