

About the Paper

Jesus Felipe writes that the key to Pakistan's development lies in its industrialization. This paper documents the level of industrialization of the country vis-a-vis other Asian countries and discusses analytical tools that should help policymakers devise a coherent industrialization plan.

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A Note on Competitiveness and Structural Transformation in Pakistan

Jesus Felipe

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A NOTE ON COMPETITIVENESS AND STRUCTURAL TRANSFORMATION IN PAKISTAN

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Jesus Felipe is Principal Economist at the Central and West Asia Department, Asian Development Bank. This paper represents the author's views and does not represent those of the Asian Development Bank, its Executive Directors, or the countries they represent. Participants at seminars given at the Pakistan Institute of Development Economics, Pakistan's Planning Commission, Planning and Development Board of Punjab's government, and State Bank of Pakistan made very useful comments and suggestions. The author also benefited from conversations with Shujat Ali, Ashfaq H. Khan, Shaukat Hameed Khan, Aqdas Ali Kazmi, Safdar Parvez, and Norio Usui. Gemma Estrada and Raquel Rago provided excellent research assistance. Any remaining errors are solely the author's.

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FOREWORD

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ABSTRACT

This paper examines Pakistan's economic prospects by analyzing the degree of structural transformation during the last three decades and by comparing it with that of other countries in Asia. This way, it intends to contribute to the literature on Pakistan's growth. The discussion is important in order to raise awareness among policymakers so that sound policies for economic transformation are implemented. Pakistan's degree of structural transformation has been lower and slower than that of other countries in Asia. Accelerating the rate of structural transformation should be a key objective of Pakistan's policymakers. Sector-specific reforms that foster competition should be viewed from the point of view of transforming the economy. This requires a dose of good policy, as the market alone cannot accomplish this. The paper argues that a well-developed plan in the form of industrial policy, understood as strategic collaboration between public and private sectors, is an important tool.

*“Progress is impossible without change,
and those who cannot change their minds
cannot change anything.”*
George Bernard Shaw

I. INTRODUCTION

The successful Asian economies (i.e., the newly industrializing economies [NIEs];¹Malaysia; Thailand; or the People’s Republic of China [PRC] and Viet Nam more recently) present two main differences between three decades ago and today. The first one is about size: they are significantly bigger. The second one relates to their structure: they are significantly different. Indeed, what sets the performance of the successful Asian economies apart from that of many other countries is not only the former’s high growth rates but also their fast and intense structural transformation: their output and employment structures have changed dramatically; resources have been transferred to higher value-added sectors (i.e., from agriculture to industry and services); production has diversified; firms have learned how to produce and export a more sophisticated and technologically advanced range of products; and their levels of labor productivity have increased significantly.

Growth and structural transformation are related in a circular way, since countries do not grow by simply reproducing themselves on a larger scale. Generally (unless all sectors of the economy grow at identical rates), countries become different as they grow, not only in terms of *what* they produce, but also *how* they do it, i.e., by using different inputs including new methods of production. The successful economies have generated new activities characterized by higher productivity and increasing returns to scale. The transition across different patterns of production and specialization involves upgrading to higher value-added activities within each sector through the introduction of new products and processes. These changes entail far-reaching transformations in terms of, among other things, economic geography and skill content of output. It is the countries that can sustain multiple transitions across different stages of their structural transformation that grow successfully.

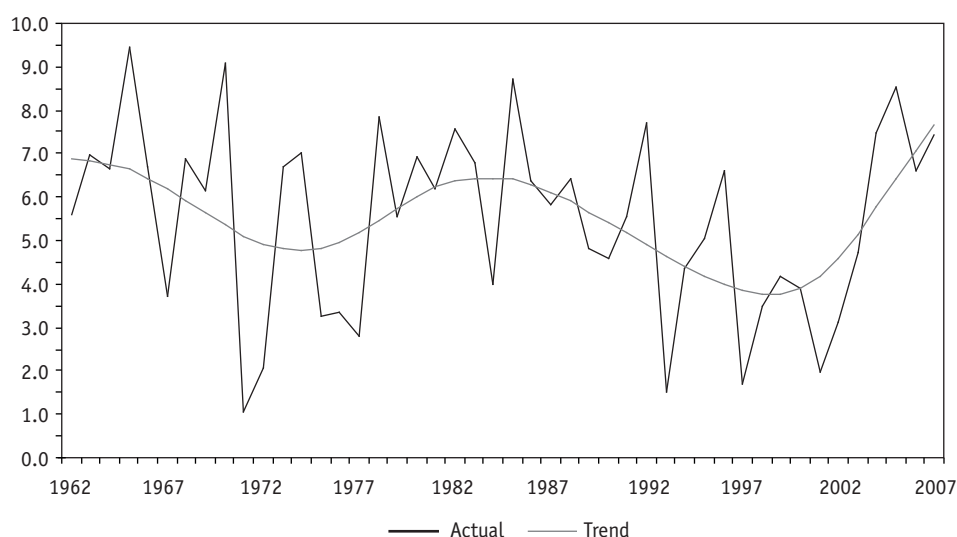
This paper is limited in scope and does not delve into the many intricacies and causal relations underlying Pakistan’s development constraints and causal relations. Rather, it attempts to provide a descriptive analysis of Pakistan’s economy and its prospects from the viewpoint of its structural transformation during the last three decades, and compares this with the experience of other countries in Asia. It intends to contribute to the literature on Pakistan’s growth (see for example, Easterly 2003 and Haque 2006). Haque (2006, 2) has argued that the lack of debate on this subject has

¹ Hong Kong, China; Republic of Korea; Singapore; Taipei,China.

kept Pakistan's "growth strategy uninformed of the new research on economic growth."² Therefore, an update and discussion is important in order to raise awareness among policymakers so that sound policies are implemented.

During the last four decades, Pakistan has grown at an average rate of slightly above 5% per annum (although with frequent "boom and bust" episodes) (Figure 1).³ The average growth rate during 2002–2007 has been 6.3%; the trend growth rate has picked up; and in three out of nine years since the 1960s, growth was at least 7% (2004, 2005, and 2007). Moreover, historically, growth was driven by private consumption, but in 2006–2007, investment was the largest contributor to output growth.

FIGURE 1
PAKISTAN'S LONG-RUN GROWTH RATE



Note: The trend growth was estimated using the Hodrick-Prescott filter with a smoothing parameter of 50.
Source: Author's calculations.

Although these growth rates are substantially higher than those of many other countries in the world, they fall short of the rates achieved by the East and Southeast Asian economies in the last 30 years; or those achieved by the PRC and Viet Nam more recently. Moreover, Pakistan has had fewer episodes of "rapid growth" since the mid-1960s (and growth during these periods has been slower too) than PRC, Indonesia, Malaysia, or Thailand. Even Lao PDR and Viet Nam have had almost as many rapid growth episodes in about half the time (Table 1).⁴

² Haque (2006) argues that Pakistan lacks an academic community and serious debate, leading to a stunted development of the economics profession. For long-run sustained growth, the country needs a new strategy based on latest research (e.g., on the role of government as creator of growth-promoting institutions).

³ Although as Figure 1 shows, it has not had a single year of negative growth during the last 45 years.

⁴ Rapid growth is defined as three consecutive average annual growth rates of at least 5%. Average annual growth rates refer to rolling seven-year periods (see ADB 2007, Table 3.1.8).

TABLE 1
RAPID GROWTH AND ACCELERATIONS

	PERIOD COVERED	NUMBER OF RAPID GROWTH EPISODES	AVERAGE GROWTH DURING RAPID GROWTH (%)	NUMBER OF GROWTH ACCELERATIONS (YEARS)	GROWTH BEFORE (%)	GROWTH AFTER (%)	GROWTH ACCELERATION (PERCENTAGE POINTS)
PRC	1965–2004	28	8.84	2 (1981, 1991)	6.36	10.87	4.51
					8.50	10.73	2.23
India	1965–2004	15	5.57	1 (1982)	3.55	5.84	2.29
NIEs							
Hong Kong, China	1965–2004	21	7.52	1 (1975)	7.47	9.76	2.29
Korea, Rep. of	1965–2004	24	7.72	1 (1984)	6.44	8.75	2.31
Singapore	1965–2004	28	7.76	1 (1987)	6.08	9.17	3.09
Taipei, China	1970–2004	22	9.33	1 (1984)	8.16	12.01	3.85
ASEAN 4							
Indonesia	1965–2004	24	7.00	1 (1988)	5.24	7.85	2.61
Malaysia	1965–2004	22	7.32	1 (1987)	4.50	8.95	4.45
Philippines	1965–2004	8	5.62	1 (1987)	0.15	3.11	2.96
Thailand	1965–2004	24	7.31	1 (1986)	5.30	9.68	4.38
Other Southeast Asia							
Lao PDR	1984–2004	9	6.13	1 (1991)	4.26	6.33	2.07
Viet Nam	1984–2004	11	7.20	1 (1991)	4.63	8.03	3.40
South Asia							
Bangladesh	1965–2004			1 (1975)	–0.09	3.80	3.89
Bhutan	1980–2004	13	6.59	0			
Maldives	1995–2004	1	6.96				
Nepal	1965–2004			1 (1983)	2.34	5.29	2.95
Pakistan	1965–2004	12	6.18	1 (1977)	3.53	6.66	3.13
Sri Lanka	1965–2004	8	5.19	0			

Source: ADB (2007, Table 3.1.9)

However, since fiscal year 2001 when the growth rate was just below 2%, growth has accelerated, and in fiscal years 2005, 2006, and 2007, growth peaked at 9.0%, 6.6%, and 7%, respectively. A key question in the minds of policymakers is whether Pakistan will be able to sustain this growth rate.⁵ One possible way to address this question is by analyzing the extent and depth of structural change of Pakistan's economy. What sort of economic transformation does Pakistan's economy require in order to sustain high growth that is compatible with a reform process? If there are lessons from the experience of developing Asia's successful economies, where should Pakistan direct its efforts?

Recent work by Hausmann and Rodrik (2006) and Rodrik (2004 and 2006) suggests that there is nothing inevitable about either growth or structural change, and in fact only a handful of countries outside the industrialized world have been able to sustain both. In this light, new perspectives are now stressing the importance of country-specific factors, history, institutions, and "coordination" difficulties, i.e., the fact that the return to one investment depends on whether another investment

⁵ A lead article in one of Pakistan's leading newspapers was entitled "No choice but to match India growth" (*The Nation* 2007).

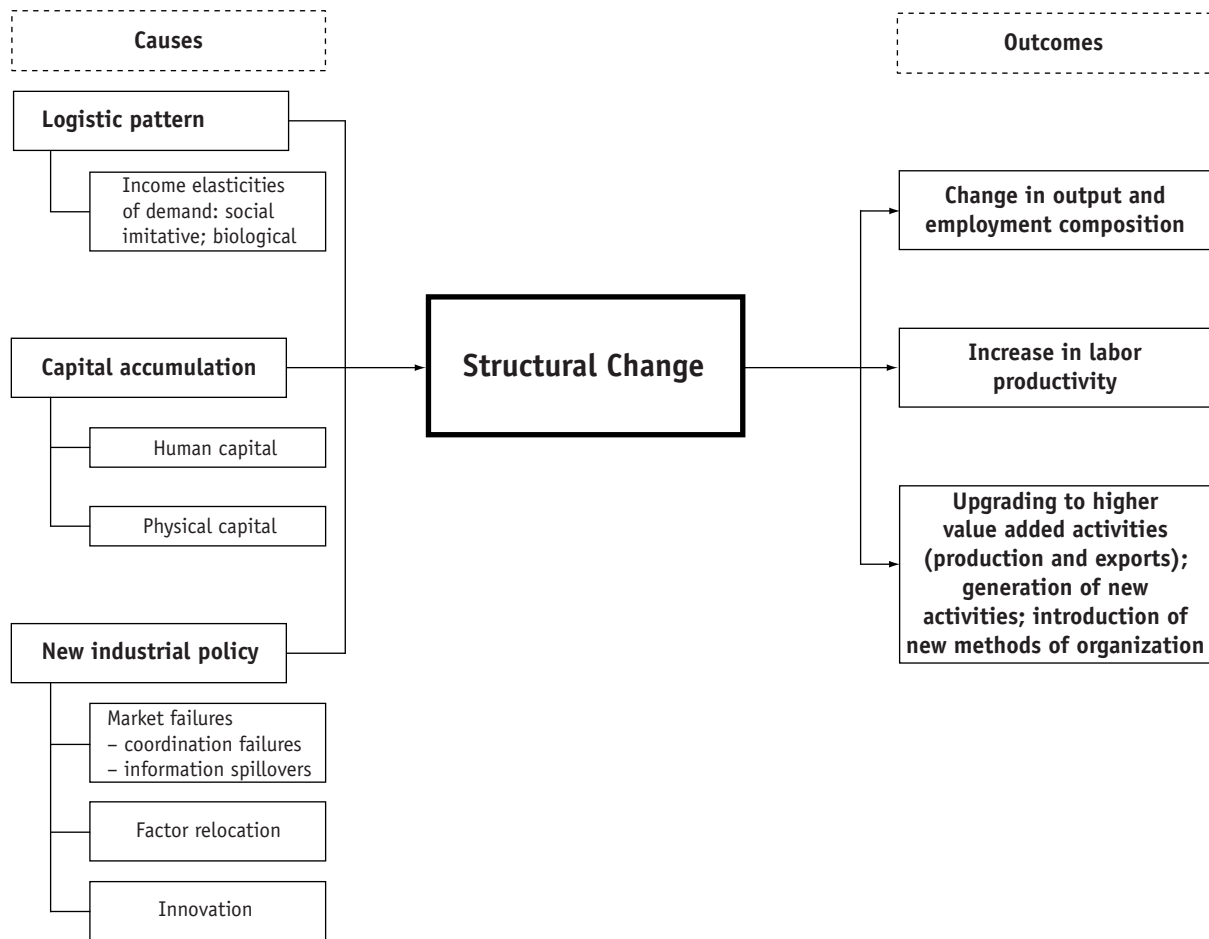
is in place. This perspective also highlights the linkages between what a country produces, how it produces it, and the opportunities for sustaining growth. It also underlines the crucial role of policy. Finally, it emphasizes the importance of competitive advantage built on task fragmentation (i.e., firms can split production by being part of international production networks or global value chains), and the importance of diversification, as opposed to traditional comparative advantage (Imbs and Wacziarg 2003).

Analysts today agree that structural transformation is a lengthy and difficult process that most developing countries find very difficult to traverse. What retards or even prevents this transformation? There are two classes of problems (market failures). The first involves coordination failures. For example, containerization of freight may not take hold if the right kind of facilities for handling containers at ports, railway stations, and trucking depots do not already exist. Likewise, the development of a hotel industry is contingent on the existence of basic infrastructure, including airports and roads. The second class of problem concerns information spillovers. If the first mover into a new activity finds that it is profitable, then other firms will most likely follow. But if the first mover fails, he or she will bear the loss (the private return to this investment is lower than the social return). Labor training is another example of this class of problem, as the firm that trains a worker may lose him or her to a firm offering a higher salary.

One implication of the modern thinking is that structural transformation is about creating new activities that can use the capabilities that an economy already possesses. The important point that the new literature emphasizes in this respect is that unless purposeful action is taken to develop these new activities, countries will not overcome these market failures that constrain structural transformation. The market, by itself, will not resolve these problems. From this point of view, policy has a vital role to play. Policy, in this context, is about creating the conditions for structural transformation and about providing the inputs that are specific to subsets of activities (Hausmann and Rodrik 2006). These inputs are property rights, institutions, and infrastructure. These are “complementary” inputs to the market whose specific form will vary depending on the circumstances. Successful policy making requires an experimental approach and a degree of creativity. Causes and outcomes of structural change are summarized in Figure 2.

The remainder of the paper is structured as follows. Section I provides an overview of Pakistan’s degree of structural change by benchmarking it to other countries in Asia. Sections II, III, and IV discuss three recent research areas on growth and structural transformation. These areas can be viewed as tools that can help conceptualize Pakistan’s development challenges. Section II is on export sophistication, Section III on product space, and Section IV on industrial policy. Policymakers in Pakistan should benefit from understanding the implications of this new literature. The last section summarizes the main findings.

FIGURE 2
STRUCTURAL CHANGE: CAUSES AND OUTCOMES

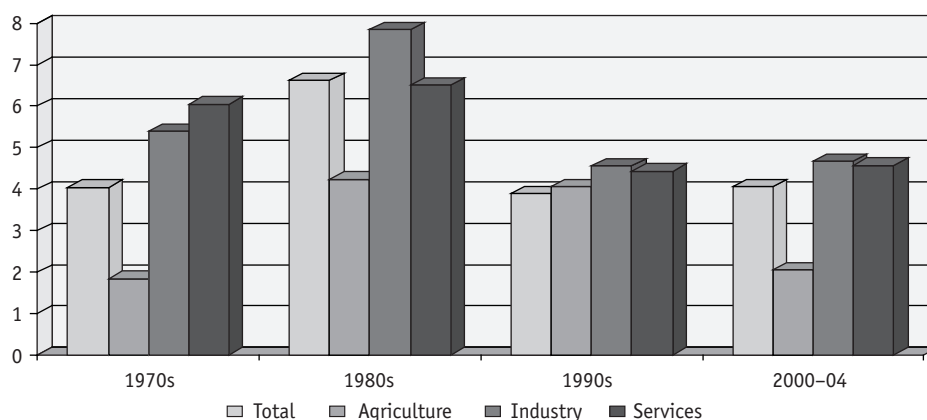


II. STRUCTURAL TRANSFORMATION IN PAKISTAN

Decadal growth rates by sector as well as by output and employment shares are shown in Figures 3 and 4. The service sector is by far the most important contributor to Pakistan's overall output growth. Table 2 provides information about the distribution of Pakistan's service sector. It is worth noting that since the 1970s, wholesale and retail trade was already the largest subcategory. In 2001–2005, transport, storage and communications plus wholesale and retail trade represented more than 50% of the service sector, and about 29% of total GDP. These two categories tend to be nontradables. This is mostly the result of the fact that since the 1970s, services have been the largest sector of the economy in terms of output, accounting now for over 50% of total GDP, and, simultaneously, having grown relatively fast. Agriculture and industry account for about 25% each. Agricultural growth is, however, very low. The result is that now the service sector contributes more than 50% to overall output growth (Figure 5).⁶

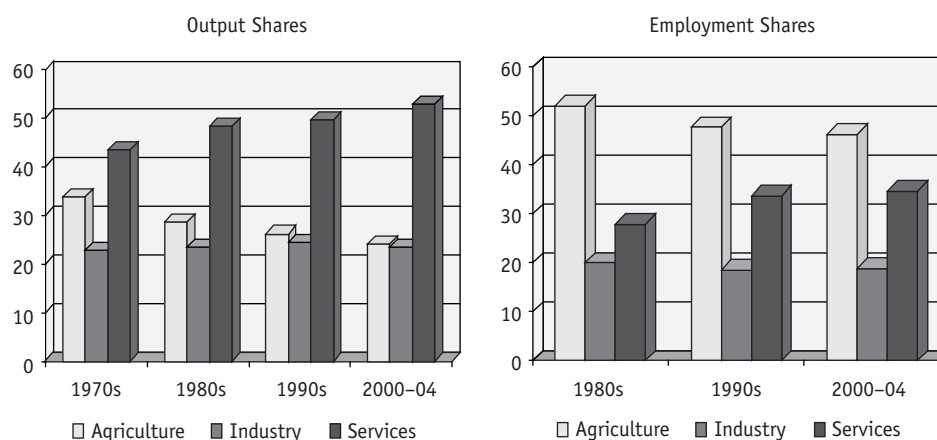
⁶ This is also the case of India and the Philippines. In Thailand, industry and services contribute about the same, about 47% each. In PRC, Indonesia, Malaysia, and Viet Nam, industry is the largest contributor to output growth.

FIGURE 3
PAKISTAN: ANNUAL GROWTH BY SECTOR (PERCENT)



Source: Author's calculations based on data from *World Development Indicators* online database (World Bank, downloaded 4 August 2006).

FIGURE 4
PAKISTAN: OUTPUT AND EMPLOYMENT SHARES (PERCENT)



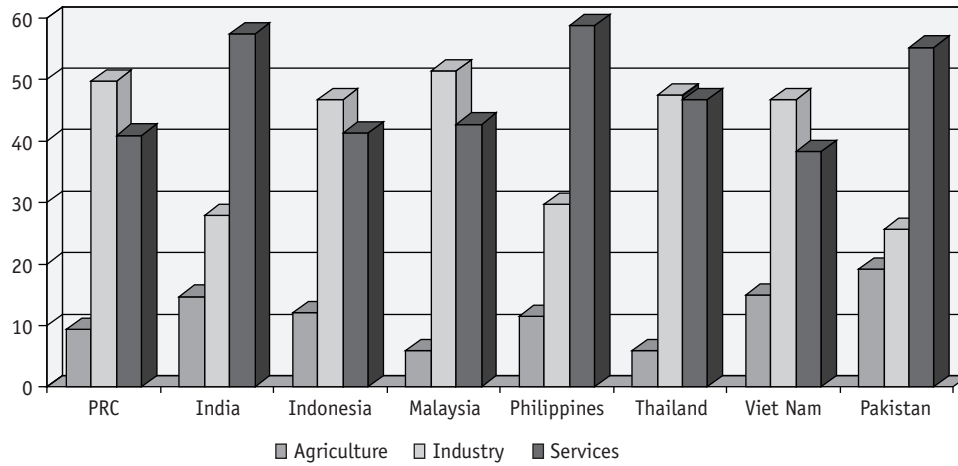
Source: Author's calculations based on data from *World Development Indicators* online database (World Bank, downloaded 4 August 2006).

TABLE 2
PAKISTAN SERVICES SECTOR, OUTPUT SHARE

	1971-75	1976-80	1981-85	1986-90	1991-95	1996-00	2001-05
Transport, Storage and Communication	7.49	7.66	9.22	8.32	10.08	10.38	12.57
Wholesale and Retail Trade	14.89	15.62	15.48	16.62	16.43	15.32	16.77
Finance and Insurance	2.29	2.57	2.98	2.99	3.18	3.22	3.51
Ownership and Dwellings	4.16	3.73	4.88	4.57	4.35	4.50	3.56
Public Administration and Defense	7.36	7.83	8.38	9.30	7.87	7.89	6.80
Community Services/Others	7.47	8.30	7.31	7.37	7.78	8.79	9.14
Total	43.65	45.71	48.25	49.18	49.69	50.10	52.34

Source: Author's calculations based on data from CEIC Data Company Ltd. (downloaded 13 December 2006).

FIGURE 5
GROWTH ACCOUNTING, 1970–2004 (PERCENT)



Note: Data for Viet Nam only covers the period 1985–2004.

Source: Author's calculations based on data from *World Development Indicators* online database (World Bank, downloaded 4 August 2006).

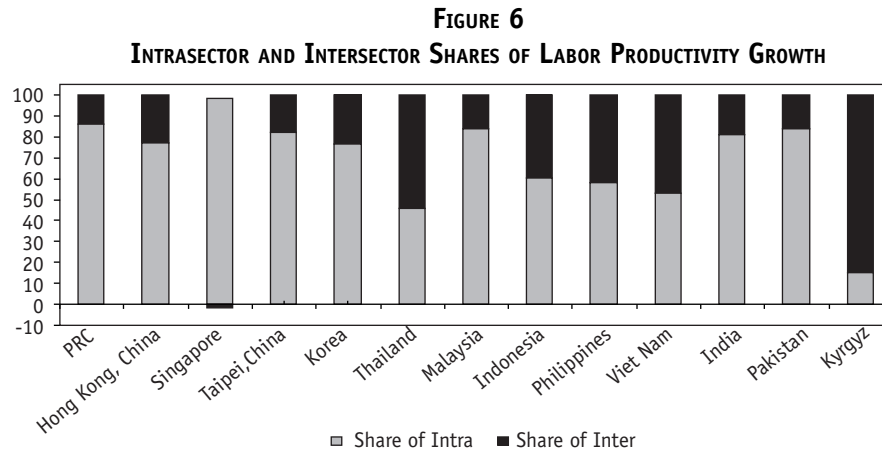
It is important to note that Pakistan is an agricultural economy in terms of structure of employment. Although the share of agricultural employment has declined over time, over 40% of Pakistan's labor force is still employed in the primary sector (from over 60% in the 1980s). This is a sector that suffers from low productivity crop yields. This is due to, among others, lack of seed varieties, drought and high temperature stress, soil nutrient mining, and salinity/water logging (PIDE 2006).⁷ The service sector employs slightly over 30% of the labor force, while industry employs less than a fifth.⁸

Figure 6 shows the contributions of intrasectoral labor productivity growth and intersectoral labor productivity growth (i.e., reallocation of labor) to overall labor productivity growth. Following Chenery et al. (1986), the economywide growth rate of labor productivity can be decomposed into two parts: one, the sum of the growth rates of labor productivity *within* sectors (weighted by the sector's share in output); and second, the effect of labor relocation *across* sectors of different productivity, calculated as the sum of the changes in the employment shares of the sectors receiving employment moving out of agriculture (i.e., industry and services) multiplied by the differential in labor productivity with respect to agriculture.⁹

⁷ PIDE (2006, 23) argues that sustained growth in agriculture of 5–6% is needed to ensure rapid growth.

⁸ A logistic cross-sectional regression indicates that Pakistan's agricultural output share (in 2004) was about what it should be (i.e., equal to the actual share), 22.5%, given the country's income per capita. Actual employment share in agriculture (in 2000), 48.5%, is slightly above what the regression predicts, 45.5%. In the case of industry, the result is similar, with the output share (in 2004) being about what it should be (24.5%). Employment (in 2000) was 2.5 percentage points higher than what it should be (18% versus 15.5%). In the case of services, the actual output share in 2000 (51.2%) is significantly above the predicted (43.4%) given the country's income per capita; while the employment share (in 2000) is about what it should be given the country's income per capita, 33.5%.

⁹ The formula used is: $\hat{q} = \sum k_i \hat{q}_i + (\lambda'_I - \lambda_I^0) \frac{(q_I - q_A)}{q} + (\lambda'_S - \lambda_S^0) \frac{(q_S - q_A)}{q}$, where \hat{q} is the growth rate of overall labor productivity; \hat{q}_i is the growth rate of each sector's labor productivity; k the respective output shares; $(q_I - q_A)/q$ is the difference between the levels of labor productivity in industry and agriculture divided by the overall level



Note: Time periods: PRC: 1987–2002; Hong Kong, China: 1978–2004; Singapore: 1970–2003; Taipei, China: 1965–2004; Korea: 1970–2004; Thailand: 1971–2004; Malaysia: 1980–2004; Indonesia: 1976–2002; Philippines: 1971–2004; Viet Nam: 1991–2004; India: 1983–2000; Pakistan: 1973–2002; Kyrgyz Republic: 1987–2002.
 Sources: Author's calculations based on data from LABORSTA Labour Statistics Database (International Labour Organisation, downloaded 9 August 2006); and *World Development Indicators* online database (World Bank, downloaded 4 August 2006).

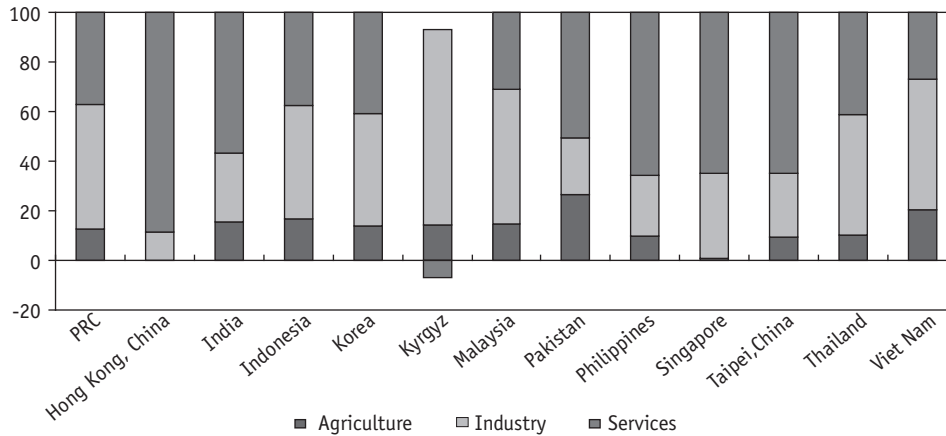
The first part of the decomposition is the intrasector or pure productivity growth effect. This component is unaffected by changes in the employment share and thus isolates the contribution due solely to productivity improvements within sectors. In general, the output share of agriculture tends to decline over time; that of industry rises in the intermediate stage of growth; and that of services increases in the final stage. As the growth rate of labor productivity tends to be highest in industry, the rise of the output share of this sector is part of the explanation of the growth acceleration that takes place during this phase. Similarly, the rise of the output share of the tertiary sector at the expense of industry in the later stages of growth is part of the explanation for the growth deceleration in that stage of growth. In most countries in Figure 6 intrasectoral productivity growth is more important. In Pakistan, it accounted for 83% of the total growth in labor productivity during 1973–2002.¹⁰

Intrasectoral contributions to labor productivity growth (i.e., the subcomponents of intrasectoral productivity growth) are shown in Figure 7. During 1973–2002, Pakistan's labor productivity grew at a rate of 2.59% per annum. More than four fifths of this increase was due to labor productivity growth within or intrasector. Productivity in agriculture grew at a rate of 2.21% per annum, accounting for 31% of the intrasectoral increase; industry 2.57% per annum (manufacturing labor productivity grew at 2.91% per annum), accounting for 24% of the intrasectoral increase; and services at 1.97% per annum, representing 45% of the intrasectoral increase.

of productivity; $(q_s - q_A)/q$ is the difference between the levels of labor productivity in services and agriculture divided by the overall level of productivity; and λ denotes the employment shares of each sector. The first term of the decomposition represents the component of overall growth that is due to the growth of labor productivity within each sector (weighted by the output shares). The remaining two terms represent the effect of the relocation of labor across sectors of unequal productivity (measured with respect to the productivity of the agriculture sector).

¹⁰ Given the high level of aggregation used (the three sectors), the decomposition hides shifts within manufacturing and within services, for example.

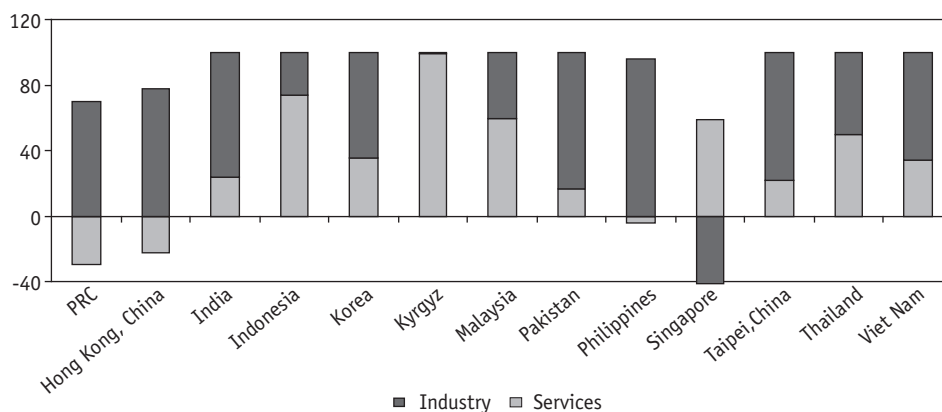
FIGURE 7
SECTOR CONTRIBUTIONS TO LABOR PRODUCTIVITY GROWTH (PERCENT)



Source: Author's calculations based on data from *World Development Indicators* online database (World Bank, downloaded 4 August 2006).

The remainder of the overall growth in labor productivity (the second part of the decomposition) in Pakistan during this period (about 17%) was due to labor reallocation from agriculture into industry and services (Figure 8). If the shift of labor is from a sector with low labor productivity to a sector of higher labor productivity, this relocation makes a contribution to overall growth, over and above the growth of labor productivity within sectors. Since in general labor productivity is lowest in agriculture and highest in industry, part of the acceleration of growth in the early stages is due to the shift of labor out of the agriculture sector and into the other sectors. Likewise, part of the deceleration in growth during the later stages is due to the shift of labor from industry into services. One reason for the slower growth of labor productivity in agriculture and services lies in the fact that possibilities of mechanization of these two sectors are limited (especially services); while the growth of labor productivity is much higher in industry because it offers much greater possibilities for mechanization. However, it is incorrect and misleading to assume that *all* services activities have productivity growth rates lower than those in all individual manufacturing industries, or even below the average for all manufacturing industries.

FIGURE 8
BAUMOL'S STRUCTURAL BONUS: INDUSTRY VERSUS SERVICES



Source: Author's calculations based on data from *World Development Indicators* online database (World Bank, downloaded 4 August 2006).

The effect of the transfer of labor on the level of productivity is what Baumol et al. (1985) and Baumol et al. (1989) call the “structural bonus.” Backward economies with a large pool of employment in low-productivity activities (normally agriculture) experience a bonus from structural change. This occurs because the transfer of labor from low to high productivity activities automatically increases the productivity *level* of the economy (i.e., a composition effect). This happens even if this transfer of resources is mainly a shift from agriculture to services (where productivity might not be significantly higher). However, as the logistic pattern of structural change drives resources toward services, and given that productivity growth in this sector is usually slower than in industry, countries experience a “structural burden.” This “burden” means that the process of structural change has a negative impact on productivity *growth*. As the share of labor in services increases, the average rate of growth of the economy decreases. In the limit, as most of the labor force has moved into the services activities, economies experience “asymptotic stagnancy” as productivity growth is mostly determined by the services sector. This means that structural change increases the level of productivity of the economy but, at the same time, as the economy matures, productivity growth slows down. The decomposition used here does not consider the structural burden.

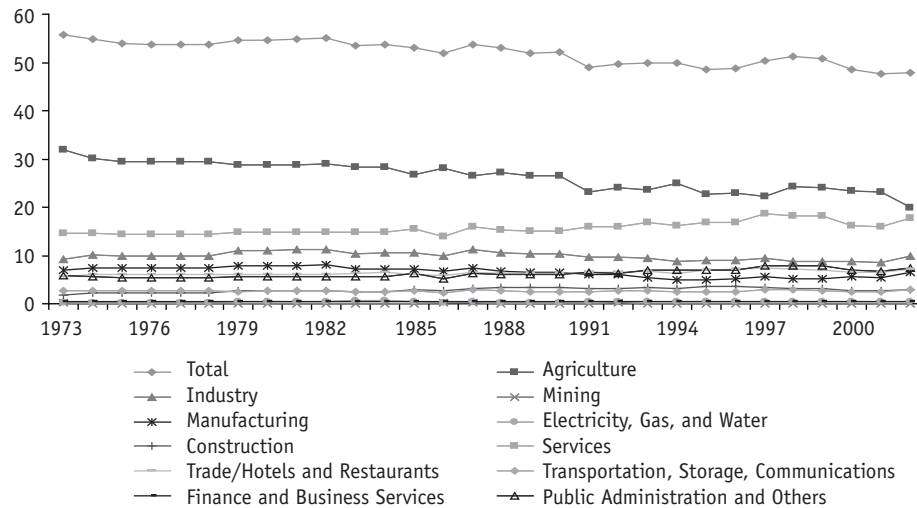
Figure 8 indicates that services have absorbed much more labor transferred out of agriculture than industry. In Pakistan, reallocation of labor into industry accounted for only 17% of the intersectoral increase in labor productivity growth, while the remaining 83% was due to reallocation of labor into services.

It is possible to analyze trends in per capita income by decomposing it into the product of the employment–population ratio and labor productivity.¹¹ Regarding the first part, Pakistan has experienced falling employment absorption capacity, as the ratio of employment to working age population has declined over time (Figure 9). Between 1973 and 2002, it fell from 55.8% to 47.8%. This is the result of a combination of factors. First, the absorption capacity of industry has been flat. Second, the decline in the absorption capacity of agriculture has not been matched by an equivalent increase in the absorption capacity of services (in the last few years the absorption capacity of

¹¹ Algebraically: $(Y/P) = (L/P) \times (Y/L)$, where (Y/P) is income per capita, (L/P) is the employment–population ratio, and (Y/L) is labor productivity.

services has also been flat). Third, the problem is aggravated by a relatively high population growth rate (2.69% per annum for 1981–1998). While this entails a demographic bonus it also poses a serious burden as long as the economy does not generate enough employment.

FIGURE 9
PAKISTAN: EMPLOYED PERSONS AS PERCENT OF WORKING-AGE POPULATION (PERCENT)



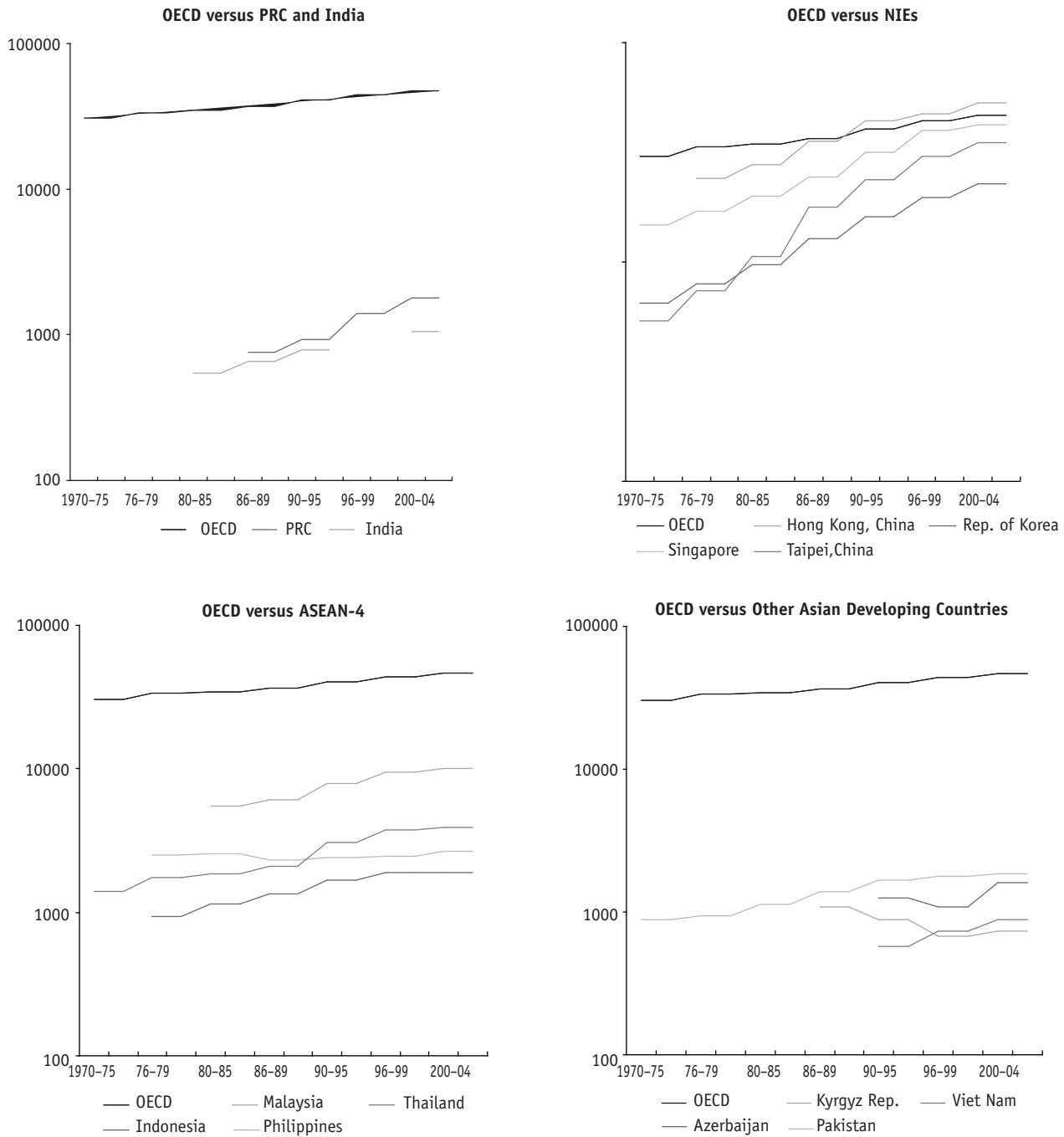
Sources: Author's calculations based on data from LABORSTA Labour Statistics Database (International Labour Organisation, downloaded 9 August 2006); and *World Development Indicators* online database (World Bank, downloaded 13 December 2006).

Successful structural transformation must lead, in the long run, to increases in labor productivity, the key determinant of living standards. Labor productivity in Pakistan is increasing, although it is still very low compared to that of the NIEs (and certainly to the average for countries of the Organisation for Economic Cooperation and Development), indicating that there is plenty of room for catch-up (Figure 10). Pakistan's level of labor productivity increased by a factor of 2.17 between 1973 and 2002 (which implies a growth rate of almost 2.6% per annum). This indicates that with a slowly increasing level of labor productivity and declining employment–population ratio, Pakistan's income per capita cannot increase fast. Especially worrisome is the fact that Pakistan's employment absorption capacity is not contributing to the increase in living standards.

Historically, structural change in the industrialized world was associated with the expansion of the secondary sector (industry). The role attributed to manufacturing in particular in the process of take-off and subsequent catch-up is usually a key element of sector studies of growth. Recently, Rodrik (2006) has argued that sustained growth requires a dynamic industrial base, an idea well established in the literature. It was probably economist Nicholas Kaldor (1966 and 1967) who provided the most thorough explanation of why industry, in particular manufacturing, plays the role of "engine of growth" (see Felipe et al. 2007 for an analysis of Kaldor's views applied to developing Asia):¹² a country with a relatively high growth rate of manufacturing productivity will have a relatively high growth rate of labor productivity in the economy as a whole.

¹² The importance of industrialization as the key driver of structural change in Pakistan is recognized by PIDE (2006), which contains detailed sectoral analyses. This document talks about the need to establish an "...industrial strategy whose overriding aim is to develop a fast growing, internationally competitive, and export-driven industrial sector that helps in poverty reduction through the provision of adequate employment opportunities to the growing labor force" (PIDE 2006, 23).

FIGURE 10
TOTAL LABOR PRODUCTIVITY (US\$2,000), LOGARITHMIC SCALE



Note: The 1980-1985, 1986-1989, 1990-1995, and 2000-2004 data for India refer only to 1983, 1988, 1994, and 2000 figures, respectively. Similarly, the 2000-2004 data for PRC, Indonesia, Kyrgyz Republic, and Pakistan refer only to 2000-2002; the 1986-1989 data for Indonesia only to 1989; the 1976-1979 data for the Philippines only to 1978; and the 1970-1975 Figure for Pakistan only to 1973-1975.

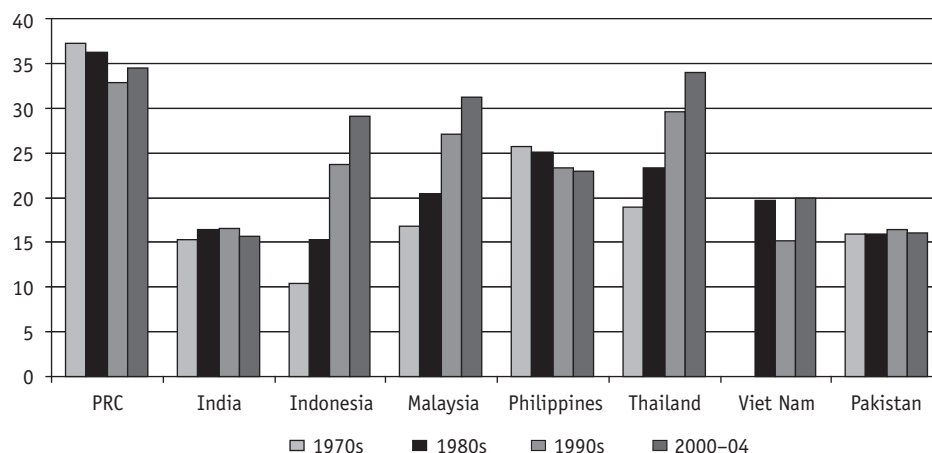
Sources: Author's calculations based on data from LABORSTA Labour Statistics Database (International Labour Organisation, downloaded 9 August 2006); *World Development Indicators* online database (World Bank, downloaded 4 August 2006); and Directorate General of Budget, Accounting and Statistics (<http://eng.stat.gov.tw/public/>, downloaded 13 December 2006).

One can, therefore, speak of the “logic of industrialization” (Nixson 1990, 313) and understand why many developing countries have adopted (or desire to adopt) strategies toward rapid industrialization, often starting with industries that use relatively simple technologies and that have the potential to be labor-intensive and thus absorb labor, such as textiles, clothing, and shoes. The experience of the industrial economies shows that establishing a broad and robust domestic industrial base holds the key to successful development, and the reason why industrialization matters lies in the potential for strong productivity and income growth of the sector. This potential is associated also with a strong investment drive in the sector, rapidly rising productivity, and a growing share of the sector in total output and employment. The presence of scale economies associated with the secondary sector, gains from specialization and learning, as well as favorable global market conditions, imply that the creation of leading industrial subsectors, along with related technological and social capabilities, remains a key policy challenge. Today, there is wide variety across countries in terms of resource endowments, pace of capital accumulation, and policy choices. This implies that there is ample room for diversity in industrial development.

Figure 11 shows the relative stagnation of Pakistan’s manufacturing sector. While the share of this sector in GDP increased significantly in countries like Indonesia, Malaysia, or Thailand during the last 30 years, it has hardly changed in Pakistan, where it has remained at about 15% since the 1970s. Something similar has occurred if we look at the sector from the point of view of employment (Figure 12). It is important to stress that, while not small (except when compared to that of Malaysia), the share of the sector has not increased.¹³

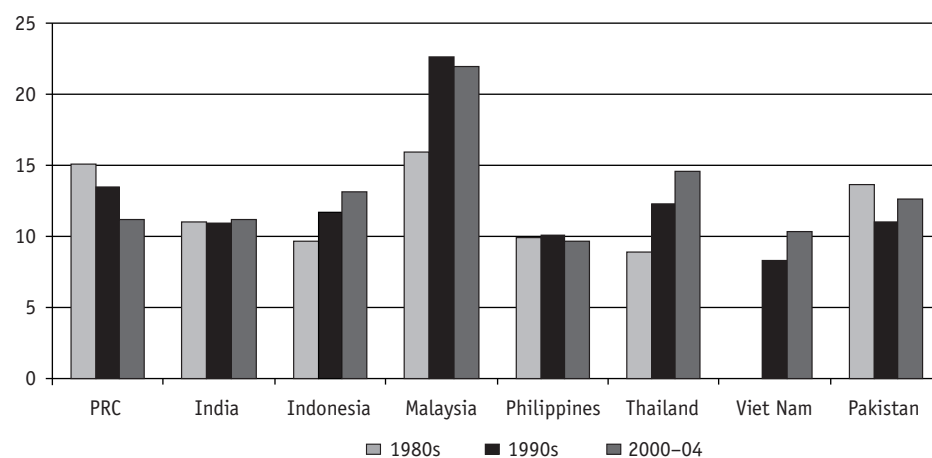
¹³ A logistic cross-sectional regression indicates that Pakistan’s manufacturing output share in 2000 was about what it should be, 14.5%, given the country’s income per capita, trade share in GDP, and population. The same regression indicates that India’s manufacturing share, while similar to that of Pakistan, is about 4 percentage points below what it should. On the other hand, PRC, Indonesia, Malaysia, and Thailand have actual shares significantly higher than the predicted ones. It is also worth mentioning that similar regressions for 1975, 1985, and 1995 indicate Pakistan’s income elasticity of manufacturing output declined significantly from 0.44 in 1975 to about 0.25 in the subsequent periods. This is a clear sign of development. In poor developing countries, the income elasticity of manufacturing output tends to be high; but as countries develop it becomes smaller, even negative in rich countries (Felipe and Estrada 2007).

FIGURE 11
MANUFACTURING OUTPUT SHARES



Note: The 1980s data for Viet Nam refer only to 1985–1989.
 Source: Author's calculations based on data from *World Development Indicators* online database (World Bank, downloaded 4 August 2006).

FIGURE 12
MANUFACTURING EMPLOYMENT SHARES



Note: The 1990s data for Viet Nam refer only to 1996 to 1999.
 Sources: Author's calculations based on data from *World Development Indicators* online database (World Bank, downloaded 4 August 2006); and Anant et al. (2006).

Looking deeper into the structure of manufacturing, one can see that this sector is heavily dependent on food and beverages and textiles (Table 3). These two categories represented about 58% of the sector's value-added in the 1970s. Industrial chemicals represented about 11% of the total. The share of electrical and nonelectrical machinery plus transport equipment was a small 8%. By the 1990s, food and beverages plus textiles still represented 48% of total manufacturing output; the share of industrial chemicals had increased to 15.5%; and that of electrical, nonelectrical machinery, plus transport equipment represented 11% of the total. While this indeed denotes a fair degree of transformation and upgrade in the manufacturing sector, the share of the last three

branches is substantially smaller than, for example, in Malaysia, where the combined share of these three categories increased from about 16% to about 40% of total manufacturing output during the same period (see Appendix Table 1 for detailed data).¹⁴

TABLE 3
PAKISTAN MANUFACTURING BRANCHES (PERCENT)

	1970s	1980s	1990s
Food and beverages	30.45	30.94	22.89
Textiles	27.78	18.14	25.06
Apparel, leather, and footwear	2.04	2.37	2.80
Wood and wood products	0.26	0.39	0.37
Paper and paper products	1.61	1.15	1.54
Printing and publishing	1.22	1.06	2.00
Industrial chemicals	11.20	14.29	15.50
Petroleum and coal products	5.27	6.01	3.26
Rubber and plastic products	1.80	1.80	1.42
Nonmetal mineral products	4.43	7.75	7.76
Basic metals	3.06	6.20	5.13
Metal products	1.62	1.06	0.81
Nonelectrical machinery	1.84	2.14	2.09
Electrical machinery	3.31	3.26	5.43
Transport equipment	2.99	2.89	3.05
Others	1.11	0.55	0.88
Total	100.00	100.00	100.00

Source: Author's calculations based on data from Industrial Statistics International Standard Classification Revision 2 (United Nations Industrial Development Organization 2005).

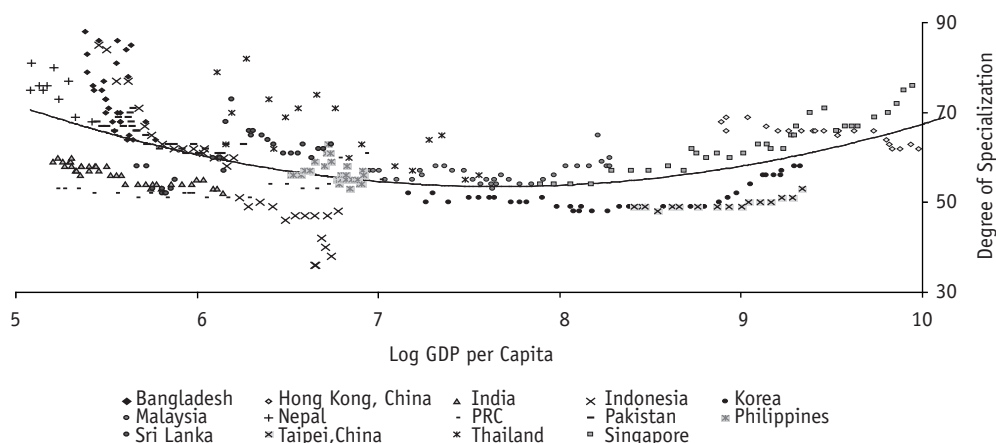
Figure 13 graphs the degree of specialization in the manufacturing sector vis-à-vis income per capita.¹⁵ As noted above, the new literature emphasizes the importance of diversification as opposed to traditional comparative advantage (i.e., the idea that as countries open up trade, they will specialize in those activities that use intensively those factors that are in abundant supply). Imbs and Wacziarg (2003), however, present evidence that suggests that at low levels of income per capita, economies tend to diversify and subsequently, as their income rises, they specialize: whatever drives economic development, it is not comparative advantage. Graphically, this corresponds to a U-shape relationship between specialization and income per capita, which Figure 13 corroborates.

¹⁴ During a presentation at Pakistan's Institute of Development Economics, Faizullah Khilji noted that census data would show that the shares of nonelectrical machinery, electrical machinery, and transport equipment have actually declined.

¹⁵ The degree of specialization was constructed using UNIDO 3-digit manufacturing data. The degree of specialization

h is defined as $h = 100 \times \left(1 + \frac{\sum_i (s_i \ln s_i)}{h_{\max}} \right)$, where $h_{\max} = \ln(\text{no. sectors})$, s_i is the share of the i -th branch in total manufacturing value-added. By construction $0 \leq h \leq 100$. If the shares of all sectors are equal, the degree of specialization is 0; and if only one sector exists, then the value of the indicator is 100.

FIGURE 13
SPECIALIZATION INDEX OF DEVELOPING ECONOMIES IN ASIA:
MANUFACTURING VALUE-ADDED



Note: The estimated regression line is:
 Specialization = 203.653 - 39.163 GDP per capita(log) + 2.554 (GDP per capita(log))²
 t-stat: (17.78) (-12.39) (12.13)
 R²: 0.30; No. of observations: 387
 Source: Asian Development Bank (2007).

Figure 13 shows, though, that individual country experiences in developing Asia do not fit the U-shaped pattern of specialization for value-added or employment suggested by Imbs and Wacziarg (2003). This, on the other hand, is not surprising as data cover a short period of time. Figure 13 shows increasing diversification as income per capita increases (at low levels) in Bangladesh, India, Indonesia, Nepal, Pakistan, and Thailand. There is no economy that becomes more specialized within comparable low income ranges. Increasing specialization is only detected at higher income levels in Korea; Malaysia; Singapore; and Taipei, China. The figure also shows that, at similar income levels, the PRC has a more diversified pattern of manufacturing output. Kochhar et al. (2006) have shown that India has a more skill-based and capital-intensive pattern of production than the PRC. Pakistan's value-added specialization index has a trend toward diversification: in 1963 Pakistan had a very high index, 74, denoting a very high concentration in the structure of manufacturing. By 1996, the index had a value of 63. The figure also shows a trend toward diversification in the PRC and India. Thailand exhibits increasing specialization. While the trend toward specialization remains in Malaysia and Singapore, the index barely changes in Korea.

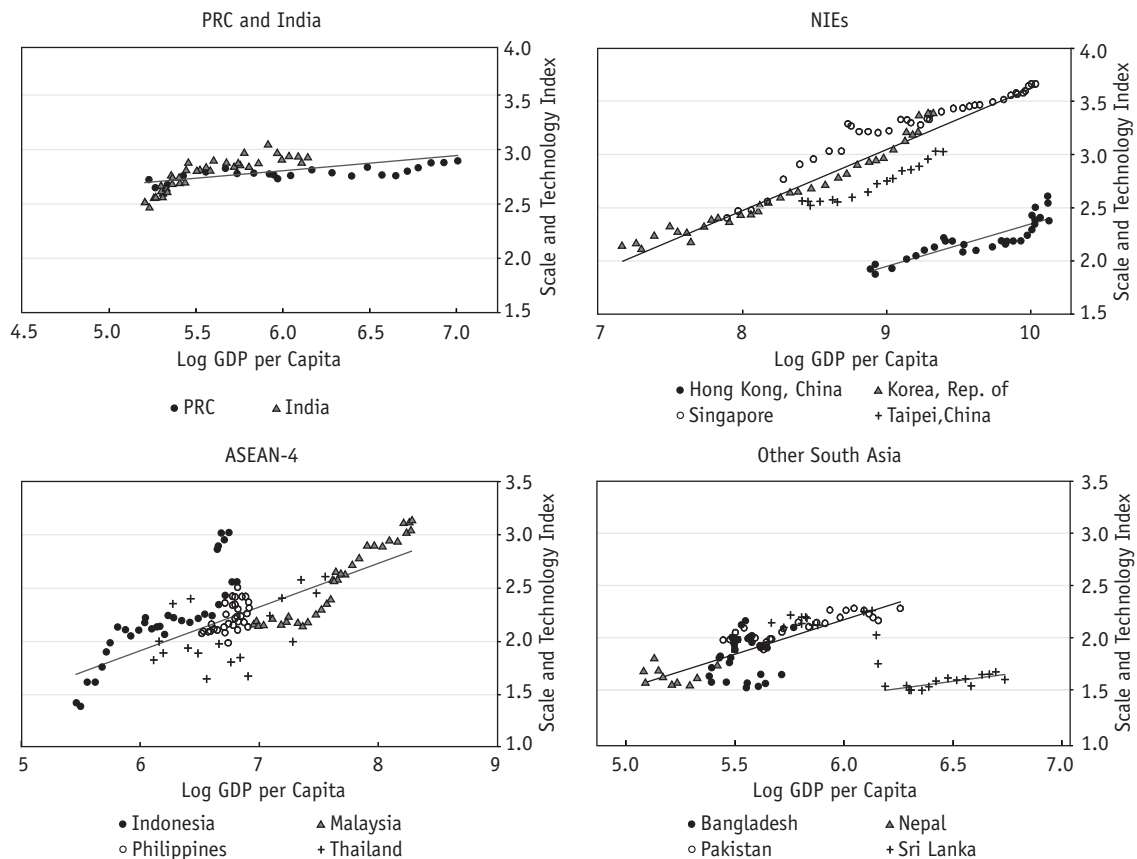
Pakistan's manufacturing sector has a relatively low technology and scale index, compared to countries like the PRC and India, for example, given the country's per capita income (Figure 14).¹⁶

¹⁶ This index is calculated by dividing all manufacturing branches into four groups according to level of technology and scale. Then the share of each group is weighted by 1, 2, 3, or 4 (1 for the lowest technology and scale level, and 4 for the highest) and summed up. Group 1 corresponds to the manufacturing branches with the lowest technology and scale economies, e.g., food and beverages, tobacco, wearing apparel, leather products. Group 2 consists of plastic and rubber products, paper, among others. Group 3 consists of iron and steel, nonmineral products, among others. Group 4 consists of products with the highest technology and scale economies, such as electrical and nonelectrical machinery, industrial chemicals, professional equipment, transport equipment, among others.

Pakistan's technology index increased from 1.77 in 1963 to 2.26 in 1996 (the last years for which data are available), and at today's income per capita, its index is well below those of while those of the PRC and India (about 3).

The share of medium- and high-technology and economies of scale manufacturing products in Pakistan's GDP has been stagnant since the 1970s (Group 4 in Figure 15; see footnote 16), well below 10% of the total; while in Malaysia the share of this group increased from less than 10% in the late 1980s to about a fifth of total GDP in 2005. The same applies to Korea. Figure 16 shows the shares for PRC; India; Indonesia; and Taipei,China. The share of group 4 is higher in these four countries. Only the share of Group 4 in the Philippines (shown in Figure 15) is similar to that of Pakistan.¹⁷

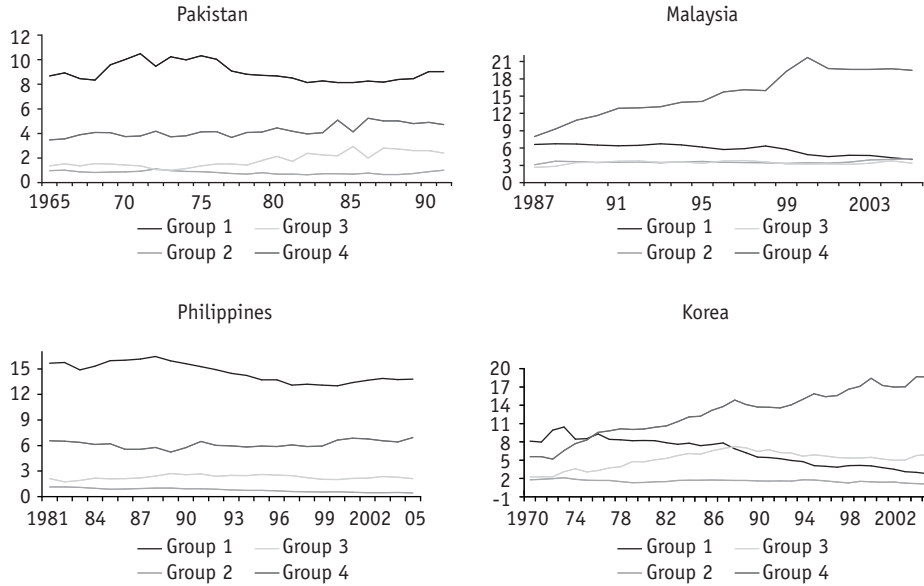
FIGURE 14
TECHNOLOGY AND SCALE INDEX



Source: Author's calculations based on data from Industrial Statistics International Standard Classification Revision 2 (United Nations Industrial Development Organization 2005).

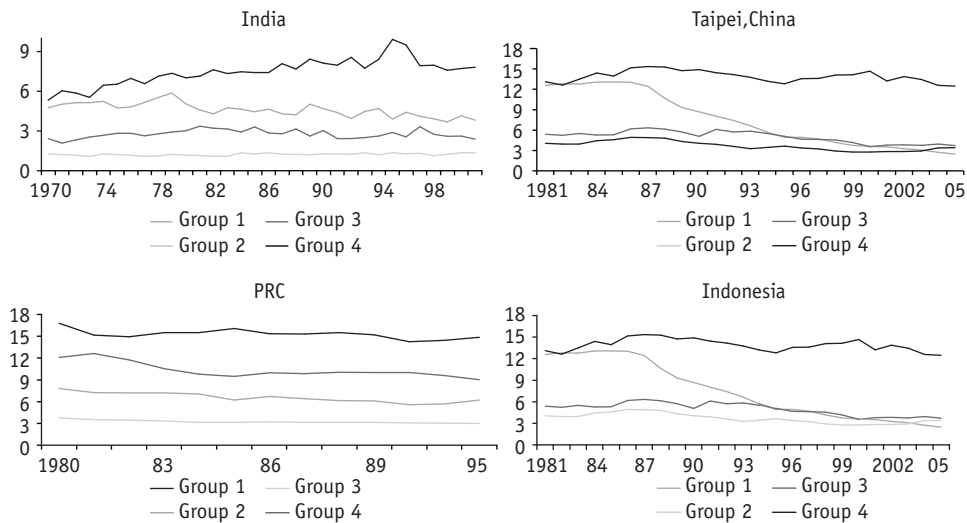
¹⁷ One must not forget that Pakistan is capable of making nuclear weapons. This means that the country has developed the capability to manufacture very sophisticated products. This, however, is different from what is required to sustain growth in a country like Pakistan. More will be said about this in Section V.

FIGURE 15
SHARES OF MANUFACTURING GROUPS IN GDP BASED ON
TECHNOLOGY AND SCALE (PERCENT)



Source: Author's calculations based on data from Industrial Statistics International Standard Classification Revision 2 (United Nations Industrial Development Organization 2005).

FIGURE 16
SHARES OF MANUFACTURING GROUPS IN GDP BASED ON
TECHNOLOGY AND SCALE (PERCENT)



Sources: Author's calculations based on data from Industrial Statistics International Standard Classification Revision 2 (United Nations Industrial Development Organization 2005); Directorate General of Budget, Accounting and Statistics (<http://eng.stat.gov.tw/public/>, downloaded 13 December 2006); and CEIC Data Company Ltd. (downloaded 13 December 2006).

It is impossible to understand East Asia's phenomenal growth between the mid-1960s and the financial crisis of 1997–1998 without bringing into the picture productivity gains derived from the *assimilation* of technologies from the developed countries (Nelson and Pack 1999, Felipe and McCombie 2001). The gains that this process brought were not the result of hard-core research and development, but of behind-the-frontier improvements. For example, Hobday (1995) described in detail how East Asian firms climbed the ladder by slowly learning:

“East Asian latecomers did not leapfrog from one vintage of technology to another. On the contrary, the evidence shows that firms engaged in a painstaking and cumulative process of technological learning: a hard slog rather than a leapfrog. The route to advanced electronics and information technology was through a long difficult learning process, driven by the manufacture of goods for export” Hobday (1995, 1188).¹⁸

Kim (1997) described Hyundai's efforts to produce a car after it had purchased the foreign equipment, hired expatriate consultants, and signed licensing agreements with foreign firms as follows:

“Despite the training and consulting services of experts, Hyundai engineers repeated trials and errors for fourteen months before creating the first prototype. But the engine block broke into pieces at its first test. New prototype engines appeared almost every week, only to break in testing. No one on the team could figure out why the prototypes kept breaking down, casting serious doubts even among Hyundai management, on its capability to develop a competitive engine. The team had to scrap eleven more broken prototypes before one survived the test. There were 2,888 engine design changes.... Ninety seven test engines were made before Hyundai refined its natural aspiration and turbocharger engines.... In addition, more than 200 transmissions and 150 test vehicles were created before Hyundai perfected them in 1992” (Kim 1997, 129).

Pakistan's Medium Term Framework 2005–2010 targets the expansion of the share of engineering products, electronics and chemicals, and other high-technology-based and value-added manufacturing industries between 2004–2005 and 2009–2010 by 3.5 percentage points (see Haque 2006, Box 1). Haque (2006, 13), however, shows some skepticism about how the Government is going to achieve this objective and claims that “it is not clear what instruments will be used. However, if past practice is an indicator, it will be a mix of subsidy and tariff protection.”¹⁹

III. EXPORTS AND STRUCTURAL TRANSFORMATION

In conventional theory à la Heckscher-Ohlin, countries export products that are more intensive in the factors in which they are relatively abundant. As development takes place, countries accumulate factors of production at different rates, and the products that countries produce and export become more intensive in these factors. In this theory, the pattern of specialization is uniquely determined by factor endowments in the sense that, independently of initial conditions, the economy converges

¹⁸ Nevertheless, case study analysis based on interviews by Hobday et al. (2004) covering 25 Korean firms in seven sectors leads the authors to conclude that although some of the leading *chaebols* are reaching the innovation frontier in some product areas, and are getting into new product design and research and development, there is reason to call into question the strength of leading Korean firms in international leadership capabilities such as new product creation and capital goods technology.

¹⁹ PIDE (2006) presents a strategy of what Pakistan needs to do in order to embark on the same path as PRC, Japan, and Korea to develop its engineering industry.

to a pattern of specialization that can be fully explained by the economy's factor endowments. At the other extreme of the theoretical spectrum, some new trade theory models treat productivity growth as the result of learning by doing and assume away factor endowments as a determinant of comparative advantage (e.g., Krugman 1987). Here, the pattern of specialization cannot be determined independently of initial conditions and history. In these circumstances, real as well as monetary shocks become important as they can influence the pattern of trade specialization. Industrial policy (see Section V) also becomes important in acquiring new comparative advantage, independently of factor endowments.

In recent work, Hausmann et al. (2005) have argued that specialization patterns are partly indeterminate and may be shaped by idiosyncratic elements. They have shown that there is a very strong relationship between the level of income of a country and a measure that they construct of the sophistication of exports (see below). One implication of this relationship is that as the process of development takes place, countries change their export package, i.e., they must undergo structural transformation. Indeed, structural change appears reflected in the improvements in quality and diversification of a country's exports. This implies, first, that the range of goods that an economy ends up producing and exporting changes in time. Second, and more important, while for the standard theory of comparative costs the transition from the production and export of one type of goods into a different one is a function of the changing factor endowments with no role for active policy, the range of goods in Hausmann et al.'s (2005) model is determined not just by factor endowments. It is also a *complicated* process that is determined by the number of entrepreneurs that can be stimulated to engage in "cost discovery" in the modern sectors of the economy.²⁰ The key and primary source of international gains is international learning leading to technical progress and increased labor productivity. However, upgrading and diversification will not occur automatically, as they require proactive measures. The cost of discovery is the uncertainty that an entrepreneur faces when producing a good for the first time in a developing economy. Even in case the good is produced with a standard technology, the institutional reality of many developing countries requires a substantial degree of adaptation. Therefore, an entrepreneur will explore the underlying cost structure of the economy. This is a process that entails considerable positive externalities for other entrepreneurs since, if the investment is successful, other entrepreneurs will follow and emulate the incumbent. This way, the private returns to the first entrepreneur are socialized. If, however, the first entrepreneur fails, his cost remains private. Therefore, the "knowledge externality" implies that investment levels in cost discovery are suboptimal unless the industry or the government find some way in which the externality can be internalized.

Thus, the mix of goods that a country produces and exports may have important implications for economic growth. In fact, not all goods are alike in terms of their consequences for economic performance: specializing in some products will bring higher growth than specializing in others. In other words, exports can be seen both as a tool of development and as a test of a country's success. In this framework, the authors argue, government policy has a potentially important positive role to play in shaping the production structure. The authors show that countries that latch on to a set of goods that are placed higher on the quality spectrum tend to perform better.

²⁰ Skarstein (2007) argues that underdeveloped countries aiming at development following the precepts of the theory of comparative costs (e.g., specialization in, for example, agriculture), will have a hard time, as this theory does not explain reality, namely, that absolute advantage owing to disparities in technological levels and labor productivities plays an important role in international trade.

Hausmann and Rodrik (2006) also note that countries' capabilities are quite specific to each activity, and that countries export some products but do not export others that either seem to be very similar or are manufactured and exported by countries that also seem to have similar endowments. For example, they note that Pakistan exports soccer balls but not hats, while Bangladesh does the opposite. While this may be an anecdote, an in-depth understanding of Pakistan's export structure is fundamental in order to understand its prospects for structural transformation.

Analysis of Pakistan's export sector also reveals important characteristics on the extent and depth of the transformation of the economy. Table 4 reveals that although Pakistan's exports have become less concentrated (the share of the top ten exports has declined from 62.8% in 1986 to 49.7% in 2004), nine of the top ten export categories are textiles and apparel.

Table 4 also shows that the weighted average of the per capita GDPs of the countries exporting Pakistan's top 10 exports, denoted by PRODY, has declined significantly (from a value of 5,014 in 1986 to 3,458 in 2004), indicating that the country is "stuck" in exports that are being exported by ever poorer countries. And, the income level of Pakistan's exports, denoted by EXPY, a proxy for its export complexity (one can think of the idea of export complexity as an indicator of competitiveness), has not shown the increase expected from a country that is undergoing the kind of structural transformation that leads to faster growth, i.e., as that seen in economies that promote exports of more sophisticated goods (Figure 17).²¹ Pakistan's index in 1986 (4,664) is the same as in 2004 (4,628), which is about the same that Indonesia, Malaysia, Philippines, and Thailand had in the late 1970s; and well below the levels of the PRC and India in the 1980s.²²

²¹ To construct PRODY and EXPY, the methodology in Hausmann et al. (2005) and data from the United Nations Commodity Trade Statistics Database at the 5-digit level are used. First, the proxy for the income level of a commodity PRODY is constructed as the weighted average of the per capita GDPs of the countries exporting a given product (i.e., each

product has an associated PRODY) as $PRODY_k = \sum_j Y_j \times \frac{(x_{jk} / X_j)}{\sum_j (x_{jk} / X_j)}$, where Y_j is the per capita GDP of country j ; x_{jk} denotes exports of country j of product k ; X_j is total exports of country j , that is, $X_j = \sum_k x_{jk}$. Note that the weight of income per capita Y_j is the revealed comparative advantage of each country in each good it exports. The advantage of using this weighted average is as follows: a country may export less of a given product than another country in absolute terms. This may, however, be more in relative terms (i.e., revealed comparative advantage). This way, the first country's income per capita will be weighted more heavily in calculating the productivity level associated with the given product. The second step consists in constructing the productivity level associated with a country's export basket, EXPY, as the weighted average of the PRODY associated with each product, that is,

$EXPY_i = \sum_k PRODY_k \times \frac{x_{ki}}{X_i}$. Certainly, there is, by construction, a relationship between EXPY and income per capita. However, this is not a mechanical outcome. Hausmann et al. (2005, 10) note that "calculating country specific PRODYs by excluding own exports from the calculation of these measures does not change the results much."

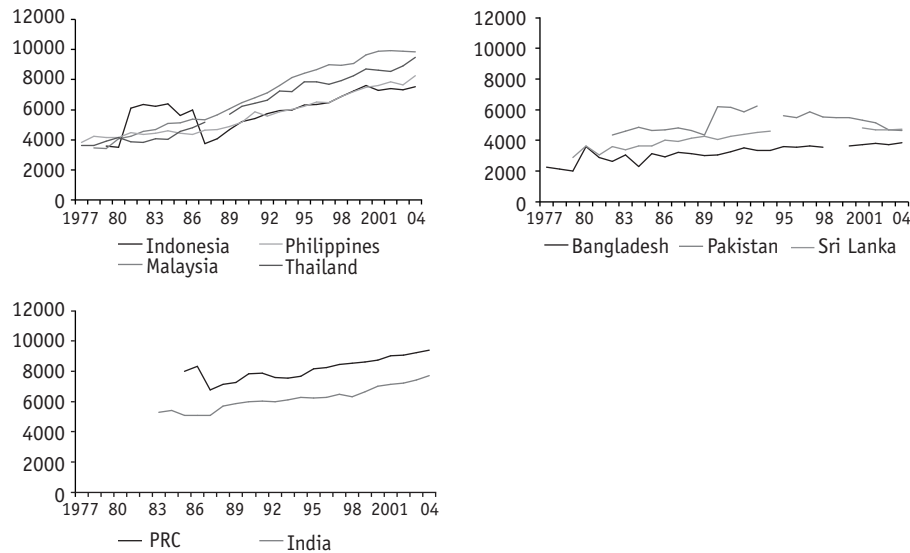
²² There is perhaps something wrong with the data. Pakistan's EXPY remained stagnant between 1981 and 1989 (at about 4,500). Then in 1990 it jumped to 6,000 and stayed there until 1993. There is no data for 1994. Then in 1995 the index took on a value of 5,594 and continued declining thereafter. In 2004 it stood at approximately the same level as in the 1980s.

TABLE 4
PAKISTAN'S TOP 10 EXPORTS

1986	PERCENT OF TOTAL EXPORTS	2004	PERCENT OF TOTAL EXPORTS
Rice, semimilled or milled (unbroken)	15.4	Other woven fabrics, less 85% of cotton, bleached, etc., finished	8.2
Other woven fabrics, less 85% of cotton, bleached, etc., finished	9.9	Bed linen of cotton	7.8
Carpets, carpeting and rugs, knotted—of wool or fine animal hair	9.6	Cotton yarn—measuring, per single yarn, from 14 to 40 km/kg, not for retail	7.5
Bed linen of cotton	6.2	Rice, semimilled, or milled (unbroken)	5.9
Other woven fabrics with 85% or more grey cotton, not mercerized	5.9	Toilet and kitchen linen of cotton	4.4
Toilet and kitchen linen of cotton	4.1	Undergarments, knitted or crocheted—of cotton, not elastic nor rubberized—men's and boy's, shirts	3.9
Goat and kid skin leather	3.4	Other woven fabrics with 85% or more grey cotton, not mercerized	3.6
Fabrics, woven, less 85% of continuous synthetic textile materials	3.0	Outerwear knitted or crocheted, not elastic nor rubberized—other, clothing accessories, nonelastic, knitted or crocheted—of cotton	3.0
Women's, girls', infants' outerwear, textile, not knitted or crocheted; other outer garments of textile fabrics, not knitted, crocheted	2.7	Men's and boys' outerwear, textile fabrics not knitted or crocheted—trousers, britches, and the like—of cotton	2.8
Medical, surgical, and veterinary instruments and appliances	2.7	Knitted or crocheted textile articles, nes, not elastics, etc.	
Percent share of top 10 exports	62.8	Percent share of top 10 exports	49.7
PRODY of the top 10 exports (weighted average of the per capita GDPs of the countries exporting a given product)	5,014	PRODY of the top 10 exports (weighted average of the per capita GDPs of the countries exporting a given product)	3,458
EXPY (weighted average of the PRODYs); income level of a country's export basket	4,664	EXPY (weighted average of the PRODYs). Income level of a country's export basket	4,628

Source: Author's calculations based on data from the United Nations Commodity Trade Statistics Database at the 5-digit level (United Nations, various years).

FIGURE 17
EXPORT COMPLEXITY SCORE



Source: Author's calculations based on data from Commodity Trade Statistics Database (United Nations, various years).

IV. THE PRODUCT SPACE: ON MONKEYS AND FORESTS

This section and Section V discuss two recent research areas in the field of structural change that should prove useful to Pakistan's policymakers: identification of product space and industrial policy.

Developing new activities and products is not an easy task for most developing countries. Lack of markets and coordination problems can create insurmountable difficulties. For this reason, new activities are rarely created in a vacuum, as their development has to take place in the context of existing capabilities, which are useful to the extent that they are similar to those of the new products and activities. However, the degree of similarity of capabilities may vary between any pair of activities. For example, one may think of a country that has developed capability, infrastructure, regulatory framework, a trained labor force, and knowledge in general in the production of garments. These capabilities may well be useful to develop a shoe industry, but are unlikely to be of much use in developing a new steel industry. Capabilities are specific to each activity.

For this reason, one can think of products as trees in the forest (the product space) being at some distance from each other in terms of capabilities (Hausmann and Klinger 2006). Firms are monkeys that live on trees. The distance between the trees reflects the similarity of the required capabilities. In general, it is easier for new activities to develop close to the areas where monkeys already live, since they will require similar capabilities. Producing very different new products (i.e., at larger distance) requires capabilities that the monkeys (firms) do not possess.

Hausmann and Klinger (2006) and Hidalgo et al. (2007) have proposed a measure of the distance between products, based on the fact that if the capabilities (e.g., infrastructure, technology) needed to produce two different products are similar, this would be revealed in the fact that countries that are good at one are also good at producing the other one. This idea of "proximity" (i.e., the idea

that the ability of a country to produce a product depends on its ability to produce other products) allows the authors to “map the space” of products in the world.²³ What are some characteristics of the forest or product space? There is, fundamentally, a high degree of heterogeneity, with a core and a periphery; some parts of the forest have trees (products) with many firms (monkeys), while other parts contain few. This implies that the development of comparative advantage in new products is strongly affected by the distance between the products being currently produced (i.e., a function of the existing comparative advantage) and the potential new ones. In their words, “*monkeys tend to jump short distances.*” The key to progressing in terms of sophistication is to position the country in a well-connected part of the forest where it is easier to move to other products.

This research shows that the way countries develop comparative advantage is far from random. Some developing countries produce in the periphery of the product space with few opportunities for diversification; others have developed capabilities easily deployable in a wide range of products creating a path to convergence. Indeed, progress is very slow in the area of the forest with few trees (few firms). First, the probability of jumping to an individual tree is strongly affected by how far the occupied trees are from it. And second, the average distance to the trees eventually occupied is much smaller than the distance to a randomly chosen tree. Moreover, the position of a country in the forest at a point in time is a good predictor of how quickly the country upgrades. Evidence indicates that this is not an easy process and that using the existing capabilities to develop new products is not automatic. In fact, when monkeys jump to new trees—or firms to new products—they land on the lower branches of the tree. Then, they move up move easily. This means that once a firm can start developing a new activity, it is easier to tackle coordination failures and gain the specific knowledge required. However, when a firm moves toward new products it has to start producing without the required capabilities, and this can be done only at lower qualities. For this reason, moving within products is easier and more feasible than between products. As Hidalgo et al. (2007) indicate their work has important policy implications:

“...the incentives to promote structural transformation in the presence of proximate opportunities are quite different from those required when a country hits a dead end. It is quite difficult for production to shift to products far away in the space, and therefore policies to promote large jumps are more challenging. Yet it is precisely these long jumps that generate subsequent structural transformation, convergence, and growth” (Hidalgo et al. 2007, 487).

V. INDUSTRIAL POLICY AS A CENTRAL PART OF PAKISTAN'S DEVELOPMENT STRATEGY

Pakistan's mission statement, according to the Planning Commission, is “to help create knowledge led, well governed enterprising and prosperous Pakistan through realistic and innovative policies and programmes delivered in the most cost effective fashion.”²⁴

Upgrading a country's production and export structures does not happen without a well-thought out and crafted “push.” Indeed, structural change in the successful Asian economies did not come naturally or easily. Though it is common to describe the transformation of the East Asian economies as a shift from garments into electronics and automobiles, the reality of what happened is much

²³ Strictly speaking, the proximity between two products is the minimum of the pairwise conditional probability of a country exporting a good given that it exports another one.

²⁴ This mission statement is engraved at the entrance of Pakistan's Planning Commission in Islamabad.

more complex. All this was a painstaking process that entailed careful identification of products that the country could produce profitably using existing capabilities; learning how to use new inputs and methods of production; and exploring new activities that required new capabilities. Indeed, in a world where agents have to explore, learn, and adapt to an unfolding and unpredictable environment, economic modernization is hardly preordained. The structural transformation of the successful Asian economies was the result of purposeful action in the form of *industrial policy* (IP) (Hausmann and Rodrik 2006, Rodrik 2004 and 2006). In footnote 17, it was noted that Pakistan has a technological level that allows it to manufacture nuclear weapons (like the old Soviet Union), while Singapore does not have that level. This, however, is no guarantee that the country can undergo successful structural transformation. The capabilities and institutions needed to develop a broad-based and sophisticated manufacturing sector that employs millions of workers are very different from those required to be able to make nuclear weapons. While both require political will, the latter requires the mobilization and coordination of a much wider group of participants in society in the context of a market economy, i.e., where globalization, fast technical change, competition and demand (i.e., what do consumers want?) are the rules the game. Singaporean companies understand this.

What is IP? Far from being interpreted as an exercise in “picking the winners”, in modern parlance, IP is an exercise in coordinating the different activities between public and private sectors with a view to identifying market failures that impede structural transformation. IP is also a process of eliciting information on significant externalities, and about constraints that exist and the opportunities available. This requires strategic collaboration between public and private sectors as well as development of the appropriate institutions for change. It does not apply only to the activities in the industrial sector but also those in agriculture and services.²⁵

Why IP? The reason is that markets alone are likely to undersupply the incentives and demand for new activities necessary to transform the economy. Today there is little economic determinism in development (i.e., countries follow a predetermined homogeneous trajectory) and a substantial role for policy is lacking. For example, many projects require simultaneous investments in order to be viable (e.g., it will be difficult to build a hotel if transportation infrastructure is not adequate). The coordination of investment decisions requires a signaling device to transmit information about present plans and future conditions. Moreover, uncertainty arising from lack of communication, that is, from one decision maker having no way of finding out the concurrent decisions and plans made by others, complicates things to the point that, if sufficiently great, may inhibit investment decisions and arrest growth.

In reality, many developing countries have adopted industrial policies in an attempt to accelerate the rate of industrialization and economic growth. The results have been mixed if judged from the varieties of growth performance under similar policies. This explains why the effectiveness of these policies is controversial; and why different views coexist on whether they made a difference and, if so, whether this was positive or negative (see, for example, Pack and Sagi 2006). This is the case even though observers and policymakers alike have amply documented the role of industrial

²⁵ Amsden (2000) and Amsden and Hikino (2000) argue that the new rules of the World Trade Organization allow countries to promote their industries, including the manufacturing sector in particular, under the umbrella of advancing science and technology (e.g., by setting up technology and parks). Subsidies in exchange for monitorable, results-oriented performance standards are acceptable. Countries can, for example, target national champions. The hurdles that developing countries face are of the following nature: (i) informal political pressures by the developed countries in favor of market opening; (ii) countries that make use of World Trade Organization rules to promote their industries are subject to “reciprocal control mechanisms”; and (iii) their lack of “vision.”

policy in fostering a fast rate of industrialization in East Asia (e.g., Amsden 1989, Wade 1990). An important reason for this state of affairs seems to be that consensus is lacking on precisely the key issue of how and under what conditions industrial policy can significantly alter the rate of capital accumulation and growth.

The successful policy interventions geared toward accelerating the transition between different patterns of specialization is the basis for Rodrik's (1994) interpretation of how Korea and Taipei, China got rich.²⁶ During these transitions, old comparative advantages were being eroded while new ones emerged slowly. Market incentives alone would have been unable to move the economy to a high growth path.²⁷ Indeed, Rodrik (1994) argued that, more than their export orientation, the distinguishing feature of these growth experiences was the sharp and sustained increase in their investment rates in the early 1960s. Through an array of government interventions, by subsidizing and coordinating investment decisions, government policy was successful in reallocating resources toward modern capital-intensive industries. With increasing returns in these activities, this reallocation raised the rate of return on capital and pushed the economy into a high growth path. Outward orientation followed because the higher investment rates increased the demand for imported capital goods. The relatively high level of skills of the labor force in both countries was a condition for the success of industrial policy.

One important lesson that Pakistan can learn from the successful Asian economies is how to develop an appropriate IP program that addresses questions such as: how can the country develop a culture of cooperation between the public and the private sector? Which private sector agents should be consulted first? Moreover, since structural transformation is also about fostering competition, what sector-specific reforms should be considered? Since structural transformation entails substantial labor reallocation and imbalances across sectors, how are these changes and their implications going to be managed? What complementary inputs to the market can the public sector provide? How should public spending on infrastructure and training be prioritized? What foreign firms should be targeted by foreign direct investment promotion agencies? And, given Pakistan's employment problem, what role could IP have in order to improve the situation?²⁸

What does it take for IP to succeed? It is impossible to provide a recipe, but it appears that willingness of the government to monitor the results and change its policies as needed is a key ingredient. Many industrial policy successes are the outcome of programs that produced poor results initially. Governments had to fine tune them in light of what they had learned. A government too involved in the industry cannot effectively do this, since the current beneficiaries of the failed policies would tend to block the changes. But, likewise, a government that simply watches from afar and keeps firms at arm's length does not accumulate the evidence to be effective. Rodrik (2004) argues that the basic elements of an institutional architecture of institutions for industrial policy are: (i) placing political leadership at the top; (ii) setting up coordination and deliberation councils;

²⁶ There is no doubt that these two countries used industrial policy in the sense of "picking the winners" and that mistakes were made. However, as Rodrik notes: "The trick for the government is not to pick winners, but to know when it has a loser" (Rodrik 2004, 12).

²⁷ Determination of their policymakers to sustain rapid industrialization was a fundamental factor.

²⁸ PIDE (2006) can be understood as an IP proposal. This document refers to the "need to *identify* specific sectors in which Pakistan should invest" to achieve high growth and development and to integrate them in the national development plans (PIDE 2006, 21; italics added). The identification process should not be an exercise in picking the winners.

and (iii) setting up mechanisms of transparency and accountability.^{29, 30} In the final analysis, it is fundamental that the main stockholders of this process be simultaneously involved. These are government, policymakers, and entrepreneurs. Each plays a key role in the design and implementation of a successful industrial policy program. While the government must show political commitment to structural change, policymakers will have to design the program, and entrepreneurs will have to implement it. The key to a successful transformation of Pakistan's economy lies in embedding private initiative in a framework of public action that encourages restructuring, diversification, and technological dynamism beyond what market forces on their own are capable of generating.

VI. CONCLUSIONS

This paper has provided an analysis of Pakistan's structural transformation during the last three decades from the perspective of recent literature on the topic. The basic tenets of this new literature are as follows.

- (i) Industrialization is the key to structural transformation and growth. This requires purposeful action, i.e., policy.
- (ii) Rapidly growing countries are those with large manufacturing sectors.
- (iii) Economic development requires diversification, not specialization. Specialization patterns tend to be indeterminate and be possibly shaped by idiosyncratic elements, not by factor endowments.
- (iv) Growth accelerations are associated with structural changes in the direction of manufacturing.
- (v) Countries that promote exports of more "sophisticated" goods grow faster.
- (vi) Developing new capabilities and activities is a difficult task. Some specialization patterns are more conducive than others to industrial upgrading.
- (vii) Industrial policy, viewed as an exercise in coordination between public and private sectors, can be an important development tool.

The empirical analysis provides valuable information about the possible areas where Pakistan's policymakers have to look into, in order to understand the relationship between structural transformation and the sustainability of a high growth rate. The main findings are as follows:

²⁹ Rodrik proposes 10 design principles for the formulation of industrial policy (Rodrik 2004): (i) incentives should be provided only to "new" activities; (ii) there should be clear benchmarks for success and failure; (iii) there must be a built-in sunset clause; (iv) public support must target activities, not sectors; (v) activities that are subsidized must have the clear potential of providing spillovers and demonstration effects; (vi) the authority for carrying out industrial policies must be vested in agencies with demonstrated competence; (vii) the implementing agencies must be monitored closely by a principal with a clear stake in the outcomes and who has political authority at the highest level; (viii) the agencies carrying out promotion must maintain channels of communication with the private sector; (ix) optimally, mistakes that result in "picking the losers" will occur; and (x) promotion activities need to have the capacity to renew themselves, so that the cycle of discovery becomes an ongoing one.

³⁰ An example of IP is the case of auto parts makers in the PRC. First, the government required foreign companies to enter into joint ventures with local enterprises, ensuring the transfer of technological capacities. Second, domestic content requirements compelled vehicle manufacturers to source more of their inputs domestically. Finally, state-owned enterprises proved to be breeding ground for private entrepreneurs.

- (i) Industry and services output growth rates are significantly higher than agriculture's, and given the service sector's high share in output, services are the major contributor to total output growth rate (over 50%). The contributions of agriculture and industry are significantly smaller. Growth in services labor productivity growth also accounts for the largest share of total labor productivity growth.
- (ii) Pakistan is a service economy from the point of view of its output structure, but an agricultural economy from the point of view of its employment structure.
- (iii) Intrasectoral labor productivity growth has contributed substantially more than reallocation of labor from agriculture into the other two sectors to overall labor productivity growth. The latter factor in fact plays a minor role accounting for overall labor productivity growth. Reallocation of labor from agriculture into services has been much more important than from agriculture into industry.
- (iv) Pakistan suffers from falling labor absorption as the absorption capacity of the service sector is not enough to compensate the falling capacity of agriculture and the stagnation of industry.
- (v) Although Pakistan's manufacturing share is not low, given its income per capita, trade ratio in GDP, and population, the share of this sector in total output has been stagnant since the 1970s. This contrasts with what has occurred in Indonesia, Malaysia, and Thailand, for example, which have seen their shares increase.
- (vi) The manufacturing sector is heavily concentrated in food and beverages and textiles. Together, they account for close to half of the sector's value-added.
- (vii) The level of technology of Pakistan's manufacturing sector is relatively low compared to that of other countries in Asia. Moreover, the share of manufacturing value-added accounted for by high-technology products is low and has remained stagnant during the last 40 years.
- (viii) Pakistan's level of labor productivity has increased very slowly since the 1970s. There is still plenty of room for catch-up with the developed world.
- (ix) The share of the top 10 exports in Pakistan's total exports has decreased significantly in the last two decades, although it is still highly concentrated in textiles. The weighed average of the per capita GDPs of the countries exporting Pakistan's top 10 exports has declined significantly, indicating that the country is "stuck" in exports that are being exported by ever poorer countries. And the income level of Pakistan's exports, a proxy for the country's export complexity and competitiveness, is at the same level it was two decades ago.

The conclusions one may derive from the empirical evidence may be somewhat negative. It is true that Pakistan's growth rate *cum* structural transformation have been lower and slower than those of other countries in Asia. Accelerating the rate of structural transformation must be a key objective of Pakistan's policymakers. As Pakistan's growth rate has accelerated in recent years and the contribution of investment to overall growth has increased, policymakers must seize this momentum to implement a growth strategy that aims at transforming the economy in the direction of the successful Asian countries. This does not mean that Pakistan should aim at emulating Korea, for example. It is not possible to do this, not only because the international environment is very different (perhaps less favorable to Pakistan today than to Korea 30 years ago), but also because the initial conditions of both countries are also very different (e.g., Pakistan's degree of poverty

and social inequalities). Despite this, there are lessons that can be studied and appropriately adapted. Perhaps the most important is that structural change requires purposeful actions and political will.

Sector-specific reforms with a view to fostering competition should be viewed from the point of view of transforming the economy. This requires a dose of good policy as the market alone will not do it. The paper has argued that a well-developed plan, in the form of industrial policy understood as strategic collaboration between public and private sectors, is an important tool. Industrial policy is not about picking winners. Identification of the product space along the lines of the new literature is the way to identify sectors. The idea is that a country has given capabilities that allow it to produce some products. These capabilities should also allow it to produce similar goods (because they require similar capabilities). Jumping successfully from the production of less sophisticated products (e.g., textiles) into the production of more sophisticated ones (e.g., electronics and automobiles) is not simply a matter of training more engineers and scientists at school, but of mastering the steps in between, the way the successful Asian countries did it. Without this, the effort at industrial upgrading will be an exercise in futility.

APPENDIX TABLE 1
 SHARE OF MANUFACTURING SUBSECTOR, BY DECADE—DEVELOPING ASIA

DMC	FOOD AND BEVERAGES	TEXTILES	APPAREL, LEATHER, AND FOOTWEAR	WOOD AND WOOD PRODUCTS	PAPER AND PAPER PRODUCTS	PRINTING AND PUBLISHING	INDUSTRIAL CHEMICALS	PETROLEUM AND COAL PRODUCTS	RUBBER AND PLASTIC PRODUCTS	NONMETAL MINERAL PRODUCTS	BASIC METALS	METAL PRODUCTS	NON-ELECTRICAL MACHINERY	ELECTRICAL MACHINERY	TRANSPORT EQUIPMENT	OTHERS	TOTAL
1970s																	
China, People's Rep. of	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
India	11.19	20.53	0.99	0.68	2.57	2.03	14.79	2.60	2.46	3.80	11.78	3.16	7.67	7.23	7.38	1.14	100.00
NIES																	
Hong Kong, China	5.18	17.96	26.60	1.93	1.27	3.70	1.66	0.00	9.22	0.94	1.15	7.50	2.19	11.41	2.60	6.68	100.00
Korea, Rep. of	18.41	14.43	5.76	2.81	2.17	2.03	9.45	5.51	4.28	5.29	6.62	3.05	3.26	8.17	5.96	2.80	100.00
Singapore	6.87	2.59	3.77	4.19	1.06	3.66	5.02	16.79	3.60	2.97	2.03	4.84	7.53	19.00	12.70	3.39	100.00
Taipei, China	16.42	7.98	5.05	3.27	2.14	5.26	6.28	5.19	4.76	5.20	4.20	4.77	9.50	9.04	4.91	6.02	100.00
ASEAN 4																	
Indonesia	39.41	14.68	1.50	3.77	1.61	1.55	11.21	0.00	4.42	6.84	0.71	3.37	1.46	4.10	4.98	0.39	100.00
Malaysia	25.06	5.38	1.52	12.66	0.85	4.32	6.28	3.09	12.23	4.93	2.94	3.79	2.86	9.74	3.29	1.08	100.00
Philippines	37.22	7.56	2.69	4.46	3.85	1.46	12.30	7.65	3.26	4.39	3.47	2.51	1.35	3.11	4.08	0.65	100.00
Thailand	41.63	15.63	0.59	3.61	1.47	1.41	5.26	6.29	2.94	7.93	2.42	3.01	0.71	2.06	4.63	0.39	100.00
Other Southeast Asia																	
Myanmar	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Viet Nam	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Other South Asia																	
Bangladesh	31.44	37.26	1.64	0.30	2.27	0.68	13.59	0.43	0.50	1.80	3.85	1.22	0.57	2.05	1.38	1.03	100.00
Bhutan	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Nepal	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Pakistan	30.45	27.78	2.04	0.26	1.61	1.22	11.20	5.27	1.80	4.43	3.06	1.62	1.84	3.31	2.99	1.11	100.00
Sri Lanka	28.06	13.86	6.66	1.78	3.59	0.84	8.80	5.36	6.31	8.48	1.59	4.01	3.29	4.29	1.83	1.24	100.00
Pacific DMCs																	
Cook Islands																	
Fiji	63.14	0.00	2.03	8.64	1.74	3.25	2.57	0.00	1.98	5.26	0.00	5.68	1.44	0.89	3.01	0.37	100.00
Papua New Guinea	36.90	0.17	0.59	15.86	1.14	3.29	5.23	0.00	0.75	2.61	0.39	5.79	8.27	2.06	13.67	3.28	100.00
Tonga	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.

continued.

APPENDIX TABLE 1. CONTINUED.

DMC	FOOD AND BEVERAGES	TEXTILES	APPAREL, LEATHER, AND FOOTWEAR	WOOD AND WOOD PRODUCTS	PAPER AND PAPER PRODUCTS	PRINTING AND PUBLISHING	INDUSTRIAL CHEMICALS	PETROLEUM AND COAL PRODUCTS	RUBBER AND PLASTIC PRODUCTS	NONMETAL MINERAL PRODUCTS	BASIC METALS	METAL PRODUCTS	NON-ELECTRICAL MACHINERY	ELECTRICAL MACHINERY	TRANSPORT EQUIPMENT	OTHERS	TOTAL
1980s																	
China, People's Rep. of	12.36	12.33	3.07	1.45	2.05	1.18	11.45	4.79	3.69	6.89	9.54	4.36	13.81	5.94	3.88	3.20	100.00
India	11.81	14.18	1.40	0.53	1.81	1.88	14.82	3.85	3.17	4.80	12.18	2.88	8.50	8.41	8.50	1.32	100.00
NIEs																	
Hong Kong, China	5.52	14.77	24.59	1.29	1.67	4.93	1.61	0.02	8.46	1.01	0.69	7.02	4.05	13.74	2.36	8.26	100.00
Korea, Rep. of	13.13	10.35	5.88	1.58	2.26	2.29	8.78	3.95	5.31	4.66	7.59	4.44	5.32	12.95	8.23	3.26	100.00
Singapore	5.32	0.84	3.36	1.99	1.45	4.15	9.12	9.46	2.69	2.29	1.43	6.11	10.01	29.95	8.92	2.92	100.00
Taipei, China	10.95	7.66	6.79	2.83	2.72	3.08	7.86	6.41	7.37	3.77	5.92	4.30	5.82	12.47	6.00	6.04	100.00
ASEAN 4																	
Indonesia	26.90	11.40	2.45	10.71	1.71	1.56	11.09	0.00	5.37	5.20	7.26	4.68	1.19	3.45	6.57	0.46	100.00
Malaysia	20.23	3.67	2.48	7.81	1.28	3.67	11.72	2.76	8.68	6.40	3.60	3.38	2.80	15.81	4.12	1.59	100.00
Philippines	35.76	5.44	5.27	4.32	2.69	1.39	11.46	10.10	3.35	3.26	4.64	1.96	1.22	5.69	2.48	0.96	100.00
Thailand	33.40	10.37	3.03	1.94	1.56	7.13	5.83	5.52	6.31	7.50	3.96	2.64	0.27	4.85	4.38	1.30	100.00
Other Southeast Asia																	
Myanmar	34.13	0.00	0.00	15.65	0.00	0.00	0.00	0.00	19.13	4.68	19.64	1.89	0.00	0.00	0.00	4.88	100.00
Viet Nam	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Other South Asia																	
Bangladesh	23.96	31.36	4.96	0.87	2.50	1.13	17.46	4.38	0.57	2.00	3.53	1.40	1.30	2.42	1.41	0.77	100.00
Bhutan	19.64	5.27	0.00	19.85	0.29	1.09	22.86	0.00	2.49	27.99	0.00	0.51	0.00	0.00	0.00	0.00	100.00
Nepal	41.30	15.96	8.10	2.48	1.13	0.94	6.05	0.00	2.21	13.00	3.02	2.83	0.00	2.24	0.00	0.75	100.00
Pakistan	30.94	18.14	2.37	0.39	1.15	1.06	14.29	6.01	1.80	7.75	6.20	1.06	2.14	3.26	2.89	0.55	100.00
Sri Lanka	49.60	7.84	9.30	1.60	1.98	1.52	4.36	5.74	5.06	6.46	0.85	1.50	0.92	1.12	0.69	1.46	100.00
Pacific DMCs																	
Cook Islands	10.95	7.66	6.79	2.83	2.72	3.08	7.86	6.41	7.37	3.77	5.92	4.30	5.82	12.47	6.00	6.04	100.00
Fiji	59.99	3.03	1.67	8.30	2.15	4.18	4.45	0.00	2.41	4.58	0.00	4.97	0.86	0.28	2.43	0.71	100.00
Papua New Guinea	52.67	0.13	0.59	17.35	1.22	2.71	3.20	0.00	0.97	3.18	0.55	7.37	5.22	0.53	4.29	0.00	100.00
Tonga	69.24	0.00	4.01	8.66	0.69	3.17	1.61	0.00	0.00	5.36	0.00	5.12	0.00	0.66	0.87	0.61	100.00

continued.

APPENDIX TABLE 1. CONTINUED.

DMC	FOOD AND BEVERAGES	TEXTILES	APPAREL, LEATHER, AND FOOTWEAR	WOOD AND WOOD PRODUCTS	PAPER AND PAPER PRODUCTS	PRINTING AND PUBLISHING	INDUSTRIAL CHEMICALS	PETROLEUM AND COAL PRODUCTS	RUBBER AND PLASTIC PRODUCTS	NONMETAL MINERAL PRODUCTS	BASIC METALS	METAL PRODUCTS	NON-ELECTRICAL MACHINERY	ELECTRICAL MACHINERY	TRANSPORT EQUIPMENT	OTHERS	TOTAL
1990s																	
China, People's Rep. of	14.66	8.02	4.48	1.31	1.95	1.14	11.44	3.62	3.43	7.34	10.24	3.34	9.19	10.35	6.35	3.15	100.00
India	12.08	9.97	2.79	0.39	1.80	1.58	19.14	4.49	3.28	4.66	12.17	2.52	7.39	7.30	8.69	1.75	100.00
NIEs																	
Hong Kong, China	10.44	13.06	16.00	0.52	2.20	11.43	2.36	0.10	3.90	1.87	0.87	5.08	8.97	12.25	3.72	7.24	100.00
Korea, Rep. of	9.34	6.01	4.52	1.86	2.29	2.52	8.89	3.58	4.78	4.73	6.89	5.00	8.93	16.85	11.68	2.11	100.00
Singapore	3.70	0.33	1.31	0.93	1.34	4.51	10.03	5.82	2.97	1.93	0.67	6.29	27.32	22.92	7.05	2.86	100.00
Taipei, China	9.22	6.43	3.89	1.96	2.20	1.32	9.04	7.21	7.11	4.53	7.06	6.74	4.79	17.35	7.61	3.54	100.00
ASEAN 4																	
Indonesia	20.05	10.29	7.11	8.77	3.92	1.81	9.83	0.13	4.48	2.91	7.60	3.74	1.55	6.09	10.64	1.08	100.00
Malaysia	9.75	3.01	2.16	6.95	1.59	2.63	9.31	2.69	7.93	5.26	3.08	4.02	5.07	29.41	5.15	1.99	100.00
Philippines	33.25	3.39	6.30	1.92	2.01	1.54	13.09	7.58	3.39	4.40	5.07	1.72	1.34	10.06	3.68	1.26	100.00
Thailand	15.52	9.24	7.32	1.56	1.09	15.42	2.31	8.89	2.99	6.00	3.00	2.06	10.96	6.69	5.16	1.80	100.00
Other Southeast Asia																	
Myanmar	36.20	0.00	1.39	9.96	0.00	0.00	23.28	0.00	5.99	8.20	9.92	0.35	0.00	0.00	0.00	4.74	100.00
Viet Nam	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Other South Asia																	
Bangladesh	25.08	16.72	21.60	0.76	1.75	2.11	12.81	0.51	0.54	4.92	2.86	1.20	0.33	4.04	4.27	0.50	100.00
Bhutan	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Nepal	32.26	26.25	11.07	2.62	1.14	0.97	4.80	0.03	2.56	9.92	2.39	3.61	0.01	1.82	0.00	0.54	100.00
Pakistan	22.89	25.06	2.80	0.37	1.54	2.00	15.50	3.26	1.42	7.76	5.13	0.81	2.09	5.43	3.05	0.88	100.00
Sri Lanka	40.00	8.87	20.25	0.99	1.40	1.13	5.26	1.56	6.41	4.49	0.95	1.05	1.63	1.39	1.98	2.63	100.00
Central Asia																	
Mongolia	36.80	17.58	21.14	4.28	0.00	1.59	1.14	0.00	0.00	3.98	0.15	2.41	0.00	0.64	0.00	10.29	100.00
Pacific DMICs																	
Cook Islands	9.22	6.43	3.89	1.96	2.20	1.32	9.04	7.21	7.11	4.53	7.06	6.74	4.79	17.35	7.61	3.54	100.00
Fiji	48.73	12.67	0.96	10.44	3.37	5.76	5.41	0.00	2.33	3.70	0.00	3.66	0.99	0.00	1.07	0.92	100.00
Papua New Guinea	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Tonga	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.

continued.

APPENDIX TABLE 1. CONTINUED.

DMC	FOOD AND BEVERAGES	TEXTILES	APPAREL, LEATHER, AND FOOTWEAR	WOOD AND WOOD PRODUCTS	PAPER AND PAPER PRODUCTS	PRINTING AND PUBLISHING	INDUSTRIAL CHEMICALS	PETROLEUM AND COAL PRODUCTS	RUBBER AND PLASTIC PRODUCTS	NONMETAL MINERAL PRODUCTS	BASIC METALS	METAL PRODUCTS	NON-ELECTRICAL MACHINERY	ELECTRICAL MACHINERY	TRANSPORT EQUIPMENT	OTHERS	TOTAL
2000-03																	
China, People's Rep. of	14.30	6.25	4.73	1.35	2.16	1.07	11.59	3.95	3.57	5.48	9.40	3.20	7.34	15.63	7.59	2.38	100.00
India	13.22	9.01	2.78	0.52	2.33	1.53	20.77	5.61	3.63	5.68	10.19	2.66	6.81	5.87	7.18	2.20	100.00
NIES																	
Hong Kong, China	9.31	11.19	8.89	0.19	1.29	19.87	3.68	0.00	1.78	3.00	1.09	2.62	5.57	19.54	5.36	6.63	100.00
Korea, Rep. of	8.19	4.81	3.12	1.44	2.25	2.47	9.53	2.48	4.17	4.00	6.48	4.06	11.28	19.76	14.06	1.91	100.00
Singapore	2.34	0.18	0.76	0.70	0.78	3.54	17.35	4.20	2.86	1.03	0.29	5.37	21.95	26.08	8.16	4.42	100.00
Taipei,China	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
ASEAN 4																	
Indonesia	21.25	8.84	7.17	8.67	5.51	1.53	11.01	0.09	4.45	0.04	4.68	2.50	2.90	8.30	11.93	1.15	100.00
Malaysia	8.39	2.18	1.75	5.75	2.11	1.99	8.08	8.63	6.96	4.91	2.64	3.17	9.10	27.11	4.98	2.25	100.00
Philippines	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Thailand	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Other Southeast Asia																	
Myanmar	59.85	0.00	1.25	0.89	0.00	0.00	0.00	0.00	6.54	0.37	12.20	2.80	5.07	3.16	5.71	2.15	100.00
Viet Nam	30.19	4.55	16.42	2.36	1.75	2.21	6.26	0.41	3.42	10.57	2.17	2.62	2.37	5.81	6.92	1.97	100.00
Other South Asia																	
Bangladesh	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Bhutan	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Nepal	45.42	10.48	8.78	1.50	1.46	2.12	10.40	0.00	3.98	6.43	2.26	5.23	0.07	1.57	0.07	0.21	100.00
Pakistan	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Sri Lanka	38.57	10.48	20.81	0.64	1.95	0.68	3.76	3.11	7.12	4.30	0.21	0.75	1.71	1.64	2.29	1.96	100.00

Source: Authors' calculations based on data from INDSTAT (UNIDO 2005).

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