ERD WORKING PAPER SERIES NO. 107

Sectoral Engines of Growth in Developing Asia: Stylized Facts and Implications

Jesus Felipe, Miguel León-Ledesma,
Matteo Lanzafame, and Gemma Estrada

November 2007

Asian Development Bank

About the Paper

Jesus Felipe, Miguel León-Ledesma, Matteo Lanzafame, and Gemma Estrada analyze the role that the different sectors of the economy have played as engines of growth in developing Asia. Both industry and services have propelled growth in the region. Likewise, technological spillovers, especially from Japan, have also played an important role as a source of growth.

ADB

Sectoral Engines of Growth in Developing Asia: Stylized Facts and Implications

Jesus Felipe, Miguel León-Ledesma,

Matteo Lanzafame, and Gemma Estrada

Jesus Felipe is Principal Economist in the Central and West Asia Department, Asian Development Bank; Miguel León-Ledesma is Reader, Department of Economics, in the University of Kent (Canterbury, U.K.); Matteo Lanzafame is Lecturer, Dipartimento di Economia, Statistica, Matematica e Sociologia "V Pareto", Universita degli Studi di Messina; and Gemma Estrada is Economics Officer in the Macroeconomics and Finance Research Division, Asian Development Bank. This paper represents the views of the authors and does not represent those of the institutions or countries they represent.

Asian Development Bank

FOREWORD

The ERD Working Paper Series is a forum for ongoing and recently completed research and policy studies undertaken in the Asian Development Bank or on its behalf. The Series is a quick-disseminating, informal publication meant to stimulate discussion and elicit feedback. Papers published under this Series could subsequently be revised for publication as articles in professional journals or chapters in books.

CONTENTS

ABSTRACT

This paper provides an analysis of developing Asia's growth experience from the point of view of its structural transformation during the last three decades. The most salient feature of this transformation has been the significant decrease in the share of agriculture and the parallel increase in the share of services. The analysis uses Kaldor's framework to discuss whether industry plays the role of engine of growth in developing Asia. The empirical results show first, that both industry and services play such a role; and second, there is evidence of endogenous, growth-induced technological progress. Likewise, the technology gap approach supports the view that technological spillovers have fostered growth in developing Asia.

I. INTRODUCTION

Except for those countries well endowed with natural resources such as oil, growth is always linked to the structural transformation of the economy. Indeed, the growth experience of the developed economies since the 19th century reveals that growth was associated to changes in the structure of the economy. More recently, the experience of the successful Asian economies (Republic of Korea [henceforth Korea]; Malaysia; Taipei,China etc.) also shows that high growth has been associated with deep changes in the structure of these economies. Moreover, many economists see the development of a modern industrial sector as the key for propelling structural transformation.

Structural transformation is reflected in changes in output and employment compositions. An economy that grows as a result of transformation generates new activities characterized by higher productivity and increasing returns to scale. The transition across different patterns of production and specialization also 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.

As Rodrik (2006) reminds us, development economists of the "old" school understood the key role that structural transformation plays in the course of development. Among these, it was probably Nicholas Kaldor (1966 and 1967) who provided the most thorough explanation of why industry plays the role of "engine of growth." Indeed, the so-called "Kaldor's Laws" provide a solid starting point for sector analyses of growth and structural change.

The purpose of this paper is to analyze developing Asia's growth experience in the context of structural transformation. Growth and structural transformation are interrelated, 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 in terms of *how* they do it (i.e., by using different inputs, including methods of production).

Specifically, we attempt to answer the following questions: (i) What has been the extent of structural change in developing Asia during the last three decades? (ii) What is the contribution of the different sectors to the growth performance of the Asian economies? (iii) What is the contribution of structural change to productivity growth and catching up?

The rest of the paper is structured as follows. Section II documents the extent of structural transformation in developing Asia. Section III provides a brief summary of the literature on Kaldor's laws. Section IV discusses the empirical evidence provided by the laws. Section V complements the analysis of growth and structural transformation in Asia through Kaldor's laws with an analysis of the importance of structure and technology diffusion. Section VI summarizes the main findings.

II. STRUCTURAL TRANSFORMATION IN DEVELOPING ASIA

During the last three decades, most countries in developing Asia have undergone massive structural change, in particular in terms of changes in both output and employment sectoral shares. Figures 1, 2, and 3 show scatterplots of the output and employment shares of agriculture, industry, and services vis-à-vis income per capita, pooling data since 1970 for the whole world. Figure 1 shows that the shares of agricultural output and employment decline as countries become richer. Figure 2 shows that as countries' income per capita increases, so do the shares of output and employment in industry, although there seems to be a point beyond which these two shares start declining. Figure 2 also shows a wide dispersion in these shares for a given income per capita. Finally, Figure 3 shows that the shares of output and employment in services clearly increase with increase in income per capita. The relationships described between sectors' shares and income per capita is referred to as logistic pattern. It is based on Engle's law (demand explanation) and on the differential productivity growth rates across sectors (supply explanation).

FIGURE 1
AGRICULTURAL OUTPUT AND EMPLOYMENT SHARES VERSUS PER CAPITA GDP, ALL ECONOMIES
(LOGARITHMIC SCALE), 1970–2004

Sources: Asian Development Bank, *Statistical Database System,* downloaded 14 September 2006; National Bureau of Statistics (various years), *China Statistical Yearbook;* Sundrum (1997) and Chadha and Sahu (2002), cited in Anant et al. (2006); World Bank, *World Development Indicators* online database, downloaded 4 August 2006. Data for Taipei,China were downloaded from http://eng. stat.gov.tw/public/Data/782617221171.xls and http://eng.dgbas.gov.tw/public/data/dgbas03/bs2/yearbook_eng/y025I.pdf on 2 October 2006.
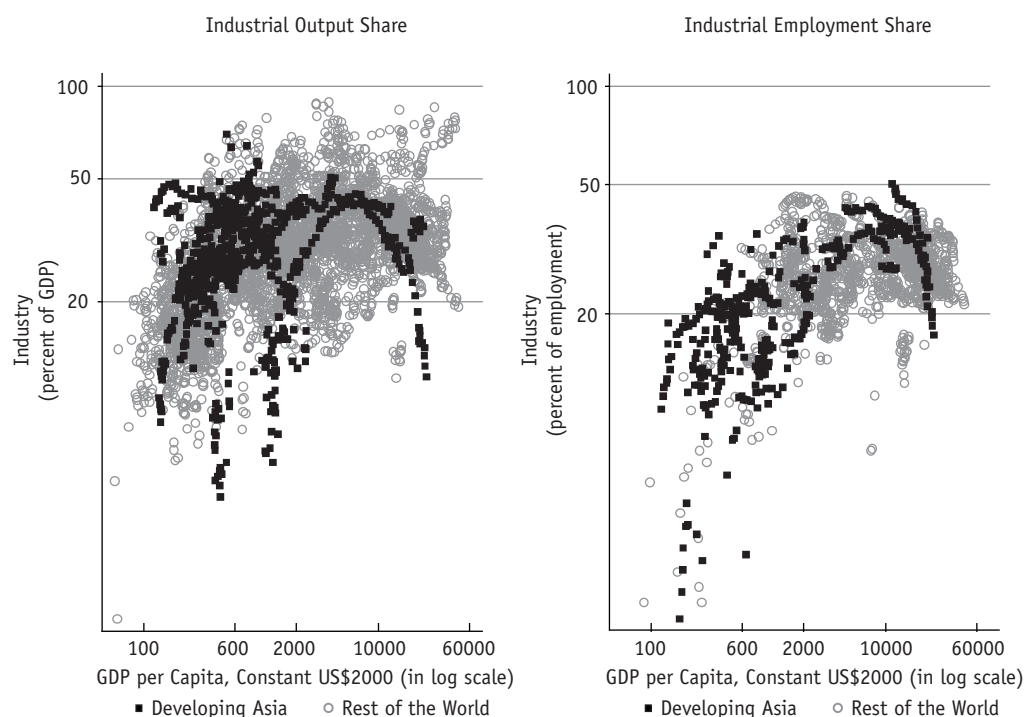
Appendix Tables 1, 2, and 3 show output and employment shares of the three sectors of the economy as well as of the manufacturing subsector by decade for developing Asia. The share

of agricultural output in total output has declined significantly in all regions during the last 30 years. Especially significant are the declines that occurred in the People's Republic of China (PRC) and India. Parallel to this decline, there has been an increase in the share of services also in all regions. The share of industry has increased significantly in some parts of developing Asia (e.g., ASEAN-4,[1] Other Southeast Asia, Other South Asia); remained the same in the PRC; and increased by a small margin in India.

The share of employment in agriculture has also declined across the region, except in Central and West Asia (although in 2000–2004, agriculture was still the largest employer in developing Asia in 12 out of 23 countries for which data was available). This is the result of the convulsion that the region underwent after the collapse of the Soviet Union. In general, the decline in agricultural employment has occurred at a much slower pace than that in output.

As in the case of the output share, there has been a generalized increase in the share of employment in services in all regions. Employment in industry has increased significantly in the ASEAN-4 countries (except the Philippines) and by a small margin in India; it has not changed in the PRC; and has suffered a decline in the newly industrialized economies or NIEs (especially Hong Kong, China) and across most of Central and West Asia.

FIGURE 2
INDUSTRY OUTPUT AND EMPLOYMENT SHARES VERSUS PER CAPITA GDP, ALL ECONOMIES
(LOGARITHMIC SCALE), 1970–2004

Sources: Asian Development Bank, *Statistical Database System,* downloaded 14 September 2006; National Bureau of Statistics (various years), *China Statistical Yearbook;* Sundrum (1997) and Chadha and Sahu (2002), cited in Anant et al. (2006); World Bank, *World Development Indicators* online database, downloaded 4 August 2006. Data for Taipei,China were downloaded from http://eng.stat.gov.tw/public/Data/782617221171.xls and http://eng.dgbas.gov.tw/public/data/dgbas03/bs2/yearbook_eng/y025I.pdf on

---

[1] The ASEAN-4 economies are Indonesia, Malaysia, Philippines, and Thailand.

2 October 2006.

The NIEs have undergone severe deindustrialization as manufacturing has lost significant weight in total output between the 1970s and 2000-2004 (see Rowthorn and Ramaswamy [1997 and 1999] and Pieper [2000]). This is not a negative phenomenon, but the natural consequence of the industrial dynamism of these economies. It is a feature of economic development that reflects their success. In terms of manufacturing employment, all four NIEs have clearly deindustrialized, especially Hong Kong, China where the share decreased by about 25 percentage points in two decades. The declines in the other three economies are significant but smaller. These developments should not be interpreted as "failure" of these economies, but as the result of the natural and dynamic process of development, i.e., the transition to service-led economies. Rowthorn and Ramaswamy (1997 and 1997) have noted that this group of countries is going through a process similar to that of the countries of the Organisation for Economic Co-operation and Development (OECD), although it must be noted that it is a process affecting Taipei,China and, especially, Hong Kong, China and to a much lesser extent Korea and Singapore. This is the result of transferring production facilities to the PRC. In Korea and Singapore, the share of manufacturing has remained at about 27% since the 1980s.

FIGURE 3
SERVICES OUTPUT AND EMPLOYMENT SHARES VERSUS PER CAPITA GDP, ALL ECONOMIES
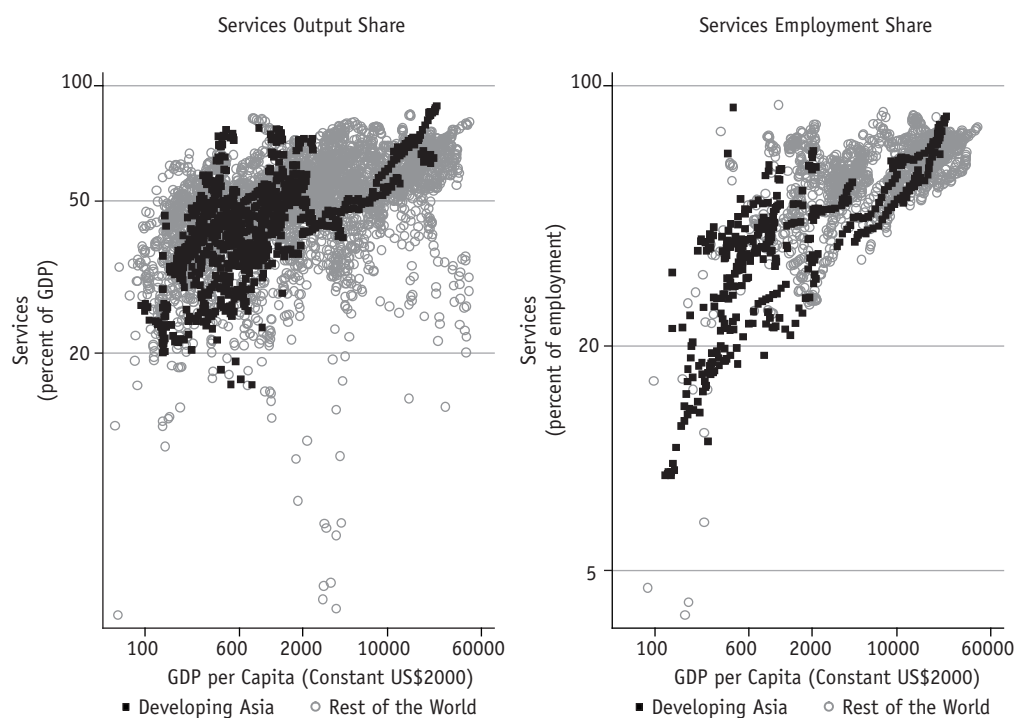(LOGARITHMIC SCALE), 1970–2004

Sources: Asian Development Bank, *Statistical Database System,* downloaded 14 September 2006; National Bureau of Statistics (various years), *China Statistical Yearbook;* Sundrum (1997) and Chadha and Sahu (2002), cited in Anant et al. (2006); World Bank, *World Development Indicators* online database, downloaded 4 August 2006. Data for Taipei,China were downloaded from http://eng. stat.gov.tw/public/Data/782617221171.xls and http://eng.dgbas.gov.tw/public/data/dgbas03/bs2/yearbook_eng/y025I.pdf on 2 October 2006.
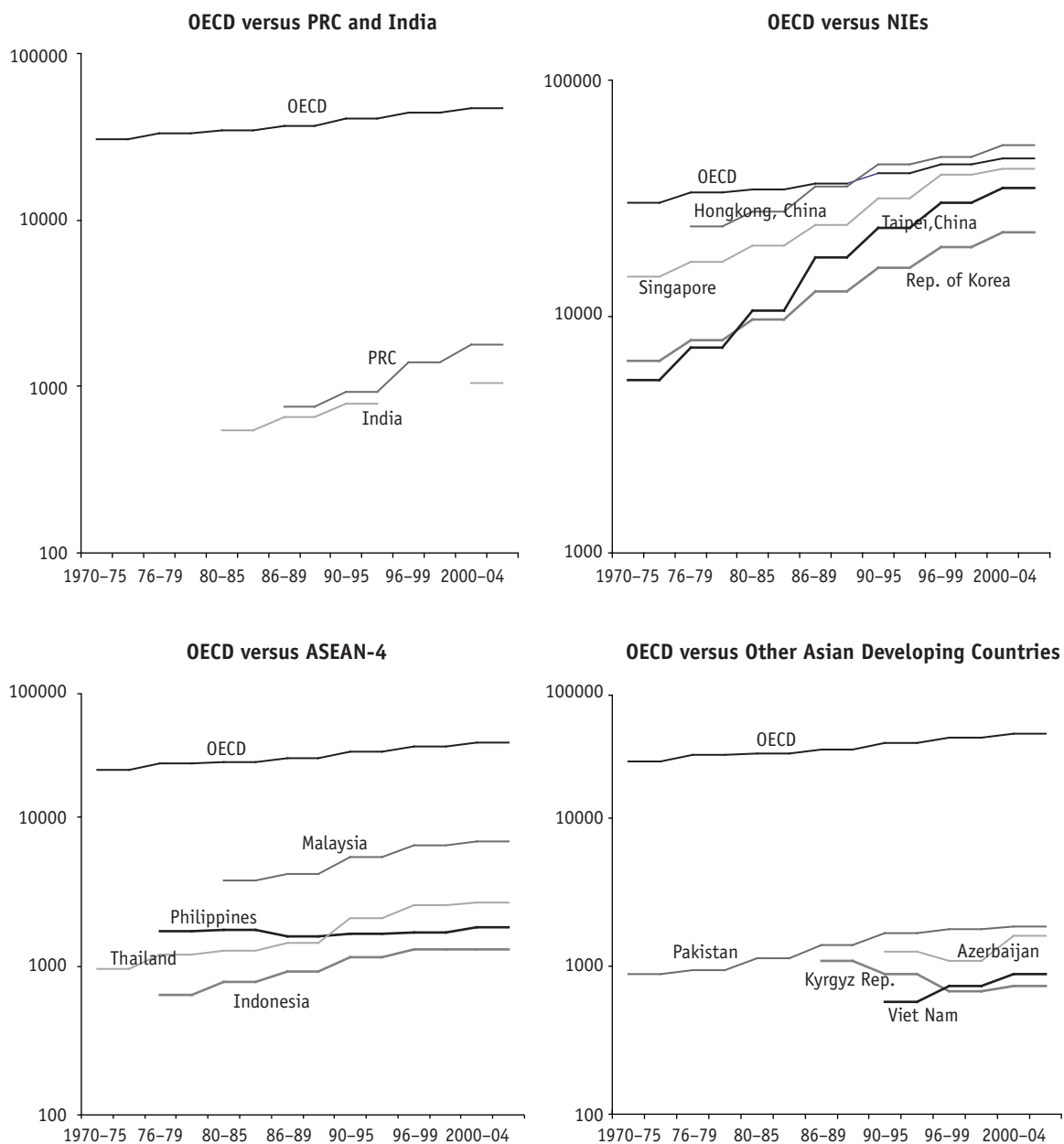
The ASEAN-4 economies and other Southeast Asia have increased their manufacturing shares significantly, both in terms of output and employment. The exception is the Philippines, which had the highest manufacturing output share among the ASEAN-4 in the 1970s, but by 2000–2004 the share had decreased by about 3 percentage points and was the lowest in the group.

Although Indonesia, Malaysia, and Thailand are cases of what can be labeled as "successful industrialization", this must be qualified with the following two observations. First, other than Korea; Kyrgyz Republic; Malaysia; and Taipei,China, none of the other economies in Appendix Table 3 had in 2000–2004 a share of employment in manufacturing as high as that of the OECD countries. Second, in terms of labor productivity (Figure 4), there is a large differential between most developing Asian countries and the OECD average. Indeed, it appears that many countries across developing Asia have industrialized at low levels of productivity. This could be due to two reasons: (i) that the product mix of new employment has been toward relatively low-productivity industries; and/or (ii) that the increase in employment has taken place in low-productivity techniques.

Other than the NIEs, today's level of productivity in the rest of the developing Asia is still below the OECD average during the early 1970s. The level of productivity in the secondary sector is significantly higher than that in agriculture. And, the level of labor productivity in the service sector is above that in industry and manufacturing. Labor productivity in industry in the Philippines in 2000–2004 was below the 1978 level, and in Indonesia it has barely increased. In most countries, labor productivity in agriculture is still very low.

Only the NIEs have achieved labor productivity levels that approach those of the OECD countries, and within this group, Singapore and Hong Kong, China are city-states with very small rural sectors. Korea and Taipei,China are significantly behind. Moreover, although in all Asian countries productivity has improved significantly (with the noted exception of the Philippines), the absolute gap with respect to the OECD productivity level has widened. In the case of Malaysia, the country with the highest productivity levels outside the OECD and the NIEs, the absolute productivity differential with respect to the OECD in industry has almost doubled, from $21,786 in 1980–1985 to $38,946 in 2000–2004, despite the fact that Malaysia's productivity in industry increased by a factor of 1.7. In other countries and sectors the gap has widened by even larger amounts.

Figure 4
Total Labor Productivity, Logarithmic Scale (constant 2000 US dollars)

OECD versus PRC and India

OECD versus NIEs

OECD versus ASEAN-4

OECD versus Other Asian Developing Countries

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.

## III. STRUCTURAL CHANGE, INDUSTRIALIZATION, AND KALDOR'S LAWS

The evidence presented so far clearly points toward a rapid process of structural transformation in developing Asia. In order to understand the potential role of this transformation, it is important to view these changes in light of the development theory literature. It is in this context that the Kaldorian sectoral growth facts or laws (Kaldor 1966 and 1967) become very relevant as an approach to the issue of how structural change has affected growth in developing Asia, and what is the role that the different sectors have played. The Kaldorian facts bring together the notion of "engine of growth" sectors, "economies of scale", and "sectoral shifts" in a simple yet informative way. This framework recognizes that some sectors may play a more important role in pulling the rest of the economy and generating productivity gains through economies of scale.

Kaldor's laws allow us to address empirically the following questions: (i) Is manufacturing still an engine of growth in Asia? (ii) Can services play a role as engine of growth? (iii) What are the most dynamic sectors in Asian countries? (iv) Can we expect continued growth in Asia, given the recent sectoral developments? It should be noted that we view Kaldor's laws more as a series of stylized facts and historical regularities rather than a theory of economic development. These facts are compatible with a diverse range of theories of growth. What is important is that these correlations are presented at the sectoral level and, hence, are helpful in analyzing and comparing patterns of economic growth and the role of structure. In this sense, our objective is "estimating", rather than "testing", these laws, following the distinction put forward by Leamer and Levinsohn (1995).

The role attributed to manufacturing in the process of take-off and subsequent catch-up is usually a key element of sector studies of growth. It is no surprise, therefore, that economists and policymakers worry about swings in manufacturing. Though economies like Australia, Canada, New Zealand, the Scandinavian countries, and others relied heavily on the primary sector for their development, they all experienced periods of strong industrial growth and diversification as essential components of their sustained economic growth. Rodrik (2006) has argued that sustained growth requires a dynamic industrial base. One can, therefore, speak of the "logic of industrialization" (Nixson 1990, 313) and understand why many developing countries have adopted 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 that 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 5 shows the scatter plot of the annual growth rate of output vis-à-vis the absolute change in the share of manufacturing in total output for the 1970s up to 2000–2004. The figure documents the positive correlation between both variables. Economies in the first quadrant with the highest increases in the manufacturing share and in the output growth rate are Cambodia, Indonesia, Korea, Lao People's Democratic Republic (Lao PDR), Malaysia, and Thailand.

FIGURE 5
OUTPUT GROWTH VERSUS CHANGE IN MANUFACTURING OUTPUT SHARE, 1970S—2000–2004
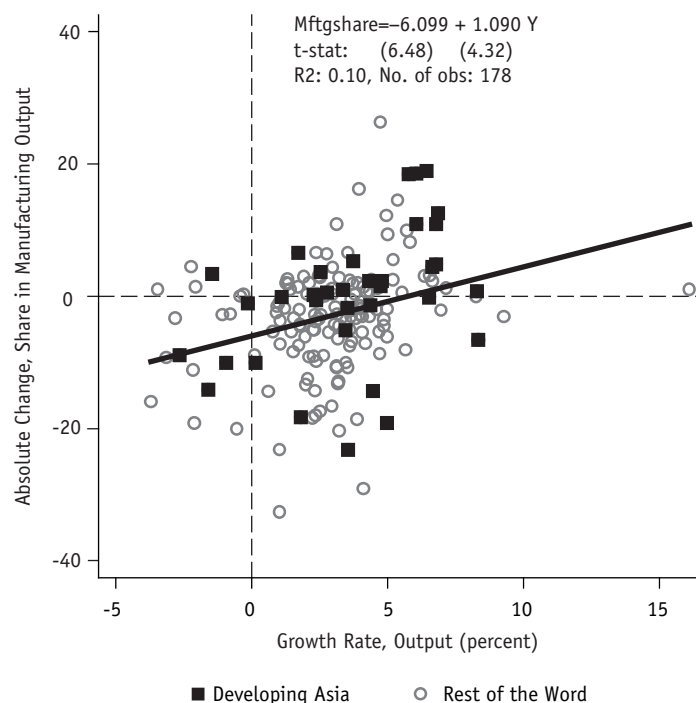
Note: Positive change in the share indicates that the share at the end of the period was higher.
Source: Authors' estimates.

Notwithstanding this observation, given the high growth rate that the service sector of a number of Asian countries has achieved recently (see Appendix Table 4), and consequently the increasing share of services in total output, one may wonder if industrialization is a step that may be bypassed today.

A.   Kaldor's Laws

Kaldor's *first law* states that the faster the rate of growth of manufacturing output, the faster the rate of growth of gross domestic product (GDP), giving to manufacturing the role of engine of growth. The characteristics of manufacturing, and industry in general, as a sector with strong input–output linkages confers this sector this potential. This role is based not only on this aspect, but also on the fact that capital accumulation and technical progress are strongest in the industrial

sector, having important spillover effects on the rest of the economy. This means that the stronger the rate of growth of manufacturing, the stronger the rate of growth of the rest of the economy. Kaldor viewed the high growth rates characteristics of middle-income countries as an attribute of the process of industrialization.

In his seminal work and for empirical purposes, Kaldor specified the laws as relationships between growth rates because he estimated a cross section of countries with data at two points in time. Kaldor's first law, i.e., that manufacturing acts as the engine of growth, can be examined through a regression of nonmanufacturing output growth ($\hat{Y}_{nm}$) on manufacturing output growth ($\hat{Y}_m$), was therefore specified as

$$\hat{Y}_{nm} = a_1 + a_2 \hat{Y}_m \tag{1}$$

where a_2 indicates the strength and size of the impact (elasticity) of the manufacturing sector's growth on the rest of the economy. This coefficient, therefore, can be viewed as the main indicator of the "engine of growth" role of this sector. Similar regressions are estimated for agriculture, industry, and services to assess their capacity as engines of growth.

Kaldor's second law states that there is a strong positive relationship between the growth of manufacturing production and the growth of manufacturing productivity. This law is also known as Verdoorn's Law and has been interpreted as evidence in support of the existence of increasing returns in the manufacturing sector (see, for example, McCombie et al. 2002). The expansion of output leads to a process of macro-dynamic increasing returns that derive in productivity gains. This can also be interpreted from the point of view of employment creation: sectors subject to scale economies have lower employment elasticities with respect to output, as productivity grows as a by-product of output expansion.[2] As productivity growth equals output growth minus employment growth, regressing productivity on total growth could induce spurious correlation. For this reason, Verdoorn's law, i.e., the induced productivity growth effect linked to increasing returns, is specified as a regression of manufacturing employment growth ($\hat{e}_m$) on manufacturing output growth ($\hat{Y}_m$). Algebraically,

$$\hat{e}_m = b_1 + b_2 \hat{Y}_m \tag{2}$$

Kaldor's hypothesis is that output expansion induces a less than proportional employment expansion that leads to productivity gains. The coefficient b_2, the elasticity of employment with respect to output, is an indicator of the degree of increasing returns. The closer to 1, the smaller the induced productivity growth and returns to scale. Traditionally, estimates of the coefficient for manufacturing are close to 0.5. With a few assumptions about the capital–output ratio, a 0.5 coefficient implies increasing returns in a standard production function (see Ros 2000, 130–3). The interpretation of this coefficient is that each additional percentage point in the growth of output is associated with a 0.5% increase in employment and a 0.5% increase in the growth of productivity. As in the case of the first law, similar regressions are estimated for agriculture, industry, and services.

As mentioned earlier, rather than interpreting the Kaldorian model of growth as a theoretical explanation of the "ultimate" causes of growth, these hypotheses are formulated empirically through

---

[2] It is also the result of a second mechanism, wherein employment growth in industry tends to increase the rate of growth of productivity in other sectors. This is the consequence of diminishing returns to labor in other sectors, absorption of surplus labor from these sectors, as well as of faster increase in the flow of goods into consumption.

regressions (1) and (2) and interpreted as stylized facts that can shed light on the questions posed above. Thus, these two hypotheses provide a set of growth facts at the sectoral level that can be used in conjunction with several theoretical interpretations to formulate a well-informed analysis of the prospective growth performance of the Asian countries. Kaldor's laws, when viewed as a set of empirical regularities, appear to be consistent with many growth models that do not rely on diminishing returns to capital. The division of labor and ideas-driven growth models of Romer (1986 and 1990), Lucas (1988), and Aghion and Howitt (1992) are all consistent with Kaldor's second law, although they are set up in economies without an explicit sectoral structure.

Kaldor's *third law* states that when manufacturing grows, the rest of the sectors (not subject to increasing returns) will transfer labor to manufacturing, raising the overall productivity of the economy. Dynamic sectors absorb workers from the stagnant ones in which the level and growth of labor productivity is very low. This raises the overall productivity level of the economy and its rate of growth. The key mechanisms that explain how structural change affects productivity growth through compositional effects were developed by Baumol et al. (1985 and 1989). According to their view, backward economies with a large pool of employment in low-productivity activities (normally agriculture) experience a bonus from structural change. This "structural bonus" arises as a result of the transfer of labor from low- to high-productivity activities. This will automatically increase the productivity *level* of the economy. This happens even if this transfer of resources constitutes mainly a shift from agriculture to services. 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*. 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.[3]

The relationship between Kaldor's third law and Baumol's asymptotic stagnancy theory is evident. The importance of a sector depends not only on its role in generating scale economies, but also on how it absorbs resources from other sectors, leading to "structural bonus" and "structural burden" effects. Although a sector with low productivity growth can absorb resources from agriculture leading to increased productivity levels, this source of economic growth is asymptotically exhausted. In the transition process, Kaldor's third law will be an important source of growth but, in the limit, induced productivity growth is the key to generating growth (see, for example, Fagerberg 2000, Timmer and Szirmai 2000).

---

[3] This description of how resource transfers in the process of structural change affect growth is very useful to analyze compositional effects. However, three aspects have to be noted. First, the concept of asymptotic stagnancy is a *relative* one. That is, growth is driven by activities whose productivity grows at a relatively slower rate than industry, but productivity growth may still be high in absolute terms. Second, it is assumed that services are necessarily a slow productivity growth sector. However, the distinction between stagnant and dynamic sectors has become blurred in recent decades by technological advances that have provoked very important changes in the organization and productivity of many services activities. Finally, although it is almost tautological that employment shifts toward the more labor-intensive activities, the model does not consider that growth in the different sectors is interdependent. That is, the expansion of some activities, especially those with increasing returns, can have an important impact on productivity in other activities. New growth theory has emphasized how the expansion of markets leads to increased division of labor and intermediate products leading to more sophisticated production processes that can be enjoyed by all the sectors in the economy. Similarly, some activities with more traditional input–output linkages can act as engines of growth through backward and forward effects on other sectors. Innovation and knowledge accumulation are but another source of sectoral spillovers that link together the developments of different sectors independently of their relative size in the economy.

IV. AN EXAMINATION OF KALDOR'S LAWS

Regressions of Kaldor's first two laws were conducted using a panel of 17 developing Asian countries for 1980–2004. The panel is unbalanced as data for some countries for some years are missing at the beginning of the sample. The lack of consistent time-series data on employment for Bangladesh, India, and Lao PDR prevented us from including these countries in the regression of the second law. The exploitation of both cross-sectional and time series data allows us to include all relevant information that would be thrown away in pure cross-sectional average estimates. The models are estimated in log levels using cointegration techniques, as the traditional growth rates specification may be simply capturing business cycle correlations that are not the focus of the investigation.

This panel of time-series allows us to address other potentially relevant problems. The first one is the bias that might be associated from the endogeneity of the regressors. Although our interest is in the stylized fact stemming from the reduced form, and not in a structural interpretation, endogeneity may induce biases in the estimated coefficients. For this reason we use a fully modified ordinary least squares (FMOLS) panel cointegration estimator, as advocated by Pedroni (2000). This is an estimator for heterogeneous panels that allows us to obtain a panel estimate of the coefficient as well as country-specific coefficients. A homogeneous cointegration vector is estimated, but fixed effects and short-run dynamics are allowed to be unit-specific.

The second problem that may arise is that there may be a high degree of correlation between the different variables across countries. World shocks affecting variables such as the terms of trade may induce cross-sectional correlation and also correlation between the regressed variables, unrelated to the Kaldorian hypotheses that are the focus of the analysis. For this reason, we also provide estimates of the panel cointegration coefficients including heterogeneous (country-specific) unobserved components estimated by obtaining principal components.[4] This estimate allows for a high degree of heterogeneity as well, but assumes common slope coefficients. We refer to these estimates as UC (unobserved component) elasticities.

A.   Kaldor's First Law

Estimation results of the first law are summarized in Figure 6, which shows the estimated long-run elasticities of output of the rest of the economy with respect to output in each one of the sectors.[5] The sector with the largest engine of growth elasticity, after controlling for common shocks, is industry. This is followed by services and manufacturing. Agriculture appears to have a very large impact using the FMOLS estimate. The introduction of the unobserved component (UC elasticity) reduces the size of the elasticity significantly. This is because agricultural output is likely to be highly correlated across countries due to common shocks stemming from, for example, climate conditions and terms of trade shocks. The larger elasticity of industry relative to manufacturing reflects the fact that industrial activities such as electricity and other utilities have important forward and backward linkages with the rest of the economy.

These results also indicate that both industry and services have acted as the engines of growth in developing Asia during the period analyzed. It is important to note that services have a larger impact than manufacturing. This is not due to mere compositional effects, as we have avoided

---

[4] See Forni et al. (2001). We included only the first principal component in the model.
[5] Cointegration tests showed that all variables in this specification were cointegrated.

this source of spuriousness by using the output of the rest of the sectors, and not total output, as the dependent variable.

FIGURE 6
ENGINE OF GROWTH EFFECTS (ELASTICITIES)
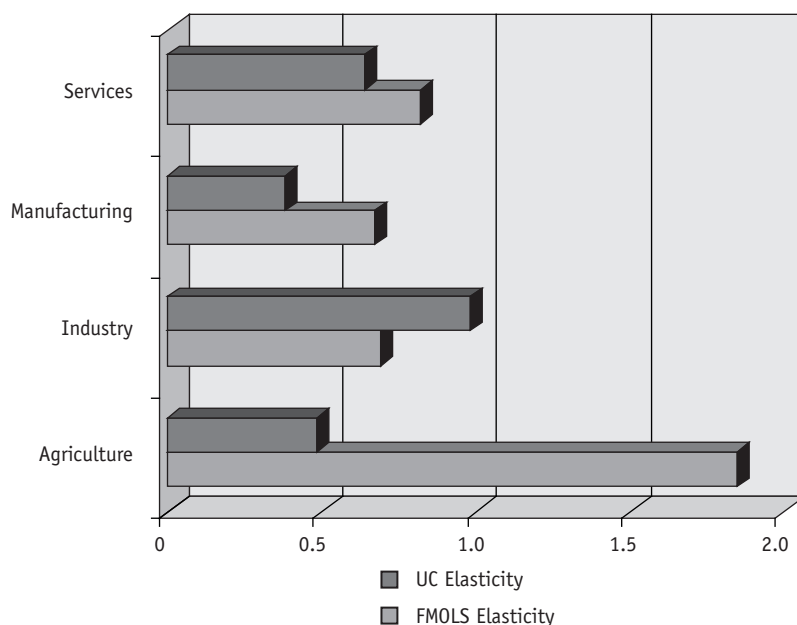
Individual economy results are shown in Table 1. The strongest elasticities of the service sector can be found in Thailand, Korea, Cambodia, Bangladesh, and Lao PDR, respectively; whereas for manufacturing, Taipei,China and the Philippines present the largest effects. Cambodia and Bangladesh have significantly larger elasticities for overall industry than for manufacturing. This may reflect the importance of utilities or construction in these countries. The results for Hong Kong, China are rather surprising, with a low elasticity for services and a negative (though insignificant) elasticity for manufacturing. The reason for these results is that the nonservices sector in Hong Kong, China is only a very small fraction of output (15% in 2003), making the results not reliable. The FMOLS results for agriculture are biased as in this sector common shocks account for a large fraction of the variation of output.

TABLE 1
ENGINE OF GROWTH ELASTICITIES BY ECONOMY

	SERVICES	MANUFACTURING	INDUSTRY	AGRICULTURE
Bangladesh	1.03	0.65	1.06	1.80
Cambodia	1.05	0.28	2.55	2.83
PRC	0.90	0.67	0.57	2.58
Hong Kong, China	0.20	-0.75	0.3	−0.71
India	0.60	0.84	0.79	2.28
Indonesia	1.00	0.51	0.87	2.02
Lao PDR	1.03	0.44	0.4	1.78
Malaysia	0.91	0.57	0.84	3.79
Myanmar	0.75	0.86	0.46	0.42
Pakistan	0.89	0.85	0.87	1.29
Philippines	0.55	1.18	0.77	1.88
Singapore	0.89	0.96	0.83	−1.41
Korea	1.03	0.66	0.83	5.51
Sri Lanka	0.74	0.58	0.92	2.88
Thailand	1.16	0.61	0.84	2.65
Viet Nam	0.93	0.75	0.98	2.09
Taipei,China	0.46	1.67	0.44	−0.28

Note: Authors' FMOLS estimates.

B. Kaldor's Second Law

Figure 7 provides the panel employment elasticities for the different sectors and for the total economy. These provide the basis for the analysis of the second law.[6] The results show that the sector with the lowest employment elasticities (highest degree of induced productivity growth) is manufacturing with an elasticity of 0.5, in line with the traditional estimates of this effect. This is followed by industry and services. Although in the case of services the UC estimation produced unreliable results,[7] the estimated elasticity of 0.68 indicates that there is a substantial degree of increasing returns in this sector, as it is statistically different from one. Agriculture shows the highest employment elasticity, and the UC estimate is not significantly different from one. The fact that the total employment elasticity for all the sectors is the lowest reflects the fact that intersectoral transfers of labor between sectors also play an important role in inducing productivity growth.

---

[6] The Verdoorn effect equations are all cointegrated except in the case of agriculture, where we could not reject the null of no panel-cointegration.

[7] The first principal component accounted for less than 25% of the total variance, indicating only small cross-sectional correlation. For this reason we prefer to rely on the FMOLS estimation for this sector.

FIGURE 7
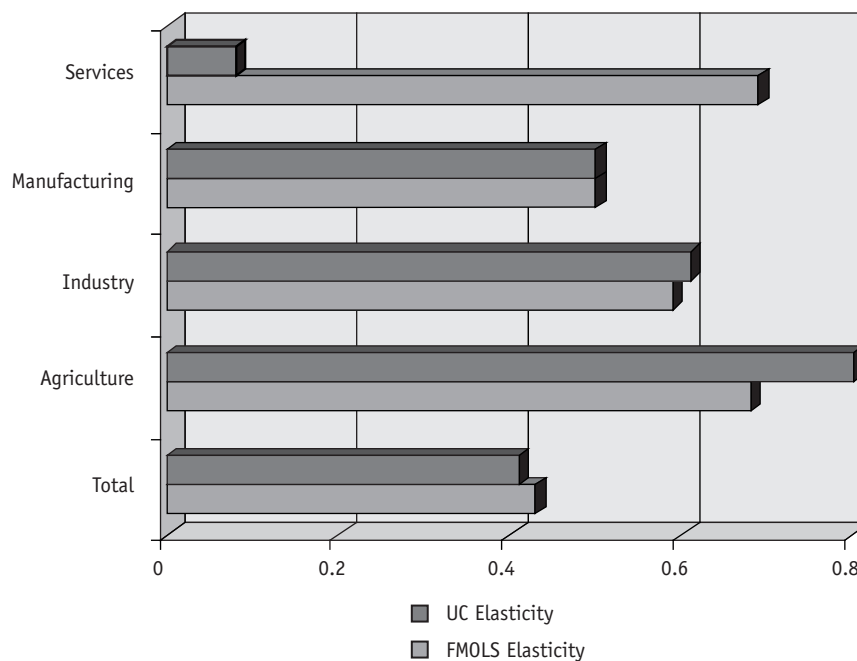**EMPLOYMENT ELASTICITIES WITH RESPECT TO OUTPUT: THE VERDOORN EFFECT**

Table 2 shows employment elasticities. The PRC's employment elasticity of industry is very low. This is followed by the elasticities for Singapore; Taipei,China; and Korea. The latter are the most mature economies in the sample. In the case of services, Taipei,China; Singapore; Myanmar; Indonesia; and Hong Kong, China have the lowest employment elasticities. With the exceptions of Myanmar and Indonesia, these economies are also more advanced. It appears that economies that are either growing very rapidly or are already more mature are the most capable of generating induced productivity growth in both sectors, and also enjoy increasing returns. This sectoral dynamism is important to avoid the "middle income trap."

TABLE 2
EMPLOYMENT ELASTICITIES BY ECONOMY

	TOTAL	INDUSTRY	AGRICULTURE	SERVICES	MANUFACTURING
Cambodia	0.86	1.39	1.15	1.42	1.20
PRC	0.22	0.10	n.a.	0.75	n.a.
Hong Kong, China	0.29	1.30	1.26	0.6	1.17
Indonesia	0.41	0.98	0.31	0.48	0.47
Malaysia	0.48	0.64	n.a.	0.58	0.55
Myanmar	0.53	0.57	0.34	0.45	0.40
Pakistan	0.41	0.28	0.68	0.70	0.20
Philippines	0.84	1.01	0.50	1.05	0.81
Singapore	0.40	0.19	0.96	0.48	0.12
Korea	0.32	0.26	n.a.	0.68	0.14
Sri Lanka	0.37	0.37	0.76	0.68	0.28
Thailand	0.35	0.59	n.a.	0.67	0.53
Viet Nam	0.34	0.35	0.60	0.68	n.a.
Taipei,China	0.25	0.21	0.82	0.41	0.14

n.a. means not available.
Source: Authors' FMOLS estimates.

C.   Kaldor's Third Law

Discussions of Kaldor's third law have been carried out in regression context with little success (see McCombie 1980).[8] Traditional estimates suffer from spurious correlation and identification problems. A more useful approach consists in decomposing the growth rate of labor productivity ($\hat{q}$) into three components:

$$\hat{q}_t = \frac{\sum_{i=1}^{3} \overbrace{q_{0i}(\lambda_{ti} - \lambda_{0i})}^{I} + \sum_{i=1}^{3} \overbrace{(q_{ti} - q_{0i})(\lambda_{ti} - \lambda_{0i})}^{II} + \sum_{i=1}^{3} \overbrace{(q_{ti} - q_{0i})\lambda_{0i}}^{III}}{q_0} \tag{3}$$

where q denotes the level of labor productivity and λ denotes the sector's employment share in total employment (both variables in periods 0 and t; i refers to the three sectors, agriculture, industry, and services). What is the interpretation of the three terms in the decomposition?

(i)   The first term (I) is the static structural reallocation effect (SSRE). This is the contribution to productivity levels of the transfer of resources from low- to high-productivity sectors. It is related to Baumol's structural bonus hypothesis. We expect that the transfer will

---

[8] Recently, Wells and Thirlwall (2003) have estimated Kaldor's laws with data for African countries. The third law is a regression of overall productivity growth on the growth of industry and the growth of employment outside industry. The coefficient of industry's growth is positive while that of employment growth outside industry is negative, indicating that the slower employment growth outside industry, the faster overall productivity grows.

increase the average level of productivity of the economy as employment shares shift from agriculture to services. This effect is calculated by shifting employment shares, keeping initial productivity levels of each sector constant.

(ii)   The second term second term (II) is the dynamic structural reallocation effect (DSRE), and represents the contribution of the resource transfer to productivity growth. It is related to Baumol's structural burden hypothesis as employment transfers toward services—a sector with (in general, though not always) lower productivity growth—reduce the overall productivity growth of the economy. The effect is calculated as the interaction between employment shifts and productivity growth.

(iii)   The final term (III) is the within-sector productivity growth (WS). It is the contribution of productivity growth within each sector to overall productivity growth. This is the growth of productivity that is not explained by sectoral shifts. It is calculated by keeping employment shares constant and allowing productivity levels to change.

The importance of making the distinction between the static and dynamic structural reallocation effects is that it helps distinguish between the *structural bonus* and *burden* effects of employment reallocation. Countries with large agricultural sectors have a lot to gain from the bonus of surplus labor in low-productivity activities. However, if the growth of employment is predominantly in sectors with lower scope for productivity growth, there is a burden effect. If productivity growth in services is lower than in manufacturing, this imposes a "relative" burden (though not absolute). Note, however, that in Kaldor's interpretation, this reallocation is "induced" by growth of the leading sector. This hypothesis cannot be examined directly by shift-share analysis, but it is clear that it is the growing sectors that will draw resources from those contracting.

The contribution of sectoral shifts to productivity growth embedded in the third law is presented in Figures 8, 9, and 10. We have decomposed productivity growth into its three components for three different subperiods, 1980–1989, 1990–1999, and 2000–2004. The average contribution of each effect throughout 1980–2004 is approximately 33% for the static structural reallocation effect (SSRE), −14% for the dynamic structural reallocation effect (DSRE), and 81% for within-sector productivity growth effect (WS). For 1980–1989, these percentages are 15.6%, −22%, and 106.5%, respectively. For 1990–1999, they are 40%, −6% and 66%, respectively; whereas for the final period the figures are 44%, −13%, and 69%, respectively. This shows that the SSRE gained importance during the last 15 years. The figures, however, mask large differences across countries. Nevertheless, they point toward the WS effect as the main driver of overall productivity growth. Within-sector productivity growth is related to productivity gains stemming from scale economies and, importantly, technology absorption from frontier economies such as Europe, Japan, and United States (US).[9] The impact of the SSRE is non-negligible, accounting for one third of productivity growth. This effect is mainly the result of the transfer of labor from agriculture into services. As expected, the DSRE is negative and related to the structural burden hypothesis.

---

[9]   Technology adoption can be thought of as a function of explicit research and development investment, human capital, foreign direct investment, and also structural composition of output in the sector.
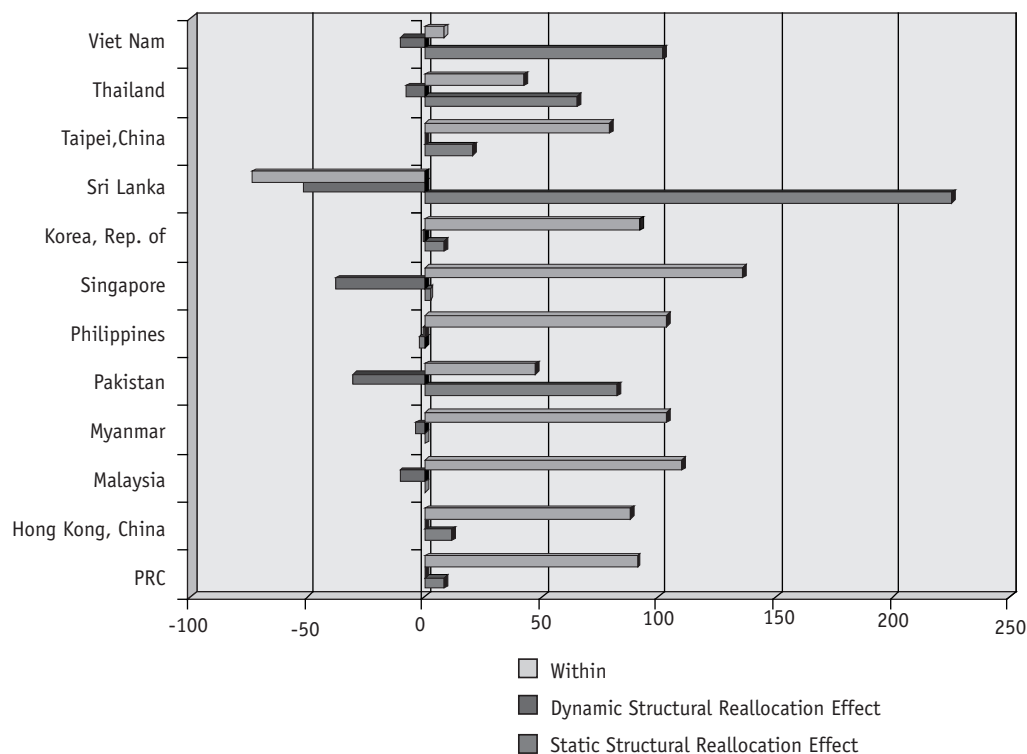
FIGURE 8
PRODUCTIVITY GROWTH DECOMPOSITION: PERCENT CONTRIBUTION OF EACH EFFECT, 1980–1989
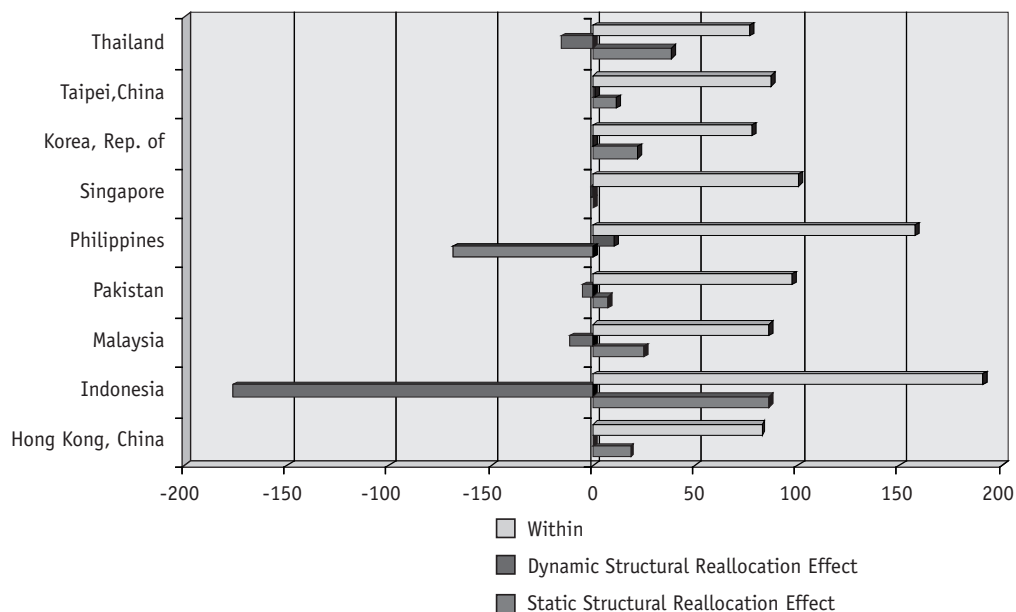
FIGURE 9
PRODUCTIVITY GROWTH DECOMPOSITION: PERCENT CONTRIBUTION OF EACH EFFECT, 1990–1999
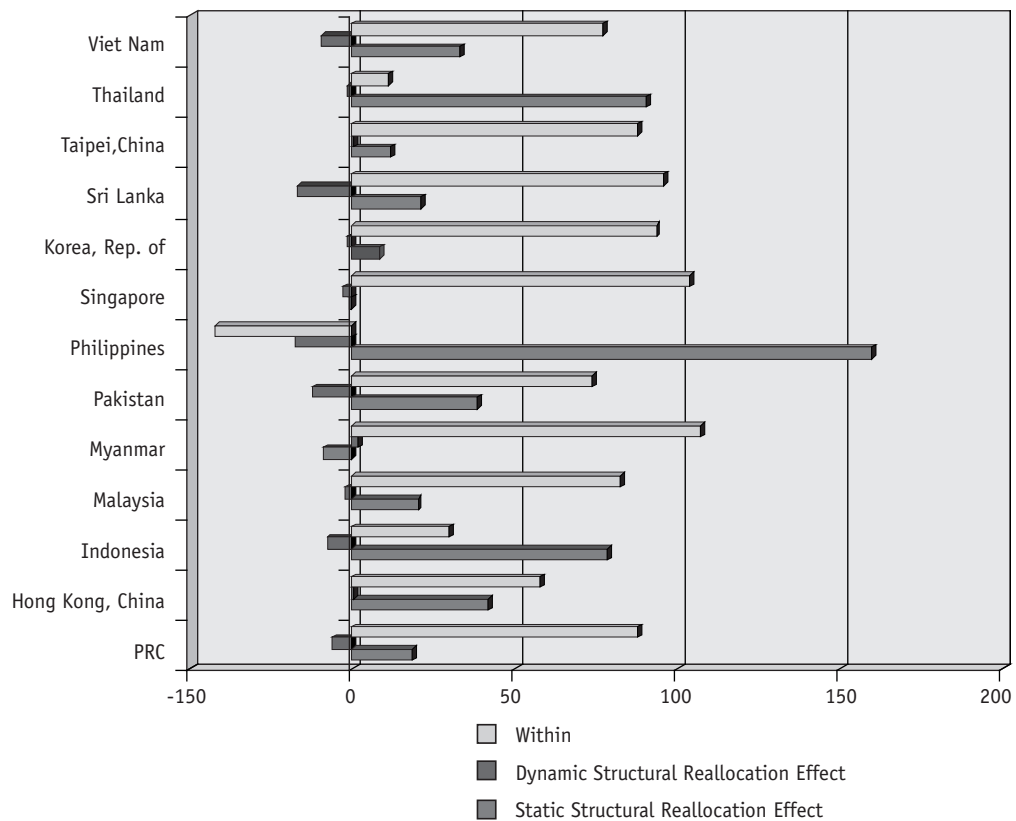
FIGURE 10
PRODUCTIVITY GROWTH DECOMPOSITION: PERCENT CONTRIBUTION OF EACH EFFECT, 2000–2004

During 1980–1989, WS productivity growth drove productivity growth. The exception was Indonesia, where the negative impact of DSRE is very large. SSRE is small for most economies except Indonesia and Thailand. During 1990–1999, SSRE acquires a more relevant role, driving productivity growth in countries such as Indonesia, Philippines, and Thailand. In 2000–2004, SSRE was the main driver of productivity growth in Sri Lanka, Viet Nam, Pakistan, and Thailand. This effect is usually larger for economies with large agricultural surplus labor and high growth. It is worth noting that, in the case of the PRC, WS productivity growth has been the main driver of total productivity growth during the last 15 years despite having a large share of employment in agriculture. For economies like Hong Kong, China; Singapore; and Korea, WS productivity growth has been also the main driver of productivity growth, as one would expect given their levels of economic development and smaller shares of agricultural employment. In general, DSRE is small, reflecting the fact that services sector productivity growth has not lagged too far behind that of industry.

The main conclusions of this section allow us to answer the main questions posed at the start of Section III:

(i)   Is manufacturing still an engine of growth in developing Asia? Manufacturing, and especially the wider industrial sector, appears to act as an engine of growth as it drives growth in other sectors and is subject to strong economies of scale. That is, there is still a traditional role for industry as an engine of growth. However, the industrial sector does not appear to drive employment transfers from agriculture, which is an important source of productivity gains.

(ii)   Can services play a role as engine of growth? The evidence shows that services have a strong and large impact on the growth of the other sectors. Indeed, this impact is larger than industry's. Although to a lesser extent than in industry, services appear to have significant productivity growth-inducing effects through the exploitation of scale economies. Services also appear to be driving productivity gains through factor reallocation effects.

(iii)   What are the most dynamic sectors in developing Asian countries? Although there are important differences across countries, both industry and services can be thought of as the dynamic sectors of Asian economies. The evidence points toward a key role for industry but, very importantly, services appear to have been able to play this dynamic role as well. The old distinction between industry and services as the dynamic and stagnant sectors of an economy, respectively, does not appear to hold true in the context of the Asian countries.

(iv)   Can we expect continued growth in Asia, given the recent developments at the sector level? The scope for growth is still very large. This is because productivity growth is likely to continue in many Asian economies through two sources. First, factor reallocation toward services, especially for the middle-low income countries in the sample, is not likely to be exhausted as a source of growth in the short run. Second, WS productivity growth through catching-up and exploitation of scale economies is likely to continue being the main driver of productivity gains in the future.

Overall, this implies that there is significant evidence of endogenous, growth-induced technological progress in developing Asia.

V. PRODUCTION STRUCTURE SIMILARITIES, TECHNOLOGY DIFFUSION, AND CATCH UP

In this section we address the third question posed in the introduction, namely, what is the contribution of structural change to productivity growth and catching up? While regression analysis of the first two Kaldorian hypotheses for the Asian countries has provided significant evidence of endogenous, growth-induced technological progress, for countries lagging behind the technological frontier, endogenous technological progress will be partly dependent on the acquisition and mastering of more advanced production techniques from the leader countries, which in turn will be determined by such factors as national research and development, human capital, and trade openness.

Furthermore, if technology is (at least to a certain extent) sector-specific, its diffusion from the most advanced to the less advanced countries will be more intense and faster the higher the degree of structural (or sectoral) similarity between them. As a result, *ceteris paribus*, technological progress will be faster for a less advanced country, the more its production structure resembles that of the technological leader. This reasoning is in line with Abramovitz (1986 and 1993), who has argued that the extent to which developing economies can benefit from the superior technology developed in advanced countries depends on their "absorption capability." The latter is itself a composite variable, determined by social as well as economic and structural factors, such as the degree of "technological congruence" with countries on the technological frontier.

Here we propose a simple approach to measuring the significance of the extent to which the productivity growth performance of the Asian countries benefited from technological spillovers from the most advanced countries flowing via a "structural channel."

First, in the spirit of the technology gap approach to growth and convergence (Gerschenkron 1962, Nelson and Wright 1992), we define a measure of the potential for technology transfer from the most advanced to the less advanced countries as given by the labor productivity ratio between the two, i.e., $GAP_i(t) = \dfrac{q_L(t)}{q_i(t)}$, where t denotes time, $q_L(t)$ is the level of labor productivity in the technologically most advanced country, and $q_i(t)$ its counterpart in the less advanced country i.

Second, we devise a measure of structural similarity making use of Krugman's specialization index (or K-index) developed by Midelfart-Knarvirk et al. (2000).[10] At each point in time, the index is constructed as the sum over the k sectors of the absolute differences between the sectors' shares of value-added in country i and in the technological leader. Its value ranges between zero and two and increases with the degree of specialization, i.e., it is higher the more a country's production structure differs from that of the technological leader. For instance, a K-index value of 0.5 indicates that 25% of the country i's production structure is out of line with that of the technologically most advanced country, in the sense that one quarter of its total output does not correspond to the average sectoral composition in the latter.[11]

This way, one can build a structurally weighted gap variable by first designing a measure of structural weights as $W_{iL}(t) = 1 - \dfrac{K_{iL}(t)}{2}$, where $0 \le W_{iL}(t) \le 1$, which increases with the degree of structural similarity, i.e., as $K_{iL}(t)$ falls. The structurally weighted gap variable is $SWGAP_i(t) = W_{iL} \times GAP_i(t)$. This variable can then be introduced in a growth regression (see Temple 1999) to capture the idea that the impact of technology spillovers on the less advanced countries' growth performance will be dependent not only on the size of the technology gap but also on the degree of structural similarity between technological leaders and followers. We examine this hypothesis by making use of a simple reduced-form growth equation.

Given the nature of the hypothesis under examination, finely sectorally disaggregated data are essential for estimation proposes. Taking this into account, we restrict our attention to manufacturing and construct the structural weights $W_{iL}(t)$ using data for 28 sectors from the United Nations Industrial Development Organization.[12] The remaining data are taken from the World Bank *World Development Indicators* (WDI) and the International Labour Organisation (ILO).[13]

---

[10] When applied to country-level bilateral comparisons it is constructed as: $K_{iL}(t) = \sum_k abs\left[v_i^k(t) - v_L^k(t) \right]$, where $v_i^k(t) \equiv \dfrac{x_i^k(t)}{\sum_k x_i^k(t)}$ and $x_i^k(t)$ denotes country i's value-added in sector k at time t and refers to the technological leader. Instead of value-added, Midelfart-Knarvirk et al. (2000) employed the gross value of output as a measure of activity level, on the grounds that this makes the results of the analysis less likely to be biased by the effects of structural shifts in outsourcing to other sectors. This option was precluded by data unavailability in our case.

[11] The upper bound of the index equals two because, by construction, it takes into account both positive and negative deviations across sectors. Thus, when calculating the "implied-percentage deviation" the value in question must be halved: in the example, (0.5/2)%=25%.

[12] The data are from the Industrial Statistics Database 2006 at the 3-digit level of ISIC Code (Revision 2) (UNIDO 2006).

[13] The source of the manufacturing value added series for the US is the Department of Commerce, Bureau of Economic Analysis.

To smooth out cyclical effects, structural weights $W_{iL}(t)$ were computed as 3-year moving averages of annual values. The regression was estimated by means of panel data techniques using an unbalanced panel of annual data over 1982–2002 for nine Asian economies, namely Bangladesh; PRC; Hong Kong, China; Indonesia; Malaysia; Singapore; Korea; Sri Lanka; and Taipei,China. The regression estimated is:

$$\hat{q}_{it} = \alpha_i + \sum_{j=1}^{2} \beta_i GAP_{it}^j + \sum_{j=1}^{2} \theta_j SWGAP_{it}^j \tag{4}$$

where $\hat{q}_{it}$ is the rate of labor productivity growth in country i and the gap variables are constructed taking both the US and Japan as the two technological leaders with respect to the less advanced Asian economies in our sample. We used the fixed-effects least squares dummy variables estimator and, since we are dealing with annual data and a fairly short time-series, we allow for just one lag. Results are reported in Table 3.[14]

<div align="center">

TABLE 3
TECHNOLOGY GAP REGRESSION

</div>

VARIABLES	COEFFICIENT	STANDARD ERROR	T-VALUE
GAP_JP	−0.008	0.005	−1.85
GAP_JP(-1)	0.050*	0.020	2.54
SWGAP_JP	0.050**	0.017	2.95
SWGAP_JP(-1)	−0.050	0.037	−1.31
GAP_US	0.016	0.008	1.95
GAP_US(-1)	−0.064**	0.020	−3.16
SWGAP_US	−0.070**	0.025	−2.77
SWGAP_US(-1)	0.074**	0.025	2.92

* and ** indicate significance at the 5% and 1% level, respectively.
Note: JP and _US denote that the leader country is Japan or the United States, respectively; (-1) indicates the first lags.

The R-squared of the regression is 0.49, suggesting that the gap and structurally weighted gap variables explain roughly half of the variation in labor productivity growth. GAP_JP is not statistically significant; however, it becomes highly significant and takes on the expected positive sign when it is interacted with $W_{iL}(t)$ to take account of structural similarities, i.e., in SWGAP_JP. The coefficient of GAP_JP(-1) is also significant and positive so that, overall, one can read the results in Table 1 as supporting the view that Japan, as the technological leader country in the region, plays a significant role as a source of technological spillovers to the other Asian economies in our sample.

When the technological gap is measured with respect to the US, results are different. Both the structurally weighted gap variable SWGAP_US and its first lag SWGAP_US(-1) turn out to be significant at the 1% level, but the former takes on a negative sign so that the overall impact of the two on labor productivity growth is negligible. Furthermore, the first lag of the GAP_US variable is also negative and significant.

---

[14] The introduction of more lags of the independent variables did not change the results qualitatively. Moreover, estimation of a dynamic version of the growth regression using the Generalized Method of Moments resulted in an insignificant coefficient on the lagged dependent variable, leading us to favor the static-version results reported in Table 3.

VI. CONCLUSIONS

The most salient feature of developing Asia's transformation during the last three decades has been the significant decrease in the share of agriculture and the parallel increase in the share of services. Some parts of developing Asia have clearly industrialized in the sense that the shares of industry and manufacturing in total output have increased (e.g., Indonesia, Malaysia, Thailand). But many other countries in the region have not seen an increase in these shares. The richest economies in the region, the NIEs, are undergoing a deindustrialization process. This simply reflects their shift to high value-added services. Various other countries in the region have had difficulties in industrializing. India and the Philippines are among the most significant examples, although for India, recent data seem to indicate that its manufacturing share has increased. Others (e.g., the Pacific economies) face industrialization as a very difficult process, since they have limited opportunities to start with. It is important to note that the patterns of structural transformation of output and employment are different, as the decline in agricultural employment is taking place at a much slower pace than that of output. This has led, in many countries across the region, to rather "asymmetric" output and employment structures. Indeed, one could say that much of the region looks like a service economy in terms of output, but like an agricultural economy in terms of employment. An additional important feature of structural change in developing Asia is that, despite its rapid growth, the level of labor productivity in most of the region still lags far behind that of the industrial countries. Given that investments were made in highly productive industry and services segments of the economy, this implies that there are still many other large segments of the economy with very low productivity. Structural transformation in developing Asia is taking place through a combination of modern and sophisticated industry and services with high and rising productivity levels, with many other backward ones (probably where a large part of the labor from agriculture is being transferred) that operate at very low productivity levels. Finally, the analysis of structural transformation from the point of view of technology and scale indicates that only a few countries in the region have undergone a significant upgrade.

Regressions of Kaldor's laws indicate that both industry and services appear to have acted as engines of growth in the Asian economies. The manufacturing sector is subject to strong increasing returns, although in services the degree of increasing returns is indeed non-negligible too. Although the share of industry and manufacturing is shrinking in total employment, this does not necessarily imply that their role as the most dynamic sectors has decreased. Induced productivity growth in manufacturing can indeed be seen as the reason for its decline as a share of output for countries that had previously industrialized. Notable exceptions are the PRC and India. In the former, industrial activity remains relatively very important and in the latter large-scale industrialization has not occurred. Services appear to have contributed largely to growth as they drag employment from the less productive agricultural sector. Although induced productivity growth in services is smaller than in industry, services appear to be a remarkably dynamic sector. Both factors together have contributed to the importance of services as an engine of growth. As the large reserves of employment in agriculture are exhausted, the contribution of services to productivity growth is likely to decrease as its productivity growth is lower than that of industry.

This will largely depend on the composition of services between dynamic and stagnant activities. However, there is no reason to believe that, in the medium run, growth will decline due to the increase in the share of services in total output. There are three main reasons for this:

(i)   There is still a very large scope for structural change, especially in the less developed economies of Asia.

(ii)   The role of the dynamic industrial sector remains very relevant for economies where industrialization occurred previously.

(iii)   The scope of within-sector productivity growth is still very large. This is likely to be facilitated by structural change itself, which increases the capacity of Asian economies to absorb foreign technology. This catching-up process is likely to lead to important productivity gains in services.

Finally, the technology gap approach, as formalized in the framework used here, provides a simple way to analyze the impact of technology diffusion on the growth performance of the Asian countries. The results support the view that technological spillovers foster growth when Japan is taken as the technological leader, but is not the case when the leader-country is the US. Moreover, structural similarity seems to be playing a significant part in the process of technology diffusion both from Japan and the US, although the overall influence from the latter is fairly small.

Appendix Table 1
Sector Output and Employment Share by Decade

Economy	Output Shares 1970s A	I	S	1980s A	I	S	1990s A	I	S	2000–2004 A	I	S	Employment Shares 1980s A	I	S	1990s A	I	S	2000–2004 A	I	S
PRC	32.33	44.54	23.13	29.31	44.60	26.09	20.33	45.50	34.17	13.63	45.61	40.76	63.87	20.24	15.89	54.15	22.63	23.22	49.78	21.95	28.28
India	42.28	22.43	35.30	34.61	26.14	39.25	29.42	26.92	43.65	23.13	26.56	50.31	67.00	15.50	17.50	63.30	16.70	20.00	59.80	18.00	22.20
NIEs																					
Hong Kong, China	–	–	–	0.52	30.28	69.20	0.16	18.06	81.78	0.08	12.87	87.05	1.35	44.60	54.05	0.55	28.28	71.17	0.25	18.85	80.90
Korea	26.16	29.82	44.02	13.43	39.20	47.37	6.64	41.39	51.98	4.19	39.64	56.17	26.78	31.12	42.10	12.97	32.88	54.15	9.68	27.65	62.67
Singapore	–	–	–	–	–	–	0.18	34.75	65.07	0.12	35.09	64.79	0.84	36.08	63.08	0.26	31.80	67.94	0.25	27.11	72.64
Taipei,China	11.60	40.58	47.82	6.13	42.98	50.89	3.16	34.16	62.68	1.79	27.29	70.92	16.98	41.97	41.05	10.79	38.82	50.39	7.33	35.72	56.95
ASEAN-4																					
Indonesia	34.02	30.07	35.91	23.18	38.12	38.70	17.91	41.77	40.32	15.72	44.94	39.35	55.90	11.46	32.64	46.73	12.58	40.69	44.62	13.70	41.68
Malaysia	27.39	33.09	39.52	20.30	39.00	40.70	13.15	42.54	44.31	9.06	49.07	41.87	31.64	24.14	44.22	20.35	31.60	48.05	15.50	31.88	52.62
Philippines	29.49	34.53	35.99	23.87	36.81	39.33	20.35	32.49	47.16	14.50	32.07	53.43	49.59	14.50	35.90	43.05	15.92	41.03	36.82	15.78	47.39
Thailand	25.67	27.57	46.76	17.92	31.99	50.08	10.38	39.73	49.89	9.58	42.73	47.69	65.42	12.05	22.53	54.62	16.95	28.44	46.42	19.07	34.51
Other Southeast Asia																					
Cambodia	–	–	–	–	–	–	46.60	15.94	37.47	35.17	26.28	38.54	–	–	–	76.37	4.36	19.28	72.09	9.47	18.44
Lao PDR	–	–	–	60.55	13.42	26.03	56.52	19.15	24.33	49.86	25.00	25.14	–	–	–	85.40	3.50	11.10	–	–	–
Myanmar	42.71	12.60	44.70	50.54	11.98	37.48	60.05	9.68	30.27	54.87	11.89	33.25	66.07	10.52	23.41	67.08	10.25	22.67	–	–	–
Viet Nam	–	–	–	41.43	26.30	32.27	30.24	28.90	40.86	23.02	38.58	38.40	–	–	–	69.31	12.38	18.48	62.75	14.35	22.90
Other South Asia																					
Bangladesh	–	–	–	31.60	21.17	47.24	27.13	23.94	48.93	23.03	26.10	50.87	68.24	16.19	15.56	67.04	11.71	21.25	64.75	10.74	24.50
Bhutan	–	–	–	51.02	20.41	28.57	40.04	31.09	28.88	34.56	37.65	27.79	–	–	–	–	–	–	–	–	–
Maldives	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	24.61	24.04	51.35	16.53	22.92	60.55
Nepal	67.44	10.11	22.46	56.02	14.20	29.78	43.49	20.92	35.59	40.40	22.10	37.50	–	–	–	79.56	3.65	16.79	–	–	–
Pakistan	33.78	22.79	43.43	28.55	23.27	48.19	26.13	24.36	49.50	24.04	23.31	52.65	52.07	20.03	27.90	47.71	18.59	33.71	46.33	18.95	34.72
Sri Lanka	28.97	26.08	44.96	27.23	27.02	45.75	23.64	26.36	49.99	19.46	26.72	53.82	50.14	19.71	30.15	42.04	22.69	35.26	36.15	24.58	39.27
Central Asia and Mongolia																					
Armenia	–	–	–	–	–	–	34.41	36.53	29.06	25.52	36.00	38.47	–	–	–	37.32	23.81	38.87	46.39	14.73	38.87
Azerbaijan	–	–	–	–	–	–	26.60	35.60	37.80	14.84	50.14	35.02	34.37	30.37	35.25	38.08	19.84	42.08	40.31	11.18	48.51
Kazakhstan	–	–	–	–	–	–	14.61	34.82	50.57	8.71	39.01	52.28	–	–	–	23.15	26.80	50.04	35.43	16.53	48.03
Kyrgyz	–	–	–	32.72	–	–	40.76	27.48	31.75	37.08	25.34	37.58	35.55	26.46	38.00	43.13	18.71	38.16	49.59	11.95	38.46

continued next page.

Appendix Table 1 *continued*

Economy	Output Shares 1970s			1980s			1990s			2000–2004			Employment Shares 1980s			1990s			2000–2004		
	A	I	S	A	I	S	A	I	S	A	I	S	A	I	S	A	I	S	A	I	S
Mongolia	–	–	–	17.36	27.30	55.34	33.73	24.90	41.37	23.12	24.36	52.52	–	–	–	47.09	21.84	31.07	45.92	14.43	39.64
Tajikistan	32.06	–	–	32.06	40.11	27.83	31.19	36.43	32.37	25.90	37.29	36.81	–	–	–	57.76	19.96	24.77	–	–	–
Turkmenistan	27.77	–	–	27.77	37.06	35.17	23.49	45.50	31.01	23.23	44.45	32.33	–	–	–	44.77	–	–	–	–	–
Uzbekistan	29.34	–	–	29.34	35.54	35.13	32.79	30.11	37.10	33.37	23.29	43.34	–	–	–	42.50	20.94	36.56	34.40	20.30	45.30
Pacific Islands																					
Fiji Islands	24.72	21.88	53.40	20.38	20.97	58.66	19.05	25.68	55.27	16.02	26.27	57.71	–	–	–	2.22	35.39	62.35	–	–	–
Kiribati	19.06	52.28	28.66	29.66	7.81	62.53	21.29	6.38	72.32	15.46	10.75	73.79	–	–	–	9.61	13.86	76.53	–	–	–
Marshall Islands	–	–	–	–	–	–	14.45	14.59	70.96	10.93	20.82	68.25	–	–	–	–	–	–	–	–	–
Micronesia	–	–	–	44.54	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Papua New Guinea	32.45	28.00	39.55	32.21	27.48	40.32	28.75	37.02	34.22	27.94	43.39	28.68	–	–	–	–	–	–	73.33	3.65	23.02
Palau	–	–	–	–	–	–	11.14	11.06	77.80	3.07	13.79	83.14	–	–	–	–	–	–	–	–	–
Samoa	–	–	–	–	–	–	19.63	26.94	53.43	14.52	26.61	58.86	–	–	–	–	–	–	–	–	–
Solomon Islands	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	26.68	13.65	59.15	–	–	–
Timor-Leste	–	–	–	–	–	–	43.15	16.77	40.08	27.20	16.21	56.60	–	–	–	–	–	–	–	–	–
Tonga	44.65	12.29	43.06	37.91	14.20	47.89	33.63	14.79	51.58	28.14	15.80	56.06	–	–	–	37.13	–	–	–	–	–
Vanuatu	21.95	6.05	72.00	22.70	9.30	68.00	16.84	10.40	72.76	14.18	8.89	76.92	–	–	–	–	–	–	–	–	–

– means data not available.

A means agriculture, I means industry, S means services.

Note: The main data source is the *World Development Indicators* (World Bank online database, downloaded 4 August 2006). Agriculture includes agriculture, fishery, and forestry. Industry includes manufacturing, mining, construction and utilities. Services include transport, trade, finance, public administration, and others. Sector shares are computed in nominal terms. It is important to add that we checked the quality of the data of this database and found some problems. We calculated the number of cases where the change between two consecutive years in the share (both output and employment, for each sector) was larger (i.e., increase in the share) or smaller (i.e., decrease in the share) than 5 percentage points. Except in extreme circumstances, e.g., wars or natural disasters, sector shares cannot change by this much between 2 years. We discovered that there were plenty of such cases for output, and substantially fewer for employment.

APPENDIX TABLE 2
MANUFACTURING OUTPUT SHARES, BY DECADE

ECONOMY	1970s	1980s	1990s	2000–2004
PRC	37.27	36.26	32.90[h]	34.50[l]
India	15.32	16.43	16.58	15.71
NIEs				
Hong Kong, China	–	21.18	9.43	4.32
Korea	21.61	27.51	27.14	27.82
Singapore	24.84[a]	26.09	26.11	27.39
Taipei,China	32.43	34.95	27.11	22.80
ASEAN-4				
Indonesia	10.42	15.35	23.72	29.04
Malaysia	16.82	20.42	27.05	31.21
Philippines	25.72	25.03	23.29	22.94
Thailand	18.98	23.32	29.55	34.00
Other Southeast Asia				
Cambodia	–	–	11.08	19.40
Lao PDR	–	9.27[d]	14.20	18.67
Myanmar	9.64	9.07	6.90	8.49[m]
Viet Nam	–	19.69[e]	15.23	19.94
Other South Asia				
Bangladesh	–	13.76	14.87	15.73
Bhutan	–	5.29	10.39	7.79[m]
Maldives	–	–	–	–
Nepal	4.11	5.24	8.77	8.85
Pakistan	15.89	15.98	16.44	15.99
Sri Lanka	19.02	15.39	15.68	15.90
Central Asia and Mongolia				
Armenia	–	–	27.56	22.68
Azerbaijan	–	–	14.08	7.87
Kazakhstan	–	–	13.30[i]	16.33
Kyrgyz	–	–	20.04	16.19
Mongolia	–	31.04	18.70	6.37
Tajikistan	–	27.70[e]	25.43	32.35
Turkmenistan	–	–	26.30[j]	15.47[m]
Uzbekistan	–	25.06[f]	11.96[j]	9.40
Pacific Islands				
Fiji	11.79	10.59	14.44	15.02[n]

APPENDIX TABLE 2. continued.

ECONOMY	1970s	1980s	1990s	2000–2004
Kiribati	1.62^b	1.16	0.98	0.89^n
Marshall Islands	–	–	1.63	4.54^o
Micronesia	–	0.40^g	–	–
Papua New Guinea	7.26	10.06	8.89	8.50^m
Palau	–	–	0.97	1.19^n
Samoa	–	–	17.10^j	15.37
Timor-Leste	–	–	2.78^k	3.29
Tonga	6.63^a	5.42	4.85	4.61
Vanuatu	3.90^c	4.45	4.88	4.21^o

– means data not available
a Refers to 1975–1979 average.
b Refers to 1978–1979 average.
c Refers to 1979.
d Refers to 1989.
e Refers to 1985–1989 average.
f Refers to 1987–1989 average.
g Refers to 1983.
h Refers to 1990–1992 average.
i Refers to 1992–1999 average.
j Refers to 1994–1999 average.
k Refers to 1999.
l Refers to 2000.
m Refers to 2000–2003 average.
n Refers to 2000–2002 average.
o Refers to 2000–2001 average.
Sources of basic data: *World Development Indicators (*World Bank online database, downloaded 4 August 2006); Directorate General of Budget, Accounting, and Statistics, Taipei,China (various years).

APPENDIX TABLE 3
MANUFACTURING EMPLOYMENT SHARES, BY DECADE

	MANUFACTURING AS PERCENT OF TOTAL EMPLOYMENT		
	1980s	**1990s**	**2000–2004**
PRC	15.11[b]	13.47	11.16[g]
India	11.05[a]	10.92[a]	11.22[a]
NIEs			
Hong Kong, China	35.89	19.02	10.20[h]
Singapore	27.91	24.53	18.31[i]
Korea	23.93	23.40	19.44
Taipei,China	33.41	28.66	27.40
ASEAN-4			
Indonesia	9.68[c]	11.73	13.15[g]
Malaysia	15.95	22.59	21.94
Philippines	9.93	10.06	9.65
Thailand	8.87	12.33	14.58
Other Economies			
Azerbaijan		9.36[e]	5.44[g]
Kyrgyztan		20.11	19.19
Pakistan	13.66	10.99	12.66
Viet Nam		8.32[f]	10.33
OECD	21.58[d]	19.20[d]	16.89[d]

a For India, the figure for each decade refers only to a single year, as follows: 1983, 1993/1994, 1999/2000.
b Refers to the period 1987–1989.
c Refers to the average for the years 1980, 1982, 1985, and 1989.
d For OECD, the number of countries covered each decade are: 18 for the 1980s; 20 for the 1990s; 21 for 2000/2004.
e Refers to the period 1992–1999.
f Refers to the period 1996–1999.
g Refers to the period 2000–2002.
h Refers to the period 2000–2001.
i Refers to the period 2001–2003.
Sources: ILO (2006); Directorate-General of Budget, Accounting, and Statistics, Taipei,China (various years); Sundaram and Tendulkar
        (2006).

APPENDIX TABLE 4
AVERAGE TOTAL GDP GROWTH AND SECTORAL GROWTH BY DECADE

ECONOMY	1970s				1980s				1990s				2000–04			
	TOTAL	AGRI-CULTURE	INDUSTRY	SERVICES	TOTAL	AGRI-CULTURE	INDUSTRY	SERVICES	TOTAL	AGRI-CULTURE	INDUSTRY	SERVICES	TOTAL	AGRI-CULTURE	INDUSTRY	SERVICES
PRC	5.90	2.39	8.22	5.79	9.23	5.14	10.05	11.93	9.53	4.23	12.10	8.91	8.76	3.28	9.77	9.36
India	2.52	0.31	3.84	4.45	5.71	4.18	6.57	6.28	5.53	2.95	5.60	7.34	5.56	1.68	6.09	7.30
NIEs																
Hong Kong, China	8.73	–	–	–	6.97	–	–	–	3.66	–	–	–	4.62	.	.	.
Korea	7.95	3.69	13.57	6.32	7.32	1.58	8.98	7.23	5.96	0.96	6.41	5.76	5.23	0.09	6.95	4.17
Singapore	8.40	2.75	9.13	8.38	7.18	–3.74	6.17	7.75	7.32	–3.49	8.13	7.14	3.98	–1.44	2.82	4.66
ASEAN-4																
Indonesia	7.48	4.15	9.80	8.41	6.14	4.01	7.08	6.62	4.51	2.06	5.67	4.53	4.54	3.41	4.06	5.50
Malaysia	7.56	4.96	8.29	8.63	5.65	3.46	6.44	6.01	6.88	0.11	8.06	7.74	5.08	3.67	5.52	4.86
Philippines	5.81	3.93	7.89	5.02	1.89	1.50	0.58	3.41	2.71	1.45	2.40	3.63	4.24	2.91	3.65	5.19
Thailand	6.80	4.06	9.40	6.63	7.02	4.39	8.67	6.82	4.94	0.42	6.91	4.50	4.97	3.39	6.12	4.13
Other Southeast Asia																
Cambodia													6.57	1.59	15.92	5.06
Lao PDR					3.86				6.18	4.86	11.24	5.44	5.78	3.56	9.82	5.89
Viet Nam					4.36				7.14	3.82	9.96	7.39	6.89	3.71	9.59	6.10
Other South Asia																
Bangladesh	0.82	–0.31	1.26	2.15	3.17	1.58	4.41	3.72	4.69	3.32	6.75	4.15	5.28	3.55	6.83	5.35
Bhutan	–	–	–	–	7.13				6.21	3.33	8.28	7.25	6.24	.	.	.
Maldives	–	–	–	–	–				–	–	–	–	6.48	.	.	.
Nepal	2.52	0.72	–	–	3.95	3.47	7.30	3.46	4.75	2.42	6.97	5.97	3.43	3.73	2.33	3.16
Pakistan	4.04	1.84	5.40	6.05	6.62	4.24	7.86	6.52	3.88	4.05	4.56	4.43	4.05	2.04	4.67	4.57
Sri Lanka	4.15	2.36	3.39	5.00	4.04	2.25	4.11	5.12	5.12	2.49	6.54	5.43	3.88	0.35	3.27	5.41

continued next page.

Appendix Table 4. *continued*

Economy	1970s				1980s				1990s				2000–04			
	Total	Agri-culture	Industry	Services	Total	Agri-culture	Industry	Services	Total	Agri-culture	Industry	Services	Total	Agri-culture	Industry	Services
Central and West Asia																
Armenia	–	–	–	–	–	–	–	–	–	–	–	–	9.40	3.65	10.19	12.23
Azerbaijan	–	–	–	–	–	–	–	–	–	–	–	–	10.05	7.66	10.48	8.71
Kazakhstan	–	–	–	–	–	–	–	–	–	–	–	–	9.83	3.58	11.79	9.51
Kiribati	2.60	–	–	–	6.23	7.15	9.06	3.80	5.15	–1.52	8.44	5.37	1.73	–	–	–
Kyrgyz	–	–	–	–	6.18	7.18	10.14	5.38	–4.05	0.70	–11.13	–2.08	4.77	3.92	4.03	6.28
Mongolia	–	–	–	–	–	–	–	–	1.38	2.64	–0.14	–1.29	4.27	–6.00	7.42	6.39
Tajikistan	–	–	–	–	–	–	–	–	–10.51	–7.98	–10.23	–4.60	9.29	–	–	–
Turkmenistan	–	–	–	–	–	–	–	–	–4.31	–3.92	–5.06	–4.00	.	–	–	–
Uzbekistan	–	–	–	–	–	–	–	–	–0.37	1.05	–3.07	–1.36	4.55	5.84	3.24	4.51
Vanuatu	–	–	–	–	1.30	0.58	1.26	1.66	3.72	1.97	0.93	4.75	0.08	–	–	–
Pacific Islands																
Fiji	5.52	3.35	3.93	7.50	0.65	2.07	0.19	0.99	2.84	0.04	4.12	3.43	2.22	–	–	–
Marshall_Islands	–	–	–	–	–	–	–	–	–0.68	–	–	–	1.35	–	–	–
Micronesia	–	–	–	–	–	–	–	–	1.06	–	–	–	2.10	–	–	–
Papua New Guinea	3.03	2.71	–	–	1.35	2.33	–	–	4.48	3.24	7.70	1.54	0.17	–	–	–
Palau	–	–	–	–	–	–	–	–	–	–	–	–	1.81	–	–	–
Samoa	–	–	–	–	–0.31	–	–	–	1.34	–	–	–	3.16	–4.83	5.67	4.85
Solomon Islands	5.29	–	–	–	5.65	–	–	–	3.14	–	–	–	–3.29	–	–	–
Timor-Leste	–	–	–	–	–	–	–	–	–	–	–	–	3.37	1.60	–0.51	5.64
Tonga	–	–	–	–	–	0.48	2.18	2.74	2.04	1.77	3.02	2.25	3.16	–	–	–
TOTAL	5.60	2.05	8.07	5.85	6.90	4.09	7.90	7.76	6.62	3.12	8.53	6.80	6.58	2.70	7.89	6.92

– means data not available.

Source of basic data: World Bank, *World Development Indicators* online database, downloaded 4 August 2006.

REFERENCES

Abramovitz, M. 1986. "Catching-Up, Forging Ahead and Falling Behind." *Journal of Economic History* 46:386–406.

———. 1993. "The Origins of the Post-War Catch-Up and Convergence Boom." In J. Fagerberg, B. Verspagen, and N. von Tunzelmann, eds., *The Dynamics of Technology, Trade and Growth*. Aldershot: Edward Elgar.

ADB. 2007. *Asian Development Outlook 2007*. Asian Development Bank, Manila.

Aghion, P., and P. Howitt. 1992. "A Model of Growth through Creative Destruction." *Econometrica* 60:323–51.

Anant, T. C. A., R. Hasan, P. Mohapatra, R. Nagaraj, and S.K. Sasikumar. 2006. "Labor Markets in India: Issues and Perspectives." In J. Felipe and R. Hasan, eds., *Labor Markets in Asia: Issues and Perspectives*. London: Palgrave Macmillan for the Asian Development Bank.

Banister, J. 2005. "Manufacturing Employment in China." *Monthly Labor Review* (July):11-29

Baumol, W. J., S. A. Batey Blackman, and E. Wolff. 1985. "Unbalanced Growth Revisited: Asymptotic Stagnancy and New Evidence." *The American Economic Review* 75:4(September):806–17.

———. 1989. *Productivity and American Leadership: The Long View*. Cambridge: MIT Press.

Fagerberg, J. 2000. "Technological Progress, Structural Change and Productivity Growth: A Comparative Study." *Structural Change and Economic Dynamics* 11:393–411.

Forni M., M. Hallin, M. Lippi, and L. Reichlin. 2001. "The Generalized Factor Model: Identification and Estimation." *The Review of Economics and Statistics* 82(3):540–54.

Gerschekron, A. 1962. *Economic Backwardness in Historical Perspective: A Book of Essays*. Cambridge, MA: Belknap Press.

Kaldor, N. 1966. *Causes of the Slow Rate of Growth in the United Kingdom*. Cambridge: Cambridge University Press.

———. 1967. *Strategic Factors in Economic Development*. New York State School of Industrial and Labor Relations, Cornell University, New York.

Leamer, E. E., and J. Levinsohn. 1995. "International Trade Theory: The Evidence." In G. Grossman and K. Rogoff, eds., *The Handbook of International Econ*. Vol III. Amsterdam: Elsevier Science B.V.

Lucas, R. E. Jr. 1988. "On the Mechanics of Economic Development." *Journal of Monetary Economics* 22:3–42.

McCombie, J. S. L. 1980. "On the Quantitative Importance of Kaldor's Laws." *Bulletin of Economic Research* 32:102–12.

McCombie, J. S. L., M. Pugno, and B. Soro, eds. 2002. *Productivity Growth and Economic Performance: Essays on Verdoorn's Law*. Houndmills and New York: Palgrave Macmillan.

Midelfart-Knarvik, K. H., Overman, H. G., Redding, S. J. and Venables, A. J. 2000. The Location of European Industry. Economic Papers 142, European Commission Directorate-General for Economic and Financial Affairs, Brussels.

Nelson, R. R., and G. Wright. 1992. "The Rise and Fall of American Technological Leadership: The Post-war Era in Historical Perspective." *Journal of Economic Literature* 30:1931–64.

Nixson, F. I. 1990. "Industrialization and Strcutural Change in Developing Countries." *Journal of International Development* 2(2, July):310–33.

Pedroni, P. 2000. "Fully Modified OLS for Heterogeneous Cointegrated Panels." *Advances in Econometrics* 15:93–130.

Pieper, U. 2000. "Deindustrialisation and the Social and Economic Sustainability Nexus in Developing Countries: Cross-country Evidence on Productivity and Employment." *The Journal of Development Studies* 36(4, April):66–99.

Rodrik, D. 2006. "Industrial Development: Stylized Facts and Policies." John F. Kennedy School of Government. Available: http://ksghome.harvard.edu/~drodrik/industrial%20development.pdf.

Romer, P. M. 1986. "Increasing Returns and Long Run Growth." *Journal of Political Economy* 94:1002–37.
———. 1990. "Endogenous Technological Change." *Journal of Political Economy* 98:71–102.
Ros, J. 2000. *Development Theory & The Economics of Growth*. Ann Arbor: The University of Michigan Press.
Rowthorn, R., and R. Rawasmany. 1997. Deindustrialization: Causes and Implications. IMF Working Paper p9/42, International Monetary Fund, Washington, DC.
———. 1999. "Growth, Trade and Deindustrialization." *IMF Staff Papers* 46(1):18–41.
Sundaram, K. and S. Tendulkar. 2006. "Changing Structue of India Workforce, Quality of Employment and Real Earnings, 1983-2000." In Institute for Human Development, *India: Meeting the Employment Challenge,* Conference on Labour and Employment Issues, 27-29 July, New Delhi.
Temple, J. 1999. "The New Growth Evidence." *Journal of Economic Literature* 37:112–56.
Timmer, M. P., and A. Szirmai. 2000. "Productivity Growth in Asian Manufacturing: The Structural Bonus Hypothesis Examined." *Structural Change and Economic Dynamics* 11:371–92.
Wells, H., and A. P. Thirlwall. 2003. "Testing Kaldor's Growth Laws across the Countries of Africa." *African Development Review* 15(2-3):89–105.

PUBLICATIONS FROM THE
ECONOMICS AND RESEARCH DEPARTMENT

ERD WORKING PAPER SERIES (WPS)
(Published in-house; Available through ADB Department of External Relations; Free of Charge)

No. 1 Capitalizing on Globalization
—*Barry Eichengreen, January 2002*

No. 2 Policy-based Lending and Poverty Reduction:
An Overview of Processes, Assessment
and Options
—*Richard Bolt and Manabu Fujimura, January 2002*

No. 3 The Automotive Supply Chain: Global Trends
and Asian Perspectives
—*Francisco Veloso and Rajiv Kumar, January 2002*

No. 4 International Competitiveness of Asian Firms:
An Analytical Framework
—*Rajiv Kumar and Doren Chadee, February 2002*

No. 5 The International Competitiveness of Asian
Economies in the Apparel Commodity Chain
—*Gary Gereffi, February 2002*

No. 6 Monetary and Financial Cooperation in East
Asia—The Chiang Mai Initiative and Beyond
—*Pradumna B. Rana, February 2002*

No. 7 Probing Beneath Cross-national Averages: Poverty,
Inequality, and Growth in the Philippines
—*Arsenio M. Balisacan and Ernesto M. Pernia,
March 2002*

No. 8 Poverty, Growth, and Inequality in Thailand
—*Anil B. Deolalikar, April 2002*

No. 9 Microfinance in Northeast Thailand: Who Benefits
and How Much?
—*Brett E. Coleman, April 2002*

No. 10 Poverty Reduction and the Role of Institutions in
Developing Asia
—*Anil B. Deolalikar, Alex B. Brilliantes, Jr.,
Raghav Gaiha, Ernesto M. Pernia, Mary Racelis
with the assistance of Marita Concepcion Castro-
Guevara, Liza L. Lim, Pilipinas F. Quising, May
2002*

No. 11 The European Social Model: Lessons for
Developing Countries
—*Assar Lindbeck, May 2002*

No. 12 Costs and Benefits of a Common Currency for
ASEAN
—*Srinivasa Madhur, May 2002*

No. 13 Monetary Cooperation in East Asia: A Survey
—*Raul Fabella, May 2002*

No. 14 Toward A Political Economy Approach
to Policy-based Lending
—*George Abonyi, May 2002*

No. 15 A Framework for Establishing Priorities in a
Country Poverty Reduction Strategy
—*Ron Duncan and Steve Pollard, June 2002*

No. 16 The Role of Infrastructure in Land-use Dynamics
and Rice Production in Viet Nam's Mekong River
Delta
—*Christopher Edmonds, July 2002*

No. 17 Effect of Decentralization Strategy on
Macroeconomic Stability in Thailand
—*Kanokpan Lao-Araya, August 2002*

No. 18 Poverty and Patterns of Growth
—*Rana Hasan and M. G. Quibria, August 2002*

No. 19 Why are Some Countries Richer than Others?
A Reassessment of Mankiw-Romer-Weil's Test of
the Neoclassical Growth Model
—*Jesus Felipe and John McCombie, August 2002*

No. 20 Modernization and Son Preference in People's
Republic of China

—*Robin Burgess and Juzhong Zhuang, September
2002*

No. 21 The Doha Agenda and Development: A View from
the Uruguay Round
—*J. Michael Finger, September 2002*

No. 22 Conceptual Issues in the Role of Education
Decentralization in Promoting Effective Schooling
in Asian Developing Countries
—*Jere R. Behrman, Anil B. Deolalikar, and Lee-
Ying Son, September 2002*

No. 23 Promoting Effective Schooling through Education
Decentralization in Bangladesh, Indonesia, and
Philippines
—*Jere R. Behrman, Anil B. Deolalikar, and Lee-
Ying Son, September 2002*

No. 24 Financial Opening under the WTO Agreement in
Selected Asian Countries: Progress and Issues
—*Yun-Hwan Kim, September 2002*

No. 25 Revisiting Growth and Poverty Reduction in
Indonesia: What Do Subnational Data Show?
—*Arsenio M. Balisacan, Ernesto M. Pernia,
and Abuzar Asra, October 2002*

No. 26 Causes of the 1997 Asian Financial Crisis: What
Can an Early Warning System Model Tell Us?
—*Juzhong Zhuang and J. Malcolm Dowling,
October 2002*

No. 27 Digital Divide: Determinants and Policies with
Special Reference to Asia
—*M. G. Quibria, Shamsun N. Ahmed, Ted
Tschang, and Mari-Len Reyes-Macasaquit, October
2002*

No. 28 Regional Cooperation in Asia: Long-term
Progress, Recent Retrogression, and the Way
Forward —*Ramgopal Agarwala and Brahm
Prakash, October 2002*

No. 29 How can Cambodia, Lao PDR, Myanmar, and Viet
Nam Cope with Revenue Lost Due to AFTA Tariff
Reductions?
—*Kanokpan Lao-Araya, November 2002*

No. 30 Asian Regionalism and Its Effects on Trade in the
1980s and 1990s
—*Ramon Clarete, Christopher Edmonds, and
Jessica Seddon Wallack, November 2002*

No. 31 New Economy and the Effects of Industrial
Structures on International Equity Market
Correlations
—*Cyn-Young Park and Jaejoon Woo, December
2002*

No. 32 Leading Indicators of Business Cycles in Malaysia
and the Philippines
—*Wenda Zhang and Juzhong Zhuang, December
2002*

No. 33 Technological Spillovers from Foreign Direct
Investment—A Survey
—*Emma Xiaoqin Fan, December 2002*

No. 34 Economic Openness and Regional Development in
the Philippines
—*Ernesto M. Pernia and Pilipinas F. Quising,
January 2003*

No. 35 Bond Market Development in East Asia:
Issues and Challenges
—*Raul Fabella and Srinivasa Madhur, January
2003*

35

ERD POLICY BRIEF SERIES (PBS)
(Published in-house; Available through ADB Department of External Relations; Free of charge)

No. 45   International Payments Imbalances
          —*Jesus Felipe, Frank Harrigan, and Aashish*
          Mehta, April 2006
No. 46   Improving Primary Enrollment Rates among the
          Poor
          —*Ajay Tandon, August 2006*
No. 47   Inclusiveness of Economic Growth in the People's
          Republic of China: What Do Population Health
          Outcomes Tell Us?

          —*Ajay Tandon and Juzhong Zhuang, January*
          2007
No. 48   Pro-Poor to Inclusive Growth: Asian Prescriptions
          —*Ifzal Ali, May 2007*
No. 49   Technology and Development in Asia
          —*Frank Harrigan, June 2007*

ERD OCCASIONAL STATISTICAL PAPER SERIES (OSP)
(Published in-house; Available through ADB Department of External Relations; Free of Charge)

No. 1   Developing an Interregional Input–Output Table
          for Cross-border Economies: An Application to Lao
          People's Democratic Republic and Thailand
          —*Benson Sim, Francisco Secretario, and Eric*
          Suan, July 2007

No. 2   Measurement of Services Sector Statistics in the
          People's Republic of China: How can They be
          Improved?
          —*Bishnu Dev Pant and Derek Blades, November*
          2007

ERD TECHNICAL NOTE SERIES (TNS)
(Published in-house; Available through ADB Department of External Relations; Free of Charge)

No. 1   Contingency Calculations for Environmental Im-
          pacts with Unknown Monetary Values
          —*David Dole, February 2002*
No. 2   Integrating Risk into ADB's Economic Analysis
          of Projects
          —*Nigel Rayner, Anneli Lagman-Martin,*
          and Keith Ward, June 2002
No. 3   Measuring Willingness to Pay for Electricity
          —*Peter Choynowski, July 2002*
No. 4   Economic Issues in the Design and Analysis of a
          Wastewater Treatment Project
          —*David Dole, July 2002*
No. 5   An Analysis and Case Study of the Role
          of Environmental Economics at the Asian
          Development Bank
          —*David Dole and Piya Abeygunawardena, Septem-*
          ber 2002
No. 6   Economic Analysis of Health Projects: A Case
          Study in Cambodia
          —*Erik Bloom and Peter Choynowski, May 2003*
No. 7   Strengthening the Economic Analysis of Natural
          Resource Management Projects
          —*Keith Ward, September 2003*
No. 8   Testing Savings Product Innovations Using an
          Experimental Methodology
          —*Nava Ashraf, Dean S. Karlan, and Wesley Yin,*
          November 2003
No. 9   Setting User Charges for Public Services: Policies
          and Practice at the Asian Development Bank
          —*David Dole, December 2003*
No. 10   Beyond Cost Recovery: Setting User Charges for
          Financial, Economic, and Social Goals
          —*David Dole and Ian Bartlett, January 2004*
No. 11   Shadow Exchange Rates for Project Economic
          Analysis: Toward Improving Practice at the Asian
          Development Bank
          —*Anneli Lagman-Martin, February 2004*
No. 12   Improving the Relevance and Feasibility of
          Agriculture and Rural Development Operational
          Designs: How Economic Analyses Can Help
          —*Richard Bolt, September 2005*

No. 13   Assessing the Use of Project Distribution and
          Poverty Impact Analyses at the Asian Development
          Bank
          —*Franklin D. De Guzman, October 2005*
No. 14   Assessing Aid for a Sector Development Plan:
          Economic Analysis of a Sector Loan
          —*David Dole, November 2005*
No. 15   Debt Management Analysis of Nepal's Public Debt
          —*Sungsup Ra, Changyong Rhee, and Joon-Ho*
          Hahm, December 2005
No. 16   Evaluating Microfinance Program Innovation with
          Randomized Control Trials: An Example from
          Group Versus Individual Lending
          —*Xavier Giné, Tomoko Harigaya,Dean Karlan, and*
          Binh T. Nguyen, March 2006
No. 17   Setting User Charges for Urban Water Supply:
          A Case Study of the Metropolitan Cebu Water
          District in the Philippines
          —*David Dole and Edna Balucan, June 2006*
No. 18   Forecasting Inflation and GDP Growth: Automatic
          Leading Indicator (ALI) Method versus Macro
          Econometric Structural Models (MESMs)
          —*Marie Anne Cagas, Geoffrey Ducanes, Nedelyn*
          Magtibay-Ramos, Duo Qin and Pilipinas Quising,
          July 2006
No. 19   Willingness-to-Pay and Design of Water Supply
          and Sanitation Projects: A Case Study
          —*Herath Gunatilake, Jui-Chen Yang, Subhrendu*
          Pattanayak, and Caroline van den Berg,
          December 2006
No. 20   Tourism for Pro-Poor and Sutainable Growth:
          Economic Analysis of ADB Tourism Projects
          —*Tun Lin and Franklin D. De Guzman,*
          January 2007
No. 21   Critical Issues of Fiscal Decentralization
          —*Norio Usui, February 2007*
No. 22   Pro-Poor Growth: Concepts and Measures
          —*Hyun H. Son, June 2007*

SERIALS
(Available commercially through ADB Office of External Relations)

1. Asian Development Outlook (ADO; annual)
    $36.00 (paperback)
2. Key Indicators of Developing Asian and Pacific Countries (KI; annual)
    $35.00 (paperback)
3. Asian Development Review (ADR; semiannual)
    $5.00 per issue; $10.00 per year (2 issues)

SPECIAL STUDIES, COMPLIMENTARY
(Available through ADB Department of External Relations)

1. Improving Domestic Resource Mobilization Through Financial Development: Overview *September 1985*
2. Improving Domestic Resource Mobilization Through Financial Development: Bangladesh *July 1986*
3. Improving Domestic Resource Mobilization Through Financial Development: Sri Lanka *April 1987*
4. Improving Domestic Resource Mobilization Through Financial Development: India *December 1987*
5. Financing Public Sector Development Expenditure in Selected Countries: Overview *January 1988*
6. Study of Selected Industries: A Brief Report *April 1988*
7. Financing Public Sector Development Expenditure in Selected Countries: Bangladesh *June 1988*
8. Financing Public Sector Development Expenditure in Selected Countries: India *June 1988*
9. Financing Public Sector Development Expenditure in Selected Countries: Indonesia *June 1988*
10. Financing Public Sector Development Expenditure in Selected Countries: Nepal *June 1988*
11. Financing Public Sector Development Expenditure in Selected Countries: Pakistan *June 1988*
12. Financing Public Sector Development Expenditure in Selected Countries: Philippines *June 1988*
13. Financing Public Sector Development Expenditure in Selected Countries: Thailand *June 1988*
14. Towards Regional Cooperation in South Asia: ADB/EWC Symposium on Regional Cooperation in South Asia *February 1988*
15. Evaluating Rice Market Intervention Policies: Some Asian Examples *April 1988*
16. Improving Domestic Resource Mobilization Through Financial Development: Nepal *November 1988*
17. Foreign Trade Barriers and Export Growth *September 1988*
18. The Role of Small and Medium-Scale Industries in the Industrial Development of the Philippines *April 1989*
19. The Role of Small and Medium-Scale Manufacturing Industries in Industrial Development: The Experience of Selected Asian Countries *January 1990*
20. National Accounts of Vanuatu, 1983-1987 *January 1990*
21. National Accounts of Western Samoa, 1984-1986 *February 1990*
22. Human Resource Policy and Economic Development: Selected Country Studies *July 1990*
23. Export Finance: Some Asian Examples *September 1990*
24. National Accounts of the Cook Islands, 1982-1986 *September 1990*
25. Framework for the Economic and Financial Appraisal of Urban Development Sector Projects *January 1994*
26. Framework and Criteria for the Appraisal and Socioeconomic Justification of Education Projects *January 1994*
27. Investing in Asia *1997 (Co-published with OECD)*
28. The Future of Asia in the World Economy *1998 (Co-published with OECD)*
29. Financial Liberalisation in Asia: Analysis and Prospects *1999 (Co-published with OECD)*
30. Sustainable Recovery in Asia: Mobilizing Resources for Development *2000 (Co-published with OECD)*
31. Technology and Poverty Reduction in Asia and the Pacific *2001 (Co-published with OECD)*
32. Asia and Europe *2002 (Co-published with OECD)*
33. Economic Analysis: Retrospective *2003*
34. Economic Analysis: Retrospective: 2003 Update *2004*
35. Development Indicators Reference Manual: Concepts and Definitions *2004*
36. Investment Climate and Productivity Studies
    Philippines: Moving Toward a Better Investment Climate *2005*
    The Road to Recovery: Improving the Investment Climate in Indonesia *2005*
    Sri Lanka: Improving the Rural and Urban Investment Climate *2005*
    Lao PDR Private Sector and Investment Climate Assessment: Reducing Investment Climate Constraints to Higher Growth *2006*

OLD MONOGRAPH SERIES
(Available through ADB Department of External Relations; Free of charge)

EDRC REPORT SERIES (ER)

No. 1   ASEAN and the Asian Development Bank
         —*Seiji Naya, April 1982*
No. 2   Development Issues for the Developing East
         and Southeast Asian Countries
         and International Cooperation
         —*Seiji Naya and Graham Abbott, April 1982*
No. 3   Aid, Savings, and Growth in the Asian Region
         —*J. Malcolm Dowling and Ulrich Hiemenz,
            April 1982*
No. 4   Development-oriented Foreign Investment
         and the Role of ADB
         —*Kiyoshi Kojima, April 1982*
No. 5   The Multilateral Development Banks
         and the International Economy's Missing
         Public Sector
         —*John Lewis, June 1982*
No. 6   Notes on External Debt of DMCs
         —*Evelyn Go, July 1982*
No. 7   Grant Element in Bank Loans
         —*Dal Hyun Kim, July 1982*
No. 8   Shadow Exchange Rates and Standard
         Conversion Factors in Project Evaluation
         —*Peter Warr, September 1982*
No. 9   Small and Medium-Scale Manufacturing
         Establishments in ASEAN Countries:
         Perspectives and Policy Issues
         —*Mathias Bruch and Ulrich Hiemenz, January
         1983*
No. 10   A Note on the Third Ministerial Meeting of GATT
         —*Jungsoo Lee, January 1983*
No. 11   Macroeconomic Forecasts for the Republic
         of China, Hong Kong, and Republic of Korea
         —*J.M. Dowling, January 1983*
No. 12   ASEAN: Economic Situation and Prospects
         —*Seiji Naya, March 1983*
No. 13   The Future Prospects for the Developing
         Countries of Asia
         —*Seiji Naya, March 1983*
No. 14   Energy and Structural Change in the Asia-
         Pacific Region, Summary of the Thirteenth
         Pacific Trade and Development Conference
         —*Seiji Naya, March 1983*
No. 15   A Survey of Empirical Studies on Demand
         for Electricity with Special Emphasis on Price
         Elasticity of Demand
         —*Wisarn Pupphavesa, June 1983*
No. 16   Determinants of Paddy Production in Indonesia:
         1972-1981–A Simultaneous Equation Model
         Approach
         —*T.K. Jayaraman, June 1983*
No. 17   The Philippine Economy: Economic
         Forecasts for 1983 and 1984
         —*J.M. Dowling, E. Go, and C.N. Castillo, June
         1983*
No. 18   Economic Forecast for Indonesia
         —*J.M. Dowling, H.Y. Kim, Y.K. Wang,
            and C.N. Castillo, June 1983*
No. 19   Relative External Debt Situation of Asian
         Developing Countries: An Application
         of Ranking Method
         —*Jungsoo Lee, June 1983*
No. 20   New Evidence on Yields, Fertilizer Application,
         and Prices in Asian Rice Production
         —*William James and Teresita Ramirez, July 1983*
No. 21   Inflationary Effects of Exchange Rate
         Changes in Nine Asian LDCs
         —*Pradumna B. Rana and J. Malcolm Dowling, Jr.,*

December 1983
No. 22   Effects of External Shocks on the Balance
         of Payments, Policy Responses, and Debt
         Problems of Asian Developing Countries
         —*Seiji Naya, December 1983*
No. 23   Changing Trade Patterns and Policy Issues:
         The Prospects for East and Southeast Asian
         Developing Countries
         —*Seiji Naya and Ulrich Hiemenz, February 1984*
No. 24   Small-Scale Industries in Asian Economic
         Development: Problems and Prospects
         —*Seiji Naya, February 1984*
No. 25   A Study on the External Debt Indicators
         Applying Logit Analysis
         —*Jungsoo Lee and Clarita Barretto, February 1984*
No. 26   Alternatives to Institutional Credit Programs
         in the Agricultural Sector of Low-Income
         Countries
         —*Jennifer Sour, March 1984*
No. 27   Economic Scene in Asia and Its Special Features
         —*Kedar N. Kohli, November 1984*
No. 28   The Effect of Terms of Trade Changes on the
         Balance of Payments and Real National
         Income of Asian Developing Countries
         —*Jungsoo Lee and Lutgarda Labios, January 1985*
No. 29   Cause and Effect in the World Sugar Market:
         Some Empirical Findings 1951-1982
         —*Yoshihiro Iwasaki, February 1985*
No. 30   Sources of Balance of Payments Problem
         in the 1970s: The Asian Experience
         —*Pradumna Rana, February 1985*
No. 31   India's Manufactured Exports: An Analysis
         of Supply Sectors
         —*Ifzal Ali, February 1985*
No. 32   Meeting Basic Human Needs in Asian
         Developing Countries
         —*Jungsoo Lee and Emma Banaria, March 1985*
No. 33   The Impact of Foreign Capital Inflow
         on Investment and Economic Growth
         in Developing Asia
         —*Evelyn Go, May 1985*
No. 34 The Climate for Energy Development
         in the Pacific and Asian Region:
         Priorities and Perspectives
         —*V.V. Desai, April 1986*
No. 35   Impact of Appreciation of the Yen on
         Developing Member Countries of the Bank
         —*Jungsoo Lee, Pradumna Rana, and Ifzal Ali,
         May 1986*
No. 36   Smuggling and Domestic Economic Policies
         in Developing Countries
         —*A.H.M.N. Chowdhury, October 1986*
No. 37   Public Investment Criteria: Economic Internal
         Rate of Return and Equalizing Discount Rate
         —*Ifzal Ali, November 1986*
No. 38   Review of the Theory of Neoclassical Political
         Economy: An Application to Trade Policies
         —*M.G. Quibria, December 1986*
No. 39   Factors Influencing the Choice of Location:
         Local and Foreign Firms in the Philippines
         —*E.M. Pernia and A.N. Herrin, February 1987*
No. 40   A Demographic Perspective on Developing
         Asia and Its Relevance to the Bank
         —*E.M. Pernia, May 1987*
No. 41   Emerging Issues in Asia and Social Cost
         Benefit Analysis
         —*I. Ali, September 1988*

No. 42　Shifting Revealed Comparative Advantage:
　　　　Experiences of Asian and Pacific Developing
　　　　Countries
　　　　—*P.B. Rana, November 1988*
No. 43　Agricultural Price Policy in Asia:
　　　　Issues and Areas of Reforms
　　　　—*I. Ali, November 1988*
No. 44　Service Trade and Asian Developing Economies
　　　　—*M.G. Quibria, October 1989*
No. 45　A Review of the Economic Analysis of Power
　　　　Projects in Asia and Identification of Areas
　　　　of Improvement
　　　　—*I. Ali, November 1989*
No. 46　Growth Perspective and Challenges for Asia:
　　　　Areas for Policy Review and Research
　　　　—*I. Ali, November 1989*
No. 47　An Approach to Estimating the Poverty
　　　　Alleviation Impact of an Agricultural Project
　　　　—*I. Ali, January 1990*
No. 48　Economic Growth Performance of Indonesia,
　　　　the Philippines, and Thailand:
　　　　The Human Resource Dimension
　　　　—*E.M. Pernia, January 1990*
No. 49　Foreign Exchange and Fiscal Impact of a Project:
　　　　A Methodological Framework for Estimation
　　　　—*I. Ali, February 1990*
No. 50　Public Investment Criteria: Financial
　　　　and Economic Internal Rates of Return
　　　　—*I. Ali, April 1990*
No. 51　Evaluation of Water Supply Projects:
　　　　An Economic Framework
　　　　—*Arlene M. Tadle, June 1990*
No. 52　Interrelationship Between Shadow Prices, Project
　　　　Investment, and Policy Reforms:
　　　　An Analytical Framework
　　　　—*I. Ali, November 1990*
No. 53　Issues in Assessing the Impact of Project
　　　　and Sector Adjustment Lending
　　　　—*I. Ali, December 1990*
No. 54　Some Aspects of Urbanization
　　　　and the Environment in Southeast Asia
　　　　—*Ernesto M. Pernia, January 1991*
No. 55　Financial Sector and Economic
　　　　Development: A Survey
　　　　—*Jungsoo Lee, September 1991*

No. 56　A Framework for Justifying Bank-Assisted
　　　　Education Projects in Asia: A Review
　　　　of the Socioeconomic Analysis
　　　　and Identification of Areas of Improvement
　　　　—*Etienne Van De Walle, February 1992*
No. 57　Medium-term Growth-Stabilization
　　　　Relationship in Asian Developing Countries
　　　　and Some Policy Considerations
　　　　—*Yun-Hwan Kim, February 1993*
No. 58　Urbanization, Population Distribution,
　　　　and Economic Development in Asia
　　　　—*Ernesto M. Pernia, February 1993*
No. 59　The Need for Fiscal Consolidation in Nepal:
　　　　The Results of a Simulation
　　　　—*Filippo di Mauro and Ronald Antonio Butiong,
　　　　July 1993*
No. 60　A Computable General Equilibrium Model
　　　　of Nepal
　　　　—*Timothy Buehrer and Filippo di Mauro, October
　　　　1993*
No. 61　The Role of Government in Export Expansion
　　　　in the Republic of Korea: A Revisit
　　　　—*Yun-Hwan Kim, February 1994*
No. 62　Rural Reforms, Structural Change,
　　　　and Agricultural Growth in
　　　　the People's Republic of China
　　　　—*Bo Lin, August 1994*
No. 63　Incentives and Regulation for Pollution Abatement
　　　　with an Application to Waste Water Treatment
　　　　—*Sudipto Mundle, U. Shankar, and Shekhar
　　　　Mehta, October 1995*
No. 64　Saving Transitions in Southeast Asia
　　　　—*Frank Harrigan, February 1996*
No. 65　Total Factor Productivity Growth in East Asia:
　　　　A Critical Survey
　　　　—*Jesus Felipe, September 1997*
No. 66　Foreign Direct Investment in Pakistan:
　　　　Policy Issues and Operational Implications
　　　　—*Ashfaque H. Khan and Yun-Hwan Kim, July
　　　　1999*
No. 67　Fiscal Policy, Income Distribution and Growth
　　　　—*Sailesh K. Jha, November 1999*

ECONOMIC STAFF PAPERS (ES)

No.　1　International Reserves:
　　　　Factors Determining Needs and Adequacy
　　　　—*Evelyn Go, May 1981*
No.　2　Domestic Savings in Selected Developing
　　　　Asian Countries
　　　　—*Basil Moore, assisted by A.H.M. Nuruddin
　　　　Chowdhury, September 1981*
No.　3　Changes in Consumption, Imports and Exports
　　　　of Oil Since 1973: A Preliminary Survey of
　　　　the Developing Member Countries
　　　　of the Asian Development Bank
　　　　—*Dal Hyun Kim and Graham Abbott, September
　　　　1981*
No.　4　By-Passed Areas, Regional Inequalities,
　　　　and Development Policies in Selected
　　　　Southeast Asian Countries
　　　　—*William James, October 1981*
No.　5　Asian Agriculture and Economic Development
　　　　—*William James, March 1982*
No.　6　Inflation in Developing Member Countries:
　　　　An Analysis of Recent Trends
　　　　—*A.H.M. Nuruddin Chowdhury and J. Malcolm
　　　　Dowling, March 1982*
No.　7　Industrial Growth and Employment in
　　　　Developing Asian Countries: Issues and

Perspectives for the Coming Decade
—*Ulrich Hiemenz, March 1982*
No.　8　Petrodollar Recycling 1973-1980.
　　　　Part 1: Regional Adjustments and
　　　　the World Economy
　　　　—*Burnham Campbell, April 1982*
No.　9　Developing Asia: The Importance
　　　　of Domestic Policies
　　　　—*Economics Office Staff under the direction of
　　　　Seiji Naya, May 1982*
No. 10　Financial Development and Household
　　　　Savings:　Issues in Domestic Resource
　　　　Mobilization in Asian Developing Countries
　　　　—*Wan-Soon Kim, July 1982*
No. 11　Industrial Development: Role of Specialized
　　　　Financial Institutions
　　　　—*Kedar N. Kohli, August 1982*
No. 12　Petrodollar Recycling 1973-1980.
　　　　Part II: Debt Problems and an Evaluation
　　　　of Suggested Remedies
　　　　—*Burnham Campbell, September 1982*
No. 13　Credit Rationing, Rural Savings, and Financial
　　　　Policy in Developing Countries
　　　　—*William James, September 1982*

No. 14 Small and Medium-Scale Manufacturing
Establishments in ASEAN Countries:
Perspectives and Policy Issues
—*Mathias Bruch and Ulrich Hiemenz, March 1983*

No. 15 Income Distribution and Economic
Growth in Developing Asian Countries
—*J. Malcolm Dowling and David Soo, March 1983*

No. 16 Long-Run Debt-Servicing Capacity of
Asian Developing Countries: An Application
of Critical Interest Rate Approach
—*Jungsoo Lee, June 1983*

No. 17 External Shocks, Energy Policy,
and Macroeconomic Performance of Asian
Developing Countries: A Policy Analysis
—*William James, July 1983*

No. 18 The Impact of the Current Exchange Rate
System on Trade and Inflation of Selected
Developing Member Countries
—*Pradumna Rana, September 1983*

No. 19 Asian Agriculture in Transition: Key Policy Issues
—*William James, September 1983*

No. 20 The Transition to an Industrial Economy
in Monsoon Asia
—*Harry T. Oshima, October 1983*

No. 21 The Significance of Off-Farm Employment
and Incomes in Post-War East Asian Growth
—*Harry T. Oshima, January 1984*

No. 22 Income Distribution and Poverty in Selected
Asian Countries
—*John Malcolm Dowling, Jr., November 1984*

No. 23 ASEAN Economies and ASEAN Economic
Cooperation
—*Narongchai Akrasanee, November 1984*

No. 24 Economic Analysis of Power Projects
—*Nitin Desai, January 1985*

No. 25 Exports and Economic Growth in the Asian Region
—*Pradumna Rana, February 1985*

No. 26 Patterns of External Financing of DMCs
—*E. Go, May 1985*

No. 27 Industrial Technology Development
the Republic of Korea
—*S.Y. Lo, July 1985*

No. 28 Risk Analysis and Project Selection:
A Review of Practical Issues
—*J.K. Johnson, August 1985*

No. 29 Rice in Indonesia: Price Policy and Comparative
Advantage
—*I. Ali, January 1986*

No. 30 Effects of Foreign Capital Inflows
on Developing Countries of Asia
—*Jungsoo Lee, Pradumna B. Rana, and Yoshihiro
Iwasaki, April 1986*

No. 31 Economic Analysis of the Environmental
Impacts of Development Projects
—*John A. Dixon et al., EAPI, East-West Center,
August 1986*

No. 32 Science and Technology for Development:
Role of the Bank
—*Kedar N. Kohli and Ifzal Ali, November 1986*

No. 33 Satellite Remote Sensing in the Asian
and Pacific Region
—*Mohan Sundara Rajan, December 1986*

No. 34 Changes in the Export Patterns of Asian and
Pacific Developing Countries: An Empirical
Overview
—*Pradumna B. Rana, January 1987*

No. 35 Agricultural Price Policy in Nepal
—*Gerald C. Nelson, March 1987*

No. 36 Implications of Falling Primary Commodity
Prices for Agricultural Strategy in the Philippines
—*Ifzal Ali, September 1987*

No. 37 Determining Irrigation Charges: A Framework
—*Prabhakar B. Ghate, October 1987*

No. 38 The Role of Fertilizer Subsidies in Agricultural
Production: A Review of Select Issues

—*M.G. Quibria, October 1987*

No. 39 Domestic Adjustment to External Shocks
in Developing Asia
—*Jungsoo Lee, October 1987*

No. 40 Improving Domestic Resource Mobilization
through Financial Development: Indonesia
—*Philip Erquiaga, November 1987*

No. 41 Recent Trends and Issues on Foreign Direct
Investment in Asian and Pacific Developing
Countries
—*P.B. Rana, March 1988*

No. 42 Manufactured Exports from the Philippines:
A Sector Profile and an Agenda for Reform
—*I. Ali, September 1988*

No. 43 A Framework for Evaluating the Economic
Benefits of Power Projects
—*I. Ali, August 1989*

No. 44 Promotion of Manufactured Exports in Pakistan
—*Jungsoo Lee and Yoshihiro Iwasaki, September
1989*

No. 45 Education and Labor Markets in Indonesia:
A Sector Survey
—*Ernesto M. Pernia and David N. Wilson,
September 1989*

No. 46 Industrial Technology Capabilities
and Policies in Selected ADCs
—*Hiroshi Kakazu, June 1990*

No. 47 Designing Strategies and Policies
for Managing Structural Change in Asia
—*Ifzal Ali, June 1990*

No. 48 The Completion of the Single European
Community Market in 1992: A Tentative
Assessment of its Impact on Asian Developing
Countries
—*J.P. Verbiest and Min Tang, June 1991*

No. 49 Economic Analysis of Investment in Power Systems
—*Ifzal Ali, June 1991*

No. 50 External Finance and the Role of Multilateral
Financial Institutions in South Asia:
Changing Patterns, Prospects, and Challenges
—*Jungsoo Lee, November 1991*

No. 51 The Gender and Poverty Nexus: Issues and
Policies
—*M.G. Quibria, November 1993*

No. 52 The Role of the State in Economic Development:
Theory, the East Asian Experience,
and the Malaysian Case
—*Jason Brown, December 1993*

No. 53 The Economic Benefits of Potable Water Supply
Projects to Households in Developing Countries
—*Dale Whittington and Venkateswarlu Swarna,
January 1994*

No. 54 Growth Triangles: Conceptual Issues
and Operational Problems
—*Min Tang and Myo Thant, February 1994*

No. 55 The Emerging Global Trading Environment
and Developing Asia
—*Arvind Panagariya, M.G. Quibria, and Narhari
Rao, July 1996*

No. 56 Aspects of Urban Water and Sanitation in
the Context of Rapid Urbanization in
Developing Asia
—*Ernesto M. Pernia and Stella LF. Alabastro,
September 1997*

No. 57 Challenges for Asia's Trade and Environment
—*Douglas H. Brooks, January 1998*

No. 58 Economic Analysis of Health Sector Projects-
A Review of Issues, Methods, and Approaches
—*Ramesh Adhikari, Paul Gertler, and Anneli
Lagman, March 1999*

No. 59 The Asian Crisis: An Alternate View
—*Rajiv Kumar and Bibek Debroy, July 1999*

No. 60 Social Consequences of the Financial Crisis in
Asia
—*James C. Knowles, Ernesto M. Pernia, and Mary
Racelis, November 1999*

41

OCCASIONAL PAPERS (OP)

No. 1   Poverty in the People's Republic of China:
Recent Developments and Scope
for Bank Assistance
—*K.H. Moinuddin, November 1992*

No. 2   The Eastern Islands of Indonesia: An Overview
of Development Needs and Potential
—*Brien K. Parkinson, January 1993*

No. 3   Rural Institutional Finance in Bangladesh
and Nepal: Review and Agenda for Reforms
—*A.H.M.N. Chowdhury and Marcelia C. Garcia,
November 1993*

No. 4   Fiscal Deficits and Current Account Imbalances
of the South Pacific Countries:
A Case Study of Vanuatu
—*T.K. Jayaraman, December 1993*

No. 5   Reforms in the Transitional Economies of Asia
—*Pradumna B. Rana, December 1993*

No. 6   Environmental Challenges in the People's Republic
of China and Scope for Bank Assistance
—*Elisabetta Capannelli and Omkar L. Shrestha,
December 1993*

No. 7   Sustainable Development Environment
and Poverty Nexus
—*K.F. Jalal, December 1993*

No. 8   Intermediate Services and Economic
Development: The Malaysian Example
—*Sutanu Behuria and Rahul Khullar, May 1994*

No. 9   Interest Rate Deregulation: A Brief Survey
of the Policy Issues and the Asian Experience
—*Carlos J. Glower, July 1994*

No. 10   Some Aspects of Land Administration
in Indonesia: Implications for Bank Operations
—*Sutanu Behuria, July 1994*

No. 11   Demographic and Socioeconomic Determinants
of Contraceptive Use among Urban Women in
the Melanesian Countries in the South Pacific:
A Case Study of Port Vila Town in Vanuatu
—*T.K. Jayaraman, February 1995*

No. 12   Managing Development through

Institution Building
— *Hilton L. Root, October 1995*

No. 13   Growth, Structural Change, and Optimal
Poverty Interventions
—*Shiladitya Chatterjee, November 1995*

No. 14   Private Investment and Macroeconomic
Environment in the South Pacific Island
Countries: A Cross-Country Analysis
—*T.K. Jayaraman, October 1996*

No. 15   The Rural-Urban Transition in Viet Nam:
Some Selected Issues
—*Sudipto Mundle and Brian Van Arkadie, October
1997*

No. 16   A New Approach to Setting the Future
Transport Agenda
—*Roger Allport, Geoff Key, and Charles Melhuish,
June 1998*

No. 17   Adjustment and Distribution:
The Indian Experience
—*Sudipto Mundle and V.B. Tulasidhar, June 1998*

No. 18   Tax Reforms in Viet Nam: A Selective Analysis
—*Sudipto Mundle, December 1998*

No. 19   Surges and Volatility of Private Capital Flows to
Asian Developing Countries: Implications
for Multilateral Development Banks
—*Pradumna B. Rana, December 1998*

No. 20   The Millennium Round and the Asian Economies:
An Introduction
—*Dilip K. Das, October 1999*

No. 21   Occupational Segregation and the Gender
Earnings Gap
—*Joseph E. Zveglich, Jr. and Yana van der Meulen
Rodgers, December 1999*

No. 22   Information Technology: Next Locomotive of
Growth?
—*Dilip K. Das, June 2000*

STATISTICAL REPORT SERIES (SR)

No. 1   Estimates of the Total External Debt of
the Developing Member Countries of ADB:
1981-1983
—*I.P. David, September 1984*

No. 2   Multivariate Statistical and Graphical
Classification Techniques Applied
to the Problem of Grouping Countries
—*I.P. David and D.S. Maligalig, March 1985*

No. 3   Gross National Product (GNP) Measurement
Issues in South Pacific Developing Member
Countries of ADB
—*S.G. Tiwari, September 1985*

No. 4   Estimates of Comparable Savings in Selected
DMCs
—*Hananto Sigit, December 1985*

No. 5   Keeping Sample Survey Design
and Analysis Simple
—*I.P. David, December 1985*

No. 6   External Debt Situation in Asian
Developing Countries
—*I.P. David and Jungsoo Lee, March 1986*

No. 7   Study of GNP Measurement Issues in the
South Pacific Developing Member Countries.
Part I: Existing National Accounts
of SPDMCs–Analysis of Methodology
and Application of SNA Concepts
—*P. Hodgkinson, October 1986*

No. 8   Study of GNP Measurement Issues in the South

Pacific Developing Member Countries.
Part II: Factors Affecting Intercountry
Comparability of Per Capita GNP
—*P. Hodgkinson, October 1986*

No. 9   Survey of the External Debt Situation
in Asian Developing Countries, 1985
—*Jungsoo Lee and I.P. David, April 1987*

No. 10   A Survey of the External Debt Situation
in Asian Developing Countries, 1986
—*Jungsoo Lee and I.P. David, April 1988*

No. 11   Changing Pattern of Financial Flows to Asian
and Pacific Developing Countries
—*Jungsoo Lee and I.P. David, March 1989*

No. 12   The State of Agricultural Statistics in
Southeast Asia
—*I.P. David, March 1989*

No. 13   A Survey of the External Debt Situation
in Asian and Pacific Developing Countries:
1987-1988
—*Jungsoo Lee and I.P. David, July 1989*

No. 14   A Survey of the External Debt Situation in
Asian and Pacific Developing Countries: 1988-1989
—*Jungsoo Lee, May 1990*

No. 15   A Survey of the External Debt Situation
in Asian and Pacific Developing Countries: 1989-
1992
—*Min Tang, June 1991*

No. 16   Recent Trends and Prospects of External Debt
          Situation and Financial Flows to Asian
          and Pacific Developing Countries
          —*Min Tang and Aludia Pardo, June 1992*
No. 17   Purchasing Power Parity in Asian Developing
          Countries: A Co-Integration Test
          —*Min Tang and Ronald Q. Butiong, April 1994*

No. 18   Capital Flows to Asian and Pacific Developing
          Countries: Recent Trends and Future Prospects
          —*Min Tang and James Villafuerte, October 1995*

SPECIAL STUDIES, CO-PUBLISHED
(Available commercially through Oxford University Press Offices, Edward Elgar Publishing, and Palgrave MacMillan)

FROM OXFORD UNIVERSITY PRESS:
Oxford University Press (China) Ltd
18th Floor, Warwick House East
Taikoo Place, 979 King's Road
Quarry Bay, Hong Kong
Tel (852) 2516 3222
Fax (852) 2565 8491
E-mail: *webmaster@oupchina.com.hk*
Web: *www.oupchina.com.hk*

1. Informal Finance: Some Findings from Asia
    Prabhu Ghate et. al., 1992
    $15.00 (paperback)
2. Mongolia: A Centrally Planned Economy
    in Transition
    Asian Development Bank, 1992
    $15.00 (paperback)
3. Rural Poverty in Asia, Priority Issues and Policy Options
    Edited by M.G. Quibria, 1994
    $25.00 (paperback)
4. Growth Triangles in Asia: A New Approach
    to Regional Economic Cooperation
    Edited by Myo Thant, Min Tang, and Hiroshi Kakazu
    1st ed., 1994 $36.00 (hardbound)
    Revised ed., 1998 $55.00 (hardbound)
5. Urban Poverty in Asia: A Survey of Critical Issues
    Edited by Ernesto Pernia, 1994
    $18.00 (paperback)
6. Critical Issues in Asian Development:
    Theories, Experiences, and Policies
    Edited by M.G. Quibria, 1995
    $15.00 (paperback)
    $36.00 (hardbound)
7. Financial Sector Development in Asia
    Edited by Shahid N. Zahid, 1995
    $50.00 (hardbound)
8. Financial Sector Development in Asia: Country Studies
    Edited by Shahid N. Zahid, 1995
    $55.00 (hardbound)
9. Fiscal Management and Economic Reform
    in the People's Republic of China
    Christine P.W. Wong, Christopher Heady, and Wing T. Woo, 1995
    $15.00 (paperback)
10. From Centrally Planned to Market Economies:
    The Asian Approach
    Edited by Pradumna B. Rana and Naved Hamid, 1995
    Vol. 1: Overview
    $36.00 (hardbound)
    Vol. 2: People's Republic of China and Mongolia
    $50.00 (hardbound)
    Vol. 3: Lao PDR, Myanmar, and Viet Nam
    $50.00 (hardbound)
11. Current Issues in Economic Development:
    An Asian Perspective

Edited by M.G. Quibria and J. Malcolm Dowling, 1996
$50.00 (hardbound)
12. The Bangladesh Economy in Transition
    Edited by M.G. Quibria, 1997
    $20.00 (hardbound)
13. The Global Trading System and Developing Asia
    Edited by Arvind Panagariya, M.G. Quibria,
    and Narhari Rao, 1997
    $55.00 (hardbound)
14. Social Sector Issues in Transitional Economies of Asia
    Edited by Douglas H. Brooks and Myo Thant, 1998
    $25.00 (paperback)
    $55.00 (hardbound)
15. Intergovernmental Fiscal Transfers in Asia: Current
    Practice and Challenges for the Future
    Edited by Yun-Hwan Kim and Paul Smoke, 2003
    $15.00 (paperback)
16. Local Government Finance and Bond Markets
    Edited by Yun-Hwan Kim, 2003
    $15.00 (paperback)

FROM EDWARD ELGAR:
Marston Book Services Limited
PO Box 269, Abingdon
Oxon OX14 4YN, United Kingdom
Tel +44 1235 465500
Fax +44 1235 465555
Email: *direct.order@marston.co.uk*
Web: *www.marston.co.uk*

1. Reducing Poverty in Asia: Emerging Issues in Growth,
    Targeting, and Measurement
    Edited by Christopher M. Edmonds, 2003

FROM PALGRAVE MACMILLAN:
Palgrave Macmillan Ltd
Houndmills, Basingstoke
Hampshire RG21 6XS, United Kingdom
Tel: +44 (0)1256 329242
Fax: +44 (0)1256 479476
Email: *orders@palgrave.com*
Web: *www.palgrave.com/home/*

1. Labor Markets in Asia: Issues and Perspectives
    Edited by Jesus Felipe and Rana Hasan, 2006
2. Competition Policy and Development in Asia
    Edited by Douglas H. Brooks and Simon Evenett, 2005
3. Managing FDI in a Globalizing Economy
    Asian Experiences
    Edited by Douglas H. Brooks and Hal Hill, 2004
4. Poverty, Growth, and Institutions in Developing Asia
    *Edited by Ernesto M. Pernia and Anil B. Deolalikar,
    2003*

SPECIAL STUDIES, IN-HOUSE
(Available commercially through ADB Office of External Relations)

1. Rural Poverty in Developing Asia
   Edited by M.G. Quibria
   Vol. 1: Bangladesh, India, and Sri Lanka, *1994*
   $35.00 (paperback)
   Vol. 2: Indonesia, Republic of Korea, Philippines,
   and Thailand, *1996*
   $35.00 (paperback)
2. Gender Indicators of Developing Asian and Pacific
   Countries
   Asian Development Bank, 1993
   $25.00 (paperback)
3. External Shocks and Policy Adjustments: Lessons from
   the Gulf Crisis
   Edited by Naved Hamid and Shahid N. Zahid, 1995
   $15.00 (paperback)
4. Indonesia-Malaysia-Thailand Growth Triangle:
   Theory to Practice
   Edited by Myo Thant and Min Tang, 1996
   $15.00 (paperback)
5. Emerging Asia: Changes and Challenges
   Asian Development Bank, 1997
   $30.00 (paperback)
6. Asian Exports
   Edited by Dilip Das, 1999
   $35.00 (paperback)
   $55.00 (hardbound)
7. Development of Environment Statistics in Developing
   Asian and Pacific Countries
   Asian Development Bank, 1999
   $30.00 (paperback)
8. Mortgage-Backed Securities Markets in Asia
   Edited by S.Ghon Rhee & Yutaka Shimomoto, 1999
   $35.00 (paperback)
9. Rising to the Challenge in Asia: A Study of Financial
   Markets
   Asian Development Bank
   Vol. 1: An Overview, *2000 $20.00 (paperback)*
   Vol. 2: Special Issues, *1999 $15.00 (paperback)*
   Vol. 3: Sound Practices, *2000 $25.00 (paperback)*
   Vol. 4: People's Republic of China, *1999 $20.00 (paper-
   back)*
   Vol. 5: India, *1999 $30.00 (paperback)*
   Vol. 6: Indonesia, *1999 $30.00 (paperback)*
   Vol. 7: Republic of Korea, *1999 $30.00 (paperback)*
   Vol. 8: Malaysia, *1999 $20.00 (paperback)*
   Vol. 9: Pakistan, *1999 $30.00 (paperback)*
   Vol. 10: Philippines, *1999 $30.00 (paperback)*
   Vol. 11: Thailand, *1999 $30.00 (paperback)*
   Vol. 12: Socialist Republic of Viet Nam, *1999 $30.00
   (paperback)*
10. Corporate Governance and Finance in East Asia:
    A Study of Indonesia, Republic of Korea, Malaysia,
    Philippines and Thailand
    *J. Zhuang, David Edwards, D. Webb, & Ma. Virginita
    Capulong*
    Vol. 1: A Consolidated Report, *2000 $10.00 (paperback)*
    Vol. 2: Country Studies, *2001 $15.00 (paperback)*

11. Financial Management and Governance Issues
    Asian Development Bank, 2000
    Cambodia   *$10.00 (paperback)*
    People's Republic of China *$10.00 (paperback)*
    Mongolia   *$10.00 (paperback)*
    Pakistan   *$10.00 (paperback)*
    Papua New Guinea *$10.00 (paperback)*
    Uzbekistan *$10.00 (paperback)*
    Viet Nam   *$10.00 (paperback)*
    Selected Developing Member Countries *$10.00 (paper-
    back)*
12. Government Bond Market Development in Asia
    Edited by Yun-Hwan Kim, 2001
    $25.00 (paperback)
13. Intergovernmental Fiscal Transfers in Asia: Current Practice
    and Challenges for the Future
    Edited by Paul Smoke and Yun-Hwan Kim, 2002
    $15.00 (paperback)
14. Guidelines for the Economic Analysis of Projects
    Asian Development Bank, 1997
    $10.00 (paperback)
15. Guidelines for the Economic Analysis of
    Telecommunications Projects
    Asian Development Bank, 1997
    $10.00 (paperback)
16. Handbook for the Economic Analysis of Water Supply Proj-
    ects
    Asian Development Bank, 1999
    $10.00 (hardbound)
17. Handbook for the Economic Analysis of Health Sector Proj-
    ects
    Asian Development Bank, 2000
    10.00 (paperback)
18. Handbook for Integrating Povery Impact Assessment in
    the Economic Analysis of Projects
    Asian Development Bank, 2001
    $10.00 (paperback)
19. Handbook for Integrating Risk Analysis in the Economic
    Analysis of Projects
    Asian Development Bank, 2002
    $10.00 (paperback)
20. Handbook on Environment Statistics
    Asian Development Bank, 2002
    $10.00 (hardback)
21. Defining an Agenda for Poverty Reduction, Volume 1
    Edited by Christopher Edmonds and Sara Medina, 2002
    $15.00 (paperback)
22. Defining an Agenda for Poverty Reduction, Volume 2
    Edited by Isabel Ortiz, 2002
    $15.00 (paperback)
23. Economic Analysis of Policy-based Operations: Key
    Dimensions
    Asian Development Bank, 2003
    $10.00 (paperback)