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Working Paper

The Service Sector in Asia: Is It an Engine of Growth?

ADB Economics Working Paper Series, No. 322

Provided in Cooperation with:
Asian Development Bank (ADB), Manila

Suggested Citation: Park, Donghyun; Shin, Kwanho (2012) : The Service Sector in Asia: Is It an Engine of Growth?, ADB Economics Working Paper Series, No. 322, Asian Development Bank (ADB), Manila, https://hdl.handle.net/11540/1257

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ADB Economics
Working Paper Series

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Donghyun Park and Kwanho Shin

No. 322 | December 2012

Asian Development Bank

ADB

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This paper was prepared for the *Asian Development Outlook 2012 Update*. We thank Ji-soo Kim and Jongkwan Lee for their excellent research assistance. We benefited from comments by Minsoo Lee, Ejaz Ghani, and other participants at the ADB-PIIE workshop in Washington, DC.

Asian Development Bank

Asian Development Bank
6 ADB Avenue, Mandaluyong City
1550 Metro Manila, Philippines
www.adb.org

© 2012 by Asian Development Bank
December 2012
ISSN 1655-5252
Publication Stock No. WPS125226

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ABSTRACT

The underdeveloped service sector in Asia has the potential to become a new engine of economic growth for developing Asia, which has traditionally relied on export-oriented manufacturing to power its growth. The central objective of this paper is to empirically analyze the prospects for the service sector as a future engine of growth. Our analysis of 12 Asian economies indicates that the service sector already contributed substantially to the region's growth in the past. Furthermore, somewhat surprisingly in light of the difficulty of achieving productivity gains in services, we also find that services labor productivity grew at a healthy pace in much of the region. Overall our analysis provides substantial cause for optimism about the role of the service sector as an engine of growth in Asia. However, some Asian countries where the service sector is currently struggling, such as the Republic of Korea and Thailand, will find it more challenging to develop the sector.

Keywords: Services, structural change, growth, productivity, Asia

JEL Classification: O14, O40, O47

I. INTRODUCTION

Developing Asia has been the star performer of the world economy for the past few decades. In the 1960s newly industrialized economies (NIEs) such as Hong Kong, China; the Republic of Korea; Singapore; and Taipei,China kicked off the region's tectonic transformation from a group of typical struggling developing countries into the most dynamic component of the global economy. The NIEs followed the Japanese blueprint of export-oriented industrialization and were in turn followed by member countries of the Association of Southeast Asian Nations (ASEAN) such as Indonesia, Malaysia, and Thailand. The region's two giants—the People's Republic of China (PRC) and India—were the next to emerge, powered by market-oriented economic reforms and opening up of their economies to foreign trade and investment. Yet other Asian countries such as Viet Nam are now following in the footsteps of the PRC and India. Sustained rapid growth has moved developing Asia from the sidelines of the global economy to the front and center. The region has outperformed not only the maturing advanced economies but also other parts of the developing world, and continues to do so. An important by-product of the region's stellar growth performance has been an unprecedented reduction in poverty.

Broadly speaking, economic growth comes from accumulation of productive factors—i.e., capital and labor—and productivity growth. It is true that productivity growth has contributed substantially to developing Asia's economic growth in the past.[1] In particular, the reallocation of surplus rural workers from low-productivity agriculture to high-productivity manufacturing boosted economywide productivity and growth. However, much of Asia's growth was also driven by factor accumulation. Favorable demographic trends led to a rapid growth of the labor force. Heavy investments in education and flexible labor market enabled Asia to fully take advantage of favorable demographics. In addition to rapid expansion of the labor force, high saving and investment rates allowed Asian countries to quickly accumulate physical capital. In some countries such as Malaysia and Singapore, large inflows of foreign direct investment (FDI) further augmented the stock of physical capital. The consequent explosion of machines, factories, buildings, roads, and ports greatly expanded Asia's productive capacity. In short, both factor accumulation and productivity growth played major roles in the region's growth.

Going forward, a number of considerations suggest that the service sector will become a more important source of growth for Asia.[2] For one, there is a well-established positive relationship between the share of services in GDP (or employment) and GDP per capita.[3] The share of services is higher in richer countries than in poorer countries, and the share of services rises as a country's GDP per capita rises over time. Many Asian countries are at or approaching income levels where the share of services tends to increase. This fact alone implies a larger future role for the service sector in the economy and in economic growth. Furthermore, while the service sector has grown in both absolute and relative terms across Asia, a wide range of internal barriers—e.g., excessive regulation—and external barriers—e.g., barriers to imports and FDI—prevent it from fulfilling its full potential. Therefore, removing those barriers will allow the service sector and the economy as a whole to grow faster. On the demand side, there is a growing appetite for a wide range of services, from tourism to health care to financial services, among Asia's fast-expanding middle class.

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[1] In an influential paper, Young (1995), based on primal growth accounting, argued that the rapid growth of East Asian countries was primarily due to rapid accumulation of capital. However, Hsieh (2002) found, on the basis of dual estimates, that the growth rate of total factor productivity in East Asian countries is significantly higher than that estimated by Young.

[2] The importance of the services sector for the growth of Asian countries has been emphasized in various studies such as Ghani (2010) and ADB (2007).

[3] See, for example, Fuchs (1981).

The global financial and economic crisis of 2008–09 will add further momentum to the shift from manufacturing to services in Asia. The crisis originated in the advanced economies and hit those economies harder than developing countries. Furthermore, the postcrisis recovery has been visibly firmer in the developing countries than in the advanced economies. The upshot for Asia is a less benign external environment in which the advanced countries have weaker growth prospects and hence appetite for imports. Therefore, manufacturing exports to the United States, European Union, and Japan will become a less forceful engine of growth for the region in the post–global crisis period. Aside from a less favorable global environment, more fundamental factors are at work as well. More specifically, manufacturing is maturing in some Asian countries and manufacturing productivity has reached high levels, which implies that the scope for manufacturing-led growth will be more limited than in the past. At the same time, it should be noted that in other countries such as India and the Philippines, there is still plenty of room for manufacturing to grow.

Its high investment rates in the past have left Asia with a large stock of physical capital. Diminishing marginal returns to capital imply that although investment will continue to make a sizeable contribution to growth, productivity growth is likely to play a relatively bigger role in the future. Given the growing weight of services and given the growing weight of productivity growth in economic growth, productivity growth of services industries will be pivotal for Asia's future growth. At a broader level, the central objective of this paper is to empirically examine the prospects for the service sector to serve as an engine of growth for Asia. The rest of the paper is organized as follows. Section 2 looks at the evolution of the service sector in major Asian countries. Section 3 investigates the relationship between per capita GDP and the share of services in GDP and employment. Section 4 assesses the role of the service sector as an engine of growth by examining the contribution of service sector to overall growth, labor productivity in services relative to manufacturing, and determinants of labor productivity in services. Section 5 concludes the paper.

II. EVOLUTION OF THE SERVICE SECTOR IN ASIAN ECONOMIES OVER TIME

In this section, we look at how the service sector has evolved in 12 major Asian economies. More specifically, we look at the share of services in total output and employment. The 12 economies are the PRC; Hong Kong, China; India; Indonesia; the Republic of Korea; Malaysia; Pakistan; the Philippines; Singapore; Taipei,China; Thailand, and Viet Nam. The data are collected from the World Bank's *World Development Indicators* (WDI). In advanced economies, the sectoral composition of employment tends to be as follows: The share of the service sector in employment is greater than the share of the manufacturing sector in employment, which, in turn, is greater than the share of the agriculture sector in employment. Hong Kong, China, the Republic of Korea, Malaysia, Singapore, and Taipei,China all fit this pattern. The shares of the three sectors in GDP are also in the same order except Malaysia.[4]

Typically, at the beginning of the industrialization process—for example, in the Republic of Korea or Malaysia—the employment share of agriculture decreases and the employment shares of both industry and services increase as industrialization proceeds. Surplus workers from rural areas migrate to cities and find work in factories and shops. Subsequently the share of industry in employment starts to stagnate but the share of services in employment continuously rises as the economy moves into the postindustrial phase. GDP shares show quite

[4] For Malaysia, the share of the service sector in GDP is approximately the same as the share of the manufacturing sector in GDP.

similar but slightly different pattern. The GDP share of agriculture continuously declines. At the beginning of industrialization the GDP share of industry increases much more rapidly than the GDP share of services, and then the former starts to stagnate and the latter rises rapidly. The sectoral employment and GDP share movements described above are typical during the process of industrialization and deindustrialization. However, while the experiences of Asian countries generally fit the above pattern, that is not always the case. We now take a closer look at the sectoral movements in employment and GDP for each of the 12 economies (see Figure 1).

Figure 1. Sectoral Employment and GDP Shares

1. People's Republic of China

2. Hong Kong, China

3. India

4. Indonesia

5. Republic of Korea

6. Malaysia

7. Pakistan

8. Philippines

9. Singapore

10. Taipei,China

11. Thailand

12. Viet Nam

Sources: World Bank, World Development Indicators online database (accessed 14 March 2012); national sources.

People's Republic of China. The employment share of agriculture has steadily decreased and the employment shares of both industry and service have increased. The employment share of the service sector has increased even more rapidly than the employment share of industry at the early stage of industrialization. Despite rapid industrialization, the employment share of industry (27.2% in 2008) has not yet reached the level the Republic of Korea experienced at the peak (36% in 1991), and the employment share of agriculture is still largest. Hence it is likely that the industrialization process will continue for a while. However, the GDP shares tell a somewhat different story. The industry GDP share has been largest since 1969. In recent years it is around 46% to 48%. By way of comparison, in the Republic of Korea the industry GDP share peaked at 42.6% in 1991. The services GDP share is increasing but still lower than the industry GDP share. Can the PRC continue to industrialize? How far will the industry GDP share increase? How much of the remaining work force in the agricultural sector will be absorbed by the industry sector? Or can they be mostly absorbed by the service sector? These are some interesting and important questions.

Hong Kong, China. As one might expect from a city-state, agriculture plays no role in either employment or GDP. There is a very clear trend in the share of services versus industry in both employment and GDP. There is a secular rise in services' share of both employment and GDP, and a corresponding secular fall in industry's share of both. The shift of labor and output from manufacturing to services mirrors the hollowing out of the territory's manufacturing base as a result of its relocation to the PRC.

India. For India, the employment shares are reported in only two years, 2000 and 2005. From the limited data, we can still detect a tendency of the employment share of agriculture to decline, and the employment shares of both industry and services to rise. However, the employment share of agriculture is much higher than the shares of the other two sectors, reflecting the continued importance of agriculture in the Indian economy. The employment share of services is a bit higher than the employment share of industry. On the other hand, the GDP share of services is much higher than that of industry. The GDP share of agriculture has steadily decreased since the mid-1970s. The GDP shares of both industry and services have increased since the mid-1970s but the GDP share of services has increased even more rapidly. This

shows the importance of the services industry for the growth performance in India. The question is, can the service sector continue to be an engine of growth in India in the future?

Indonesia. The employment share of agriculture did not change much until the early 1990s and then it started to decline rapidly until the late 1990s. The employment shares of both industry and service started to increase in the early 1990s. Since the late 1990s, however, the employment share of the three sectors has remained fairly stable. On the other hand, the GDP share of industry increased most drastically before the 1980s. The GDP share of services increased but not as much as the GDP share of industry.

Republic of Korea. The Republic of Korea shows a typical pattern of industrialization and deindustrialization. The GDP share of industry has not decreased much, staying around 40%, while its employment share has decreased continuously to 25% since the early 1990s. On the other hand, while the employment share of services has continuously increased, the GDP share of services has not since the early 2000s. Overall, the Republic of Korea is a high-income economy in which the manufacturing sector continues to play a major role.

Malaysia. The employment shares show the typical movements of ups and downs resulting from industrialization and deindustrialization. The employment share of industry increased from the late 1980s and then started to decrease from the late 1990s. The employment share of services increased rapidly from the late 1990s. On the other hand, however, only the GDP share of industry increased rapidly while the GDP share of service decreased until the mid 1970s. Since then, though, the shares of both industry and service have increased at the same pace.

Pakistan. Pakistan does not show any signs of industrialization: The employment share of industry has not changed much and is at around 20%. The employment share of agriculture has declined modestly and the decrease has been mostly absorbed by services. The GDP shares also show the same pattern. While the GDP share of industry has increased modestly, the decrease of the GDP share of agriculture has been mostly absorbed by the GDP share of services. Is industrialization missing in Pakistan? Can the service sector be an engine of growth even without industrialization?

Philippines. The employment shares show the same pattern as in Pakistan. The GDP shares also show a similar pattern as in Pakistan. There are some differences though. The GDP share of industry initially increased until the early 1980s, then decreased. Since the early 1980s, the GDP share of services has been increasing very rapidly. Overall, the patterns are consistent with the general perception of the Philippines as a country that has failed to develop a strong manufacturing base.

Singapore. The employment share of agriculture is minimal. The employment share of industry has been decreasing since the early 1990s and the decrease has been absorbed by the service sector. The GDP share of industry did not decrease much until the mid-2000s and then started to decrease slowly. The enduring strength of the industry sector, which contrasts sharply with its hollowing out in Hong Kong, China, is partly due to government efforts to maintain a vibrant manufacturing base.

Taipei,China. Taipei,China seems to be a typical case of industrialization and deindustrialization. The employment share of industry is over 35%. The GDP share of industry fell sharply from the peak of about 48% to about 30 to 32% in the early 2000s and has remained at that level. More recently, while the employment share of the service sector continuously

increased, its GDP share has not. Notwithstanding the relocation of many manufacturing firms to the PRC, manufacturing remains an important part of the economy.

Thailand. The employment share of agriculture has been continuously decreasing. The employment shares of both industry and services increased until the mid-1990s. The employment share of services has been increasing even more rapidly since then, but the employment share of industry has not changed much. Since Thailand has a strong agricultural sector and is a major food exporter, the employment share of agriculture is still the largest. The employment share of services is slightly lower and the employment share of industry is much lower, at around 20%. On the other hand, the GDP share of services has not changed much and even decreased recently. The decrease in the GDP share of agriculture is mostly offset by the GDP share of industry. This suggests that the service sector is dragging the growth performance of Thailand.

Viet Nam. The data for sectoral employment shares are available only for 2005–10 and show a very similar pattern to India. It seems that Viet Nam is still in the midst of industrialization in the sense that the decrease in the GDP share of agriculture is mostly offset by the GDP share of industry. The GDP share of the service sector has been decreasing since the mid-1990s, which is somewhat surprising. The service sector remains very much underdeveloped.

Overall, the evolution of services' share in GDP and employment over time in Asian countries largely mirrors the international historical experience. Quite clearly, the service sector is playing a large and growing role in GDP and employment across the whole region. At the same time, our review of country experiences reveals a great deal of heterogeneity in the relative importance of services among Asian countries, as highly emphasized by Ghani (2010). To some extent such heterogeneity is rooted in the wide range of income and development levels in Asia. As explained in section 3 below, the share of services in GDP and employment tends to rise with per capita income. However, income and development levels can explain only part of the intra-Asian heterogeneity. For example, India's service sector is larger than other countries at a similar income level whereas the reverse is true for the PRC. Furthermore, there is also a great deal of heterogeneity with respect to the growth rate of the share of services in GDP and employment. For example, in 1980 the share of services in employment was similar in Indonesia and the Philippines but by 2010 it was noticeably higher in the Philippines.

Tables 1 and 2 show the sectoral real GDP growth rates and labor productivity growth rates, respectively, in three subsample periods: period 1 (1960–80), period 2 (1980–2000), and period 3 (2000–2010). On average, the real GDP growth rate of the service sector was lower than that of the industry sector during the first two periods. But in the second period, the gap between the two narrowed sharply and they were quite comparable. In fact, by the third period, the service sector outgrew the industry sector. While it is widely argued that productivity growth in services is inherently difficult to achieve, Table 2 shows that some countries have in fact been able to achieve substantial gains. Furthermore, the gap between the average labor productivity growth rate of the services and industry sectors narrowed sharply in period 3.

Table 1. Sectoral Real GDP Growth Rate, 1960–2010 (%)

	Period 1 (1960–1980)				Period 2 (1980–2000)				Period 3 (2000–2010)			
Economy	Agriculture	Industry	Services	Aggregate	Agriculture	Industry	Services	Aggregate	Agriculture	Industry	Services	Aggregate
China, People's Republic of	3.82	6.41	0.57	3.23	4.88	10.89	10.95	9.40	4.11	10.86	10.52	9.95
Hong Kong, China	–	–	–	–	–	–	–	–	–3.71	–2.77	4.28	3.04
India	2.68	5.99	5.43	4.32	3.02	5.67	6.74	5.35	2.94	7.63	8.89	7.43
Indonesia	3.59	8.36	5.89	5.88	2.78	6.18	5.42	5.21	3.39	3.99	6.77	5.08
Korea, Republic of	2.79	12.03	6.01	6.62	2.40	8.31	6.63	6.87	1.35	5.32	3.59	4.20
Malaysia	4.59	8.05	8.90	7.55	2.01	7.60	6.54	6.37	2.89	2.85	6.35	4.51
Pakistan	3.59	8.11	6.26	5.52	4.13	5.77	5.40	5.12	2.63	5.91	5.00	4.67
Philippines	4.06	6.56	4.76	5.28	1.57	1.44	3.10	2.25	2.81	4.10	5.43	4.65
Singapore	2.01	9.16	7.84	8.25	–4.29	6.87	7.52	7.24	–4.31	5.08	5.78	5.54
Taipei,China	3.56	11.81	9.35	9.26	0.48	4.87	8.02	6.63	0.03	5.80	2.85	3.76
Thailand	4.61	9.92	7.40	7.31	2.67	7.89	5.47	5.96	2.07	5.18	3.70	4.22
Viet Nam					3.65	8.67	6.74	6.40	3.52	8.70	7.09	6.99
Average	3.53	8.64	6.24	6.32	2.12	6.74	6.59	6.07	1.47	5.22	5.85	5.34

"–" means data not available.

Note: Agriculture refers to ISIC divisions 1–5 and includes forestry, hunting, and fishing. Industry refers to ISIC divisions 10–45 which comprise mining, manufacturing, construction, electricity, water, and gas. Service refers to ISIC divisions 50–99 that cover wholesale and retail trade, transport, and government, financial, professional, and personal services. The data are collected from World Bank, World Development Indicators online database except for Taipei,China and Viet Nam for which we rely on national sources. We use 2000 market prices for all countries except for Taipei,China and Viet Nam for which 2006 and 1994 market prices are used, respectively. Due to the lack of data for Viet Nam, the second period average is calculated by using 1988–2000 data.

Sources: State Bank of Viet Nam; World Bank, World Development Indicators online database; http://www.cbc.gov.tw/mp2.html (all data accessed 14 March 2012)

Table 2. Sectoral Labor Productivity Growth Rate, 1980–2010 (%)

	Period 2 (1980–2000)				Period 3 (2000–2010)			
Economy	**Agriculture**	**Industry**	**Services**	**Aggregate**	**Agriculture**	**Industry**	**Services**	**Aggregate**
China, People's Republic of	4.52	7.88	5.30	7.46	6.10	7.93	8.07	9.54
Hong Kong, China	–	–	–	–	–0.24	1.67	1.88	2.34
India	–	–	–	4.46	2.05	2.02	5.41	4.90
Indonesia	–1.66	0.98	–4.98	–1.43	3.25	1.40	3.83	3.34
Korea, Republic of	6.14	6.38	2.03	4.78	5.59	5.74	1.57	3.32
Malaysia	0.50	1.79	0.91	1.68	4.26	2.05	2.10	2.08
Pakistan	1.52	5.43	1.64	2.82	–1.81	3.54	4.39	2.24
Philippines	0.71	–1.35	–1.21	–0.29	1.13	1.89	1.84	1.75
Singapore	–7.36	4.17	4.54	4.40	–8.58	5.29	0.78	1.88
Taipei,China	3.27	3.70	4.33	4.78	3.00	5.16	1.17	2.75
Thailand	2.01	3.29	1.05	3.88	2.94	2.71	0.08	2.44
Viet Nam				4.46	3.00	0.73	3.10	4.38
Average	1.07	3.59	1.51	3.36	1.72	3.34	2.85	3.41

"–" means data not available.
Note: See note for Table1. Since the employment data start from 1980, we do not report statistics for period 1. Due to the lack of data, the second period average is obtained by using 2005–2010 for Viet Nam and 2000–2005 data for India.
Sources: State Bank of Viet Nam; World Bank, World Development Indicators online database; http://www.cbc.gov.tw/mp2.html (all data accessed 14 March 2012)

We now examine individual countries. While the PRC is experiencing industrialization, the growth rate of GDP in the service sector is quite comparable to that in the industry sector. Table 2 suggests that the growth of the service sector, particularly in the last period (2000–2010), is mainly due to labor productivity growth. In Hong Kong, China, the growth of the economy is mainly due to the growth of the service sector. The other sectors are small and show even negative growth rates. India is rapidly growing, particularly in the last subsample period. The GDP growth rate of the service sector is higher than that of the industry sector. The labor productivity growth rate of the service sector is much higher than that of the industry sector. Figure 1 suggests that the driving engine of growth in Indonesia is the industry sector. Interestingly, however, the GDP growth rate as well as the labor productivity growth rate of the service sector is higher than those of the industry sector in the last subsample period. In the Republic of Korea, the service sector real GDP growth rate is particularly low. The labor productivity growth rate of the service sector is even more problematic.

In Malaysia, the service sector GDP growth rate is quite comparable to that of the industry sector. In fact, in the last subsample period, the service sector growth rate was much higher than the industry sector growth rate. The labor productivity growth rate of the service sector was lower in the 1980–2000 period than for industry but similar in the last subsample period. In Pakistan, while the service sector GDP growth rate has always been lower than the industry sector GDP growth rate, the two were comparable in the last two subsample periods. The labor productivity growth rate of the service sector was lower in the second subsample period but higher than that of the industry in the last subsample period. In the Philippines, the service sector growth rate was lower than the industry sector growth rate in the first subsample period but higher in the last two subsample periods. The labor productivity growth rates were both negative in the second subsample period, but they were positive and comparable in the last subsample period.

In Singapore, the growth rate of the service sector was much lower than that of the industry sector in the first subsample period but slightly higher in the last two subsample periods. The labor productivity growth rate of the service sector was comparable to that of the industry sector in the second subsample period but much lower in the last subsample period. In Taipei,China, the service sector growth rate was high in the second subsample period but much lower in the last subsample period. The labor productivity growth rate also showed the same pattern. In Thailand, the service sector growth rate was lower than the industry sector growth rate in all three subsample periods. The gap between the two was even wider for labor productivity growth. In Viet Nam, the service sector growth rate was quite high in the last two subsample periods even though it was lower than the industry sector growth rate. The labor productivity growth rate was reported only for the last subsample period and was quite high.

One interesting feature of the service sector is that a growing range of services are increasingly tradable as a result of technological advances, especially in information and communication technology. The share of service sector output that is exported is reported in Table 3. In most Asian countries, there is a tendency in the share of service sector output that is exported to increase over time. Some exceptions are the PRC (2000–2009), Indonesia (2000–2009), Malaysia (2000–2009), Pakistan (1990–2000), the Philippines (1990–2000), Singapore (1990–2000), and Viet Nam (2000–2009). In general, city-states with sophisticated service sectors, such as Singapore and Hong Kong, China, export a large share of their services output. Large countries such as the PRC, India, Indonesia, and Pakistan have a lower share. India has a pretty large share compared with other large countries. The Republic of Korea has a low share compared with other mid-sized countries. Somewhat surprisingly, Asian countries have a

large share compared with South American countries and developed countries. Eastern European countries have a relatively large share as well.

Table 3. Export Ratio of the Service Industry, (%)

	Service exports/Services, value added		
Economy	**1990**	**2000**	**2009**
12 Asian Economies			
China, People's Republic of	5.2	6.5	6.0
Hong Kong, China	–	28.1	46.7
India	3.7	7.8	13.0
Indonesia	5.2	8.2	7.3
Korea, Republic of	8.6	11.5	16.1
Malaysia	20.6	34.5	32.2
Pakistan	8.2	3.9	4.8
Philippines	16.8	8.1	11.9
Singapore	51.0	49.7	75.6
Thailand	15.0	23.1	25.2
Viet Nam	–	22.4	15.3
South American Countries			
Argentina	3.1	2.7	6.4
Brazil	1.8	2.6	2.9
Chile	12.9	10.8	10.6
Mexico	5.3	3.8	3.0
Eastern Europe			
Czech Republic	–	22.9	19.8
Hungary	21.9	23.1	23.2
Developed Countries			
France	10.0	9.4	7.8
Germany	6.6	7.1	10.8
United Kingdom	9.6	12.8	15.7
United States	3.9	4.1	5.2

Note: Due to the lack of data, data for 2008 instead of 2009 are used for Hungary and the United States.
Source: Authors' estimates based on data from the World Bank, World Development Indicators online database (accessed 14 March 2012).

III. PER CAPITA GDP AND THE SHARE OF THE SERVICE SECTOR IN GDP AND EMPLOYMENT

According to a well-known stylized fact, as per capita income increases, the shares of services in both employment and GDP rise. This relationship is often characterized as linear or quadratic (for example, see Kongsamut, Rebelo, and Xie 1999 and Buera and Kaboski 2009). However,

more recently, Eichengreen and Gupta (2009) argue there are two distinct waves of service sector growth. According to them, the service sector's share of output begins to rise at relatively modest incomes but at a decelerating rate as growth proceeds, which they call the first wave, and then it begins to rise again in a second wave at higher income levels. The first wave is characterized by the rise of the traditional services—lodging, meal preparation, housecleaning, beauty and barber shops—while the second wave is dominated by modern services—banking, insurance, computing, communication, and business services.

The two waves of service sector growth can be characterized by a quartic relationship. Following Eichengreen and Gupta (2009), we estimate a quartic relationship between the service sector's share of GDP and per capita GDP as follows[5]:

$$\frac{S_{it}}{GDP_{it}} = \text{constant} + \sum_{T=1}^{2} \theta_T D_T + \alpha_1 Y_{it} + \alpha_2 Y_{it}^2 + \alpha_3 Y_{it}^3 + \alpha_4 Y_{it}^4 + \epsilon_{it}$$

where S_{it}, GDP_{it}, and Y_{it} are the service sector value added, GDP, and log per capita GDP, respectively, for country *i* at time *t*. D_T is a period dummy: D_1 for 1970–89 and D_2 for 1990–2010. The period dummies are included to allow for different intercepts for different time periods. Our sample, collected from the *World Development Indicators*, covers 157 countries from 1960 to 2010. Since employment data are available from 1980, we include only D_2 in the regression of the employment share equation.

Table 4 reports two estimation results: without period dummies (column 1) and with period dummies (column 2). We include country fixed effects. In both cases, all the per capita GDP terms of the first to the fourth orders are highly significant, confirming the quartic relationship. When we include the two period dummies in the second column, their coefficients are positive and significant, suggesting different intercepts in different subsample periods. In fact, the more recent the subsample period is, the higher is the intercept.

Figure 2 shows the actual shares of the service sector in GDP in the 12 Asian economies and compares them with the typical pattern in different subperiods, predicted by the quartic line fitted on the basis of the estimation in column II, Table 4. Those estimation results allow for different period dummies.[6] In the figures we also denote the 95% confidence bands by grey lines. If an observation lies above the fitted line, the share of services in GDP is higher than in other countries with similar per capita GDP, and the reverse is true for observations below the fitted line. We can observe a number of distinct patterns among Asian countries, implying a high degree of heterogeneity across the region. The share of the service sector in GDP lies below the predicted line in both periods 1 (1970–89) and 2 (1990–2010) for the PRC, Indonesia, the Republic of Korea, Malaysia, and Viet Nam. The share of the service sector in GDP lies above the predicted line in both periods 1 and 2 for Hong Kong, China. The share of the service sector in GDP lies below the predicted line in period 1 but above it in period 2 for India and the Philippines. The share of the service sector in GDP lies above the predicted line in period 1 but below it in period 2 for Singapore and Thailand. Pakistan's service sector lies more or less on the predicted line. In Taipei,China, the service sector lies below the predicted line in period 1 but on the predicted line in period 2.

[5] While Eichengreen and Gupta (2009) cover 1950–2005 for over 80 countries, our sample covers 1960–2010 and 157 countries.

[6] In order to save space, we provide figures only for periods 1 and 2.

Figure 2: Service Sector GDP Share and Per Capita GDP for 12 Asian Economies

Note: The figure shows the estimated relationship and 5 percent confidence interval for two periods based on the regression in Column II, Table 4.
Sources: Authors' estimates; World Bank, World Development Indicators online database; national sources (all data accessed 14 March 2012).

Table 4. Relationship Between Service Sector GDP Share and Log Per Capita GDP
[Dependent Variable: Services/GDP (in percent)]

	I	II
Log Per Capita Income	361.920***	414.668***
	[4.631]	[5.472]
Log Per Capita Income, squared	–62.647***	–72.132***
	[–4.252`]	[–5.050]
Log Per Capita Income, cube	4.703***	5.453***
	[3.865]	[4.623]
Log Per Capita Income, quartic	–0.126***	–0.149***
	[–3.381]	[–4.132]
Dummy for 1970–1989		1.069***
		[2.927]
Dummy for 1990–2010		4.929***
		[12.604]
Country Fixed effects	yes	yes
Observations	5,402	5,402
Number of Countries	157	157
R-squared	0.199	0.249

Note: t statistics are in brackets. "***" indicates coefficient is significant at 1 percent level. Column I shows the quartic relationship with a common intercept for all years. Column II allows the intercepts to differ in periods 1970–1989 and in 1990–2010. Data on per capita income after 1980 are from the World Bank, World Development Indicators online database and before 1980 are from Maddison (2003). Data on the service sector share of GDP are from the World Bank, World Development Indicators online database (accessed 14 March 2012).
Source: Authors' estimates.

Table 5 reports the same regression results except that the dependent variable is the share of the service sector in employment rather than GDP. The results indicate that there is also a similar quartic relationship between the share of the service sector in employment and per capita GDP.

Figure 3 shows the actual shares of the service sector in employment in the 12 Asian economies and compares them with the typical pattern in different subperiods, predicted by the quartic line fitted on the basis of the estimation in column II, Table 5. If an observation lies above the fitted line, the share of services in GDP is higher than in other countries with similar per capita GDP, and the reverse is true for observations below the fitted line. A number of different patterns emerge and again, Asian countries are characterized by a great deal of heterogeneity. The share of service sector in employment lies below the predicted line in both periods 1 (1970–89) and 2 (1990–2010) for the PRC, Indonesia (recently approached the predicted line), Pakistan; Taipei,China; and Thailand. The service sector lies on the predicted line in period 1 but above it in period 2 for Hong Kong, China. India and Viet Nam have data for only a few years in period 2 and they both lie below the predicted line. The Republic of Korea, Malaysia, the Philippines (recently above the predicted line) and Singapore (at the beginning slightly

above the predicted line) lie more or less on the predicted line. The service sector lies below the predicted line in period 1 but on the predicted line in period 2 for Taipei,China.

Figure 3: Service Sector Employment Share and Per Capita GDP for Individual Economies

Note: The figure shows the estimated relationship and 5 percent confidence interval for two periods based on the regression in Column II, Table 3.
Sources: Authors' estimates; World Bank, World Development Indicators online database; national sources (all data accessed 14 March 2012).

Table 5. Relationship Between Service Sector Employment Share and Log Per Capita GDP
[Dependent Variable: Employment in Services/Total Employment (in percent)]

	I	II
Log Per Capita Income	1,432.620***	1,013.291***
	[5.722]	[4.173]
Log Per Capita Income, squared	–248.977***	–177.987***
	[–5.708]	[–4.210]
Log Per Capita Income, cube	18.957***	13.694***
	[5.659]	[4.220]
Log Per Capita Income, quartic	–0.529***	–0.386***
	[–5.532]	[–4.169]
Dummy for 1990–2010		4.345***
		[13.117]
Country Fixed effects	yes	yes
Observations	2,222	2,222
Number of Countries	139	139
R-squared	0.393	0.439

Note: Data on the service sector share of employment are from the World Bank, World Development Indicators online database (accessed 14 March 2012). For others, see note for Table 4.
Source: Authors' estimates.

The above findings can be used to interpret the relative performance of the service sector. For example, if the share of the service sector in a country's employment is on the predicted line, but its share of GDP lies below the predicted line, we can interpret that, compared with other countries with the same level of per capita GDP, its service sector workforce produces less GDP. This indicates that its service sector performs poorly. According to this line of reasoning, our findings suggest that there are broadly three groups of countries.[7] The service sector performs better than the international norm in Hong Kong, China; India; and Pakistan. The service sector performs more or less in line with the international norm in the PRC, the Philippines, and Viet Nam. This is also arguably the case for Indonesia, Singapore, and Taipei,China. Finally, the service sector performs worse than the international norm in the Republic of Korea and Thailand, and arguably in Malaysia as well. As noted earlier, while the relative importance of services is high and growing across Asia, the region's service sector is marked by a great deal of heterogeneity. Such heterogeneity extends to the performance of service sector.

[7] Our classification is based on relative labor productivity of the service sector comparing countries with similar per capita GDP. Another possible interpretation of the graphs is that if both employment and GDP shares of the service sector lie below the predicted line, the smaller size itself is also an indication of less development. However, since the size of the service sector depends on a number of country-specific characteristics such as natural resource endowment, it may be misleading to solely rely on size without controlling for such characteristics.

IV. CAN THE SERVICE SECTOR BE AN ENGINE OF GROWTH FOR ASIA?

In this section, we empirically examine the prospects for the service sector to become an engine of growth for Asia. To do so, we investigate (1) contribution of agriculture, industry, and service sectors to GDP growth, (2) productivity of the service sector relative to the industry sector, and (3) determinant of service sector productivity.

A. Sectoral Contribution to GDP Growth

We focus on the three most recent decades: 1980s, 1990s, and 2000s. The sectoral contribution in each decade is calculated by dividing the log difference in the sectoral value-added by the log difference in the aggregate GDP (multiplied by the sectoral weights). The first three columns in each decade panel (1980s, 1990s, and 2000s) in Table 6 sum up to 100%. The last column in each decade panel is the aggregate GDP growth rate in each decade. Overall, the service sector makes the biggest contribution to GDP growth. In the 1980s, the service sector made the biggest contribution to growth in the Philippines (81.7%), Singapore (71.2%), Taipei,China (67.9%), the Republic of Korea (55.3%), Pakistan (53.2%), and Thailand (51.0%). In the 1990s, services made the biggest contribution in Taipei,China (77.8%), Singapore (64.0%), India (61.1%), the Philippines (58.3%), the Republic of Korea (57.2%), and Pakistan (51.6%). In the 2000s, services made the highest contribution in Hong Kong, China (107.3%), Singapore (69.1), Malaysia (67.0%), India (65.7%), the Philippines (62.8%), Indonesia (56.4%), and Pakistan (55.3%). In general, the service sector's contribution tends to be larger for more advanced economies. As the economy grows, the service sector becomes larger and hence the overall growth depends more on the performance of the service sector. In this sense, the performance of the Republic of Korea's service sector is noticeably weak relative to its per capita GDP. On the other hand, the performance of the service sector in India and Pakistan is noticeably strong relative to their per capita GDP.

B. Labor Productivity in the Services versus Industry Sector

In the literature, a number of arguments have been made for why labor productivity growth is low in the service sector:[8] (1) Services are intensive in labor rather than capital, making it difficult to achieve innovation, which is embodied in capital; (2) service sector firms are too small to devote adequate resources to research and development or to risk new production techniques; (3) international competition is weak because most services are nontradable; and (4) a lot of employment in services reflects underemployment of individuals who cannot find jobs in other places. Hence it has been long argued that as economies become more services oriented, growth slows down. As the manufacturing sector matures and resources are reallocated to the service sector, achieving productivity growth and hence economic growth becomes more challenging. This line of reasoning underlies the widely held notion that services cannot be a driver of growth for developing economies. However, we saw earlier that in a number of Asian countries, labor productivity growth rate of the service sector is quite high.

[8] See, for example, Eichengreen, Perkins, and Shin (2012) and other studies cited therein.

Table 6. Sectoral contributions to GDP Growth (%)

Economy	1980s				1990s				2000s			
	Agriculture	Industry	Services	Aggregate	Agriculture	Industry	Services	Aggregate	Agriculture	Industry	Services	Aggregate
China, People's Republic of	21.3%	35.4%	43.4%	8.9	7.6%	52.4%	40.1%	9.9	4.5%	52.8%	42.7%	10.0
Hong Kong, China									-0.1	-7.2	107.3	3.0
India	21.3	29.0	49.7	5.3	13.2	25.8	61.1	5.4	7.2	27.1	65.7	7.4
Indonesia	12.7	45.2	42.1	6.2	8.1	55.0	36.9	4.2	9.5	34.1	56.4	5.1
Korea, Rep. of	3.2	41.5	55.3	8.1	1.7	41.1	57.2	5.6	1.3	51.2	47.6	4.2
Malaysia	9.6	47.2	43.2	5.8	1.4	54.7	43.9	6.9	5.1	28.0	67.0	4.5
Pakistan	18.8	28.0	53.2	5.9	26.1	22.4	51.6	4.3	13.1	31.6	55.3	4.7
Philippines	10.7	7.7	81.7	1.7	10.3	31.4	58.3	2.8	7.7	29.5	62.8	4.7
Singapore	-0.4	29.2	71.2	7.5	-0.1	36.1	64.0	7.0	-0.1	30.9	69.1	5.5
Taipei,China	-0.1	32.4	67.7	7.2	-0.1	22.3	77.8	6.1	0.0	50.2	49.8	3.8
Thailand	6.9	42.0	51.0	7.6	3.8	53.5	42.6	4.3	4.0	54.3	41.7	4.2
Viet Nam					16.1	46.6	37.3	7.3	10.2	50.3	39.5	7.0
	10.4	33.8	55.8	6.4	8.0	40.1	51.9	5.8	5.2	36.1	58.7	5.3

Note: The sectoral contribution in each decade is calculated by dividing the log difference in the sectoral value-added by the log difference in the aggregate GDP (multiplied by the weights). The first three columns in the three panels (1980s, 1990s, and 2000s) sum up to 100%. The last column in each panel is the aggregate GDP growth rate in each decade. Data are from the World Bank, World Development Indicators online database (accessed 14 March 2012).
Source: Authors' estimates.

Table 7 shows that the labor productivity of both manufacturing and service sectors increases as per capita GDP increases. Columns I to III are pooled ordinary least squares (OLS) estimation results of regressing the labor productivity of manufacturing and service sectors and their relative labor productivity on per capita GDP. The coefficient of the log per capita GDP is slightly higher when the dependent variable is the log labor productivity of the service sector (column I) rather than the log labor productivity of the industry sector (column II). Figures 4.1 and 4.2 show the actual log labor productivity of the service sector and the industry sector, respectively, as well as the estimated trends. When we regress the labor productivity of the service sector relative to that of the industry sector on per capita GDP, the coefficient is positive and significant (column III). The results seem to suggest that labor productivity in services grows faster than that in industry, which is counterintuitive.

However, the above OLS estimation has limitations. In particular, other control variables are not included in the regression. In columns IV to VI, we report the results of panel estimation with fixed effects. Panel estimation with fixed effects eliminates unobserved but time-invariant country-specific variables and hence focuses on the time series variations within countries. Now the results are reversed. The coefficient of the log per capita GDP is much lower when the dependent variable is the log labor productivity of the service sector rather than the log labor productivity of the industry sector (columns IV and V). The coefficient is also negative and significant when the dependent variable is the relative productivity of the service sector (column VI). Hence the panel estimation results indicate that in general labor productivity grows more slowly in the service sector than in the industry sector.

Figure 4.1: Log Labor Productivity in Service and Log Per Capita Income

Note: The linear prediction line is derived from the regression in column I, Table 7.
Source: World Bank, World Development Indicators online database (accessed 14 March 2012).

Figure 4.2: Log Labor Productivity in Industry and Log Per Capita Income

Note: The linear prediction line is derived from the regression in column II, Table 7.
Source: World Bank, World Development Indicators online database (accessed 14 March 2012).

Table 7: Relationship between Log Labor Productivity and Log Per Capita GDP

	I	II	III	IV	V	VI
Dependent Variable	Log Labor Productivity in Service	Log Labor Productivity in Industry	Log Relative Labor Productivity	Log Labor Productivity in Service	Log Labor Productivity in Industry	Log Relative Labor Productivity
Log Per Capita Income	1.106***	1.058***	0.048***	0.493***	0.916***	–0.423***
	[104.957]	[90.972]	[4.663]	[35.052]	[56.101]	[–21.732]
Country Fixed effects				yes	yes	yes
Observations	1,469	1,469	1,469	1,469	1,469	1,469
Number of Countries	94	94	94	94	94	94
R-squared	0.882	0.849	0.015	0.472	0.696	0.256

Note: t statistics are in brackets. *, **, *** indicate coefficient is significant at 10, 5, and 1 percent levels, respectively. Columns I, II, and III are pooled OLS estimation. Columns IV, V, and VI are panel fixed effects estimation. Data are from the World Bank, World Development Indicators online database (accessed 14 March 2012).
Source: Authors' estimates

C. Determinants of Service Sector Productivity

These findings suggest that the labor productivity in the service sector is not entirely determined by the per capita GDP. In this section, we empirically examine the more general determinants of labor productivity in the service sector based on the equation typically adopted in the empirical growth literature.[9]

We divide the sample into five-year periods: 1975–80, 1980–85, 1985–90, 1990–95, 1995–2000, 2000–2005, and 2005–10. We calculate the growth rate of five-year average labor productivity in the service sector. We then regress the growth rate of five-year average labor productivity on explanatory variables at the initial year of each period. We use the initial-year explanatory variables to avoid endogeneity problems. The specification of the empirical model is as follows:

$$g_{it,t+5} = c_0 + c_1 Y_{it} + c_2 Trade_{it} + c_3 Service\ Trade_{it} + c_4 Urban_{it} + c_5 Democracy_{it} + c_6 Proximity_i + c_7 Nontropic_i + c_8 AGE_{it} + c_9 Latitude_i$$

$g_{it,t+5}$	:	the growth rate of five-year average labor productivity for country *i* from *t* to *t+5*
Y_{it}	:	log per capita income for country *i* at *t*
$Trade_{it}$	:	log total trade (percent of GDP) for country *i* at *t*
$Service\ Trade_{it}$	:	log trade in services (percent of GDP) for country *i* at *t*
$Urban_{it}$	:	urban population (percent of total population) for country *i* at *t*
$Democracy_{it}$	:	institutionalized democracy score for country *i* at *t*
$Proximity_i$	:	log distance from UK or US (minimum) for country *i*
$Nontropic_i$	:	land outside the tropics (percent of total) for country *i*
AGE_{it}	:	aged dependency ratio (over 65 as percent of working-age population) for country *i* at *t*
$Latitude_i$	:	latitude of country centroid for country *i*

The explanatory variables are the same as those used by Eichengreen and Gupta (2009).[10] While they used the share of the service sector in GDP as the dependent variable, we use labor productivity growth in the service sector as the dependent variable. We use the institutionalized democracy score from the Polity IV data series; distance, from CEPII; nontropical area and latitude, from Gallup, Sachs, and Mellinger (1999); governance indicators from the World Bank; and aggregate governance indicators and all other data from the *World Development Indicators*. See Eichengreen and Gupta (2009) for a more detailed description and rationale of the explanatory variables.

Table 8 reports the results. We report panel estimation with random effects (column I) and panel estimation with fixed effects (column II). In column II, the coefficients of the proximity (log difference from UK or US) and nontropical area (land outside the tropics) and latitude are not reported because those variables are not time-varying.

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[9] A number of empirical studies investigate the determinants of growth. See, for example, Barro and Sala-i-Martin (2003) and other studies cited therein.

[10] We do not include one explanatory variable, governance, that is used in Eichengreen and Gupta (2009) due to the fact that the governance data are available only from 1996.

Table 8. Determinants of Labor Productivity in the Service Sector
[Dependent Variable: Average Five-Year Growth Rate of Labor Productivity]

	I	II
Log Per Capita Income	–0.024***	–0.040***
	[–5.174]	[–3.262]
Log Trade (% of GDP)	–0.015*	–0.027*
	[–1.861]	[–1.897]
Log Trade in Services (% of GDP)	0.019***	0.026**
	[2.898]	[2.123]
Urban Population (% of total)	0.000**	0.001
	[2.161]	[1.380]
Institutionalized Democracy Score	–0.001	0.001
	[–0.831]	[0.588]
Log Distance from UK or US (minimum)	0.005	
	[1.160]	
Land Outside the Tropics (% of total)	0.01	
	[1.307]	
Aged Dependency Ratio (% of working-age population)	–0.001***	–0.001**
	[–4.230]	[–2.597]
Latitude of Country Centroid	0	
	[1.537]	
Observations	266	266
Number of Countries	73	73
R-squared	0.083	0.098

Note: t statistics are in brackets. "*"," **", "***" indicate that the coefficient is significant at 10, 5, and 1 percent levels, respectively. The results are based on panel estimation with random effects (column I) and fixed effects (column II) respectively. Institutionalized democracy score is collected from the Polity IV data series; distance from CEPII; non tropical area and latitude from Gallup, Sachs and Mellinger (1999); governance indicators from the World Bank; aggregate governance indicators, and all other data, from the World Bank, World Development Indicators online database (accessed 14 March 2012).
Source: Authors' estimates.

We now interpret the results of the random effects estimation (column I). The coefficient of the initial per capita GDP is negative and highly significant. This means that the lower the initial level of per capita GDP, the higher is the subsequent growth rate of labor productivity in the service sector. This result is consistent with other studies found in the empirical growth literature where the explanatory variable is typically the growth rate of output instead of the labor productivity. The coefficient of total trade as percentage of GDP is negative and significant at 10%. This looks implausible but a possible explanation is as follows: In general, industry products are more tradable than services and hence trade is more beneficial for the industry sector than the service sector. In contrast the coefficient of services trade as a percentage of

GDP is positive and significant at 1%. This implies that trade in services only contributes to the growth of labor productivity in the service sector.[11] This is plausible since import of services exposes domestic services firms to foreign competition and forces them to become more efficient. Likewise, exporting services requires services firms to be able to compete in foreign services markets.

The coefficient of urban population is also positive and significant at 5%, whereas the coefficient of aged dependency is negative and significant at 1%. The other coefficients are not significant.

The results of the fixed effects estimation (column II) are very consistent with the results of the random effects model. The only exception is that the coefficient of urban population becomes insignificant. But it is still positive and its *t*-value is pretty high (1.38). The consistency between the results of the random effects and fixed effects models gives us some confidence about the robustness of our empirical findings.

V. CONCLUDING OBSERVATIONS

The central objective of this paper was to empirically examine the prospects for the service sector to act as an engine of growth in Asia. While there are differences across the 12 Asian economies, their overall experiences are consistent with well-established international historical patterns of sectoral shares of GDP and employment. As a country industrializes, the shares of industry and service sectors in both GDP and employment rise whereas the share of agriculture falls. As the country deindustrializes and moves into the postindustrial phase, the share of services rises while the shares of both industry and agriculture fall. Interestingly and significantly, we find that a number of Asian countries have been able to achieve substantial labor productivity gains in the service sector, which contradicts the conventional wisdom of labor productivity growth being difficult to achieve in services. Combined with significant real output growth in the service sector comparable to that of the industry sector, this suggests that services has already been a major source of growth in Asia. Another promising sign is that the share of service sector output that is exported tends to rise over time in most Asian countries.

Our analysis of the well-known relationship between per capita GDP and the share of services in GDP/employment indicates that some countries' service sector share is higher than that predicted by their per capita GDP while it is lower in other countries. However, the broader, more fundamental trend is an increase in the share of services as income rises. When we computed the contribution of agriculture, industry, and services to GDP growth, we find that in general the service sector made the biggest contribution. One highly significant finding is that the lower the per capita GDP, the greater the scope for labor productivity growth in the service sector. Since the income level of much of Asia remains relatively low notwithstanding the region's rapid growth, this implies that there is still a lot of room for services productivity growth. An equally significant result is that services trade seems to have a significant and positive effect on services productivity growth. We also find that the share of service sector output that is exported has been increasing over time and that it is higher than South American countries and developed countries.

[11] Francois (1990) demonstrated that liberalizing trade in services yields efficiency gains for both importing and exporting countries due to increased division of labor.

Overall, our evidence suggests that the service sector has already contributed substantially to Asia's productivity and GDP growth in the past. Since the fast-growing region is rapidly becoming richer and services tend to become more important as income level rises, services are set to play an even bigger role in the future. The popular perception of Asia's service sector lagging its manufacturing sector—i.e., world-class manufacturing and third-class services—is further cause for optimism about the future prospects of the service sector. That is, if even a relatively underdeveloped service sector contributes significantly to growth, then clearly a more developed service sector can contribute even more. More fundamentally, a wide range of internal impediments—e.g., excessive regulation and state monopolies—and external impediments—e.g., barriers to services trade and FDI—shackle Asia's service sector. Removing those obstacles will unleash the full potential of Asia's service sector to generate jobs and growth. In fact, some Asian countries such as India and the Philippines have already begun to capitalize on this potential by exporting services.

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The Service Sector in Asia: Is It an Engine of Growth?
Based on the analysis of 12 Asian economies, the study finds that the service sector already contributed substantially to the region's growth in the past. Further, services labor productivity grew at a healthy pace in most of the region. Overall, the analysis provides substantial cause for optimism about the role of the service sector as an engine of growth in Asia.

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