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Working Paper

Performance of the Service Sector in the Republic of Korea: An Empirical Investigation

ADB Economics Working Paper Series, No. 324

Provided in Cooperation with:

Asian Development Bank (ADB), Manila

Suggested Citation: Park, Donghyun; Shin, Kwanho (2012) : Performance of the Service Sector in the Republic of Korea: An Empirical Investigation, ADB Economics Working Paper Series, No. 324, Asian Development Bank (ADB), Manila,
<https://hdl.handle.net/11540/1256>

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ADB Economics Working Paper Series



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Donghyun Park and Kwanho Shin
No. 324 | December 2012

Asian Development Bank



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This paper was prepared for the *Asian Development Outlook 2012 Update*. The authors had the benefit of comments by Pracha Koonnathamdee, Marcus Norland, and other participants at the ADB-PIIE Workshop in Washington. The authors would like to thank Ji-soo Kim and Jongkwan Lee for their excellent research assistance.

Asian Development Bank
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1550 Metro Manila, Philippines
www.adb.org

© 2012 by Asian Development Bank
December 2012
ISSN 1655-5252
Publication Stock No. WPS125233

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ABSTRACT

There is a widespread perception that the Republic of Korea's service sector lags behind its dynamic world-class manufacturing sector. We empirically analyze the past performance of the Republic of Korea's service sector in order to assess its prospects as an engine of growth. Our analysis resoundingly confirms the conventional wisdom of an underperforming service sector. In light of the Republic of Korea's high income and development level, the poor performance of modern services is of particular concern. We identify a number of factors underlying the poor performance, and set forth policy recommendations for addressing them. Overall, the Republic of Korea faces a challenging but navigable road ahead in developing a high value-added service sector.

Key Words: Services, structural change, growth, productivity, Republic of Korea

JEL Classification: O14, O40, O47

I. INTRODUCTION

By any measure, the Republic of Korea has been one of the most successful economies in the postwar period.¹ Export-oriented industrialization endowed the country with a highly competitive manufacturing sector which produces and exports, among others, mobile phones, automobiles, electronics products, ships, and steel, to all corners of the world. There is, however, a general perception that the Republic of Korea's service sector has long lagged its dynamic world-class manufacturing sector. There are a number of reasons why developing the service sector matters for the Republic of Korea. For one, the fact that the Republic of Korea's manufacturing industries are globally competitive suggests that they have reached high productivity levels and the scope for further productivity improvements is limited. In striking contrast, the service sector's productivity remains low compared to advanced economies—it was second lowest among Organisation for Economic Cooperation and Development (OECD) economies, after Poland (see Cho 2009)—so there is plenty of scope for productivity improvement. Put differently, developing the hitherto underdeveloped service sector can help to sustain growth at a time when the manufacturing sector is maturing and subject to growing competitive pressures from less developed countries such as the People's Republic of China (PRC) and elsewhere. Furthermore, it will facilitate the Republic of Korea's transition to a post-industrial, services-led economy.

While growth has been respectable and the economy has continued to expand at a healthy pace since the Asian crisis, there has nevertheless been a clear loss of economic dynamism since then. The Republic of Korea's per capita income has reached levels where growth typically tends to slow down. At the same time, the weaker performance may partly reflect the difficult structural challenge of moving from a manufacturing-led economy to a more balanced economy in which services plays a larger role. In the case of a high-income, high-tech economy such as the Republic of Korea, what is especially relevant in the context of service sector development are high-end services such as computing and business services as opposed to low-end services such as housecleaning and barber shops. In addition, while the Republic of Korea's exports are skewed toward manufactured goods, there may be some high-end tradable services in which the Republic of Korea has a potential comparative advantage—e.g., medical tourism.

The Republic of Korea's rapid demographic transition, along with growing levels of income inequality and relative poverty, provide further impetus for a more robust service sector (Jones 2012, Noland 2012). The Republic of Korea's exceptionally fast population aging is driven by the collapse of fertility to one of the lowest in the world at around 1.2 children. The country currently has the fourth youngest population in the OECD area but will have the second oldest by 2050. A large and growing elderly population will increase the demand for certain types of services. For example, the demand for health care is higher among the elderly than the non-elderly. Likewise, the physical frailty of the elderly implies a greater demand for long-term care and other services involving physical assistance. In addition, the need for affordable, adequate, and sustainable old-age income support can stimulate the demand for financial services. At the same time, growing income inequality points to a need to expand social spending. In this connection, public services, which enhance the productivity of low-income groups through education, training, and re-training and thus improve equality of opportunity, are critical.

¹ Recently CNN reports that there are only two countries, the Republic of Korea and Taipei, China, that have grown at an average annual pace of more than 5% for the last five decades in a row (available at <http://globalpublicsquare.blogs.cnn.com/2012/04/25/sharma-five-decades-of-five-percent-growth/>).

In this paper we examine the performance of the Republic of Korea's service sector. In Section II we empirically examine and confirm the conventional wisdom that the Republic of Korea's service sector lags its manufacturing sector. In Section III we analyze some possible factors underlying the poor performance of the Republic of Korea's services. Section IV sets forth some policy options for strengthening the Republic of Korea's service sector. Section V concludes the paper.

II. THE PERFORMANCE OF THE REPUBLIC OF KOREA'S SERVICE SECTOR: AN EMPIRICAL ASSESSMENT

As noted above, there is a widespread perception that the Republic of Korea's service sector performs poorly relative to its dynamic world-class manufacturing sector.² In this section, we empirically investigate the extent to which this perception is borne out by actual data.

Figure 1 of Park and Shin (2012) shows the shares of agriculture, industry, and services in employment during 1980–2000 and their shares in gross domestic product (GDP) during 1960–2000. The share of agriculture continuously declined. Interestingly, although the process of industrialization started in the 1960s the share of agriculture exceeded 30% even in 1980. The trend is consistent with the stylized fact of the demographic hollowing out of rural areas which leaves them with an increasingly older population. Up to the early 1990s, the share of both industry and services in employment rises as rural residents, especially younger residents, moved to the cities during the industrialization process. Since the early 1990s, with the advent of deindustrialization and the Republic of Korea's shift into the post-industrial phase, the share of industry fell but the share of services continued to rise.

The share of the three sectors in GDP shows a similar pattern. As might be expected, the share of agriculture fell sharply and continuously as the Republic of Korea industrialized. The share of industry rose steadily until the early 1990s when it peaked and has more or less stabilized since then, albeit with substantial volatility. On the other hand, the share of services in GDP rose steadily until the early 2010s although it has fluctuated around 60% since then. A comparison of the evolution of the shares of services in employment and GDP since 1980 reveals a marked difference between the two. More precisely, the share of services in employment has grown noticeably faster and more consistently than its share in GDP. Output growth has thus failed to keep pace with employment growth in services.

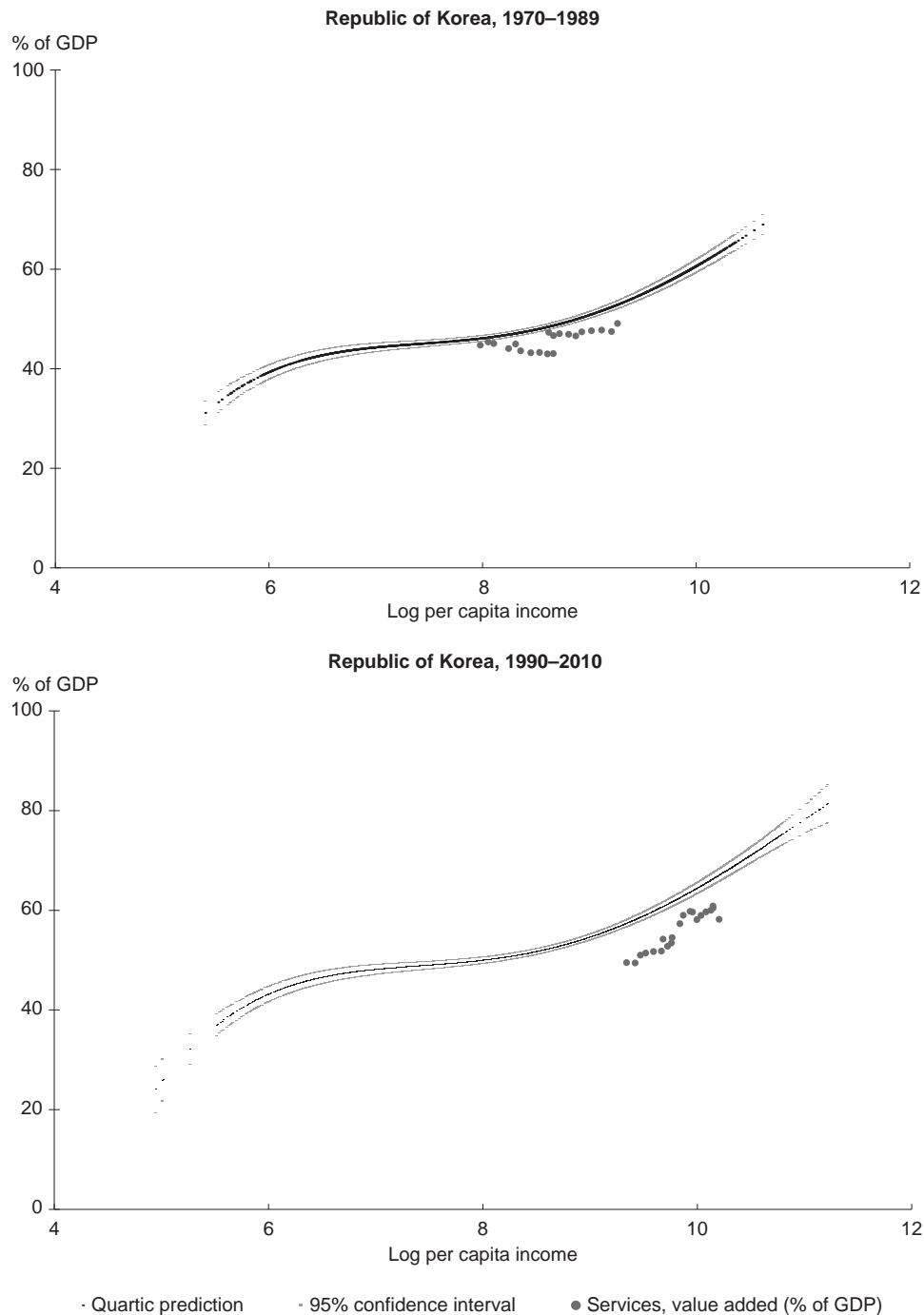
A well-known stylized fact of economic growth and development is that the share of services in GDP tends to increase as a country becomes richer. Figure 1 shows how the share of service sector in the Republic of Korea's GDP and employment evolved over time as its per capita GDP increased rapidly. We follow Eichengreen and Gupta (2009) and Park and Shin (2012) to estimate a quartic relationship between per capita GDP and the shares of the service sector in GDP and employment. Figure 1(A) shows and compares the actual shares of the service sector in the Republic of Korea's GDP with the line fitted on the basis of the quartic regression for two sub-periods: 1970–1989 and 1990–2010. We divide the sample period at 1990 because the Republic of Korea's deindustrialization (in terms of employment) started around this year. Figure 1(b) shows and compares the actual shares of the service sector in the Republic of Korea's employment with line fitted on the basis of the quartic regression for two sub-periods: 1980–1989 and 1990–2010. Since employment data are available from 1980 onward, the first year in this figure is 1980. In both figures we denote the 95% confidence bands

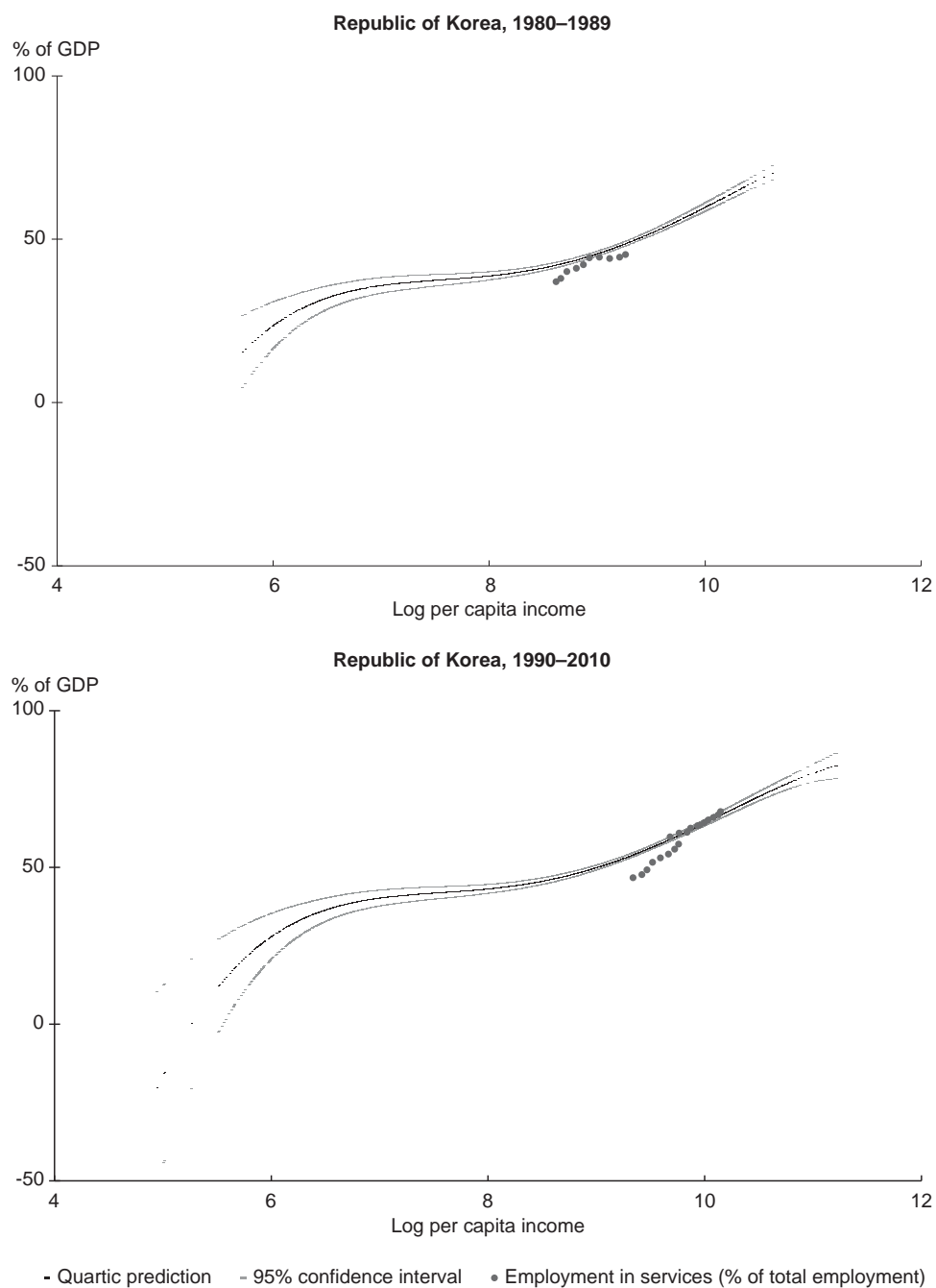
² See Jones (2009).

by grey lines. While the share of the service sector in GDP lies below the predicted line in both periods, 1970–1989 and 1990–2010, the share of the service sector in employment lies more or less on the predicted line. This implies that labor in the Republic of Korea's service sector does not produce as much value added as other countries of a similar per capita GDP levels.

Figure 1. Service Sector GDP and Employment Shares and Per Capita GDP

(A) GDP Share and Per Capita GDP



(B) Employment Share and Per Capita GDP

Note: The figures show the estimated relationship and 5% confidence intervals for two periods based on the regression in Column II, Table 4 and Column II, Table 5, respectively, reported in Park and Shin (2012).

Source: Park and Shin (2012).

Table 1 reports the average output—value added—and employment shares of the service sector for various countries for various decades. Both output and employment shares of the service sector have continuously increased in most countries. However, for example in 2009, the GDP share of services in the Republic of Korea is much lower than that in developed

countries. While the employment share in the Republic of Korea is lower than that in developed countries, the gap is much smaller. Therefore, not only has the Republic of Korea's services output growth lagged its services employment growth over time, but relative to developed countries, the Republic of Korea's services output lags its services employment. Both trends imply weak labor productivity growth in the Republic of Korea's service sector. It is also striking to compare the Republic of Korea's service sector performance to that of Taipei, China, a fellow newly industrialized economy (NIE) at a similar income level. In 2009, Taipei, China, had a higher GDP share of services—68.5% versus the Republic of Korea's 61.0%—along with a higher employment share—67.8% versus the Republic of Korea's 58.9%. While the Republic of Korea's services share of GDP is comparable to that of South American countries and Eastern European countries, its services share of employment is higher than those of other countries except Argentina. As emphasized by Eichengreen, Perkins, and Shin (2012), the employment share of services grew at an exceptional speed in the Republic of Korea, surging from 37% in 1980 to 67.8% by 2009. This suggests that the deindustrialization process may have been too fast and labor productivity growth in the service sector has not kept pace with it.

Table 1. Output and Employment Shares of the Service Sector

Economy	GDP Share (%)				Employment Share (%)			
	1980	1990	2000	2009	1980	1990	2000	2009
12 Asian Economies								
China, People's Republic of	21.6	31.5	39.0	43.4	13.1	18.5	27.5	—
Hong Kong, China	—	—	88.3	92.6	48.4	62.4	79.4	87.4
India	39.6	43.8	50.5	55.3	—	—	24.1	—
Indonesia	34.3	41.5	38.5	34.5	30.4	30.2	37.3	41.5
Korea, Republic of	47.3	49.5	57.3	61.0	37	46.7	61.2	67.8
Malaysia	36.3	42.6	43.1	46.2	38.7	46.5	49.5	59.5
Pakistan	45.6	48.8	50.7	54.2	26.8	28.9	33.5	35.2
Philippines	36.1	43.6	51.6	55.2	32.8	39.7	46.7	50.3
Singapore	62.3	67.8	65.4	71.6	62.6	61.7	65.5	77.1
Taipei, China	45.7	55.0	66.4	68.5	38.0	46.3	55.0	58.9
Thailand	48.1	50.3	49.0	45.2	18.9	22	32.2	38.9
Viet Nam	—	38.6	38.7	38.8	—	—	22.3	—
South American Countries								
Argentina	52.4	55.9	67.4	60.7	—	67.6	76.2	75.2
Brazil	45.2	53.2	66.7	68.5	—	54.5	59.1	60.7
Chile	55.3	49.8	55.5	53.9	59.8	55.5	62.2	65.6
Mexico	57.4	63.7	67.8	61.3	—	46.1	55.1	62.1
Eastern Europe								
Czech Republic	—	45.0	58.0	60.5	—	—	55.3	58.3
Hungary	33.8	46.4	62.4	66.2	36.8	45	59.7	64.2
Developed Countries								
France	63.3	68.7	74.2	79.2	56.2	64.8	69.5	74.1
Germany	56.5	61.2	68.5	72.7	—	—	63.7	69.5
United Kingdom	57.2	64.1	71.7	78.2	58.9	64.8	73	78.6
United States	63.6	70.1	75.4	77.4	65.7	70.7	74.3	78.6

— = data not available.

Note: Due to the lack of data, we use data in 2008 instead of 2009 for the following countries: Hungary and United States for GDP share; and Republic of Korea, Pakistan, and the United States for employment share.

Source: World Bank. World Development Indicators online database (accessed 14 March 2012).

Table 2 reports the labor productivity growth rate for the same group of countries during the same period as in Table 1. In Asian and Eastern European countries, in general labor productivity growth rate in services is lower than in industry. This is in line with widespread perception of Asian economies, especially those in East and Southeast Asia, as having relatively well-developed manufacturing sectors and underdeveloped service sector. The exception is India, where labor productivity growth rate in service is much higher than in industry. This is not surprising in light of India's well-known success as the world's foremost information communications technology and business process outsourcing (ICT-BPO) services exporter.³ In South American countries and developed countries, labor productivity growth rate in services is as high as or only slightly lower than in industry. In the Republic of Korea's case, however, there is a huge gap between the labor productivity growth of industry and services. In both the 1980s and 2000s, compared to other countries, the difference is largest in the Republic of Korea. Again, in the international context, the Republic of Korea's service sector underperforms and underperforms noticeably.

Table 2 . Labor Productivity Growth Rate (%)

Economy	Industry			Service		
	1980s	1990s	2000s	1980s	1990s	2000s
12 Asian Economies						
China, People's Republic of	4.72	11.05	7.93	5.32	5.28	8.07
Hong Kong, China			1.67			1.88
India			2.02			5.41
Indonesia	6.74	-1.9	1.4	-6.85	-4.04	3.83
Korea, Republic of	4.79	7.09	5.74	1.65	1.43	1.57
Malaysia	0.36	3.22	2.05	0.77	1.05	2.1
Pakistan	5.09	5.88	3.54	2.85	0.02	4.39
Philippines	-2.11	-0.6	1.89	-1.68	-0.74	1.84
Singapore	2.62	5.72	5.29	4.72	4.37	0.78
Taipei, China	4.59	3.98	4.95	3.83	4.01	1.23
Thailand	3.64	2.85	2.71	2.65	-0.95	0.08
Viet Nam			0.73			3.1
South American Countries						
Argentina	-1.8	6.1	0.75	4.05	2.34	0.72
Brazil	-0.71	0.03	-1.41	-1.98	-0.18	1.1
Chile	-0.89	4.4	-0.2	0.03	3.78	1.02
Mexico		-0.89	-0.22		1.12	-1.26
Eastern Europe						
Czech Republic		4.92	3.71		-0.24	2.14
Hungary		6.92	2.24		0.84	1.52
Developed Countries						
France	2.92	1.81	0.6	1.04	1	-0.26
Germany		2.3	0.13		1.12	0.02
United Kingdom	1.22	3.29	0.92	0.97	1.77	0.81
United States	2.06	2.86	1.74	2.15	1.37	0.98

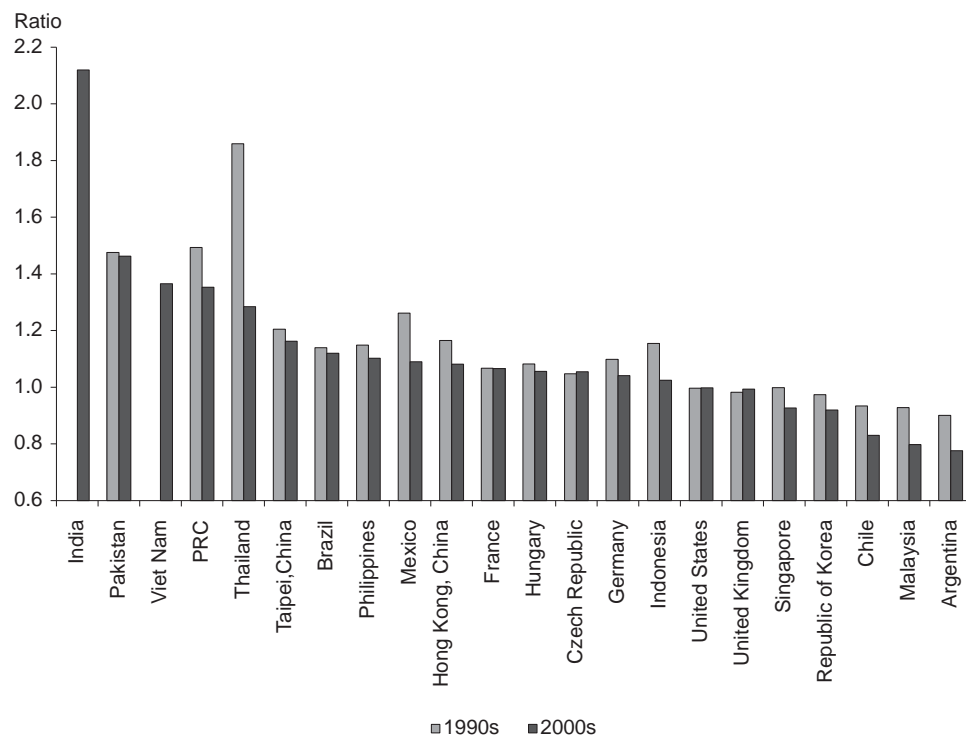
Source: Most data are available up to 2009 except the following countries with the most recent available year in parenthesis: People's Republic of China (2007), India (2005), Republic of Korea (2008), and Pakistan (2008).

Source: World Bank. World Development Indicators online database (accessed 14 March 2012).

³ See, for example, Gordon and Gupta (2004).

Figure 2 shows relative labor productivity of the service sector. The index is calculated by dividing labor productivity of the service sector by aggregate labor productivity. If it is greater (less) than 1, labor productivity of the service sector is higher (lower) than aggregate labor productivity. Therefore, the index gauges whether the service sector workers are more or less productive than workers in the economy as a whole. We measure it twice, for the averages of the 1990s and 2000s. Relative services labor productivity is higher than 1 in a number of countries. In general, it is higher, the less developed the country. This is due to the large share of the agricultural sector in less developed countries. The Republic of Korea's relative productivity is less than 1 in both periods and even declines between the 1990s and 2000s. Given the Republic of Korea's income and development level, its relative services labor productivity seems noticeably low.

Figure 2. Relative Labor Productivity of the Service Sector



Note: Relative labor productivity of the service sector is calculated by dividing labor productivity of the sector by the aggregate labor productivity.

Source: World Bank. World Development Indicators online database (accessed 14 March 2012).

According to Eichengreen and Gupta (2009), there are two distinct waves of service sector growth and development. In the first wave, the service sector share of output begins to rise at relatively modest incomes but at a decelerating rate as the economy grows. In the second wave, the share rises again at higher level of incomes. Importantly, the two waves are populated by different kinds of services. 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 the supplementation of modern services—banking, insurance, computing, communication, and business services. Based on the above findings, they defined three groups of services according to whether their shares of GDP have fallen,

risen slowly, or risen rapidly over time.⁴ The first group (group I) includes traditional services: retail and wholesale trade, transport and storage, public administration and defense. In many countries, particularly in advanced countries, the share of this group in GDP has fallen noticeably over time. The second group (group II) is a hybrid of traditional and modern services and this group includes education; health and social work; hotels and restaurants; and other community, social, and personal services. Their shares rise slowly with time. The final group (group III) consists of modern services consumed by both the household and corporate sectors and this group includes financial intermediation, computer services, business services, communication, and legal and technical services. The share of the final group in GDP has been increasing very rapidly in recent years. In light of its high income and development level, what is most relevant and crucial for the Republic of Korea is to develop services in group III.

Table 3 shows the shares of service group I, II, and III in (a) output (GDP) and (b) employment. In each panel, the first column is for the United States, the second column for EU-15 average, and the third column for the Republic of Korea. The share of the first group in output decreased over time in all three cases. However, its share is still large comparable to that of either group II or III. In fact, in the Republic of Korea it still remains the largest group. The share of the second group in output increased moderately over time. The share of the third group increased most rapidly over time. The Republic of Korea's share of every group is lower than that of either the United States or European Union. In particular, the share of the third group in output is particularly small for the Republic of Korea. This is mainly due to the low share of other business activities. Other business activities include all the business related services not related to real estate activities and they are a key area where productivity growth is high in many advanced countries. Other than business activities, the output share of health and social work is also particularly small.

The employment share shows a similar pattern over time. One difference is that the share of the first group for EU-15 countries did not decrease over time. The difference in the employment share between the Republic of Korea and the European Union is very small in groups I and II. However the difference remains still large in group III. The employment share of health and social work, and other business activities is especially small.

There are some subcategories such as other community, social, and personal service, and hotels and restaurants, where the employment share of the Republic of Korea is particularly large. Areas where output share is very low relative to employment share are: group I (wholesale trade, transport, and storage), group II (other community, social, and personal), and group III (other business activities). These are thus service subcategories where the Republic of Korea suffers from serious labor productivity problems.

⁴ Eichengreen and Gupta did not include real estate activities; private households with employed persons; and extra-territorial organizations and bodies in the classification of group I, II, and III. Moreover, due to an update in 2011, data on two industries—renting of machinery and equipment; and legal, technical and advertising—are no longer reported separately, but are included in other business activities.

Table 3. Output and Employment Shares of the Service Subsectors in Different Years

(A) Output Shares (%)	1970			1980			1990			2000			2007		
	US (1977)	EU- 15	Republic of Korea	US	EU- 15	Republic of Korea	US	EU- 15	Republic of Korea	US	EU- 15	Republic of Korea	US	EU- 15	Republic of Korea
Group I	24.3	22.9	26.3	23.8	22.1	24.7	21.9	20.1	20.4	20.3	20.1	18.1	20.4	19.2	18.0
Public Administration and Defense	9.8	8.8	6.5	9.3	8.6	6.1	9.3	7.1	5.2	7.7	6.6	5.7	8.0	6.2	6.4
Wholesale Trade	5.0	4.7	6.4	5.4	4.2	5.5	4.5	4.1	4.7	4.6	4.4	3.4	4.7	4.2	2.9
Transport and Storage	3.4	5.2	5.9	3.4	5.5	6.6	2.8	5.0	4.8	2.9	5.0	4.6	2.7	4.9	4.9
Retail Trade	6.1	4.1	7.6	5.7	3.8	6.6	5.3	3.9	5.6	5.1	4.1	4.4	5.1	3.9	3.8
Group II	13.8	10.9	9.5	14.2	15.1	9.2	16.9	16.1	11.8	17.8	17.7	13.3	19.2	17.8	15.3
Health and Social Work	4.9	3.6	1.0	5.3	5.3	1.0	7.0	5.9	2.1	7.0	6.5	2.7	8.2	6.6	3.9
Education	4.4	3.6	3.7	4.3	5.3	4.3	4.5	5.1	4.7	4.6	5.1	5.0	4.8	5.1	6.0
Other Community, Social, and Personal	2.3	2.2	2.2	2.4	2.7	2.1	3.0	3.0	2.5	3.6	3.6	2.6	3.7	3.7	2.9
Hotels and Restaurants	2.2	1.6	2.5	2.3	1.7	1.8	2.5	2.0	2.5	2.5	2.4	2.9	2.6	2.4	2.6
Group III	13.4	10.0	4.0	14.6	12.8	9.0	18.8	16.1	11.5	22.6	18.3	14.2	23.0	20.5	16.9
Financial Intermediation	5.0	3.8	2.1	5.4	4.7	5.8	6.5	5.5	5.8	8.4	5.0	6.9	8.7	5.9	8.7
Post and Telecommunication	3.4	2.1	0.8	3.4	2.4	1.4	3.2	2.6	2.0	3.2	2.5	2.4	2.9	2.6	2.4
Other Business Activities	5.0	4.0	1.0	5.7	5.7	1.8	9.1	8.0	3.7	11	10.8	5.0	11.5	12.0	5.8

(B) Employment Shares (%)

	1970			1980			1990			2000			2007		
	US (1977)	EU- 15	Republic of Korea	US	EU- 15	Republic of Korea	US	EU- 15	Republic of Korea	US	EU- 15	Republic of Korea	US	EU- 15	Republic of Korea
Group I	27.7	21.4	14.1	27.8	23.5	18.7	26.5	24.3	23.9	24.9	24.1	25.7	24.4	23.6	23.3
Public Administration and Defense	10.5	6.0	1.7	10.5	7.1	2.1	9.4	7.4	2.9	8.1	7.0	3.6	8.2	6.5	3.4
Wholesale Trade	4.3	3.7	4.0	4.5	4.2	5.6	4.3	4.5	7.3	3.9	4.4	7.4	3.8	4.3	6.2
Transport and Storage	3.5	4.2	3.5	3.4	4.3	4.0	2.9	4.2	4.6	3.0	4.2	5.1	3.0	4.3	5.2
Retail Trade	9.3	7.6	4.8	9.5	8.0	7.0	10.0	8.2	9.2	9.8	8.5	9.7	9.5	8.5	8.5
Group II	24.8	14.5	14.7	25.0	18.2	13.8	28.1	21.6	15.5	30.4	24.8	22.7	33.3	26.5	27.0
Health and Social Work	6.9	4.7	0.9	7.2	6.4	1.0	9.0	7.8	1.5	10.1	9.2	2.0	11.4	9.9	3.2
Education	7.7	4.2	3.1	7.3	5.6	3.4	7.3	6.1	5.1	7.8	6.5	5.6	8.5	6.7	7.2
Other Community, Social, and Personal	4.7	2.6	3.2	4.6	3.1	3.5	5.1	3.8	4.4	5.5	4.6	5.9	5.8	4.9	7.9
Hotels and Restaurants	5.6	2.9	7.4	5.9	3.1	6.0	6.7	3.8	4.5	7.0	4.5	9.1	7.6	5.1	8.7
Group III	11.4	7.1	2.4	12.4	8.9	2.7	16.1	12.1	5.1	18.5	15.4	9.3	19.3	16.9	12.6
Financial Intermediation	3.8	2.0	1.6	4.0	2.7	1.4	4.3	3.1	2.4	4.2	3.0	3.6	4.2	2.9	3.5
Post and Telecommunication	2.1	1.6	0.4	2.1	1.7	0.5	1.9	1.7	0.5	1.9	1.5	0.9	1.6	1.4	1.2
Other Business Activities	5.5	3.6	0.3	6.3	4.5	0.8	9.9	7.2	2.2	12.4	10.9	4.8	13.5	12.6	7.9

US = United States.

Note: Group classifications for the service sector follow Eichengreen and Gupta (2009). Due to lack of data, US data are for 1977 instead of 1970.
 Source: EU KLEMS (accessed 14 March 2012).

While labor productivity captures how productive workers are, total factor productivity (TFP) captures the efficiency with which all factors of production are used. Table 4 reports the growth rate of TFP in the service subsectors. We use TFP growth for industry value added, obtained from the EU KLEMS (capital, labor, energy, materials, services) database.⁵ It calculates TFP growth by subtracting weighted cost share of capital and labor inputs growth from the industry value-added growth at constant prices. Instead of using standard measures of labor input, such as numbers employed or hours worked, it measures labor input as labor services which takes the heterogeneity of the labor force into account. Our key findings are as follows. TFP growth in group III is not always higher, but it is higher than in group I or II in the most recent period, 2001–2007, in all three economies. Despite its low level of technology relative to the United States or European Union, the Republic of Korea's growth rate of TFP in group I and II is as low as in those two economies. The growth rate of TFP in group III for the Republic of Korea is higher than in the United States and European Union. However, this is probably due to the high growth rate of TFP in financial intermediation and post and telecommunication. The growth rate of TFP in other business activities is particularly low in the Republic of Korea. Our results for TFP growth are generally consistent with those for labor productivity growth.

In sum, the evidence from this section resoundingly confirms the conventional wisdom that the Republic of Korea's service sector performs poorly and lags its world-class manufacturing sector. This implies that there is plenty of scope for developing the service sector and more well-developed services can contribute a lot to economic growth and dynamism. Among the service sectors, it is business related activities which are most far behind. Yet it is precisely such service activities which are most pivotal to strengthening the service sector in a high-income economy such as the Republic of Korea. Other service areas which perform poorly include wholesale trade, transport and storage, and other community, social and personal services.

⁵ A detailed explanation on the calculation of TFP in the EU KLEMS database can be found in Timmer, O'Mahony, and van Ark (2007).

Table 4. Average Growth Rate of Productivity in Different Periods

(A) Total Factor Productivity

	EU-15				United States				Republic of Korea			
	1971– 1980	1981– 1990	1991– 2000	2001– 2007	1978– 1980	1981– 1990	1991– 2000	2001– 2007	1978– 1980	1981– 1990	1991– 2000	2001– 2005
Group I	0.00	1.05	0.66	0.47	-1.20	0.69	1.04	1.09	-3.72	1.87	1.23	0.87
Public administration and defense	-1.37	0.09	-0.20	-0.15	-1.95	-0.51	-1.56	-0.13	-1.38	-3.22	-1.69	0.23
Wholesale Trade	-0.31	0.71	0.92	1.11	-0.70	1.19	4.76	1.28	-8.77	4.71	2.21	0.42
Transport and Storage	1.12	1.87	0.98	0.02	1.15	2.15	0.86	2.01	1.46	1.60	2.16	1.95
Retail Trade	0.59	1.68	0.88	0.79	-1.81	1.47	2.16	2.40	-6.00	2.68	3.72	1.05
Group II	0.13	-0.52	-0.52	-0.97	0.01	-0.87	-1.11	-0.12	-1.27	2.56	-0.37	-2.21
Health and Social Work	0.34	-0.30	-0.14	-0.59	0.43	-2.28	-2.13	-0.13	3.67	7.01	-1.79	-4.04
Education	0.46	0.29	-0.45	-1.08	-0.23	-1.59	-1.09	-1.64	-2.34	-1.68	0.23	-1.62
Other Community, Social, and Personal	-0.06	-1.87	-1.36	-1.36	0.49	2.43	0.07	1.84	4.29	2.85	2.28	-2.20
Hotels and Restaurants	-0.50	-1.27	-0.79	-0.93	-1.10	0.37	0.22	-0.05	-6.68	8.13	-2.67	-1.35
Group III	-0.28	-0.04	0.03	0.94	0.43	-1.90	-1.20	1.37	2.38	3.70	0.35	3.09
Financial Intermediation	0.06	0.62	0.78	2.25	-2.68	-4.20	-0.62	1.37	5.61	4.74	0.57	5.65
Post and Telecommunication	1.37	2.45	3.50	3.72	4.66	-0.58	-0.21	4.47	6.75	7.10	11.94	7.33
Other Business Activities	-0.87	-1.62	-1.57	-0.61	0.79	-0.62	-2.02	0.54	-8.81	0.33	-4.88	-3.34

(B) Labor Productivity

	EU-15					United States					Republic of Korea				
	1971– 1980	1981– 1990	1991– 2000	2001– 2007		1978– 1980	1981– 1990	1991– 2000	2001– 2007		1971– 1980	1981– 1990	1991– 2000	2001– 2007	
Group I (Weighted Total)	1.38	1.40	1.89	1.03		-0.73	1.64	2.54	2.27		0.00	1.32	1.99	2.06	
Public Administration and Defense	0.64	0.68	1.07	1.04		-1.40	0.93	-0.19	0.68		-2.97	-3.12	-0.51	1.62	
Wholesale Trade	1.00	1.06	2.98	1.50		1.22	2.93	6.62	2.95		1.17	4.20	2.61	2.93	
Transport and Storage	2.78	2.57	2.81	0.94		1.84	2.40	2.32	2.87		7.15	3.18	3.45	2.04	
Retail Trade	1.85	1.91	1.00	0.48		-2.11	1.60	3.01	3.08		0.99	3.96	3.05	1.96	
Group II (Weighted Total)	0.63	-0.42	0.08	-0.39		0.21	-0.52	-0.51	0.62		1.71	1.99	-0.30	-1.19	
Health and Social Work	0.46	-0.56	0.42	0.63		0.53	-1.57	-1.47	1.05		4.40	7.65	-0.57	-4.27	
Education	0.65	0.17	0.17	-0.90		0.61	-0.57	-0.47	-0.95		0.38	-1.92	-0.06	-2.09	
Other Community, Social, and Personal	1.07	-0.31	-0.40	-0.91		1.02	1.95	0.76	1.84		2.81	3.01	2.08	-0.76	
Hotels and Restaurants	0.43	-1.60	-0.51	-1.78		-2.76	0.09	0.59	0.35		3.31	7.54	-2.80	1.85	
Group III (Weighted Total)	1.35	0.71	1.62	1.77		2.22	0.24	1.79	3.07		10.86	5.13	2.77	2.91	
Financial Intermediation	0.14	1.10	2.06	2.27		1.67	0.26	2.91	2.58		16.49	5.85	2.44	5.54	
Post and Telecommunication	3.28	3.76	7.44	5.36		6.22	1.01	2.93	6.45		13.49	10.46	12.09	5.58	
Other Business Activities	1.87	-0.39	-0.45	0.05		0.79	-0.18	0.51	2.25		2.77	2.35	-1.40	-4.88	

Note: Groups 1–3 values are weighted averages with individual industry's value added used as weights. Due to data availability, the period covered for EU-15 countries is indicated in parenthesis as follows: Austria (1981–2007), Belgium (1981–2006), Denmark (1981–2007), Spain (1981–2007), Finland (1971–2007), France (1981–2007), Germany (1992–2007), Greece (Not Available), Ireland (1989–2007), Italy (1971–2007), Luxembourg (Not Available), The Netherlands (1980–2007), Portugal (Not Available), Sweden (1994–2007), and UK (1971–2007).

Source: EU KLEMS (accessed 14 March 2012).

III. WHY DOES THE REPUBLIC OF KOREA'S SERVICE SECTOR PERFORM SO BADLY? SOME POSSIBLE EXPLANATIONS

In the preceding section, we saw that the Republic of Korea's service sector performs poorly in the international context, especially relative to its income and development level. The obvious question to ask is why? In this section, we will explore four possible explanations.⁶ First, too rapid deindustrialization, most evident in the sharp rise in the share of services in employment, may have led to a lot of underemployment in marginal services jobs. Second, government regulations and restrictions, which are designed to protect small and medium enterprises (SMEs) and service sector jobs, may hold back the growth of the service sector. Third, relatively low research and development (R&D) expenditures in the service sector and low ICT investments may hinder innovation in services and thus movement to high value-added service activities. Fourth, barriers to services trade and FDI, designed to protect domestic firms and industries from foreign competition, weaken their incentives to become more efficient. We now examine each of the four potential explanations in more detail.

A. Too Rapid Deindustrialization and Underemployment in Services

As evident in Table 1 above, the share of services in employment grew at an exceptional speed.⁷ The frantic pace of the reallocation of labor from manufacturing to services in the Republic of Korea has made it difficult for some workers to find new employment and hence they end up in disguised unemployment in the service sector, which contributes to low productivity growth in the service sector. That is, they end up underemployed in marginal service sector jobs. Based on shift-share analysis, Eichengreen, Perkins and Shin (2012) find that roughly 70% of the growth of aggregate labor productivity in the Republic of Korea in 1970–2007 was attributable to the within effect—i.e., economy-wide increases in productivity holding sectoral shares constant—which is not due to the reallocation of workers. In particular, they find that it was manufacturing with its relatively fast productivity growth that mainly accounts for the within effect. The role of the shift effect that is due to reallocation of workers from low productivity to high productivity sectors is relatively minor. Therefore, it is clear that labor reallocation from manufacturing to service sectors did not contribute a lot to productivity growth. To the contrary, the too rapid reallocation of labor to the service sector holds down the growth of service sector productivity.

B. Government Regulations and Restrictions

While the objective of the Korean government's regulations and restrictions on the service sector is to protect SMEs and jobs, there is a serious risk that they end up stifling the growth and dynamism of the sector. We follow Woelfl et al. (2010) to construct Table 5 based on the concept of product market regulation (PMR) indicators. According to Woelfl et al. (2010), the underlying idea behind the PMR indicators is to turn qualitative information such as laws and regulations that may affect competition into quantitative indicators. They seek to measure regulations which are potentially anti-competitive in areas where competition is viable, and look primarily at policy settings instead of market outcomes. The economy-wide PMR indicator

⁶ Jones (2009) also examines factors behind the low productivity of the Republic of Korea's service sector. In particular, he emphasizes (i) the legacy of an export-led growth strategy that attracted the most productive resources into manufacturing, (ii) insufficient competition in services due to heavy regulations, (iii) low R&D and ICT investment, and (iv) the weakness of SMEs.

⁷ This is also emphasized by Kim (2006) as a structural problem for the Korean economy.

covers both general and sectoral regulatory issues in three domains —state control, barriers to entrepreneurship, and barriers to trade and investment.

Table 5 reports PMR scores for the three domains for OECD average and five Asian countries—PRC, India, Indonesia, Japan, and the Republic of Korea.⁸ The Republic of Korea's economy-wide PMR score is 1.48, a little bit higher than OECD average (1.36) but much lower than that of other countries such as PRC (3.30), India (2.84) and Indonesia (2.73). A lower score means less restrictions. The indicator for state control in the Republic of Korea (1.99) is lower than that of the OECD average (2.04). The indicator for barriers to entrepreneurship is also lower for the Republic of Korea (1.14) than the OECD (1.42). However, the Republic of Korea does poorly in the score for administrative burdens on startups, especially for corporation—i.e., the Republic of Korea (2.75) vs. the OECD (1.36). The Republic of Korea does particularly poorly in the score for barriers to entry in services—i.e., the Republic of Korea (2.31) vs. the OECD (1.76). In this category, in fact, the Republic of Korea fares even worse than India and Indonesia. The Republic of Korea also scores poorly in the indicators for barriers to trade and investment—i.e., the Republic of Korea (1.30) vs. the OECD (0.63). In particular, the scores for tariffs (the Republic of Korea's 2.00 vs. the OECD's 1.31) and other regulatory barriers (1.60 vs. 0.79) are low.

A lot of government restrictions on the service sector are geared toward the protection of employment in SMEs. As such, it would be useful to examine the status of SMEs in the Republic of Korea. The relative labor productivity as measured by the relative value added per person employed in SMEs for the service sector as a whole changed from 49% (=26.1/53.3) of large firms in 2001 to 41% (=61.1/148.1) in 2009 (as calculated from the bottom line). The problem of poor labor productivity in SMEs thus grew worse since labor productivity growth over the past ten years was considerably higher among large firms than among SMEs.

The problem is more severe in more traditional service sectors. The relative labor productivity of SMEs in group I plunged from 52% to 29% during the same period. The relative productivity of SMEs in group II declined from 58% to 36%, and from 92% to 66% in group III. A sizable gap in productivity between large and small firms is evident in every group. However, as a result of different relative productivity growth, the gap is now smallest in group III. This reflects the fact that the regulations tend to protect SMEs engaged in more traditional services. More specifically, the gap is particularly large in wholesale and retail trade, hotels and restaurants, education, arts and sports, and real estate and renting, where restrictive regulations are heavy and low-productivity SMEs can still survive. However, it is worrisome that the productivity gap is also widening even in the most modern service sector, group III. Heavy government protection of SMEs is motivated by their high share in employment. The share of SMEs in employment even increased further from 86.3% to 91.2% (total), 90.9% to 95.7% (group I), 92.1% to 93.9% (group II), and 71.2% to 78.9% (group III).

⁸ For Asia, the PMR indicators are available for only five countries.

Table 5. Integrated Product Market Regulation Indicator

	PRC	India	Indonesia	Japan	Republic of Korea	OECD average
Product market regulation	3.30	2.84	2.73	1.14	1.48	1.36
State control	4.63	3.58	4.36	1.43	1.99	2.04
1. Public ownership	5.33	4.00	5.10	2.01	2.76	2.93
Scope of public enterprise sector	6.00	4.91	5.73	2.00	1.75	3.08
Government involvement in infrastructure sector	5.48	4.65	4.83	1.18	2.65	3.30
Direct control over business enterprise	4.50	2.45	4.74	2.85	3.88	3.20
2. Involvement in business operation	3.94	3.15	3.63	0.85	1.22	2.42
Price controls	4.38	1.13	3.00	1.40	1.78	2.64
Use of command and control regulation	3.50	5.18	4.25	0.31	0.67	2.53
Barriers to entrepreneurship	2.89	2.73	1.86	1.37	1.14	1.42
1. Regulatory and administrative opacity	0.25	2.01	0.16	1.13	0.00	1.55
License and permits system	0.00	2.00	0.00	2.00	0.00	1.87
Communication and simplification of rules and procedures	0.50	2.02	0.32	0.25	0.00	0.91
2. Administrative burdens on startups	5.58	4.44	1.64	0.74	1.57	1.68
Administrative burdens for corporation	5.25	4.50	1.00	1.75	2.75	1.36
Administrative burdens for sole proprietor firms	5.50	5.50	2.25	0.00	0.75	1.53
Sector specific administrative burdens	6.00	3.33	1.67	0.46	1.21	1.55
3. Barriers to competition	2.83	1.74	3.79	2.24	1.85	1.77
Legal barriers	1.43	0.86	4.57	1.43	1.14	1.52
Antitrust exemptions	0.00	1.23	2.86	0.50	0.44	1.37
Barrier to entry in network sectors	5.39	3.56	3.92	3.68	3.52	1.57
Barrier to entry in services	4.50	1.33	0.00	3.36	2.31	1.76
Barriers to trade and investment	2.40	2.22	1.97	0.62	1.30	0.63
1. Explicit barriers to trade and investment	2.52	2.84	2.33	1.24	1.00	1.08
Barriers to FDI	3.36	2.52	2.88	1.48	1.01	1.34
Tariffs	2.00	4.00	1.00	0.00	2.00	1.31
Discriminatory procedures	2.21	2.00	3.13	2.25	0.00	1.08
2. Other barriers	2.27	1.60	1.60	0.00	1.60	0.79
Regulatory barriers	2.27	1.60	1.60	0.00	1.60	0.87

FDI = foreign direct investment, OECD = Organisation for Economic Co-operation and Development, PRC = People's Republic of China.

Note: The data are obtained from Indicators of Product Market Regulation Database, referring to the beginning of 2008.

Source: OECD. 2011. Product Market Regulation database (accessed 14 March 2012).

C. Low R&D Expenditures and Low ICT Investment

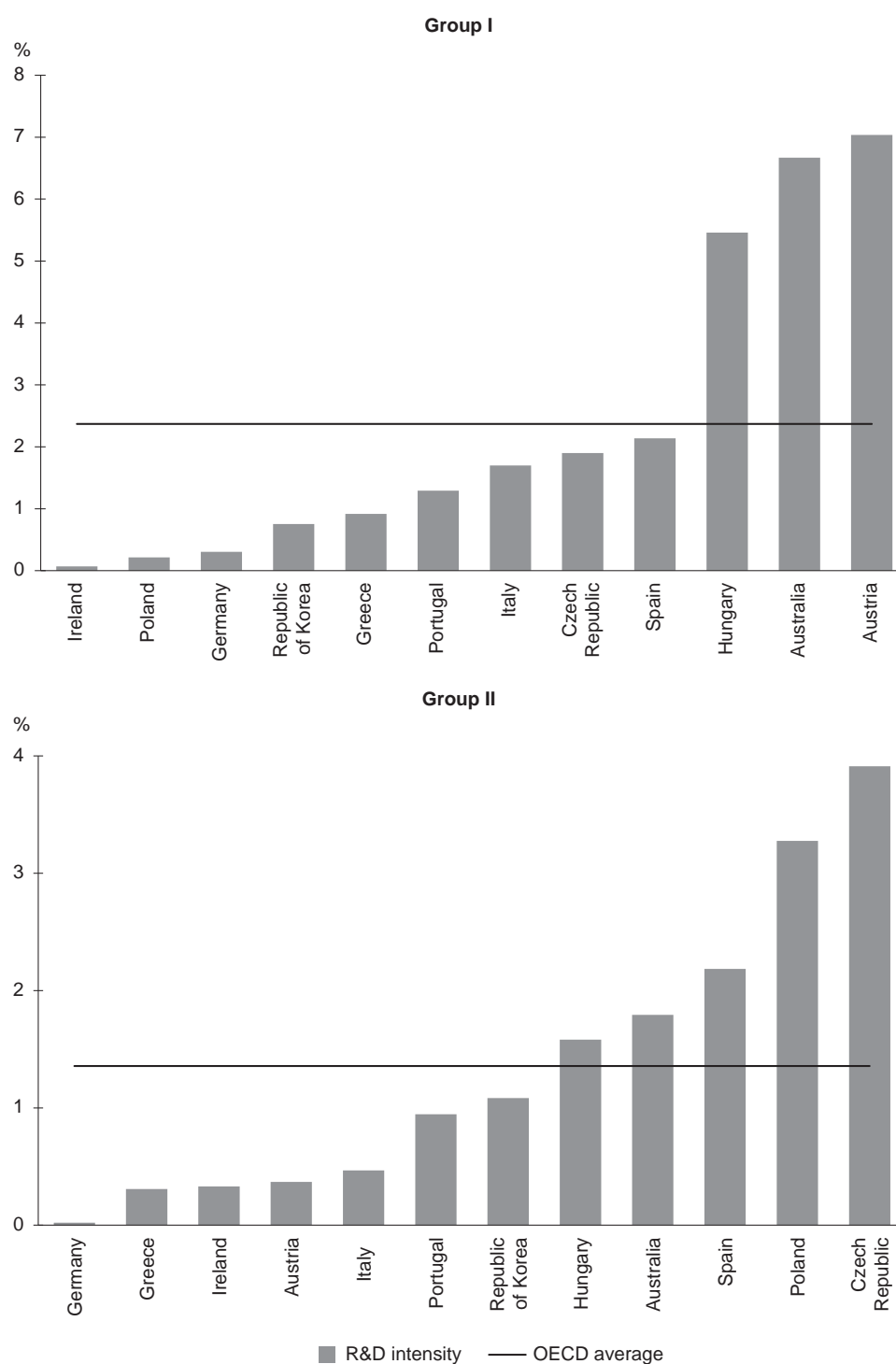
Another possible explanation for the poor performance of the service sector in the Republic of Korea is relatively low R&D expenditures and low ICT investment, which hinder innovation in services and moving up the value chain toward higher value-added services activities.⁹ R&D intensity of a sector is measured as R&D expenditures as a percentage of value added in the sector. Data are collected from OECD STAN Indicators. The data are for the most recent years available, 2004–2009. The R&D intensity of the Republic of Korea's manufacturing is higher than the OECD average. It is ninth highest out of 33 countries. In contrast, the R&D intensity of the Republic of Korea's service sector is lower than the OECD average. It is only eighteenth out of 33 countries. Therefore, in the Republic of Korea there are visibly more innovative investments in the manufacturing sector than in the service sector. This may help to explain why services lag behind manufacturing in productivity. As evident in Figure 3, for every services group, R&D intensity in the Republic of Korea underperforms the OECD average. The gap is largest for group 1, which is subject to most regulatory restrictions and thus provides the least incentive for investing in R&D.

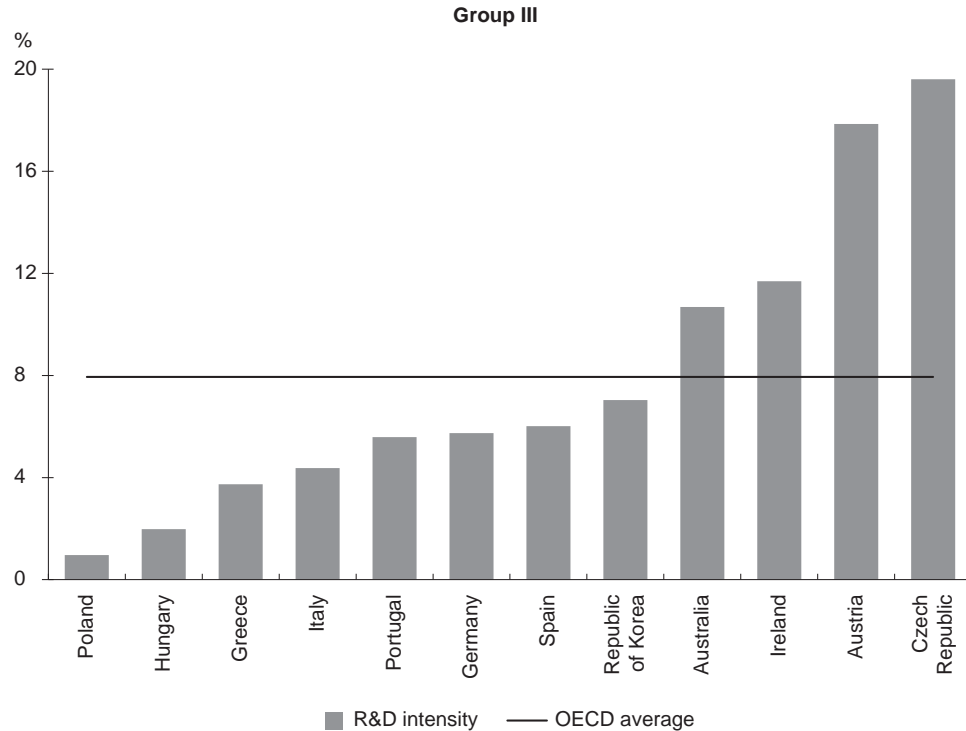
In the EU KLEMS database, ICT investment is defined as investment in computing equipment, communication equipment, and software. From ICT investment, the database constructs ICT capital. Then based on the standard growth accounting exercise, value-added growth is decomposed into the contributions of capital—both ICT and non ICT, labor, and multifactor productivity. In general, ICT contribution is largest for group III, followed by group II, and lowest in group I. This is intuitively plausible because modern services stand to gain the most from application of ICT. In general, ICT's contribution to value added growth grows larger over time if we exclude the last subsample period. Interestingly, ICT's contribution declines in every country in the last period. As might be expected, ICT's contribution is larger in group III, the modern service sector, than in group I or II. When we compare the Republic of Korea with the United States and European Union, the contribution of ICT capital in the Republic of Korea is lower and it is markedly lower for group I. The difference is smallest in group III. The only exception is telecommunication, the one sub-category of group III where the contribution of ICT capital in the Republic of Korea actually exceeds that of the European Union and United States.

D. Barriers to Services Trade and Barriers to FDI in Services

Just like barriers to goods trade and barriers to FDI in manufacturing, the main objective of barriers to services trade and barriers to FDI in services is to protect domestic firms and industries from foreign competition. The standard argument for opening up trade and FDI is also identical for both manufacturing and services—they encourage domestic firms and industries to become more efficient in order to survive foreign competition. By the same token, the standard argument against barriers to trade and FDI in both sectors is that they hamper productivity growth by diluting competitive pressures and hence incentives of domestic players to raise their game.

⁹ There are a number of studies that find that ICT investment enhances productivity. See, for example, Fernald and Ramnath (2004).

Figure 3. R&D Intensity of Service Subsectors



Note: R&D intensity is measured as R&D expenditures as a percentage of value added in each group: I, II and III. Group classifications for the service sector follow Eichengreen and Gupta (2009). Group I includes “wholesale and retail trade”, Group II includes “hotels and restaurants” and “community social and personal services” and Group III includes “financial intermediation” and “real estate, renting and business activities”. R&D expenditure data are collected from OECD STAN Indicators and value added data are from EUKLEMS. The data are for the most recent year available as follows: Poland (2005), Greece (2005), Portugal (2005), Hungary (2006), Ireland (2005), Czech Republic (2007), Spain (2006), Italy (2007), Australia (2004), Austria (2006), Germany (2006), and Republic of Korea (2006).

Source: Authors' estimates.

Table 6 reports the share of services trade in total trade for twelve Asian economies, along with selected major South American countries, East European countries, and developed countries. In most countries, service trade share in total trade has increased over time. This is particularly true in India and the United Kingdom. It also has increased in the Republic of Korea, but the increase is minimal, particularly from 2000 to 2010. Compared to other Asian economies, the Republic of Korea's services trade share is not large; in fact, it is smaller than Hong Kong, China; Pakistan; Philippines (except in 2000); and Singapore. The Republic of Korea's share is comparable to that of South American countries and Eastern European countries, and it is lower than that in most developed countries. The only exception is Germany, which is well known for its strong bias toward manufacturing and relatively underdeveloped services. In the Republic of Korea, the share of services in imports is larger than that in exports (except in 1990). This is also true for South American countries. In the case of the Republic of Korea, the difference grows larger over time. In developed countries except Germany and Eastern European countries, the share of services in exports exceeds its share in imports.

Table 6. Services Trade Shares in Total Trade

Economy	Service Exports as % of Total exports			Service Imports as % of Total Imports		
	1990	2000	2010	1990	2000	2010
12 Asian Economies						
China, People's Republic of	10.2	10.9	9.8	9.3	14.4	12.7
Hong Kong, China	–	16.6	21.2	–	10.5	10.4
India	20.2	27.8	35.5	20.6	26.3	26.6
Indonesia	8.5	7.4	9.6	22.0	27.9	16.9
Korea, Republic of	13.6	15.0	15.1	13.5	17.4	18.2
Malaysia	11.8	12.4	14.1	17.3	17.8	17.0
Pakistan	20.9	13.6	23.0	20.3	18.5	17.7
Philippines	28.4	8.3	22.1	12.6	10.8	15.6
Singapore	19.0	15.8	23.8	13.3	17.8	23.6
Taipei, China	9.4	11.6	12.8	20.3	15.4	12.9
Thailand	22.0	17.0	14.9	17.6	21.6	22.2
Viet Nam		15.8	9.4		18.8	11.4
South American Countries						
Argentina	16.5	15.8	16.2	45.6	27.8	20.7
Brazil	10.7	14.7	13.6	26.7	23.0	25.7
Chile	18.1	17.5	13.2	22.7	21.9	17.6
Mexico	16.6	7.5	4.8	19.9	8.8	7.7
Eastern Europe						
Czech Republic	–	19.1	15.2	–	14.5	13.0
Hungary	24.0	17.0	17.5	21.8	13.1	15.1
Developed Countries						
France	26.8	21.8	21.9	21.6	17.9	18.3
Germany	13.2	13.2	15.5	19.7	21.9	19.3
United Kingdom	23.6	29.6	36.8	18.5	23.0	23.1
United States	27.3	26.6	29.6	19.0	15.0	17.2

– = data not available.

Source: World Bank. World Development Indicators online database (accessed 14 March 2012).

Table 7 reports and compares the trade performance of selected major economies in the manufacturing sector versus the service sector. The Republic of Korea is the world's fifth largest exporter and thirteenth largest importer of manufactured goods. The fact that the Republic of Korea ranks among the world's five biggest exporters of manufactures is a vivid testament to its status as a globally significant manufacturer. The Republic of Korea generally runs a large trade surplus in manufactured goods. In contrast, the Republic of Korea plays a visibly smaller role in global services trade. The Republic of Korea is the world's fifteenth largest exporter and

eleventh largest importer of services. Most notably, the Republic of Korea's rank as an exporter of services—15—is much lower than its rank as an exporter of manufactured goods—5, lending further support to the notion that the Republic of Korea's service sector lags its manufacturing sector. In contrast to its large surplus in manufactures trade, the Republic of Korea runs a deficit in services trade.

Table 7. Trade Indicators, 2010 (\$ billion)

(A) Manufacturing Trade

Economy	Export	Rank	Trade balance	Economy	Import	Rank	Trade balance
Top 10							
PRC	1,478.1	1	617.8	United States	1,382.3	1	−536.3
Germany	1,044.2	2	318.9	PRC	860.3	2	617.8
United States	846.0	3	−536.3	Germany	725.4	3	318.9
Japan	685.3	4	334.2	France	444.2	4	−35.5
Korea, Rep. of	414.8	5	173.3	Hong Kong, China	397.1	5	−89.3
France	408.6	6	−35.5	United Kingdom	382.8	6	−98.0
Italy	368.1	7	61.7	Japan	351.1	7	334.2
Netherlands, The	326.1	8	29.3	Canada	308.5	8	−118.2
Belgium	309.2	9	33.0	Italy	306.4	9	61.7
Hong Kong, China	307.8	10	−89.3	Netherlands, The	296.8	10	29.3
Other economies							
United Kingdom	284.8	11	−98.0	Mexico	247.3	12	−20.7
Singapore	257.4	12	53.1	Korea, Rep. of	241.5	13	173.3
Mexico	226.5	13	−20.7	Singapore	204.3	15	53.1
Thailand	146.9	17	19.5	India	169.4	17	−29.2
India	140.3	18	−29.2	Brazil	141.3	20	−66.5
Malaysia	133.7	19	11.2	Thailand	127.4	22	19.5
Czech Rep.	115.0	23	18.0	Malaysia	122.5	23	11.2
Hungary	78.1	26	14.9	Czech Rep.	97.0	27	18.0
Brazil	74.9	27	−66.5	Indonesia	85.2	28	−25.9
Indonesia	59.2	28	−25.9	Hungary	63.2	30	14.9
Philippines	44.2	34	5.0	Argentina	48.1	36	−25.5
Argentina	22.6	43	−25.5	Chile	40.7	41	−31.7
Pakistan	15.9	44	−3.1	Philippines	39.2	43	5.0
Chile	9.0	54	−31.7	Pakistan	18.9	56	−3.1

(B) Services Trade

Economy	Export	Rank	Trade balance	Economy	Import	Rank	Trade balance
Top 10							
United States	544	1	142	United States	402	1	142
United Kingdom	239	2	70	Germany	263	2	-25
Germany	238	3	-25	PRC	193	3	-22
PRC	171	4	-22	United Kingdom	169	4	70
France	145	5	13	Japan	158	5	-17
Japan	141	6	-17	France	132	6	13
India	124	7	36.9	India	117	7	7
Spain	124	7	7	Italy	111	8	-12.3
Singapore	112	9	15.5	Ireland	107	9	-9.2
Hong Kong, China	106	10	55.1	Singapore	96.5	10	15.5
Other economies							
Korea, Rep. of	82.7	15	-11.2	Korea, Rep. of	93.9	11	-11.2
Thailand	34	27	-11.8	Brazil	62.6	18	-30.8
Brazil	31.8	29	-30.8	Hong Kong, China	50.9	21	55.1
Czech Rep.	21.7	33	3.4	Thailand	45.9	23	-11.8
Hungary	19.1	34	3.2	Indonesia	26.1	29	-9.3
Indonesia	16.8	36	-9.3	Mexico	25.6	30	-10.2
Mexico	15.4	37	-10.2	Czech Republic	18.2	36	3.4
Philippines	13.2	40	1.9	Hungary	15.9	38	3.2
Argentina	13.2	41	-0.9	Argentina	14.1	40	-0.9
Chile	10.8	45	-1	Chile	11.8	44	-1
Viet Nam	7.5	50	-2.5	Philippines	11.3	46	1.9
Pakistan	6.4	52	-0.7	Viet Nam	9.9	48	-2.5
				Pakistan	7.1	53	-0.7

PRC= People's Rep. of China.

Source: World Bank. World Development Indicators online database (accessed 14 March 2012).

We estimate a gravity equation for the Republic of Korea's total trade and services trade, and compare the two to see if there are significant differences between the two. The specification of the gravity equation is as follows:

$$\begin{aligned} \ln(Trade_{ijt}) = & \beta_0 + \gamma KOR + \beta_1 \ln Dist_{ij} + \beta_2 \ln(Pop_{it}) + \beta_3 \ln(Pop_{jt}) + \beta_4 \ln(GDP_{it}) \\ & + \beta_5 \ln(GDP_{jt}) + \beta_6 CU_{ijt} + \beta_7 Language_{ij} + \beta_8 RTA_{ijt} + \beta_9 Border_{ij} \\ & + \beta_{10} Island_{ij} + \beta_{11} \ln(Area_i Area_j) + \beta_{12} ExComColony_{ij} \\ & + \beta_{12} CurColony_{ij} + \beta_{13} ExColony_{ij} + \delta Year_t + \varepsilon_{ijt} \end{aligned} \quad (1)$$

Where i and j denote countries, t denotes time, and the variables are defined as:

- KOR is a binary variable which is unity if country i is the Republic of Korea.
- $Trade_{ijt}$ denotes the average value of real bilateral trade between i and j at time t .
- $Dist_{ij}$ is the distance between i and j .
- Pop is population.
- GDP is real GDP.
- CU_{ijt} is a binary variable which is unity if i and j belong to the same currency union.
- $Language_{ij}$ is a binary variable which is unity if i and j have a common language.
- RTA_{ijt} is a binary variable which is unity if i and j belong to the same regional trade agreement at time t .
- $Border_{ij}$ is a binary variable which is unity if i and j share a land border.
- $Area$ is the land mass of the country.
- $Island_{ij}$ is the number of island countries between i and j .
- $ExComColony_{ij}$ is a binary variable which is unity if i and j were ever colonies after 1945 under the same colonizer.
- $ExColony_{ij}$ is a binary variable which is unity if i ever colonized j or vice versa.
- $CurColony_{ijt}$ is a binary variable which is unity if i and j are currently in a colonial relationship at time t .
- $Year_t$ is a set of binary variables which are unity in the specific year t .

The total trade data are collected from the *Directions of Trade* database. The service data are collected from the OECD. The GDP and population data are from Penn World Table 7.0. Other data are obtained from Rose and Spiegel (2011) except for the regional trade agreement (RTA) dummy, which is extended by using the reports to CEPII and the World Trade Organization (WTO).

We use total exports (imports) as the dependent variable in Table 8 and service exports (imports) as a dependent variable in Table 9. All variables except for the binary variables are taken as logarithms. We drop the observations if either total trade or services trade takes zero or negative values.¹⁰ In both tables, the first and third columns are for exports and the second and the fourth columns for imports. We also include a *KOR* dummy variable in the last two columns. A number of findings emerge from our estimation of the above gravity equation. The fit of the gravity equation for service trade is as good as the fit for total trade. The estimated coefficients for distance and number of islands are smaller when we use service trade as a dependent variable. Service is weightless, which means that physical distance and shipping matters less than for goods trade. The estimated coefficient for common language is larger for service trade. Communication matters more for service trade. The effects of currency union and regional trade on service trade are at least as large as their effects on total trade. The estimated coefficients for colony related variables are larger for service trade. Again, communication matters more for service trade. The estimated coefficient for the *KOR* dummy is positive in both cases but it is smaller for service trade. This implies that the Republic of Korea trades more in goods and services and in services alone than a comparable country but the degree of over-trading is less for service trade.

With respect to FDI inflows, the share of service sector FDI in total FDI was much smaller than the OECD average in 2006. The share of service sector FDI grew but still remains smaller than the OECD average in 2010. Furthermore, the share of group III in total service sector FDI inflows is lower in the Republic of Korea than the OECD average.

¹⁰ Dropping zero or negative trade values may generate biased estimates, but Linders and de Groot (2006) suggest that this bias is negligible in practice.

Table 8: Gravity Equation for Total Exports and Imports

Dependent Variable	I Total Exports	II Total Imports	III Total Exports	IV Total Imports
Dummy for [Rep. of] Korea			1.112*** [6.076]	0.909*** [3.225]
Log distance	-1.096*** [-35.820]	-1.033*** [-21.857]	-1.108*** [-36.422]	-1.043*** [-22.104]
Log population 1	1.074*** [59.605]	1.128*** [40.551]	1.059*** [58.598]	1.116*** [39.837]
Log population 2	0.830*** [47.777]	1.095*** [40.857]	0.817*** [47.043]	1.084*** [40.299]
Log per capita GDP 1	1.554*** [35.452]	0.785*** [10.921]	1.570*** [35.867]	0.801*** [11.140]
Log per capita GDP 2	1.144*** [70.366]	1.281*** [49.634]	1.133*** [69.711]	1.272*** [49.162]
Dummy for currency union	0.057 [0.669]	0.280** [2.085]	0.069 [0.819]	0.291** [2.173]
Dummy for common language	0.840*** [10.445]	0.576*** [4.668]	0.791*** [9.867]	0.535*** [4.338]
Dummy for regional trade agreement	0.058*** [2.972]	0.076** [2.280]	0.062*** [3.164]	0.080** [2.393]
Dummy for land border	0.279** [2.032]	0.633*** [3.015]	0.289** [2.130]	0.642*** [3.070]
Number of islands	0.101* [1.691]	0.665*** [7.220]	0.114* [1.928]	0.675*** [7.361]
Log product of land areas	0.012 [0.991]	0.021 [1.160]	0.019 [1.622]	0.027 [1.501]
Dummy for common colonizer	1.651*** [5.600]	1.900*** [4.199]	1.628*** [5.570]	1.884*** [4.181]
Dummy for current Colonial Relationship	0.719 [0.889]	0.689 [0.553]	0.747 [0.931]	0.711 [0.574]
Dummy for ever in Colonial Relationship	0.350*** [2.979]	0.781*** [4.332]	0.405*** [3.463]	0.825*** [4.587]
Observations	17,677	17,677	17,677	17,677
R-squared	0.425	0.154	0.425	0.154

Note: t statistics are in brackets. *, **, *** indicate that the coefficient is significant at 10, 5, and 1 percent levels, respectively. Population 1 (2) refers to export (import) country's population in the export (import) equations, column 1 (2) and column 3 (4). The same is true for GDP 1 and 2. Distance is collected from CEPII, population and per capita GDP from Penn World 7.0, regional trade agreement from CEPII and WTO, and other data from Rose and Spiegel (2011).

Sources: Alan Heston, Robert Summers and Bettina Aten, Penn World Table Version 7.0, Center for International Comparisons of Production, Income and Prices at the University of Pennsylvania, June 2011; Centre d'Etudes Prospectives et d'Informations Internationales (CEPII); International Monetary Fund, Direction of Trade Statistics (all databases accessed 14 March 2012); Rose and Spiegel (2011).

Table 9: Gravity Equation for Service Exports and Imports

Dependent Variable	I Service Exports	II Service Imports	III Service Exports	IV Service Imports
Dummy for [Republic of] Korea			0.868*** [4.230]	0.879*** [4.504]
Log distance	-0.733*** [-21.021]	-0.796*** [-24.075]	-0.742*** [-21.384]	-0.805*** [-24.478]
Log population 1	0.912*** [44.531]	0.961*** [49.445]	0.899*** [43.710]	0.948*** [48.617]
Log population 2	0.713*** [36.280]	0.735*** [39.357]	0.702*** [35.648]	0.724*** [38.748]
Log per capita GDP 1	2.805*** [49.123]	2.533*** [47.714]	2.818*** [49.432]	2.545*** [48.036]
Log per capita GDP 2	1.222*** [62.381]	1.111*** [60.214]	1.211*** [61.757]	1.100*** [59.633]
Dummy for currency union	0.387*** [3.806]	0.378*** [3.945]	0.400*** [3.955]	0.392*** [4.109]
Dummy for common language	1.121*** [12.469]	1.060*** [12.385]	1.082*** [12.062]	1.021*** [11.964]
Dummy for regional trade agreement	0.073** [2.539]	0.046* [1.778]	0.078*** [2.717]	0.052** [1.982]
Dummy for land border	0.530*** [3.467]	0.535*** [3.673]	0.540*** [3.556]	0.544*** [3.767]
Number of islands	0.085 [1.260]	0.427*** [6.663]	0.097 [1.448]	0.439*** [6.895]
Log product of land areas	-0.037*** [-2.809]	-0.070*** [-5.575]	-0.031** [-2.327]	-0.064*** [-5.091]
Dummy for common colonizer	2.375*** [7.186]	2.212*** [7.038]	2.355*** [7.177]	2.193*** [7.032]
Dummy for current Colonial Relationship	2.102** [2.296]	2.631*** [3.027]	2.128** [2.340]	2.656*** [3.079]
Dummy for pairs ever in Colonial Relationship	0.745*** [5.673]	0.545*** [4.364]	0.786*** [6.015]	0.588*** [4.727]
Observations	17,677	17,674	17,677	17,674
R-squared	0.433	0.384	0.433	0.384

Note: See note for Table 8.

Source: See Table 8.

IV. POLICY IMPLICATIONS

The analysis of the previous two sections, which empirically confirmed the poor performance of the Republic of Korea's service sector and tested some potential explanations for the poor performance, gives rise to some policy implications. In this section, we explore policy options for improving the performance of the Republic of Korea's underperforming service sector. Some of our policy options echo those of Pilat (2005) and Jones (2009) although they are more specific to the Republic of Korea.

A. Policies to Cope with Too Rapid Deindustrialization and Underemployment in Services

The very rapid rise in the service sector's share of employment, in conjunction with a markedly slower rise in its share of GDP, implies that the sector has been acting as an absorber of surplus workers who are unable to find productive employment in the face of the structural transformation. Since many of those workers end up in marginal, low-productivity, low-wage services jobs, this brings down the productivity of the service sector. The appropriate policy response does not involve slowing down the pace of deindustrialization, which reflects market forces and contributes to the dynamism and efficiency of the Republic of Korea's world-class manufacturing sector. Instead it should be based on facilitating and mitigating the large adjustment costs associated with the structural shift from manufacturing to services. For example, more flexible labor markets can help to reduce the structural unemployment arising from deindustrialization. Similarly, more assistance to those workers seeking new jobs, for example well-designed training programs, can help dislocated workers from the manufacturing sector look for and find jobs which better match their qualifications in the new service industries.

B. Policies to Speed Up the Republic of Korea's Successful Transition to a Post-Industrial Economy

Those sets of policies are related to and complementary to policies to cope with too rapid deindustrialization. According to our analysis, what lies at the heart of the poor performance and underdevelopment of the Republic of Korea's service sector is a failure to move into higher value-added services activities. While its income is converging toward OECD levels, in one important sense, its economic structure is not. Although the share of services in both employment and output has been rising, much of the growth has come from traditional services rather than modern services. That is, while the country's service sector has experienced quantitative expansion, it has a lot of scope for qualitative leveling up. The country's large services imports and persistent deficit in services trade suggests that there is substantial demand for services. In particular, its high income and development level implies a large demand for high-end services. One obvious policy implication is for government to subsidize the training and re-training of workers so they can help to meet this demand. In addition, the government can provide fiscal and other incentives to promote high value-added services such as design and prototyping at the beginning of the global value chain (GVC) and marketing and branding at the end of the GVC. According to the smile curve hypothesis, most of the value added in GVC lies in high-end services activities at both ends of the GVC rather than pure manufacturing, or simply making things, in the middle.

C. Deregulation

Our analysis indicates that the Republic of Korea's service sector faces substantial government regulations and restrictions, which aim to protect SMEs and SME jobs in the sector. Examples of such regulations and restrictions include strict entry and licensing requirements, stringent approval requirements, and significant government involvement and price controls. Since the very objective of the Republic of Korea's service sector regulations is to protect a specific group of firms from competition, they reduce competitive pressures and are likely to be a significant contributor to the sector's poor productivity performance. According to Pilat (2005), OECD countries' experiences with regulatory reforms have been, by and large, very positive. For example, in many OECD countries, deregulation of air passenger transportation and road freight has delivered substantial benefits in the form of lower prices, new services, and higher labor and capital productivity. However, given the often large adjustment costs of services deregulation—e.g., the entry of a big supermarket chain wiping out small neighborhood stores—it is probably best to pursue services deregulation as a gradual, evolutionary process.

D. More R&D Expenditures and More ICT Investment

Relative to other OECD countries, the Republic of Korea's R&D expenditures and ICT investments are relatively low. This can be a significant barrier against innovation in services and moving up the value ladder toward higher value-added services. Some of the policies that are beneficial for innovation in services are beneficial for innovation in general. For example, strengthening intellectual property protection will strengthen incentives for R&D and other innovative activities in both services and manufacturing sectors. At the same time, given the potentially large positive spillovers from services innovations, the government has to resolve the tradeoff between encouraging innovation and the diffusion of innovation to the rest of the economy. It is also possible to directly stimulate R&D in services by providing tax credits and grants. One technology which is a particularly powerful tool for improving services productivity is ICT, which has revolutionized the delivery of services. In order to maximize the potential benefits of ICT for services, the government should ensure a competitive environment in the ICT industry. Innovation will be especially helpful for modern services, where the Republic of Korea lags visibly.

In ICT-advanced countries such as the United States, the private sector plays an important role so that many ICT investments are made via venture capital provided to creative venture firms. Venture capital for ICT activities in the Republic of Korea slowed down markedly after the burst of the ICT bubble in 2001 and began to bounce back only in 2006.¹¹ However this recovery was largely attributable to the government support through policy funds such as the Korea Venture Fund. Heavy direct involvement of the government in providing venture capital can result in inefficient allocation of funds. Therefore, policy should be directed more toward stimulating private venture capital which eventually contributes to efficient ICT investment in the service sector.

E. Remove Barriers to Services Trade and Barriers to FDI in Services

Barriers to services trade and FDI inflows into services protect domestic firms and industries from foreign competition, and thus dilute their incentives to innovate and raise their productivity. Therefore, liberalizing trade and FDI can potentially contribute to improved efficiency in the service sector. According to Pilat (2005), OECD studies find that trade and FDI in services

¹¹ See Lee (2011).

delivers large benefits for OECD economies and developing countries alike. In the case of the Republic of Korea, it is widely believed that opening up various sectors to FDI as part of post-Asian crisis structural reforms brought about substantial productivity gains.¹² In recent years, the Republic of Korea has been pursuing free trade agreements (FTAs) with trade partners in both the developed world and developing world. In view of the potentially large benefits of services trade, in the future Korean policymakers should consider high-level FTAs which explicitly incorporate services trade. In fact, the Republic of Korea's recently formed FTAs with the United States and European Union are good examples of such high-level FTAs that seek to promote services trade. International investment agreements (IIAs) lubricate FDI in both services and industry. Even in the absence of IIAs, policymakers can unilaterally reduce barriers to FDI.

V. CONCLUDING OBSERVATIONS

The Korean economic miracle is largely based on a dynamic world-class manufacturing sector which exports goods all over the world. Korean manufacturers such as Samsung, Hyundai and LG are world leaders in their respective industries, and make and export a wide range of high-tech manufactured goods such as mobile phones, LCDs and automobiles. High savings and investment rates enabled the Republic of Korea to quickly build up a large stock of physical capital in the manufacturing sector. Just as importantly, openness to advanced foreign technology and a well-educated workforce capable of learning and absorbing such technology allowed the Republic of Korea's manufacturing sector to technologically level up rapidly. While this growth model of export-oriented industrialization delivered sustained fast growth for decades, the Republic of Korea currently finds itself at a pivotal crossroads between a manufacturing-led past and an increasingly services-oriented future. The Republic of Korea's manufacturing sector is maturing with high productivity levels and limited room for further growth. This means that the service sector, especially productivity growth in that sector, will have to play a bigger role in the Republic of Korea's future growth. All the more so since the Republic of Korea's exceptionally rapid population aging, combined with growing income equality, implies greater scope for certain services—e.g., health care, long term care, and basic public services.

The Republic of Korea's experience of industrialization and deindustrialization is in line with the earlier experiences of the advanced economies. The share of industry and services in output and employment typically rise at the expense of agriculture during the industrialization process. As industry matures and deindustrialization sets in, the share of services rises at the expense of industry while agriculture continues to fall. In the case of the Republic of Korea, the core problem is that although the share of services in output and employment has risen, its productivity growth has underperformed. Our analysis resoundingly confirms the popular belief that the Republic of Korea's service sector still lags the manufacturing sector even though deindustrialization already began in the early 1990s. Therefore, the center of gravity of the Korean economy is shifting from a dynamic world-class manufacturing sector to a stagnant third-class service sector, dragging down productivity growth for the economy as a whole. The central challenge for the Republic of Korea in the post-industrial phase is thus to overhaul and upgrade its service sector so that a productive, high value-added, modern service sector can become an engine of growth.

¹² For example, Kim and Kim (2003) find a productivity improvement in distribution services where there was a large inflow of FDI due to liberalization in the 1990s.

The underwhelming performance of the Republic of Korea's service sector up to now gives rise to serious doubts about its future contribution to aggregate growth. Furthermore, we saw that the sector faces a daunting array of impediments it must overcome if it is to fulfill its potential. For example, while deregulation can unleash competition and thus encourage the Republic of Korea's services firms to raise their game, their underlying motivation—protection of SMEs and SME jobs—makes it politically difficult to pursue. Nevertheless, upon closer inspection, there are some grounds for optimism about the Korean service sector's prospects. Above all, high value-added services activities, which are the biggest area of weakness in the Republic of Korea's service sector, require high levels of human capital. The Republic of Korea's highly educated workforce, which enabled it to quickly move up the technological ladder, can in principle also serve as a key ingredient in the leveling up of the Republic of Korea's service sector. In addition, the Korean entertainment industry's well-known success in exporting its products—i.e., the Korean wave—suggests that it is possible for the Republic of Korea to become a major services exporter. Notwithstanding such strengths, the Republic of Korea faces a formidable challenge in upgrading its service sector.

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Performance of the Service Sector in the Republic of Korea: An Empirical Investigation

This paper empirically analyzes the past performance of the Republic of Korea's service sector in order to assess its prospects as an engine of growth. The analysis confirms the conventional wisdom of an underperforming service sector in the country. The paper identifies factors underlying the poor performance and sets forth policy recommendations for addressing them.

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