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Implications for India-South Korea
Economic Cooperation**

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Abstract

As the economy moves from lower to higher stages of development, there occurs a shift from simpler to more modern and complicated techniques of production on the one hand and from primary to secondary and/or to tertiary sectors on the other. The excess growth of tertiary sector coupled with state-of-the-art technology has got its own implications for the future development patterns of the system. The excessive growth of tertiary sector and its effect on economic growth, employment and sustainability of the system has become a matter of concern.

In India and South Korea, the share of tertiary sector in the gross domestic product has crossed the fifty percent level. Due to very structure of nations' service sector, in both the countries, a huge service sector is struggling to be productive. The service sector in both the countries is varied and vast; each country having its own specialization and comparative cost advantages areas. *In this context, the work is an attempt to delineate the emerging model of service sector in India and searching for areas of India-South Korea economic cooperation.*

Keywords: Service Sector, Tertiary Sector, Economic Cooperation

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Introduction

As the economy moves from lower to higher stages of development, there occurs a shift from simpler to more modern and complicated techniques of production on the one hand and from primary to secondary and/or to tertiary sectors on the other. The excess growth of tertiary sector coupled with state-of-the-art technology has got its own implications, for the future development patterns of an economy. Overgrown tertiary sector has its effect on economic growth, employment and sustainability of the system. In India and South Korea, the share of tertiary sector in the gross domestic product has crossed the fifty percent level. Due to very structure of nations' service sector, in both the countries, a huge service sector is struggling to be productive. The service sector in both the countries is varied and vast; each country having its own specialization and comparative cost advantages areas. *In this context, the work is an attempt to delineate the emerging model of service sector in India and searching implications for India-South Korea economic cooperation.*

Methodology and Coverage

Database for the study is formed by secondary data sources. Aggregate National Accounts Statistics data for both India and South Korea have been obtained from the websites of statistical organizations/offices of respective countries. Disaggregate data for India has been obtained from 'Input-Output Transaction Table (IOTT), 2006-07' and for South Korea, it has been obtained from 'STAN Input-Output Table (Mid 2000's)'. On the methodology plane, in addition to sectoral and employment shares, the work has went in for an elaborate analysis based on input-output formalism. Input-output table for India is available at 60 sector disaggregation (Appendix Table 1) and for South Korea it is available at 37 sector disaggregation (Appendix Table 2). Using the sector matching procedure, a concordance table has been prepared which provided the common sector classification scheme for both the countries, at 29 sector disaggregation level (Appendix Table 3). Using these comparable input-output matrices, input-output structures and linkage patterns have been analyzed at a disaggregated level. Wherever needed, appropriate price adjustments have been made.

A Synoptic Review of Theory and Empirics

"What constitute the service producing sector? ", is one the major definitional issues in the empirical literature. Generally, the service producing sector is defined by exclusion, i.e., services are defined by what they are not. This residual definition has contributed to somewhat negative perception about the value of the sector (McLachlan et al. 2002). In contrast to this, as per Riddle (1986), "the term 'residual' has another more misleading implication, that of size; a 'residual' is usually thought of as that little bit which is left over".

The main difference between services and goods depends on the nature of market transactions as well as intrinsic characteristics of services in relation to other goods (Singh, 2006). The nature of the market and the intrinsic characteristics of services are both subject to change, as economies and technologies evolve. Another way to define services is to look for common features or 'peculiarities' that make them different from goods or other types of economic activities. For instance, feature of non-storability of services, which requires that services must be consumed as they are produced (Hill, 1977) and feature that services are tangible (Griliches, 1992). It is the absence of tangibility that leads to non-storability, and to non-transferability. The property of tangibility must be interpreted with caution, as some of the service products like software programs and various forms of digital electronic content have only limited tangibility, but are storable and transferable. In recent times, the literature seems to be settling down to accept some distinctive features of a product that can be considered service; these are intangibility, heterogeneity, simultaneity of production and consumption, and perishability (Parasuraman et al. 1985; Rust and Chung, 2005).

Empirics on sectoral growth and performance analysis draw their origin from the dual economy model of Lewis (1954) and Hirschman (1958) which attempt to explain economic growth by examining the role and relationship between the traditional agricultural sector and modern manufacturing sector. There exist two opposing schools of thought on the relationship between the service producing sector and economic growth (Glasmeyer and Howland, 1993). *First*, is of the view that the service producing sector can aid economic growth; and *second* is of the view that the service producing sector should not be seen as independent of, nor is it a replacement for, the traditional goods producing sector such as agriculture, mining, and manufacturing.

The available evidence indicates that the service producing sector has dominated the goods producing sector in most of the developed economies; it accounts for about two-thirds of employment and output in many advanced economies such as Canada and Australia (Economic Council of Canada, 1991). The relationship between the service producing sector and economic growth must be viewed in terms of both the size of the sector in economic activity and to productivity gains. Increasingly, the service sector is seen as the key to economic growth in a post-industrial economy. As per S&P report, the East Asian region will have trouble in maintaining the growth momentum over the long term, if it continues to rely primarily on traded goods due to stiff competition from China and India (Standard and Poor, 2007). As compared to the goods producing sector, the service sector is less likely to be

export oriented and hence less likely to be affected by slowdown in growth of a major trading partner (Mansell, 1985).

Miles and Boden (2000) describe services as the 'Cinderella sector', largely ignored by economists, industrial relations researchers and students of innovation. They argue, however, that as the share of services in national economies continues to grow, and the linkages between services and other sectors of the economy are extended, the tendency to overlook services becomes less tenable.

While analyzing the relationship, Dutt and Lee (1993), using cross-section country-level data from three decades, found that the effect is negative or positive depending on how the role of the service sector is measured, but they argue that there is a strong case that effect is, in fact, usually negative. Another study on U.S. economy by Triplett and Bosworth (2004), argues that "We find that the bulk of the post-1995 acceleration of productivity growth was within the services producing industries. In the period after 1995, labor productivity in the goods producing industries improved, but not nearly so much as it did in the services producing industries. Multifactor productivity, moreover, accelerated strongly in services producing industries (we measured it at 0.3 percent a year before 1995 and at 1.5 percent a year for the 1995-2001 period) but hardly at all in the goods producing sector".

There are large number of studies on the Indian economy that have explored the service sector and economic growth nexus. Study by Pradhan et al. (2006) is of the view that the services economy is heavily concentrated in industries characterized by small scale operations because of the linkages between service and industry. As the technological change takes place for development and growth, services sector gives much positive result rather than manufacturing and agriculture sector, because of its low capital-output ratio. Nagaraj (2010) examined the dynamics of increasing share of service sector in GDP and less employment growth over the decade. Although service sector growth is without a correspondence shift in the workforce distribution but its growth is widely attributed to technological change and economic reforms. Rashmi Banga (2005) concluded that the use of services is growing rapidly in the industrial sector and the increased use of services is contributing to both output and productivity growth in the industrial sector. Further, the Indian services sector might not only succeed in sustaining its own growth but might also help in improving the growth rate of industrial sector in the near future.

Despite the huge number of studies on service sector productivity and economic growth in the developed economies, there are very few studies to relate the service sector

growth dynamism with the prospective trade relations between two economies; and there exists an ample scope of research for the same.

Analysis

There are three distinct phases of development that could be identified for most of the developed countries of the world: the first had been the dominance of agriculture; the second being the emergence of the manufacturing sector; and the third and of course current phase being the emergence of the service producing sector, as a dominant player in terms of contribution to economic activity. The ICT revolution since the 1980s has been clearly responsible for this. In most of the advanced economies, the growth of the service producing sector is above national average. Analysts are of the opinion that the rapid growth in the Indian economy since the early 1990s is primarily due to the rapid growth in the service sector (Singh, 2006); but the South Korean experience, in this regard, has not been strictly on the same lines. On analytical level, first, the analysis has been carried out at aggregate level and then at a disaggregate level.

Structural Change: India and South Korea in Global Scenario

The main features and trends due to structural change in the world economy have been analyzed nicely in a working paper (UNIDO, 2010). After surveying the relevant theoretical and empirical literature on structural change, it analyzes the historical evolution of agriculture, industry and services in terms of their share of world value added. This analysis covers six continental regions and spans a period of 40 years. It includes 18 sub-sectors for a sample of 30 countries, including India and South Korea. Three main findings resulted from the work. *First*, the long-term rise in the share of services in global value added has been slowing down in the last decade. *Second*, the upward trend in the global value added share of North America and Asia seems to be partly reverted in favour of other regions. *Third*, after a setback during the 1980s, structural transformation in the manufacturing sector has been accelerating in the last two decades.

The productive structure of the world economy has changed rapidly in the last decades, reinforcing the established trends from the past. In terms of value added at current prices and exchange rates (table 1), the service sector already dominant in 1970, making 51.7 per cent of world production, touched the level of 67.3 percent in 2000, and has been 66.4 per cent in 2010. The share of agriculture that was 10.0 per cent in 1970 went down to 3.6 percent in 2005 and has been 4.2 per cent in 2010. Similarly, the share of industry that was 38.3 percent in 1970 declined to 29.1 in 2000 and improved marginally and registered the mark of 29.4 percent in 2010. *This gives support to the view that tertiarization has been the*

dominant feature of structural change in the global economy, and that the economic development reached the stage in which not only agriculture but also the industrial sector was growing more slowly till 2000 but the recent decade shows a slight reversal in the trend; service sector has been marginally taken over by primary and secondary sector share improvement.

Table 1: Sectoral Distribution of Total Value Added (Percent shares at current prices)

Sector	Year				
	1970	1980	1990	2000	2010
WORLD					
Agriculture	10.0	7.3	5.6	3.6	4.2
Industry	38.3	38.4	33.3	29.1	29.4
Services	51.7	54.3	61.1	67.3	66.4
Total	100	100	100	100	100
ASIA					
Agriculture	21.7	12.6	8.7	6.3	7.4
Industry	37.9	41.6	37.8	34.4	38.0
Services	40.4	45.8	53.5	59.3	54.6
Total	100	100	100	100	100
INDIA					
Agriculture	43.5	36.8	30.0	23.2	17.6
Industry	20.3	24.2	27.6	26.4	27.3
Services	36.3	39.0	42.4	50.4	55.1
Total	100	100	100	100	100
SOUTH KOREA					
Agriculture	29.1	16.0	8.7	4.6	2.6
Industry	26.7	36.2	40.2	38.6	39.3
Services	44.2	47.8	51.2	56.8	58.0
Total	100	100	100	100	100

Source: UN Statistics Database, <http://unstats.un.org/>

Asia, where agriculture dominated the historically structure of economy, also followed the same path. Service sector share that was 40.4 percent in 1970 touched the mark of 59.3 percent in 2000 and is 54.6 percent in 2010. In Asia, the share of agriculture in value added declined faster than the world economy; it has almost reached the one-third level in 2010, at where it was in 1970. The share of industry in Asia that was 37.9 percent in 1970, after hovering around 35 to 37 percent for years, is finally 38.0 percent in 2010. In India, the share of agriculture that used to be 43.5 percent in 1970, came down to 30.0 percent in 1990 and has been 17.6 percent in 2010. Share of Industry has improved from 20.3 percent in 1970, to 27.6 percent in 1990 and to 38.0 percent in 2010. Share of service sector in India touched the level of 55.1 percent in 2010 as compared to 36.3 percent in 1970. Greater share of value added released by agriculture has gone to service sector, as compared to the industry.

Historically, the Indian economy has been agrarian economy but over a period of time it has moved from agriculture to service sector lead economy by bye-passing the industrial growth.

Traditionally, the South Korea has been dominated by service sector. In South Korea, the service sector share that used to be 44.2 percent in 1970, improved to 51.2 percent in 1990 and is 58.0 in 2010. An important fact to be noted in the South Korean economy is that share of industry is stable around 39 to 40 percent in the last three decades but the share of agriculture has declined drastically from 29.1 percent in 1970 to mere 2.6 percent in 2010. Much of this decline has been in the decade of 1970s and 1980s.

An important observation that emerges from the above analysis is that tertiarization is a universal phenomena; share of agriculture is being gradually substituted, largely by service sector and marginally by industry. World over and in India and South Korea, the share of industry has shown a marginal improvement in the recent decade. *South Korea followed the global transition to tertiarization where the traditional agricultural oriented systems have been first replaced by industry and then the service sector took the lead. In India, the tertiarization has been with the coexistence of larger share of agriculture and relatively weaker industrial base. As compared to South Korea, the viability of Indian tertiarization is a million dollar question that needs to be researched in detail.*

Structural change at sub-sector level of service sector is presented in table 2. Global scenario is indicative of the fact that the share of sector ‘trade, restaurants and hotels’ in GDP is shrinking over time; it was 28.41 percent in 1970 and has been 22.53 in year 2010. Same is the case of ‘transport, storage and communication’ sub-sector; as against 12.55 percent in 1970, it has been 10.71 percent in 2010. Share of ‘other services’, including ‘banking trade and finance’ and ‘real estate and dwelling’ that was 59.04 percent in 1970 rose to 63.97 in 1990 and has been 66.76 percent in 2010. Against this global backdrop, South Korean economy has followed the global trend at a faster pace; decline in ‘trade, restaurants and hotels’ and ‘transport, storage and communication’ and increase in ‘other services’ has been faster than the global economy. On the other hand in India, the share of sub-sector ‘trade, restaurants and hotels’ has improved from 23.36 percent in 1970 to 29.33 in 1990 and to 30.31 percent in 2010. The share of sub-sector, ‘transport, storage and communication’ improved from 10.93 percent in 1970 to more than 15 percent in years 1990 and 2000 but finally decreased to settle at 13.89 percent in 2010. Against the increasing global trend, the ‘other services’ sub-sector has shown a significant decline from 65.81 percent in 1970 to 55.80 percent in 2010. *Both India and South Korea depict a differential behavior as far as sectoral shares of service sector are concerned; Indian structural change is characterized by*

growing share of subsectors 'trade, restaurants and hotels' and 'transport, storage and communication' and South Korean economy is lead by growth of other services that includes banking, insurance, finance, education, research and development etc. This differential behavior of service sub-sector is a first sign for potential cooperation among the two countries.

Sectoral growth rates for Indian and South Korean economies are presented in table 3. Gross domestic product in Indian economy grew at the rate of 4.32 percent per annum during 1960 to 1980. It picked up to 6.74 percent in period of 1980 to 2000 and the last decade has registered a growth of 8.89 percent. This high level of growth has a slightly damped pattern in last two years due to a large number of factors like financial crisis, recession, infrastructure bottlenecks and other retarding factors. On the other hand GDP in South Korea that grew at the rate of 6.62 percent per annum during the period 1980-2000, has come down to 4.20 percent per annum, in the last decade. Sector-wise growth rates in India are indicative of the fact that service sector is the fastest growing sector; it has grown at the rate of 8.89 percent per annum in the last decade followed by industry which grew at the rate of 7.63 percent per annum. Agriculture, in India, is facing a slow down.

Table 2: Sub-Sector Distribution of Total Service Sector Value Added (Percent shares at current prices)

Country/Region	Year	Wholesale, retail trade, restaurants and hotels	Transport, storage and communication	Other services	Total
India	1970	23.26	10.93	65.81	100
	1980	29.55	10.93	59.52	100
	1990	29.33	15.28	55.39	100
	2000	28.63	15.27	56.10	100
	2010	30.31	13.89	55.80	100
South Korea	1970	38.58	15.16	46.26	100
	1980	32.21	16.92	50.87	100
	1990	29.69	13.63	56.68	100
	2000	24.79	13.22	61.99	100
	2010	20.79	12.51	66.70	100
World	1970	28.41	12.55	59.04	100
	1980	27.01	12.11	60.88	100
	1990	24.61	11.42	63.97	100
	2000	22.99	10.68	66.33	100
	2010	22.53	10.71	66.76	100

Source: UN Statistics Database, <http://unstats.un.org/>

Sectoral Growth Dynamics in India and South Korea

On the other hand, in South Korea, in terms of growth, still the industry has the highest growth as compared to other two sectors, followed by services and agriculture in order. In South Korea, all the sectoral growth rates have declined over time; much of the

decline has been in industry followed by services in order. *In terms of GDP growth, India is in a higher growth trajectory, lead by service sector and industry following it, especially in the last decade. It has a huge unfilled domestic demand for goods and services. High growth trajectory of India with huge unfilled domestic demand and sector specific slow down in South Korea is the next important basis for cooperation among two economies.*

Table 3: Sectoral Real GDP Growth Rates, 1960-2010 (Percent)

Country	Sector	Period		
		1960-1980	1980-2000	2000-2010
India	Agriculture	2.68	3.02	2.94
	Industry	5.99	5.67	7.63
	Services	5.43	6.74	8.89
	Aggregate	4.32	5.35	7.43
South Korea	Agriculture	2.79	2.40	1.35
	Industry	12.03	8.31	5.32
	Services	6.01	6.63	3.59
	Aggregate	6.62	6.87	4.20

Source: Calculated

Table 4: Sectoral Contributions to GDP Growth (Percent), in India and South Korea

Country	Sector	Period		
		1980s	1990s	2000s
India	Agriculture	21.3	13.2	7.2
	Industry	29.0	25.7	27.1
	Services	49.7	61.1	65.7
	Aggregate	5.3	5.4	7.4
South Korea	Agriculture	3.2	1.7	1.3
	Industry	41.5	41.1	51.2
	Services	55.3	57.2	47.6
	Aggregate	8.1	5.6	4.2

Source: Calculated

To analyze the role of service sector as an engine of growth, straight forward way is to relate it with GDP growth and employment growth. Table 4 gives the sectoral contributions to GDP growth in India and South Korea. As already said, in the last decade, the Indian economy has registered a higher growth rate as compared to South Korea. In the decade of 2000s, it has been 7.4 percent in India as compared to 4.2 percent in South Korea. In the decade of 1980s, service sector contribution to total GDP growth has been 49.7 percent in India and 55.3 percent in South Korea. In the decade of 1990s, service sector contribution to growth in India that was 61.1 percent touched the mark of 65.7 in last decade. On the other hand, In South Korea, the service sector contribution to GDP growth came down to 47.6 percent in last decade as compared to 57.2 percent in decade of 1990s. In South Korea, during the last decade, GDP growth rate has been dominated by Industry; its contribution has been to the tune of 51.2 percent. *Presently in India, the service sector is an engine of GDP*

growth rate but in South Korea, industry followed by service sector is leading the GDP growth.

Relation of Output and Employment in India and South Korea

Analysis of any macro relation between growth of output and employment in any economy as a whole is of considerable importance, as it bears a significant implication. For the design of developments strategy, any economy has two basic objectives, i.e., economic growth and creation of employment opportunities. In most of the countries of the world the service sector plays a significant role in the expansion of both GDP and employment. As per table 5, in India, the share of service sector in GDP that was 36.3 percent in 1970, became 42.4 in 1990 and registered the percentage mark of 55.1 percent in year 2010. Corresponding to this GDP share, the service sector share in total employment, that was 16.7 percent in 1970, became 20.5 percent in 1990 and touched the level of mere 24.8 percent in 2010. In India the service sector has failed to play any significant role in employment generation. On the other hand in South Korea, the share of service sector in GDP touched the level of 58.0 percent in 2010, as compared to 44.2 percent in 1970 and 51.2 percent in 1990. Corresponding to GDP share, the share of service sector in employment has shown a dramatic improvement. It was 34.3 percent in 1970 and registered the level of 68.0 percent in 2010. *That is to say, in South Korean economy, the employment share of service sector has grown faster than the GDP share in the past two decades.*

Table 5: Service Sector Share in GDP and Employment in India and South Korea

Year	Service sector share (percent of total)			
	India*		South Korea**	
	GDP	Employment	GDP	Employment
1970	36.3	16.7	44.2	34.3
1975	37.7	17.2	43.6	32.4
1980	39.0	17.7	47.8	38.6
1985	40.7	19.1	47.4	45.6
1990	42.4	20.5	51.2	47.7
1995	46.4	23.2	51.8	54.8
2000	50.4	25.8	56.8	61.2
2005	52.8	25.3	56.3	65.2
2010	55.1	24.8	58.0	68.0

Source: Calculated

*Estimated from CSO and NSSO India databases

** OECD, Korean National Statistical Office (NSO)

In India the service sector has failed to play any significant role in employment generation. The tertiary sector's share in GDP has increased but it has not been able to displace the labour from primary sector. *In India, in terms of employment, still the primary sector remains largest employer.* In South Korea, the changing share of the service sector in

GDP is mirrored in the changing share of employment/labour force in this sector but in India, the changing shares of sectoral GDP is not in consonance with labour force share.

This dichotomous behavior of two economies raises the need for Indian economy to go in for India-South Korean cooperation in designing its services sector sub-systems that will generate employment.

Input-Output Structures in India and South Korea

As per basic economics, nature and quantum of cooperation between two economies is a function of type and level of maturity of production systems. This is best guided by share of intermediate input or share of final consumption in the gross value of output (table 6). In India, the share of intermediate input in GDP is 50.17 percent as compared to 59.43 percent in South Korea. This means, the South Korean production system is more matured than Indian one. For primary sector, the share of intermediate input in gross value of output is 64.53 in India and 54.64 percent in South Korea. That is to say, the rigor of processing involved in primary sector is higher in India as compared to South Korea. In secondary sector, share of intermediate input in GDP is just 54.10 percent in India as against 72.52 percent in South Korea. Same is the case of tertiary sector. This implies that the manufacturing and service production systems are less developed in India, as compared to South Korea. In terms of rigor of processing, South Korean secondary sector and the Indian primary sector are at a higher pedestal and services are comparable, in terms of rigor of processing involved. *This differential in intermediate input use is another reason for proposed cooperation between the two economies.*

Table 6: Share of Intermediate Input and Final Consumption in Output in 2006

Country/Sector	Intermediate input as a percentage of gross value of output	Final consumption as a percentage of gross value of output	Gross value of output
India			
Primary	64.53	35.47	100.00
Secondary	54.10	45.90	100.00
Tertiary	39.06	60.94	100.00
Total	50.17	49.83	100.00
South Korea			
Primary	54.64	45.36	100.00
Secondary	72.52	27.48	100.00
Tertiary	44.65	55.35	100.00
Total	59.43	40.57	100.00

Source: Calculated from Input-Output Transaction Tables

An analysis of *linkages, both backward and forward*, in both the countries can give us the finer details of prospective cooperation. Sector-wise percentage share of input requirements in India and South Korea is presented in table 7. For producing a unit value of primary sector output in India, 13.9 percent of the total input comes from primary sector, 10.43 percent comes from secondary sector and 7.28 percent of it comes from tertiary sector. In South Korea, the respective percentages are 6.19, 25.69 and 10.14 percent. South Korean primary sector has a higher input linkage with secondary and tertiary sector, as compared to India. In India for producing a unit value of output in secondary sector, intermediate input requirements are 13.34 percent, 41.13 percent and 3.9 percent, respectively from primary, secondary and tertiary sector. These figures are 8.14 percent, 51.13 percent and 12.01 percent for South Korea. That is, South Korean secondary sector has a higher backward linkage with secondary and tertiary sector, as compared to India. Likewise, the South Korean tertiary sector has a greater backward linkage with secondary and tertiary sector, as compared to India. Indian primary sector is depicting a greater backward integration with itself, in comparison to South Korea. South Korean service sector is well integrated with other sectors on the backward side and Indian services sector is what may be termed as a footloose or a standalone system. *This differential behavior of input linkage patterns of two economies is indicative of the fact that South Korean experience may serve as a guide mark for further development of secondary and tertiary sector in India.*

Table 7: Sector-wise Composition of Input Requirements per unit of Output in India and South Korea

Country/Component	Sector		
	Primary	Secondary	Tertiary
India			
Primary	13.9	13.34	2.03
Secondary	10.43	41.13	13.52
Tertiary	7.28	16.95	13.0
Other Components	-3.64	3.9	1.4
Value Added	72.03	24.68	70.05
Total	100	100	100
Korea			
Primary	6.19	8.14	0.62
Secondary	25.69	51.13	15.02
Tertiary	10.14	12.01	26.97
Other Components	-	-4.3	-
Value Added	57.98	33.02	57.39
Total	100	100	100

Source: Calculated from Input-Output Transaction Tables

Disaggregate Sector-wise backward dependence is presented in table 8. In India the service sectors, with higher input requirement from primary sector are, 'hotels and restaurants

(21)'; from secondary sector, 'transport and storage (22)' and 'health and social work (27)'; and from tertiary sector these are 'transport and storage (22)' and 'other business services (28)'. In South Korea such sectors, with higher intermediate input dependence on secondary sector are, 'wholesale and retail trade (20)', 'hotels and restaurants (21)', 'education, research and development (26)' and 'public administration (29)'. Sectors with greater intermediate input dependence on tertiary sector are almost all the sectors. Hence, the South Korean services sector has not only the higher backward linkages at aggregate level but these linkages also hold at the disaggregate level. *South Korean service sector is natural outgrowth of the general economic growth trajectory but in India the linkages are somewhat subdued. The South Korean experience of service sector, characterized by strong integration, can be used as a guide mark for the Indian services sector development.*

Table 8: Sector-wise Input Structure of Service Sector in India and South Korea

Sector*	Primary sector	Secondary sector	Tertiary sector	Gross value added	Adjust-ment	Total
India						
20	0.00	2.44	10.43	86.88	0.25	100.00
21	26.48	20.00	18.87	32.90	1.75	100.00
22	1.54	36.21	20.37	37.18	4.71	100.00
23	0.00	14.30	9.94	78.50	-2.74	100.00
24	0.00	6.44	16.08	76.77	0.71	100.00
25	0.00	4.67	0.00	95.23	0.09	100.00
26	0.18	2.95	7.15	89.54	0.18	100.00
27	0.27	25.11	8.75	62.37	3.50	100.00
28	0.04	9.96	19.82	69.68	0.50	100.00
29	0.00	0.00	0.00	100.00	0.00	100.00
Total	7.28	16.95	13.0	70.05	1.04	100.00
South Korea						
20	6.30	37.19	16.39	40.12	0.00	100.00
21	0.00	25.93	31.24	42.83	0.00	100.00
22	0.00	8.04	42.27	49.69	0.00	100.00
23	0.00	2.31	34.99	62.70	0.00	100.00
24	0.00	9.83	15.00	75.17	0.00	100.00
25	0.01	8.45	13.93	77.61	0.00	100.00
26	0.53	25.08	18.49	55.91	0.00	100.00
27	0.72	19.30	36.23	43.74	0.00	100.00
28	0.25	13.78	17.05	68.93	0.00	100.00
29	5.00	35.69	18.13	41.18	0.00	100.00
Total	10.14	12.01	26.97	57.39	0.00	100.00

Source: Calculated from Input-Output Transaction Tables

*Sector coding as per appendix tables 2 and 3

Sector-wise output disposition of service sector in India and South Korea is given in table 9. In both India and South Korea, the higher delivery of output for final use is associated with sectors like 'hotels and restaurants (21)', 'real estate, ownership and dwelling (25)', 'education, research and development (26)', 'health and social work (27)' and 'public administration (29)'. In India, the higher output delivery for intermediate input use is 75.49

percent for ‘communication (23)’ sector and 80.79 percent for ‘banking, insurance and finance (24)’ sector. On the other hand, in South Korea, the higher output delivery for intermediate input use is 73.75 percent in ‘transport and storage (22)’ sector. Other sectors with more than 60 percent mark are ‘wholesale and retail trade (20)’, ‘banking, insurance and finance (24)’ and other business services (29)’. In terms of intermediate input use, the sectors with higher production system development level in India are communication, banking, insurance and finance; and in South Korea are transport, storage, trade, banking, insurance, finance and other business services. *This differential behavior in production system development level of various service sectors is significant enough to go for cooperation between two countries.*

Table 9: Sector-wise Output Disposition of Service Sector in India and South Korea

Sector	Primary	Secondary	Tertiary	Intermediate input use	Total final use	Total
India						
20	6.17	36.74	8.69	51.58	48.42	100.00
21	0.10	0.13	18.63	18.86	81.14	100.00
22	4.61	30.93	13.90	49.45	50.55	100.00
23	0.54	35.20	39.69	75.49	24.51	100.00
24	2.98	47.78	30.01	80.79	19.21	100.00
25	0.00	0.00	0.00	0.00	100.00	100.00
26	0.00	0.00	1.12	1.12	98.88	100.00
27	0.00	0.00	2.31	2.31	97.69	100.00
28	0.88	14.55	19.38	34.86	65.14	100.00
29	0.00	0.00	0.00	0.00	100.00	100.00
South Korea						
20	1.31	38.89	20.51	60.71	39.29	100.00
21	0.00	0.00	34.47	34.47	65.53	100.00
22	1.44	37.94	48.59	87.96	12.04	100.00
23	0.42	7.91	45.27	53.60	46.40	100.00
24	0.85	14.30	46.93	62.08	37.92	100.00
25	0.15	3.32	22.78	26.25	73.75	100.00
26	0.02	19.14	4.42	23.58	76.42	100.00
27	0.32	1.36	2.56	4.24	95.76	100.00
28	0.73	25.42	37.87	64.02	35.98	100.00
29	0.08	0.00	1.80	1.88	98.12	100.00

Source: Calculated from Input-Output Transaction Tables

*Sector coding as per appendix tables 2 and 3

Size and technology-wise, the two economies, India and South Korea are very different (table 10). Real GDP of India is almost three times of GDP of South Korea and number of workforce to generate this GDP, in India, is almost 20 times of South Korea in the year 2010. The crude measure of labour productivity, the output per employee, is indicative of the fact that in India the productivity per employee is 8952 US\$ as compared to 57067 US\$ in South Korea in 2010; which is almost one-sixth of Korea. In India, in the temporal dimension, as compared to 3733US\$ in 1970 the productivity level has been 9962 US\$ in

2010; that is a little more than 2.5 times level, in four decades. In South Korean case, the rise in the productivity has been more than nine times, during the same period. *In some critical areas of Indian service sector, South Korean experience of productivity development can be of immense use in improving the productivity of the service sector related system.*

Table 10: Aggregate Labour Productivity Levels in India and South Korea

Country	Year	Real GDP at chained PPPs (in mil. 2005 US\$)	Number of persons engaged (in millions)	Productivity (Output/Employee)
India	1970	679323	182	3733
	1980	772802	249	3104
	1990	1072662	323	3321
	2000	1941299	391	4965
	2010	4341894	485	8952
South Korea	1970	60064	9	6404
	1980	170846	13	12707
	1990	459996	18	25369
	2000	879630	21	42386
	2010	1347171	24	57067

Source: *Penn World Tables*

Trade in Services

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. Foreign trade related parameters of service sector relating to India and South Korea are presented in table 11. India's service sector export ratio is lower as compared to South Korea, but it has improved a lot in the past. In India, the ratio of service exports as a percentage of total exports is not only higher than South Korea but it has also been growing at a much faster pace; it has been 20.2 percent in 1990 and 35.5 percent in 2010, for India against the same for South Korea as 13.6 in 1990 and 15.1 percent in 2010. In India, on the import side, service imports as a percentage of total Imports are also on the higher side, in comparison to South Korea. Although, both the economies are heading towards strengthening of international trade in services, but still there are several economic and non-economic country-specific trade barriers if the two countries opt to go for wider economic cooperation. These barriers need another elaborate study fortified with a wider database. Any future agreement should not only focus on increasing trade and investment flows between the two economies by removing the existing barriers on both sides but should also emphasize co-operation and technical collaboration in various sectors.

Table 11: Foreign Trade Related Parameters of Service Sector (Percent) in India and South Korea

Year	Country	Year		
		1990	2000	2010
Service exports/Service value added	India	3.7	7.8	13.0
	South Korea	8.6	11.5	16.1
Service exports as a percentage of total exports	India	20.2	27.8	35.5
	South Korea	13.6	15	15.1
Service imports as a percentage of total imports	India	20.6	26.3	26.6
	South Korea	13.5	17.4	18.2

Source: World Development Indicators online Database

Areas for Future Cooperation

On the whole, the service sector led growth in India, in the light of emerging production, employment and trading structures, has its own implications for economic cooperation between two countries. Over a period of time, both the nations have developed their specialization and core competencies in all the sectors, in general, and in the service sector, in particular. Analysis shows that there are complementarities between the two countries in terms of economic structures and future outlook. In this context, following areas that can be shortlisted for future co-operation between the two countries.

- a) *Information and Communication Technology*: The Korean electronic and hardware industry is well recognized all over the world. Similarly, the Indian software industry is considered to be among the most competitive in the world market.
- b) *Human Resource Development*: India has a vast workforce, due to rapid economic growth in the past few years but the intellectual capital is in short supply. Korea, on the other hand, faces a shortage of overall manpower but Korea has long expertise in certain industries.
- c) *Healthcare*: In the new policy regime, the size and capability of the healthcare industry in India has grown rapidly in the recent past. There is a high demand for quality health professionals. Korea's has made remarkable progress in medical sciences there is a glut of health professionals in Korea.
- d) *Science and Technology*: It is an area in which both countries are already co-operating in. Although there is an India-Korea Joint committee on S&T, it is imperative to intensify the cooperation between various institutions based in the two countries. India is endowed with well educated personnel and Korea has the financial resources; coming together will benefit both.
- e) *Research and Development*: In pharmaceutical industry, the fact that from being a major importer India has today become a net exporter proves the strength and overall

competitiveness of the industry. India has both R&D facilities and human capital to leverage and South Korea is focusing on R&D in pharmaceutical-related areas. There is scope for cooperation between the two countries in the areas of clinical trials, vaccines, biotech goods, traditional medicinal products etc.

f) *Construction and Related Services*: In last two decades, the construction sector has been the fast growing sectors in India. There is growing infrastructural demand. Korean companies are well endowed with technological capability and their global exposure is also high.

g) *Tourism*: Due to the strong, ancient historical and cultural linkages between the two countries, there is huge potential for enhancing tourism-related trade and investment flows.

The list of areas for future cooperation identified above is just indicative and not an exhaustive one.

Conclusion

Analysis is indicative of the fact that in India, the service sector is an engine of growth and in South Korea industrial sector supported with service sector is a guiding force. Over a period of time, both the economies have developed their own areas of expertise and specialization. There is an ample scope for economic cooperation among the two countries. The list of areas identified is just indicative; to derive an exhaustive list of areas and economic activities for cooperation, an elaborate study fortified with a wider database is called for.

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Table 1: Input-Output Sector Classification Scheme for India

Code	Sector
1	Food Crops
2	Cash Crops
3	Plantation Crops
4	Other Crops
5	Animal Husbandry
6	Forestry and logging
7	Fishing
8	Coal and lignite
9	Crude Petroleum and Natural gas
10	Iron ore
11	Other Minerals
12	Sugar
13	Food Products Excluding Sugar
14	Beverages
15	Tobacco products
16	Cotton Textiles
17	Wool, Silk & Synthetic Fiber Textiles
18	Jute, hemp, mesta textiles
19	Textile Products including Wearing
20	Wood and wood products
21	Furniture and fixtures-wooden
22	Paper and Paper Products
23	Printing, Publishing and Allied Activities
24	Leather and leather products
25	Plastic and Rubber Products
26	Petroleum products
27	Coal tar products
28	Inorganic heavy chemicals
29	Organic heavy chemicals
30	Fertilizers
31	Paints, varnishes and lacquers
32	Pesticides, Drugs and Other Chemicals
33	Cement
34	Non-Metallic Mineral Products
35	Iron & steel Industries and Foundries
36	Other Basic Metals Industry
37	Metal Products except Machinery and Transport Equipment
38	Agriculture Machinery
39	Industrial machinery for Food & Textiles
40	Other Machinery
41	Electrical, Electronic Machinery & Appliances
42	Railway Transport Equipment
43	Other Transport Equipment
44	Miscellaneous Manufacturing Industries
45	Construction
46	Electricity
47	Water Supply
48	Railway Transport Services
49	Other Transport Services
50	Storage and warehousing
51	Communication
52	Trade
53	Hotels and restaurants
54	Banking
55	Insurance
56	Ownership of dwellings
57	Education and research
58	Medical and health
59	Other Services
60	Public Administration and Defense

Source: *Input-Output Transaction Matrix, 2006-07*, CSO, India

Table 2: Input-Output Sector Classification Scheme for South Korea

Code	Sector
1	Agriculture, hunting, forestry and fishing
2	Mining and quarrying
3	Food products, beverages and tobacco
4	Textiles, textile products, leather and footwear
5	Wood and products of wood and cork
6	Pulp, paper, paper products, printing and publishing
7	Coke, refined petroleum products and nuclear fuel
8	Chemicals and chemical products
9	Rubber and plastics products
10	Other non-metallic mineral products
11	Basic metals
12	Fabricated metal products except machinery and equipment
13	Machinery and equipment n.e.c
14	Office, accounting and computing machinery
15	Electrical machinery and apparatus n.e.c
16	Radio, television and communication equipment
17	Medical, precision and optical instruments
18	Motor vehicles, trailers and semi-trailers
19	Other transport equipment
20	Manufacturing n.e.c; recycling
21	Electricity, gas and water supply
22	Construction
23	Wholesale and retail trade; repairs
24	Hotels and restaurants
25	Transport and storage
26	Post and telecommunications
27	Banking, Finance and insurance
28	Real estate activities, Ownership of dwellings
29	Renting of machinery and equipment
30	Computer and related activities
31	Research and development
32	Other Business Activities
33	Public admin. and defense; compulsory social security
34	Education
35	Health and social work
36	Other community, social and personal services
37	Private households with employed persons

Source: *South Korea STAN Input-Output Table, Mid 2000's*

Table 3: Concordance Table for Common Input-Output Sector Classification Scheme for India and South Korea

Sector Code	Sector	I-O Table Sector Code*	
		India	South Korea
1	Agriculture, hunting, forestry and fishing	1-7	1
2	Mining and quarrying	8-11	2
3	Food products, beverages and tobacco	12-15	3
4	Textiles, textile products, leather and footwear	16-19, 24	4
5	Wood and products of wood and cork	20-21	5
6	Pulp, paper, paper products, printing and publishing	22-23	6
7	Coke, refined petroleum products and nuclear fuel	26	7
8	Chemicals and chemical products	28-32	8
9	Rubber and plastics products	25	9
10	Other non-metallic mineral products	27, 33-34	10
11	Basic metals	35-36	11
12	Fabricated metal products except machinery & equipment	37	12
13	Machinery and equipment n.e.c	38-40	13
14	Electrical, electronic machinery & appliances	41	14-17
15	Motor vehicles, trailers and semi-trailers	43	18
16	Other transport equipment	42	19
17	Manufacturing n.e.c	44	20
18	Electricity, gas and water supply	46-47	21
19	Construction	45	22
20	Wholesale and retail trade	52	23
21	Hotels and restaurants	53	24
22	Transport and storage	48-50	25
23	Communication	51	26
24	Banking, Insurance and Finance	54-55	27
25	Real estate, ownership of dwellings etc.	56	28
26	Education, research and development	57	31,34
27	Health and social work	58	35
28	Other Business Services	59	29,30,32,36,37
29	Public administration and defense	60	33

*Country-wise detailed sector specification available in appendix tables 1 and 2.

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