

Chapter IV

Integrating into Asia's International Production Networks: Challenges and prospects for India⁴¹

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During the past three decades, IPNs were created by multinationals in labour-intensive manufacturing industries among East and South-East Asian countries. This phenomenon, in which FDI played a major role, was fuelled by the adoption of export-led outward-oriented growth strategy by Asian countries since the 1980s decade. In stark contrast, India, one of the world's currently emerging and rapidly growing economies in terms of GDP growth adjusted for purchasing power parity (PPP), has been largely left out of such global division of labour.⁴² A plausible reason is that India strictly followed a self-reliance and import-substitution growth until about 1991, when it adopted major policy reforms towards a more outward orientation.

The “stop-go” economic reforms during the past two decades have reduced trade barriers and produced “relatively” open trade and investment environments in India. The economy grew very rapidly at an annual average of 7.2 per cent between 2000 and 2009, with the merchandise trade-to-GDP ratio doubling from about 21 per cent in 2000 to 42 per cent in 2008, compared with just 13 per cent in the pre-reform period in 1990. However, the Indian manufacturing sector has so far not played an important role in the Indian growth process. When benchmarked with rapidly-growing countries in East and South-East Asia, Indian manufacturing industries have lagged in development and have not integrated into the growing IPNs in Asia.

In this context, integrating into global manufacturing markets through participation in IPNs is viewed as a key driver in providing development opportunities for the Indian manufacturing sector through technology transfers and access to global markets. It is therefore important to analyse whether India is beginning to integrate into IPNs in Asia and globally, and whether that potential has been successfully utilized by the manufacturing sector. It is also important to identify the policy challenges that businesses are likely to face while aiming to connect India with the Asian IPNs. This chapter aims to shed light on these issues.

Against the above backdrop, this chapter analyses the current state of participation of India in IPNs of manufacturing industries in Asia, and identifies the

⁴¹ This chapter draws on existing literature on this subject by Srivastava and Sen (2011).

⁴² In 2010, India's GNI at PPP was about US\$ 4.2 trillion (World Bank, 2010).

constraints and challenges for India's deeper participation in the near future. The changing directions of India's trade policy and that of FDI are critically analysed with regard to their role in fostering greater participation by India in Asian IPNs. This includes India's recent initiatives towards Asian economic integration by entering into regional and bilateral PTAs, with ASEAN, the Republic of Korea and Japan. This chapter includes case studies of two industries (auto-components and electronics) to illustrate potentially successful examples of India emerging as an important regional player in Asian IPNs. The emerging policy challenges and key recommendations for India to integrate into Asian IPNs are analysed, thus highlighting the implications for other countries in South Asia.

Section 1 of this chapter presents the ongoing economic reforms of India. Section 2 analyses the current status of India in the Asian IPN process. Section 3 expands on Srivastava and Sen (2011) by analysing the trends, extent and patterns of production fragmentation in India's merchandise trade in parts and components (P&C) for manufacturing products during two distinct sub-periods. The first sub-period was 1994-2004, which covered the first phase of calibrated globalization of the Indian economy. The second sub-period, 2005-2008, covered the effect of the ongoing integration of India into the global economy, and the events running up to the global economic crisis of 2008-2009. This period was chosen in order to capture the effect of economic reforms in India during the previous decadal period and more recent years. The Athukorala (2005) and Athukorala and Yamashita (2005) framework is applied in analysing the extent and trends in trade in P&C in India's manufacturing sector trade, separately from that of total trade flows, for which disaggregated product level data is used from the United Nations COMTRADE database at the 5-digit level based on the Standard Industrial Trade Classification (SITC) Revision 3.

Section 3 estimates the extent of intra-industry trade in these P&C trade sectors in the Indian economy. Intra-industry trade estimates provide indirect evidence of the role of FDI in the process of production fragmentation, especially when the sector concerned is more producer-driven.⁴³ It also uses estimates of marginal intra-industry trade in India's manufacturing trade in P&C, which provide useful insights to the nature and magnitude of product fragmentation.

Section 4 provides a case study of the industry experience of India's integration into Asian IPNs. Following Srivastava and Sen (2011) and Nag (2009), the auto-components and electronics components industries emerge as the two potentially most important sectors wherein there is evidence of international product fragmentation and, hence, scope for participating in global and Asian IPNs.

Section 5 analyses the policy challenges that are impeding India's strong participation in Asian IPNs, and focuses on the unilateral measures that have been

⁴³ Producer-driven commodity chains are mainly led by multinationals that play a central role in coordinating production networks (Gereffi, 2001).

undertaken as a part of economic reforms as well as those within a select group of countries/regions through regional and bilateral PTAs. The unilateral measures analysed relate to India's overall direction of trade policy, involving (a) the reduction of tariffs and non-tariff barriers as well as steps to improve trade facilitation, and (b) the state of infrastructure that has been identified as one of the biggest structural bottlenecks towards integrating India into IPNs.

In conclusion, section 6 provides policy recommendations derived from the analysis, highlighting implications for India and South Asia in general.

1. Ongoing economic reforms of India

In July 1991, India adopted wide-ranging economic policy reforms in areas such as trade, investment, financial sector, industrial deregulation and reformation of the public sector. These reforms were aimed at achieving macro-economic stabilization through improved fiscal management, reduced distortions in the production structure, and increased competitiveness of India's external sector through the reduction of trade barriers and encouragement of private capital flows (of which FDI was a major constituent).

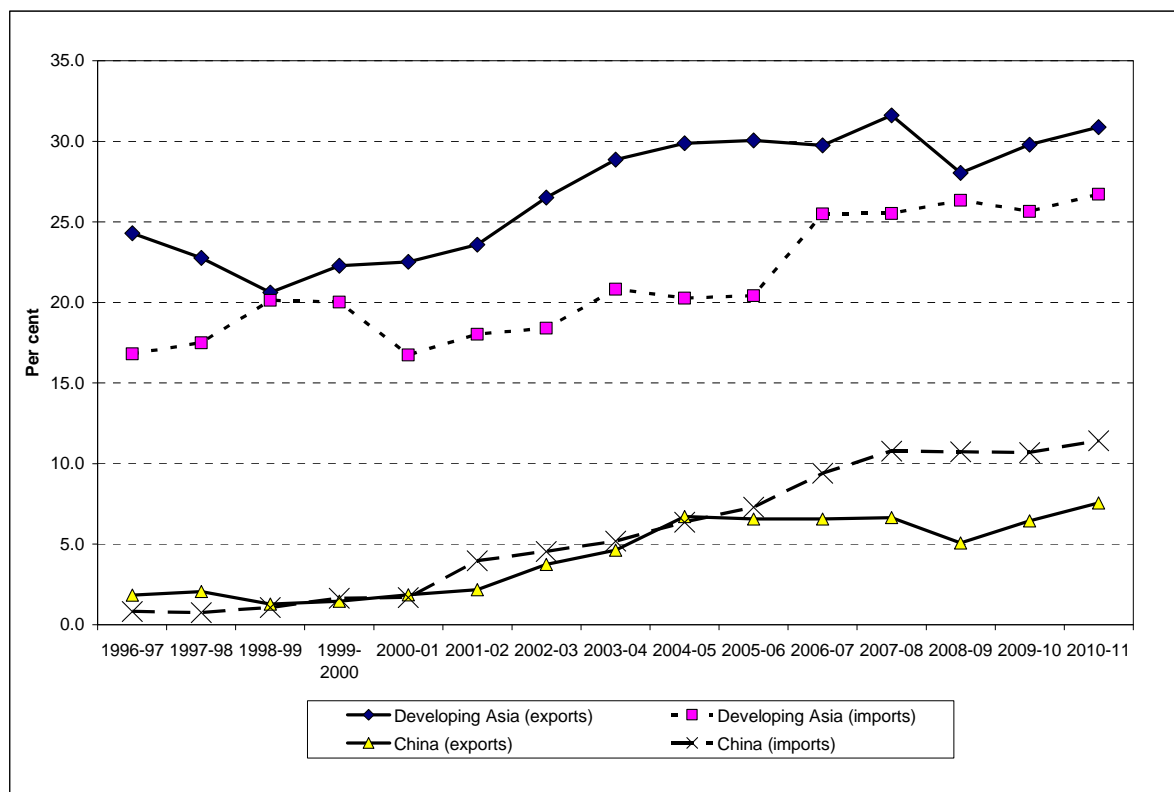
Rajan and Gopalan (2011) observed that after a decade of the ongoing reforms, India had experienced an international trade renaissance with its merchandise exports (including re-exports) with revenue than doubling from about US\$ 95 billion in fiscal year April 2005-March 2006 to nearly US\$ 220 billion in 2011. India's exports grew at an average of almost 20 per cent between 2000 and 2009, averaging US\$100 billion annually. Its merchandise imports more than doubled from about US\$ 138 billion to US\$ 327 billion in the same period.

From being among the relatively insignificant players in global trade in 1990 (ranked below fortieth position globally, and constituting a share of 0.5 per cent of global merchandise exports and a share of 0.7 per cent in global merchandise imports), India moved rapidly up the global trade rankings. It was ranked twentieth in world exports in 2010, with its share of global merchandise exports increasing to 1.4 per cent, and thirteenth in world imports, with merchandise import shares increasing to 2.1 per cent. In the area of trade in commercial services, India's performance was highly impressive in 2010, when the country gained seventh position among world exporters and importers of commercial services – constituting a share of 3.3 per cent for that year, compared with thirty-fourth and twenty-eighth, respectively, in 1995 (WTO, 2011a). Among developing countries globally, India was ranked as the second largest exporter and importer of commercial services in 2010, next to China (WTO, 2011a).

India's "Look East policy" and its integration with South-East and East Asia is a significant policy development. China has emerged as the most important Asian trade partner of India during the past decade (figure 27). India's trade with Singapore have also expanded considerably after the signing of the India-Singapore Comprehensive Economic Cooperation Agreement. During the fiscal year from April 2009 to September 2010, Asia was India's largest export destination, accounting for

55 per cent of total exports, compared with just 40 per cent in 2001-2002;⁴⁴ during that period China accounted for 10 per cent of India's total exports.

Figure 27. India's shares in merchandise trade with developing Asia and China



Source: Reserve Bank of India, 2011.

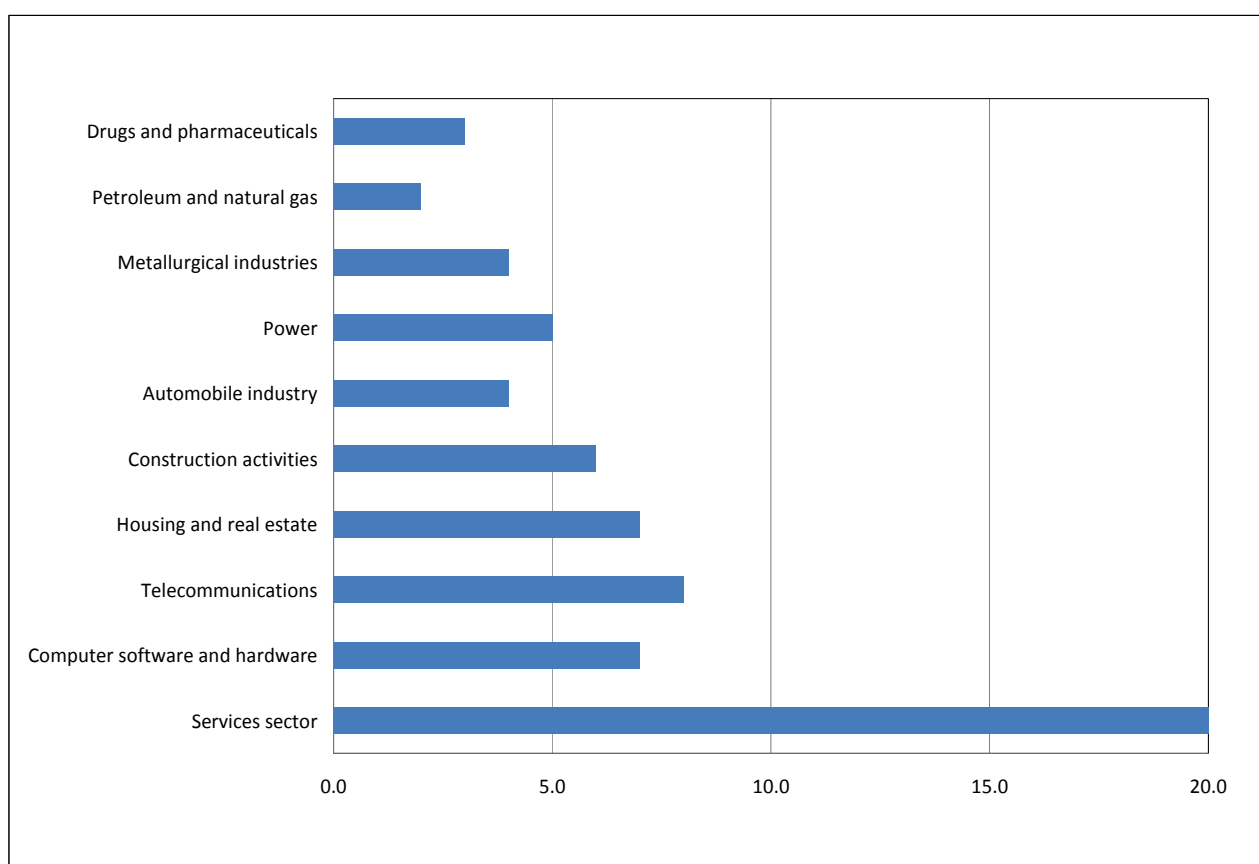
The FDI regime in India has also been significantly liberalized, with the opening up of its economy to foreign investors in industries such as power and fuels, electrical equipment, transport, chemicals, food processing, metallurgical, drugs and pharmaceuticals, textiles, and industrial machinery as well as in a range of commercial service activities. Besides liberalizing inward FDI inflows, procedures for outward FDI were also liberalized in the 1990s. This has resulted in a number of Asian countries investing in India as well as Indian companies investing in Asia. India attracted a cumulative total of FDI inflow worth US\$ 150 billion during April 2000-September 2011, with Singapore (10.1 per cent), Japan (4.8 per cent) and the Republic of Korea (0.6 per cent) being ranked as second, fifth and fourteenth foreign investors in India during the same period (Department of Industrial Policy and Promotion, 2011).

Figure 28 presents the share of cumulative inward FDI inflows in the top 10 industrial sectors of India from April 2000 to September 2011. The figure suggests that

⁴⁴ See Rajan and Gopalan, 2011.

foreign investors have focused on the services sector of India; thus, the role of FDI in stimulating the IPN development process in India is still insignificant. The services sector (including financial and non-financial services) was the largest FDI-recipient sector, attracting nearly 20 per cent of India's inward FDI inflow. In contrast, industries such as automobiles and electronics, which are an important part of Asian IPNs accounted for a small share in FDI inflows to India. The automobile industry (including automobile parts and components manufactures) was the seventh largest sector in terms of attracting inward FDI in India (constituting just 4 per cent of the share of FDI equity inflows over this period). The electronics industry was not even among the top 10 industry sectors attracting FDI inflows during this period.

Figure 28. India's share of inward FDI inflows in the top 10 sectors, April 2000-September 2011



Source: Department of Industrial Policy and Promotion (2011); FDI sectoral data revalidated in line with Reserve Bank of India data that reflect minor changes in the FDI figures compared with sectoral data published earlier.

Recognizing that the manufacturing sector has to play a key role in sustaining India's rapid growth, the Government has approved the draft national manufacturing policy for increasing the share of manufacturing in the gross domestic product (GDP) from the current share of 16 per cent to 25 per cent by 2025. In order to provide the necessary environment for India to emerge as a global manufacturing hub, the Government plans to build mega-industrial zones that contain world-class infrastructure

facilities. The project is expected to improve connectivity within the country and create 100 million new jobs for the Indian workforce.

2. Current state of India in IPN process

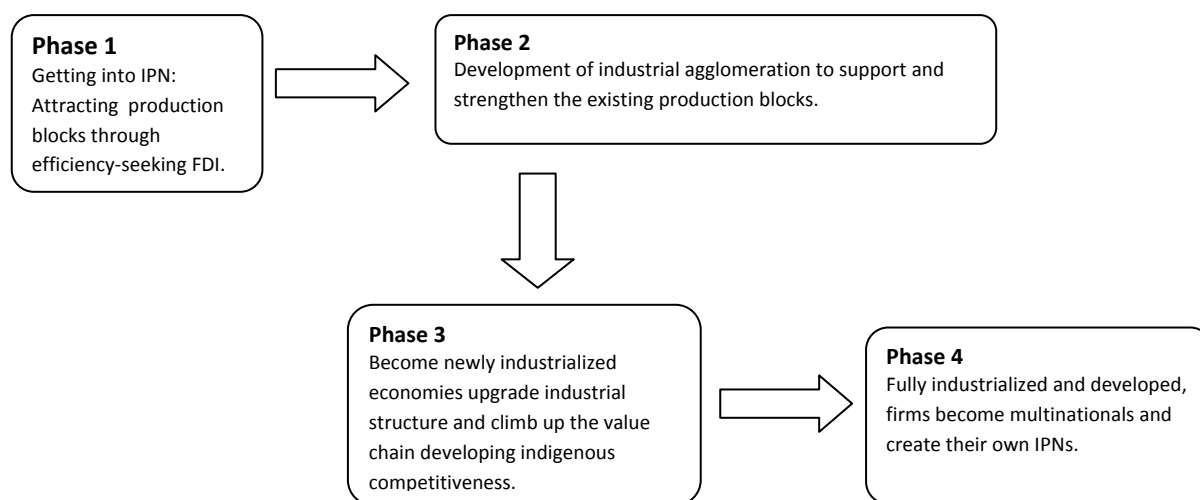
In the global context, the value chains are controlled by MNCs that play the central roles in coordinating production networks, which includes backward- and forward-linkages. Industries that are subject to design, research and development, and significant economies-of-scale such as semiconductors, automobiles and heavy machinery, are likely candidates for the creation of IPNs controlled by MNCs. In Asia, IPNs of these industries have enabled different countries to participate along the global value-added chain of a good. As a result, expansion of intra-firm and intra-industry (IIT) trade transactions between countries participating in the production networks has been rapid.

Kimura (2007 and 2009) developed an analytical framework based on the spatial nature of production networks and applied it to the Asian context, particularly ASEAN. He identified four phases of industrialization based on current participation in production/distribution networks (figure 29). The first phase essentially consists of countries that need to get into the production networks, and which are building a business-friendly investment climate in order to attract new production blocks. Typically, these are low-income developing economies, which face significant policy challenges in attracting efficiency-seeking or export-platform FDI.⁴⁵ The second phase requires development of industrial agglomeration to support the existing production blocks. For countries in the second phase,⁴⁶ it is important to attract foreign small and medium-sized enterprises (SMEs) that form into industrial clusters of vertical production network by removing investment bottlenecks and improving service link arrangements. The third and fourth phases comprise countries that are industrialized and whose firms are already internationally competitive and have become multinationals developing their own production and distribution networks. Thus, developing international competitiveness of indigenous firms is crucial to moving towards the last two phases of industrialization in IPNs.

⁴⁵ The lesser developed ASEAN economies (Cambodia, Lao People's Democratic Republic and Myanmar) are placed currently in this category (Kimura, 2009).

⁴⁶ According to Kimura (2009), Viet Nam has already moved into this phase, with most of the other low-income South-East Asian countries trying to develop capabilities to enter the phase.

Figure 29. The four phases of industrial development through utilizing IPNs



Source: Based on Kimura, 2009.

In the Indian context, it seems that FDI inflows have apparently not made a significant contribution to the development of IPNs, as the FDI inflows have been more market-seeking in nature. Veeramani (2009) analysed IIT of 75 Indian industries and found that India's IIT was negatively influenced by the market-seeking nature of its inward FDI in the domestic industries.⁴⁷ This view of market-seeking motives driving Indian FDI in manufacturing has been empirically established by studies such as Aggarwal (2001), Kumar (1990), Kumar and Siddharthan (1994), Pailwar (2001) and Pant (1993 and 1995), among others.

Based on the framework proposed by Kimura (2007) illustrated above, India would probably be characterized as having entered the first phase of integrating into IPNs. There are some modest signs that show India might gradually get involved in the IPN process after ongoing economic reforms have been pursued for more than a decade. Veeramani (2002) found that India's IIT grew significantly and responded positively to economic reforms that have unleashed a series of trade and investment

⁴⁷ Veeramani (2009) analysed the effect of trade barriers and multinationals on India's IIT in 75 industries through panel regressions. The study estimated IIT using 4-digit data based on the International Standard Industrial Classification (ISIC). The Grubel-Lloyd (G-L) index as well as an additional measure of marginal IIT, as suggested by Brühlhart (1994), was used to understand changes in the levels of India's IIT

liberalization measures since the 1990s.⁴⁸ Kumar (2003) noted that reforms prompted foreign multinationals to begin exploring the potential of India as an export-production platform in a modest manner. Srivastava (2007) observed that India was indeed becoming attractive to export-oriented FDI, with a greater potential in services than in the manufacturing sector. According to Banik and Gilbert (2010), one of the major reasons that IPNs had yet not flourished in South Asia was that manufacturing activities of countries in that subregion placed emphasis on low-level technology, labour-intensive exports such as textiles, leather products, in which there was little scope for production fragmentation. If India is to participate in global and Asian IPNs, diversification towards exporting parts and components of vertically-fragmented final products is essential.

3. Production fragmentation in India's manufacturing trade: Trends and patterns

This analysis compares patterns of trade in P&C by India for 1994, 1999, 2004 and 2005-2008.⁴⁹ Following the definition and methodology of Athukorala (2005), parts and components are defined at the 5-digit SITC Revision. 3. Data were downloaded from the United Nations COMTRADE database. The dataset for this study contains 231 products from SITC 7 and 8, i.e., 172 products belonging to SITC 7 (machinery and transport equipment) and 59 belonging to SITC 8 (miscellaneous manufactured articles).⁵⁰

In 2008, global P&C exports were worth US\$ 1,118 billion. India's contribution to global exports was only about 0.8 per cent, which is quite insignificant when compared with other developing economies in East and South-East Asia.⁵¹ However, the growth of India's P&C exports has been significantly higher than the growth of merchandise exports in general as well as manufacturing exports (figure 30).

The structure of India's exports has been highly concentrated. The top 10 export items constituted more than 60 per cent of total exports in the P&C categories. Parts and accessories of automobiles and other vehicles (categories 784 and 785 in SITC Rev. 3) constituted the bulk of India's P&C exports, followed by parts and components for electrical, electronic and telecommunications equipment (categories SITC 75 to 77).⁵²

⁴⁸ Veeramani (2002) analysed trends in India's overall intra-industry trade (IIT) and with its 51 trading partners in three years: 1988, 1995 and 2000.

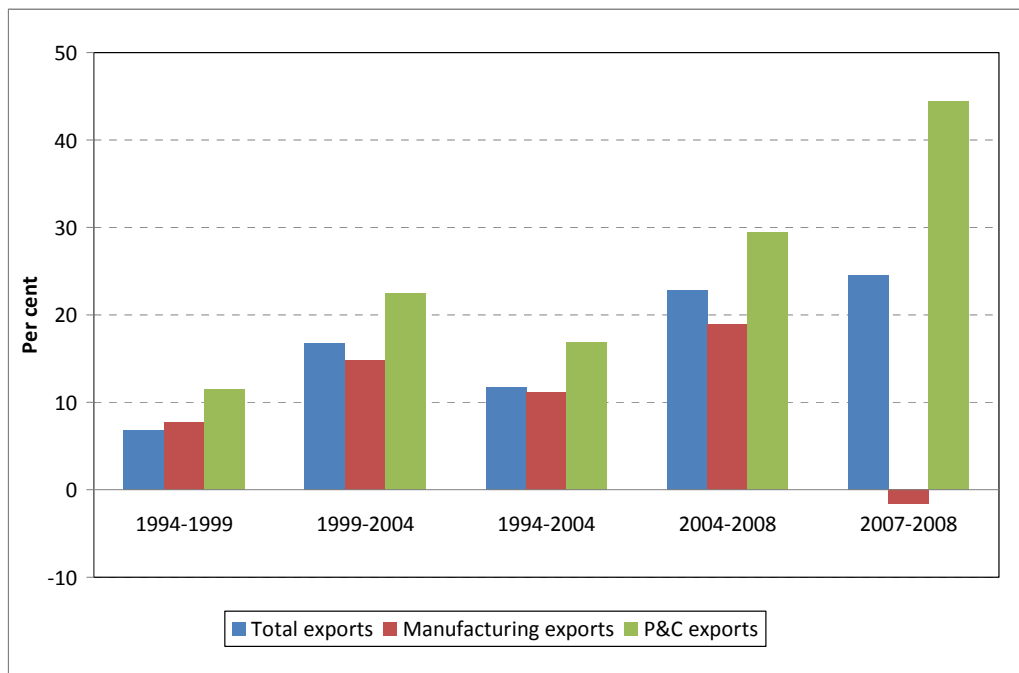
⁴⁹ The merit of using trade in parts and components as evidence of the intensity of IPN activities is discussed in chapter 3 of this book.

⁵⁰ The merit of using SITC Revision 3 classification is noted comprehensively in Athukorala and Yamashita, 2005.

⁵¹ See Athukorala, 2010.

⁵² For details see Appendix II to this book, tables 1a and 1b.

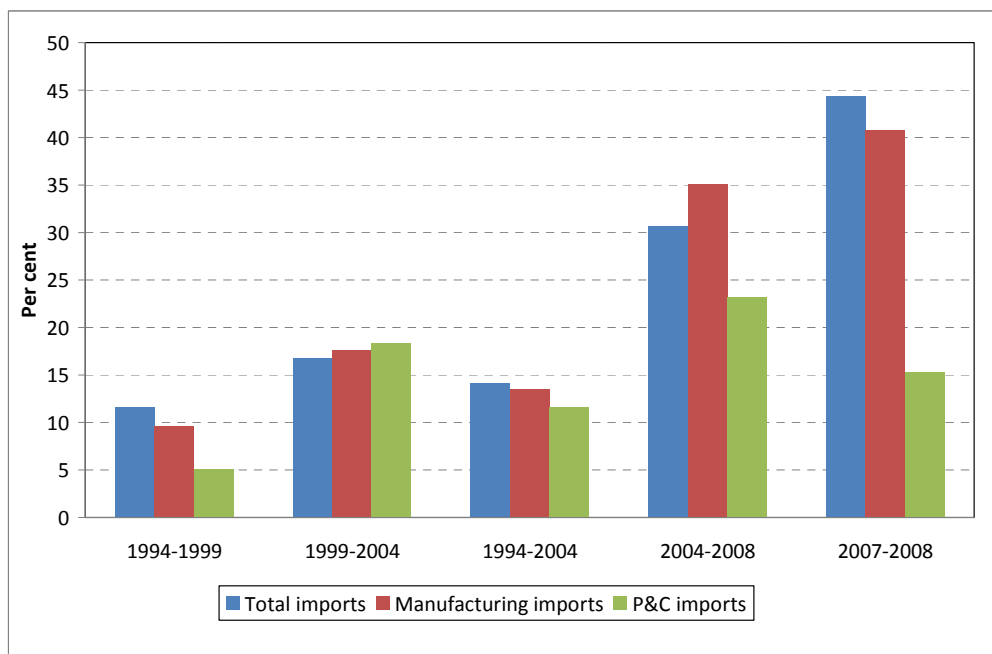
Figure 30. Growth in India's merchandise exports, 1994-2008



Source: Computed by authors from United Nations COMTRADE data.

India contributed about 1.5 per cent to world imports of parts and components. Unlike the export side, India's growth of P&C imports was less than that of total merchandise imports and manufacturing imports; the difference was particularly large during recent years (figure 31).

Figure 31. Growth in India's merchandise imports, 1994-2008



Source: Computed by authors from United Nations COMTRADE data.

The import composition was slightly less concentrated than that of exports. The top 10 items constituted no more than 50 per cent of total P&C imports by India. Parts and accessories for data processing machines (SITC 75997) have been among the most important items in P&C imports by India.⁵³

India's intra-industry trade in parts and components

Parts and components trade in IPNs usually involves a higher degree of IIT.⁵⁴ This study followed the methodology used by Rajan (1996) and Srivastava and Sen (2011). Estimating IIT of P&C trade involves three steps.⁵⁵ The first step separates India's total P&C trade into one-way trade (inter-industry trade explained by the traditional comparative advantage theory) and two-way trade (IIT), which implies that trade might involve fragmented production chains. The second step is an estimate both of the value of IIT as well as the G-L index, which measure degree of IIT of those products. The third step is an analysis of the estimates of marginal IIT (MIIT), as suggested by Brühlhart (1994), to ascertain whether the change in trade volumes in these parts and components during the periods analysed are due more either to intra-industry or to inter-industry trade.⁵⁶

In the first step, the methodology applied is that of Abd-el Rahman (1991) and Ando (2006), which breaks down India's total P&C trade into one-way trade and two-way trade. Figure 32 provides the results of this break-down for 1994-2004. The share of two-way trade, which represents IIT, increased from 53.7 per cent to 79.4 per cent during 1994-2008. This provides evidence that evolving international production fragmentation in India has been increasingly felt through India's trade in 231 parts and components.

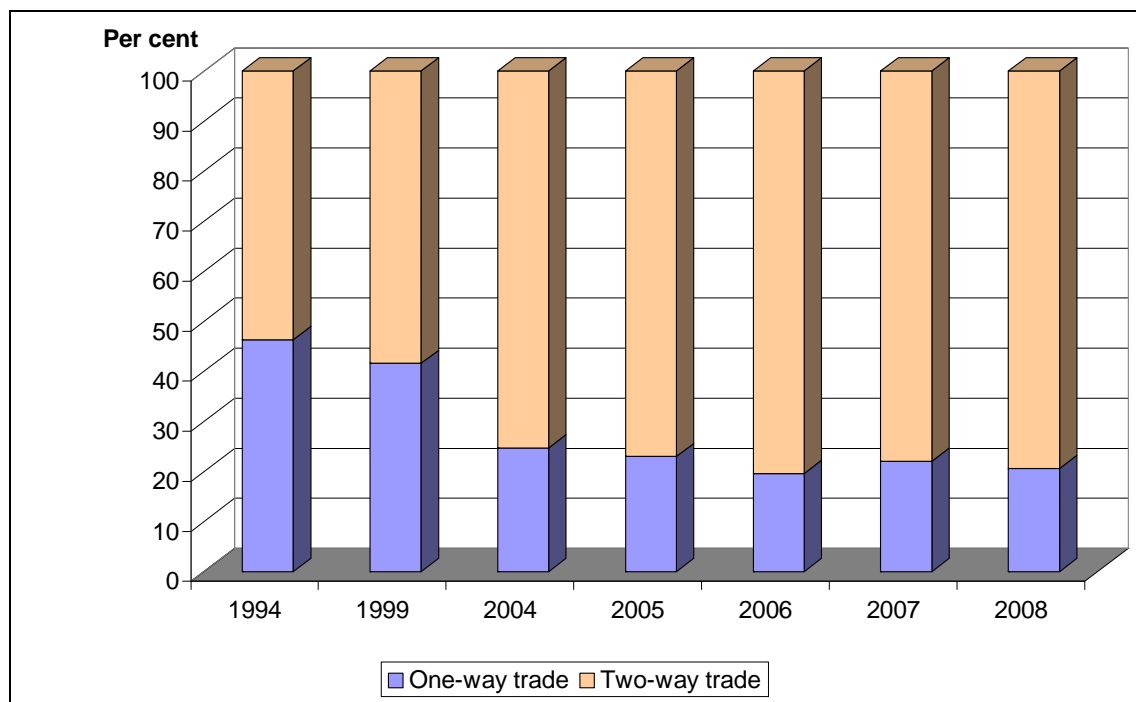
⁵³ For details see Appendix II of this book, tables 2a and 2b.

⁵⁴ IIT has generally been estimated in the empirical literature by the Grubel-Lloyd (G-L) index (Grubel and Lloyd, 1975). The later versions of the index have been modified to improve upon the downward bias (Rajan, 1996).

⁵⁵ Although several empirical studies on IIT among East Asian economies have attempted to distinguish between horizontally and vertically differentiated products, this paper does not make such a distinction with volume of India's P&C trade in total trade being significantly lesser in magnitude.

⁵⁶ MIIT is a transposition of the G-L index using first differences of trade flows (Brühlhart, 1994). Similar to the Grubel-Lloyd (G-L) index, the MIIT index takes value from 0 to 1. The value close to 1 indicates the almost 100 per cent of the changes in trade over the time period is due to changes of intra-industry trade, while the index is close to zero indicates that inter-industry trade explained most of the trade changes. The derivations and interpretations of these indices are presented in Annex to this chapter.

Figure 32. Patterns of India's parts and components trade, 1994-2008



Source: Author's calculations, based on United Nations COMTRADE data.

There has been an increasing degree of IIT in parts and components for machinery and electronic products as well as for automobile and other vehicles. Specifically, auto-parts (SITC 78439) were always among the top three products that involved a high amount of IIT throughout the period of the study.⁵⁷ The results of MIIT estimates for the top 10 P&C products involving the highest levels of IIT in 2008 are presented in table 11. It can be seen that from 1994 to 2008 intra-industry trade accounted for more than 50 per cent of the changes in trading of eight products in the top 10 P&C products. Automotive parts and accessories (SITC 78434 and 78439), parts for spark-ignition combustion piston engines (SITC 71391) and photosensitive semiconductor devices (SITC 77637) showed relatively high levels of MIIT in both periods covered by the study.

⁵⁷ The estimates for the top 10 P&C products involving product fragmentation due to IIT over the period of the study are presented in Appendix II of this book, tables 3a and 3b.

Table 11. Marginal intra-industry trade in top 10 products involving P&C trade in 2008

Commodity Code	2008 (over 1994)	2008 (over 1999)
78439	74.0	75.3
79295	48.4	70.4
77637	87.3	88.9
71392	78.4	88.6
77282	64.9	66.2
78434	95.5	94.6
76493	34.4	36.3
78537	71.2	40.4
72855	67.7	63.6
71391	82.6	99.5

Source: Calculated from United Nations COMTRADE data.

Note: See Appendix I of this book for commodity description.

4. Indian industries in IPNs: A case study

The previous section suggests that product fragmentation appears to emerge in some Indian automotive components and electronics sectors. Anecdotal evidence shows that automobile MNCs from Japan, the Republic of Korea, Europe and United States (such as General Motors, Suzuki, Ford, Toyota, Hyundai, Daimler Chrysler Fiat, Skoda, Mitsubishi, Honda, Volvo and Yamaha) have increasingly exported auto-components from India to global markets. In the area of consumer electronics, MNCs such as Samsung, LG, Nokia and Philips are strengthening their presence in India, and increasingly outsourcing parts and components from their Indian suppliers (India Brand Equity Foundation, 2011). India's participation in Asian IPNs in each of these industries is analysed below.

(a) Auto-components industry

The Indian auto-component industry has been growing at 20 per cent annually since 2000. The value of the auto-components industry has been estimated at US\$ 22 billion in 2009-2010, growing at a compound annual growth rate (CAGR) of 20.4 per cent since 2004-2005. Technological shifts in the Indian automobile industry have been the key drivers of growth and innovation. India is currently emerging as a hub for engine components. Global original equipment manufacturers (OEMs) have been setting up engine manufacturing units in the country. By 2012, India was expected to foresee the increased deployment of IT-enabled automobile support systems that would promote

innovation in this industry, such as global positioning systems, anti-braking systems, and automatic speech recognition and safety systems.⁵⁸

The auto-component industry recorded a total investment of US\$ 9 billion in 2009-2010, compared with US\$3.8 billion in 2004-2005. During 2000-2011, the automobile industry (including auto-components) has been the sixth-largest recipient of FDI equity inflows into India, receiving a cumulative FDI inflow worth US\$ 6.4 billion from April 2000 to September 2011, constituting a 4 per cent share of total FDI (Department of Industrial Policy and Promotion, 2011). According to the Automotive Component Manufacturers Association (ACMA) (2011), investment in the industry (both domestic and foreign) is expected to reach US\$ 35 billion by 2020.

Rising domestic demand has been a major factor driving the strong growth. In addition, the availability of low-cost skilled manpower is attracting foreign OEMs to invest in India. According to the India Brand Equity Foundation (IBEF) (2011), there are approximately 400,000 engineering graduates each year in India, and the cost of entry-level engineers is as low as US\$ 8,000 per year. Recently, the Government provided investment incentives, such as lower excise duties, realization of value-added tax (VAT), allowing FDI up to 100 per cent, which have strongly contributed to the growth of this industry (ACMA, 2011).

Currently, MNCs play a minor role in India's auto-component production. In 2010, MNCs such as Magna, Visteon, Federal-Mogul Corporation (North American-based), Valeo, Bosch (European-based) and Denso (Japan-based) contributed only 15 per cent of the production in the Indian auto-components market.⁵⁹ This suggests that compared to South-East and East Asia, the role of Asian MNCs in India's auto-components industry has been minimal (IBEF, 2011). Data are unavailable for the contribution of MNCs in this industry by country of origin, which makes it impossible to ascertain whether Asian or non-Asian MNCs have been playing the dominant role in FDI in this industry, and more particularly in the subsector of auto-components.⁶⁰

India exported about 13 per cent of its auto-components in 2010-2011, at a value of US\$ 5.2 billion. This industry witnessed a CAGR of 21 per cent in its exports from US\$ 1.3 billion in 2003-2004. Principal export items included replacement parts, tractor parts, motorcycle parts, piston rings, gaskets, engine valves, fuel pump nozzles, fuel injection parts, filter and filter elements, radiators,

⁵⁸ India's process-engineering expertise, applied to re-designing of production processes, has resulted in the reduction in manufacturing costs of components. As a result, India, today, has become the outsourcing hub for several global automobile manufacturers.

⁵⁹ The organized sector of this industry contributed 58 per cent of total production, with Indian firms contributing 43 per cent of total production while MNCs accounted for 15 per cent. The unorganized sector contributed 27 per cent of production (IBEF, 2011).

⁶⁰ Monthly FDI statistics published by the Department of Industrial Policy and Promotion of India provide detailed data on either aggregate country-wise FDI equity inflows or by industrial sectors, but not both.

gears, leaf springs, brake assemblies and bearings, clutch facings, head lamps, auto bulbs and halogen bulbs, spark plugs and body parts (ACMA, 2011). Nag (2009) observed that India's auto-components exports were growing notably but that the growth rate was much smaller than that of China. He estimated that during 1995-2006, India's exports of auto-components increased from US\$ 0.28 billion to US\$ 1.38 billion, while China's auto-components exports increased from US\$ 0.38 billion to US\$ 8.93 billion during the same period.

Currently, India's trade in auto-components is running at a deficit with Asia, while it is in surplus with Europe and North America. Europe was the main destination for Indian auto-component exports in 2010-2011 with a share of 36 per cent. North America accounted for nearly 24 per cent of these exports, while the share of Asia was 28 per cent. The majority of exports to Europe have comprised sourcing of auto-parts by European-based automobile OEMs such as BMW, Volkswagen, Fiat Renault and Mercedes Benz. During the same period, 54 per cent of India's auto-component imports were from Asia, followed by Europe (36 per cent) and North America (8 per cent).

Table 12 presents the top 10 export destinations for Indian auto-components in 2008, identified at the SITC 5-digit product level. With the exception of the Republic of Korea and Thailand, no other East or South-East Asian country ranked among the top three destinations for all auto-component exports during that year. The majority of India's auto-component exports were destined for the United Kingdom, the United States, Italy, Germany, Mexico, Bangladesh, Sri Lanka and Middle Eastern countries. Nag (2011) also found that in 2007-2008, IIT in auto-components of India was higher for trade with the United States and Germany than with any Asian country.⁶¹ He noted that while the majority of India's auto-exports were not destined for Asia, India was increasingly sourcing a significant amount of auto-components from Asia. This suggests that India's level of participation in Asian IPNs involves more one-way than two-way trade in auto-components.

Although the current participation of India in Asian IPNs is relatively low, it has been gradually increasing. Table 13 presents the trends in India's automobile P&C exports to major Asian countries involved in automotive IPNs during 1994-2008. The share of India's automobile P&C exports to eight major auto-component producers in Asia increased from 6.3 per cent in 1994 to 10.8 per cent in 2008. The table shows rapid expansion rates in exports to the Republic of Korea, Thailand, China and Japan.

⁶¹ Nag (2011) defined auto-components as within the 8-digit harmonized commodity description and coding system classification.

Table 12. Export shares and major destinations for India's auto-parts, 2008

78425		78431		78432		78433		78434		78436		78439	
Export destination	Share (%)	Export destination	Share (%)	Export destination	Share (%)	Export destination	Share (%)	Export destination	Share (%)	Export destination	Share (%)	Export destination	Share (%)
Senegal	19.14	United States	28.9	Republic of Korea	41.0	United Kingdom	26.1	Hungary	27.9	Italy	40.5	United States	28.4
United Arab Emirates	17.1	Mexico	11.7	United States	16.5	United States	21.6	Thailand	14.3	Turkey	15.6	Italy	9.7
France	7.6	France	4.9	Germany	9.1	Mexico	11.9	South Africa	13.9	Sweden	15.2	Germany	6.7
Japan	5.7	China	4.4	United Arab Emirates	5.4	Italy	6.7	Argentina	13.7	France	7.9	United Kingdom	5.5
Australia	5.2	Italy	4.4	Australia	3.3	Egypt	4.6	Singapore	6.0	Germany	7.8	United Arab Emirates	3.5
Israel	5.1	United Kingdom	4.3	Spain	2.7	Poland	3.0	Germany	5.9	United Kingdom	6.5	Belgium	3.5
Guinea	4.5	Germany	3.7	United Kingdom	2.4	Netherlands	2.9	United States	5.0	United States	2.9	Republic of Korea	2.8
Bahrain	4.5	South Africa	3.4	Saudi Arabia	1.9	China	2.6	Italy	4.3	Indonesia	1.3	Turkey	2.6
Nepal	3.2	Poland	2.9	Slovakia	1.4	United Arab Emirates	2.4	China	2.1	Cameroon	1.0	France	2.6
Sri Lanka	3.2	Spain	2.8	Egypt	1.3	Japan	2.2	United Kingdom	0.9	Sri Lanka	0.5	South Africa	2.1

Source: Calculated from United Nations COMTRADE data.

Note: See Appendix I of this book for commodity description.

Table 13. India's exports of auto-parts to major countries involved in Asian IPNs, 1994-2008

	1994		1999		2004		2008	
	Value (US\$ million)	Share in total (%)	Value (US\$ million)	Share in total (%)	Value (US\$ million)	Share in total (%)	Value (US\$ million)	Share in total (%)
China	0.1	0.0	0.5	0.2	12.4	1.7	22.9	1.3
Thailand	0.8	0.3	0.4	0.2	10.8	1.5	50.1	2.8
Malaysia	2.9	1.1	2.8	1.1	11.5	1.6	11.7	0.7
Indonesia	3.9	1.6	2.7	1.1	5.7	0.8	12.3	0.7
Singapore	7.1	2.8	2.0	0.8	2.8	0.4	4.4	0.3
Viet Nam	0.0	0.0	0.1	0.0	0.7	0.1	0.6	0.0
Japan	0.9	0.4	3.8	1.5	7.6	1.1	18.6	1.1
Republic of Korea	0.1	0.0	6.6	2.6	7.2	1.0	69.9	4.0
Hong Kong, China	0.5	0.2	1.7	0.7	0.8	0.1	0.6	0.0
World	251.4	6.5	253.0	8.1	709.9	8.4	1 765.5	10.8

Source: Calculated from United Nations COMTRADE data.

Note: See Appendix I of this book for commodity description.

The economic reforms since the 1990s have significantly liberalized India's trade in auto-components. India's tariffs on imported auto-components decreased from 35 per cent to 10 per cent during 2001-2008. Manufacturing and imports in this sector are now free from licensing and approval requirements. Tariffs on raw material have been reduced from 10 per cent to between 5 per cent and 7.5 per cent. A restriction on foreign equity has been lifted for investment in auto-component sector, and foreign equity input is allowed up to 100 per cent. In addition, the Government has initiated a number of investment incentives to encourage R&D, technology upgrading and use of fuel-efficient technologies.⁶²

Those measures are expected to allow Indian and India-based global auto-manufacturers to source auto-components more efficiently, and to increase integration of the Indian automobile sector into IPNs of MNCs. A case study by Nag (2011) points to the evidence that India is beginning to be chosen as an export platform for some auto-parts. Toyota Kirloskar Auto Parts (TKAP), a joint-venture between Toyota and a local manufacturer, has been exporting gearboxes from India to its assembly plants in different parts of the world, including Thailand, since 2004. In addition, Toyota has included India as a part of the firm's international multipurpose vehicle (IMV) project, by designating India as its production base for gearboxes and other auto-parts supplied to Indonesia and other countries in Toyota's network. The rapid rise of India's gearbox exports (SITC 78434) appears to be associated with this development (figure 33).⁶³

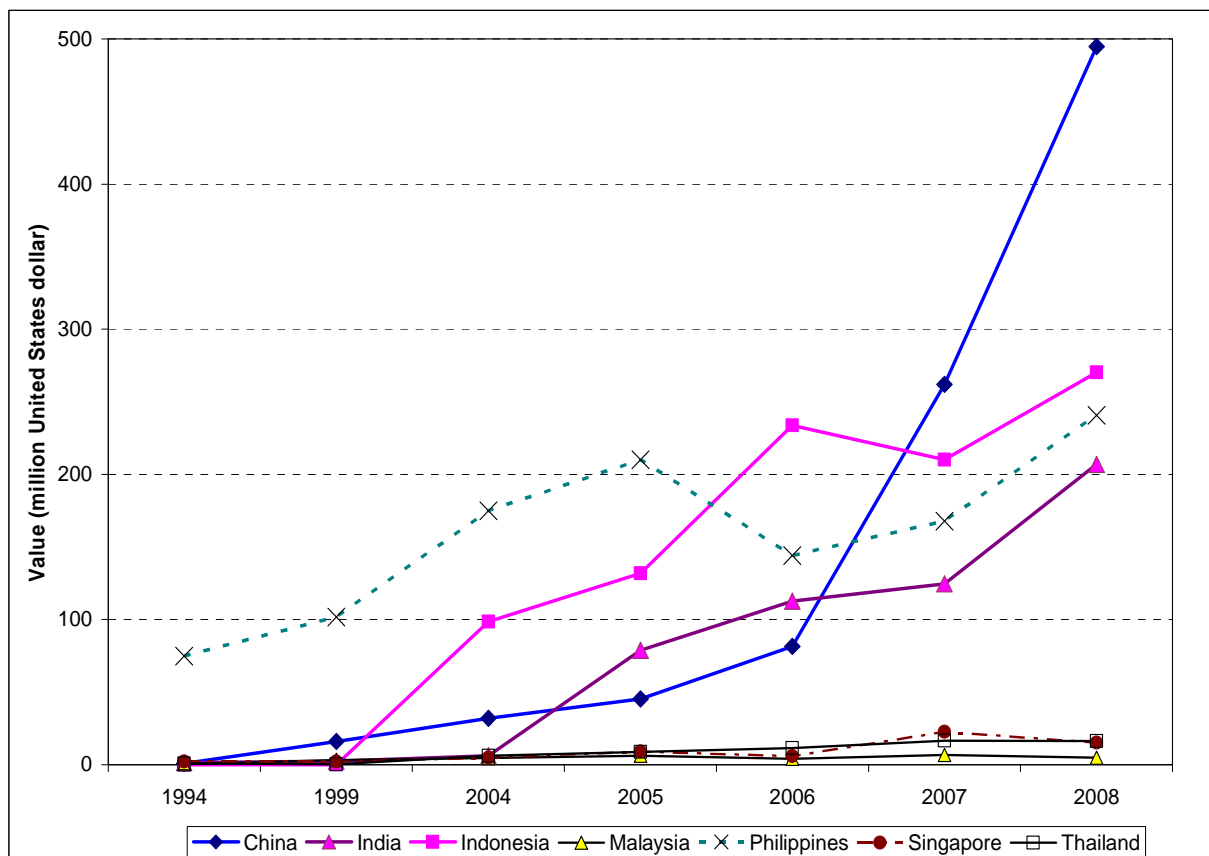
Apart from Toyota, automotive manufacturers such as Hyundai, Renault-Nissan, Ford, Chevrolet, Honda, Toyota and VW are investing in new capacity for supplying local and overseas markets. Suzuki India has developed a global sourcing policy and is trying to procure components from its suppliers throughout the world by integrating them into its Asian IPNs (Nag, 2011). This is expected to increase two-way trade of auto-components among China, India and Indonesia, where Suzuki's

⁶² The aim of the Automotive Mission Plan 2006-2016 by the Ministry of Heavy Industries as well as public enterprises is aimed at increasing the auto-industry output from US\$ 34 billion in 2006 to US\$ 160 billion by 2016, and export revenues to US\$ 35 billion during the same period (export revenue was US\$ 5 billion in 2010-2011). The Automotive Mission Plan recommended setting up a technology modernization fund, with special emphasis on SMEs, and encouraging the establishment of development centres as well as streamlining training research institutions around auto hubs. As part of the national automotive testing and R&D infrastructure project, the Government planned to set up an R&D fund of US\$ 388.5 million to enable the industry to adopt and implement global standards of vehicular safety, emission and performance standards. The recent Union Budget of 2010-2011 has also given further impetus to the automotive industry by increasing weighted income tax deduction for in-house R&D from 150 per cent to 200 per cent, and for outsourced R&D from 125 per cent to 175 per cent; this is expected to reduce the upgrading costs of companies.

⁶³ According to Nag (2011), exporting gearboxes is just the beginning of Toyota's strategy to integrate India into its Asian IPNs, and there may be possibilities for Toyota and other global automobile manufacturers to source automotive hardware such as cast parts, metal components and sub-assemblies as well as software from their Indian operations.

plants are located. In the case of two-wheelers, Indian companies such as TVS and Bajaj Auto are beginning to show a strong presence in Asian markets, particularly in Indonesia. These two companies recorded export growth of more than 50 per cent in 2006 and have recently expanded manufacturing capacity in Asia, with TVS investing US\$ 55 million in establishing an assembly plant in Indonesia.

Figure 33. Exports of gearboxes (SITC 78434) from selected Asian countries, 1994-2008



Source: Calculated from United Nations COMTRADE data.

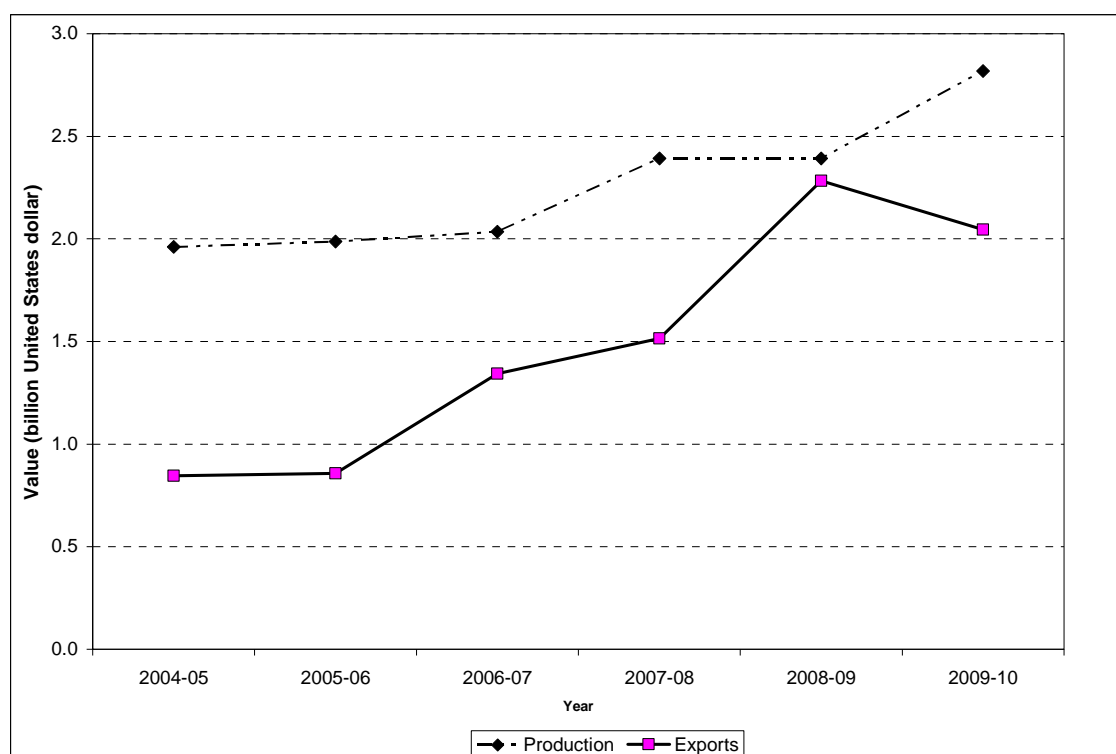
At the national level, it is still challenging for India to develop production and trade linkages with Asian IPNs to a scale that is comparable with China and ASEAN countries. The current trade and investment structures of the Indian auto-components industry are linked more with European and North American MNCs than with Asian MNCs. Europe and North America together account for more than 60 per cent of auto-component exports by India. Nag (2011) found that Indian auto-component producers preferred to tie up with European or American MNCs more than with Asian MNCs. A major reason is the higher flexibility in doing business, because Asian MNCs usually do not allow their local partners to supply the same products to firms outside their production networks

(b) *Electronics component industry*

The electronic components industry is a subsector of the electronics industry that caters to the requirements of consumer electronics, telecom, defence and information technology sectors. Some examples of electronic parts and components exported from India are television picture tubes (black and white, and colour), monitor tubes, diodes and transistors, power devices, integrated circuits, hybrid microcircuits, resistors, capacitors (plastic film, electrolytic, tantalum and ceramic), connectors, switches, relays, magnetic heads, printed circuit boards, crystals, loudspeakers, and hard and soft ferrites. Most of the top global semiconductor companies have set up chip design centres in India. With the introduction of the Special Incentive Package Scheme announced by the Government, it is expected that chip manufacturing will start in the near future.

Production of electronic components during 2009-2010 registered a growth of 17.7 per cent from 2008-2009. The rapid growth of India's electronic components industry has mainly been driven by growth in the consumer electronics industry. The demand for electronic components such as printed circuit boards, semiconductor devices, connectors, wound components and antennas increased due to demand from indigenous manufacturing of mobile phones, set top boxes, DVD players etc. Shares of electronic components in total production increased from an average of 43 per cent in 2004-2005 to 72 per cent in 2009-2010 (figure 34).

Figure 34. Trends in India's electronics components production and exports, 2004-2010



Source: Electronics and Software Exports Promotion Council, 2011.

Table 14 presents the export values and shares of major export destinations of the top 10 items of India's electronics component exports in 2010, which also corresponds to the SITC 77 broad product category in the trade data. The bulk of these electronics component exports were destined for OECD countries, particularly the United States and Germany. This suggests that India's links with Asian IPNs on the export side in this industry are also not so strong.

However, according to the Electronics and Software Exports Promotion Council (2011), following the onset of the global economic crisis in 2008-2009, the share of India's electronics components exports to the European Union declined from 46 per cent in 2008-2009 to 37 per cent in 2009-2010, while exports to Japan, the Republic of Korea and East Asia as well as Singapore, Hong Kong, China and South Asian countries increased from 5 per cent to 11 per cent during the same period.

Table 14. India's exports of electronics-parts: Value and share in major destinations, 2009-2010

Products	Export value in 2009-2010 (US\$ million)	Major destinations during 2009-2010, with approximate percentage share of items in total export value
Boards, panels, consoles, Desks, cabinets etc.	454.1	United States (11 per cent), Germany (10 per cent), United Arab Emirates (9 per cent), United Kingdom (6 per cent), China (4 per cent), others (60 per cent)
Solar cells	320.2	Germany (55 per cent), Netherlands (12 per cent), Italy (7 per cent), Spain (4 per cent), Australia (4 per cent), others (18 per cent)
Populated P&CB	204.6	China (23 per cent), United Arab Emirates (19 per cent), United States (17 per cent), the Netherlands (10 per cent), Hong Kong, China (5 per cent), others (26 per cent)
Transformers	142.8	Ethiopia (12 per cent), Nigeria (9 per cent), Kenya (8 per cent), Djibouti (7 per cent), United Kingdom (6 per cent), others (58 per cent)
Printed circuits boards – blank	94.1	United States (26 per cent), Austria (21 per cent), China (10 per cent), Germany (7 per cent), Spain (6 per cent), others (30 per cent)
Antennas	91.9	Germany (24 per cent), Netherlands (15 per cent), Russia Federation (10 per cent), China (9 per cent), Hong Kong, China (6 per cent), others (36 per cent)
Parts of transformers	66.3	United States (10 per cent), Islamic Republic of Iran (8 per cent), United Arab Emirates (8 per cent), Germany (5 per cent), Turkey (5 per cent), others (64 per cent)
Capacitors	61.6	Germany (26 per cent), HK (10 per cent), Nigeria (9 per cent), United States (9 per cent), Czech Republic (7 per cent), others (39 per cent).
Diodes	46.1	Germany (38 per cent), Spain (10 per cent), Italy (7 per cent), Singapore (6 per cent), United States (6 per cent), others (33 per cent).
Parts of meters	40.7	Bahrain (72 per cent), United States (20 per cent), Singapore (1 per cent), Mauritius (1 per cent), Nigeria (1 per cent), others (5 per cent).

Source: Electronics and Software Exports Promotion Council, 2011.

Foreign investment in the electronic component industry has been facilitated by the export promotion scheme that allows foreign investment of up to 100 per cent in production exclusively for exports. The units set up under these programmes are bonded factories that are eligible to import their entire requirements of capital goods, raw materials and components, spares and consumables, office equipment etc. free of import tariffs. As in case of auto-parts industry, this industry has also benefited from economic reforms, reductions and elimination of tariff barriers, and the creation of Special Economic Zones (SEZs) for electronics firms to manufacture for export purposes as well as for the domestic market. In addition, tax incentives in SEZs, such as (a) total income tax exemption on export profits for five years, (b) 50 per cent tax exemption for the subsequent five years and (c) 50 per cent tax exemption on ploughed-back profits for five years thereafter, has encouraged the growth and exports of this industry.

However, the small amount of cumulative FDI inflows over the past decade suggests that MNCs have not played a significant role yet in development of this sector (IBEF, 2011). From 2000 to 2011, the electronics industry has been the twenty-fifth largest recipient of FDI equity inflows in India, receiving a cumulative FDI inflow worth US\$ 1.1 billion from April 2000 to September 2011, constituting a share of 0.7 per cent of the total FDI inflow (Department of Industrial Policy and Promotion, 2011).⁶⁴

It is evident that current trade and investment patterns of the Indian electronic components industries are linked more with European and North American MNCs more than with Asian MNCs. Contract manufacturing and sourcing of electronic components is where India is currently playing a role in global IPNs, but the industry needs to move up the value chain and acquire capabilities as a manufacturing base to further strengthen its role in IPNs involving Asian countries in the near future.

5. Improving India's participation in Asian IPNs: Policy challenges

The question is how can India strengthen its participation in Asian IPNs? As argued by Kimura (2009) and Hew, Das and Sen (2009), creating a competitive and business-friendly investment climate is the first step, with improvements in physical infrastructure to reduce trade costs as the next step that will allow industrial agglomeration and link it to the production blocks. The role of bilateral and regional PTAs involving tariff and non-tariff barrier reduction, regulatory reform, and reducing transaction and trade costs in an IPN are also of significance. In the Indian context there are four policy challenges to effectively plugging into global and Asian IPNs:

⁶⁴ Again, data are unavailable on the contribution of MNCs, by country of origin, in this industry. This makes it impossible to ascertain whether Asian or non-Asian MNCs have been playing the dominant role in FDI in this industry, and more particularly in the subsector of electronic components.

- (a) The need for continued unilateral trade and investment liberalization with emphasis on regulatory reforms;
- (b) The reduction of transactions costs of trade and improvement of the physical and institutional infrastructure;
- (c) Addressing factor market rigidities and making labour laws flexible;
- (d) Utilizing PTAs effectively with countries that are already part of Asian IPNs and supporting the PTAs with unilateral “second-generation” reforms.

The significance of each of these policy challenges and India’s position vis-à-vis South-East and East Asian developing countries needs to be analysed in detail.

(a) *Unilateral trade and investment liberalization with emphasis on regulatory reforms*

India’s development strategy has moved away from an inward-looking stance towards a global and outward-oriented strategy during the past two decades. As a part of its unilateral trade liberalization since the first generation of economic reforms of 1991, Indian policymakers have highlighted the need to expand the volume of trade and use trade expansion as a policy tool to promote economic growth and employment.⁶⁵ One of the major objectives of the new foreign trade policy is to enhance the process of diversification of India’s export products and markets.

The shift to non-traditional markets has been actively aided by offering a range of incentives to exporters to explore 39 new markets – 26 under the focus market scheme and 13 under market-linked focus product schemes.⁶⁶ The focus market scheme primarily aims to offset high freight costs involved in trade with selected international markets in order to enhance India’s export competitiveness in those countries. Measures include providing credit for payment of import duties and other forms of export financial assistance for exporters – ranging from 2.5 per cent to 3 per cent of the value of exports. Under the focus product scheme, a number of products (including automobiles and other engineering products) have been given incentives. The objective is to encourage production and exports of those products that possess high employment elasticity.⁶⁷

As a result of policy shifts towards outward orientation, India’s simple average applied MFN tariff rate declined from 15.1 per cent in 2006/07 to 12 per cent in 2010/11. The largest proportion of lines (8,042, i.e., 71 per cent) was subject to a tariff rate of between 5 per cent and 10 per cent, while 12.8 per cent of total lines were subject to a tariff rate greater than zero but lower than 5 per cent. This is a major shift from 2006/07, when 65 per cent of all tariff lines were within the 10-15 per cent range,

⁶⁵ With the latest foreign trade policy of 2009-2014, Indian policymakers are hoping to achieve an annual export growth of 15 per cent; with the long-term objective being to accelerate export growth to 25 per cent per annum and to double India’s share in global trade by 2020 (WTO, 2011c).

⁶⁶ See Rajan and Gopalan, 2011.,and WTO, 2011c..

⁶⁷ See Rajan and Gopalan, 2011..

followed by 10.4 per cent of lines at 25-30 per cent. Overall, India is estimated to have reduced its applied tariffs by an average 19.5 per cent during 2001-2009 (IDE-JETRO and WTO, 2011b).

The above tariff reductions have narrowed the gap between the levels of India's trade protection and those of ASEAN and China. India's trade-weighted MFN tariffs are now at 6 per cent, which is lower than those of Brazil and the Russian Federation, and not far from the Chinese and ASEAN levels (Sally, 2011). However, table 15 shows that when compared to other developing countries in East and South-East Asia, India's tariff structure still has room for further liberalization.

Table 15. Tariff structure of non-agricultural goods in India and selected developing Asian economies

Per cent of tariff lines 2009								
	Duty-free	0 <= 5	5 <= 10	10 <= 15	15 <= 25	25 <= 50	50 <= 100	> 100
India	2.4	12.7	76.3	1.1	2.2	4.4	0.6	0
China	7.8	19.9	46.5	14.3	10.5	1	0	0
Indonesia	23.7	41.6	17	15.7	1.4	0.5	0	0
Malaysia	56.9	7.7	8.5	3.6	16.3	6.9	0	0
Singapore	100	0	0	0	0	0	0	0
Thailand	24.2	43	15.2	0.2	6.2	10.8	0.4	0
Philippines	2.6	59.9	22.7	13.2	1	0.6	0	0
VietNam	37.8	19.6	7.3	9.3	11.5	13.6	0.3	0

Per cent of import values 2008								
	Duty-free	0 <= 5	5 <= 10	10 <= 15	15 <= 25	25 <= 50	50 <= 100	> 100
India	14.3	48.6	36.7	0	0.1	0.1	0.1	0
China	48.4	18.2	27.8	2.9	2.5	0.2	0	0
Indonesia	61.2	20	8.7	8.3	0.6	0.7	0.5	0
Malaysia	64.6	14.6	2.1	5	6.7	7	0	0
Singapore	100	0	0	0	0	0	0	0
Thailand	50.8	29.6	14.7	0	1.3	3.3	0.3	0
Philippines	22.2	60.8	9.1	4.5	0.7	2.6	0	0
VietNam	44.6	23.5	10.8	10.2	3.9	6.3	0.7	0

Source: WTO, 2011b.

Table 16 presents the average MFN applied tariffs, in 2009, of India and other developing Asian economies in selected manufacturing sectors that constitute the bulk of traded parts and components. This suggests that scope exists for India to reduce tariffs further, especially in the transport equipment sectors, to match the Chinese level.⁶⁸ A recent study by IDE-JETRO and WTO (2011) found that India's tariff

⁶⁸ These are sectoral averages.

levels for raw materials and semi-processed goods are higher than those of the ASEAN and East Asian economies.⁶⁹

Table 16. Average MFN applied tariffs by selected product groups of India and selected developing Asian economies in the non-agricultural sector, 2009

	Non-electrical machinery	Electrical machinery	Transport equipment	Other manufactures
India	7.3	7.2	20.7	8.9
China	7.8	8.0	11.5	11.9
Indonesia	2.3	5.8	10.6	6.9
Malaysia	3.6	4.3	11.6	4.8
Singapore	0	0	0	0
Thailand	4.1	7.5	20.3	10.2
Philippines	2.3	4.0	9.1	4.9
Viet Nam	4.0	10.9	18.9	12.1

Source: WTO, 2011b.

However, there is concern that while tariff barriers may have declined drastically in India over the past decade, significant non-tariff barriers exist that include licensing requirements, provisional anti-dumping and safeguard duties, and tighter standards restrictions. These non-tariff measures continue to affect trade and investment relations of India with its major trading partners, including those in Asia. Elements of such non-tariff barriers include: (a) complex and often non-transparent administrative requirements as well as para-tariff measures involving customs surcharges; (b) additional charges; (c) internal taxes and charges levied on imports; and (d) decreed customs valuation.⁷⁰

In the area of industrial and FDI policy, India has pursued unilateral liberalization measures towards outward-orientation by abolishing industrial licensing in most industries. This has encouraged private sector participation and opened up most industries to inward FDI, while encouraging Indian companies to invest abroad (Srivastava, 2007). After liberalization, the FDI attractiveness of India tended to increase. From being ranked sixth in A.T. Kearney's 2003 FDI confidence, India was ranked third after China and the United States in 2010.⁷¹ Ahluwalia (2002) noted that India's economic reforms created a more competitive environment. He found that

⁶⁹ IDE-JETRO and WTO, 2011 (figure 8).

⁷⁰ The Research and Information Systems for Developing Countries institution (RIS) (2004) estimated that for India-Bangladesh border trade, a consignment needs at least 22 documents, involving 55 signatures and 116 copies for final approval.

⁷¹ This index ranks 64 countries on the basis of their FDI attractiveness, computed from a survey that tracks investor confidence among global executives to determine their order of preferences (A.T. Kearney, 2010).

States which create an investor-friendly business environment attract the majority of inward FDI.

However, the need for further unilateral liberalization in trade and FDI, focusing on domestic regulatory reforms, remains a major challenge for India. Studies indicate much of inward FDI in India's manufacturing sectors has been largely undertaken as "market-seeking" to serve the large and growing domestic market in India rather than the "efficiency-seeking" FDI that will link India with Asian IPNs in China, Thailand, Malaysia, Singapore and other Asian countries.⁷² Sally (2011) estimated that although in terms of overall FDI regulatory restrictiveness India is on a par with China, Indian services sectors such as insurance, aviation, construction, retail and distribution are facing higher levels of protection. Based on the 2010 overall enabling trade index, which measures factors, policies and services that facilitate the trade in goods across borders, India lagged behind China in market access, border administration, transport and communications infrastructure, and the business environment (table 17).⁷³

Table 17. Enabling trade index comparisons of India and selected Asian developing economies

Country	Overall market environment		Market access		Border administration		Transport and communications		Business
	Rank	Score	Rank	Score	Rank	Score	Rank	Score	
	Infrastructure								
	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank
Singapore	1	6.1	1	6.0	1	6.6	7	5.7	2
China	48	4.3	79	3.9	48	4.5	43	4.1	41
India	84	3.8	115	3.4	68	4.0	81	3.3	58
Indonesia	68	4.0	60	4.2	67	4.0	85	3.3	60
Malaysia	30	4.7	31	4.7	44	4.6	24	5.0	51
Philippines	92	3.7	64	4.1	74	3.8	83	3.3	103
Viet Nam	71	4.0	50	4.4	88	3.5	68	3.6	64
Thailand	60	4.1	113	3.5	41	4.6	40	4.2	71

Source: World Economic Forum, 2010.

⁷² See Aggarwal (2001), Kumar and Siddharthan (1994), Kumar (1990), Pant (1993 and 1995), and Pailwar (2001).

⁷³ This index is made up of four sub-indexes that measure the degree of market access, border administration, transport and communications infrastructure, and business environment that assesses the overall environment created by a country to enable its trading partners to trade and invest more among each other (World Economic Forum, 2010).

Another important issue is the pace of India's liberalization, which has not kept up its momentum. Sally (2011) observed that the process of India's unilateral trade liberalization had largely been witnessed in two reform bursts of 1991-1993 and 1998-2004, after which it had slowed. The slowdown and stalling of multilateral liberalization through WTO and rapid proliferation of "new regionalism" in Asia has further diverted the energies of Indian trade policymakers away from unilateral liberalization and domestic reforms.⁷⁴ This indicates that while the Indian economy may have become outward-oriented, the perception among trading partners of India as a preferred trade and investment partner needs to improve further. An important challenge will be the reduction of behind-the border restrictions on international trade and investment. Thus, the proper institution and regulatory reforms and infrastructure improvement are crucial to improving the business environment and reducing trade costs.

(b) Reducing transaction costs, and improving physical and institutional infrastructure for cross-border trade and investment

India has high international trade costs. According to the World Bank (2010), the average cost of export in India was US\$ 945 per container, driven mainly by export related documentation. The report estimated that in 2010, trade-related transaction costs in India amounted to approximately US\$ 17 billion, or 10 per cent of the nation's export value. Banik and Gilbert (2010) noted that India has one of the highest logistics cost, at 13 per cent of GDP, arising from low quality infrastructure involving inefficient ports, airports, very complicated bureaucratic procedures, frequent electricity outage and high transportation costs. This complex business environment not only hampers the trade but also creates a fertile environment for corruption.

Table 18 compares India with respect to other developing Asian countries involved in IPNs, based on the World Bank (2011) "Ease of Doing Business Index indicators for 2012", where a smaller number indicates a better performance on each sub-indicator and a higher ranking related to the creation of a business-friendly environment. India is ranked lower than China for all measures of ease of doing business except for electricity supply and protection of investors. India's scores were particularly low in starting and closing a business, dealing with construction permits, paying taxes, trading across borders and enforcing contracts, all of which are critical to reducing transaction costs of trade.⁷⁵ Since these are important elements of the soft "institutional" infrastructure that supports the development of IPNs, it is evident that Indian policymakers will need to focus attention on reducing transaction costs of doing business and to address regional disparities if India is to emerge as the next assembly centre, when compared to China, in the near future.

⁷⁴ See Rajan, Sen, Siregar, 2001; and Rajan and Sen, 2004.

⁷⁵ Sally (2011) noted, however, that given the size of the Indian economy, there was a need to further observe the considerable variation among the performance of Indian States, and that if only the top 10 performing States were counted, India would potentially jump 55 places in the ease-of-doing-business rankings, making it almost comparable to China.

Table 18. Doing Business Rank 2012 comparisons of India and selected Asian developing economies

Economy	Ease of doing business	Starting business	Dealing with construction permits	Getting electricity	Registering property	Getting credit	Protecting investors	Paying taxes	Trading across borders	Enforcing contracts	Resolving insolvency
Singapore	1	4	3	5	14	8	2	4	1	12	2
Thailand	17	78	14	9	28	67	13	100	17	24	51
Malaysia	18	50	113	59	59	1	4	41	29	31	47
China	91	151	179	115	40	67	97	122	60	16	75
VietNam	98	103	67	135	47	24	166	151	68	30	142
Indonesia	129	155	71	161	99	126	46	131	39	156	146
India	132	166	181	98	97	40	46	147	109	182	128
Philippines	136	158	102	54	117	126	133	136	51	112	163

Source: World Bank, 2011.

Indeed, some effort has been made to introduce reforms in recent years in order to improve India's business environment. Compared to the 2011 rankings, when India was ranked 139 overall in terms of doing business, it jumped seven places to 132 in the 2012 rankings.⁷⁶ This was mainly due to some second-generation reforms introduced during 2009-2011 in opening and closing a business, paying taxes and trading across borders (table 19). The Government acknowledged the importance of minimizing high transaction costs by creating a task force in October 2009 to identify ways of improving "the functioning of export processes, and reducing time and money spent in export transactions, with a view to enhancing the competitiveness of Indian exports".⁷⁷ This task force has proposed measures such as round-the-clock customs clearance at selected ports, reductions in levies, and electronic message exchange between the customs authority and the director-general for foreign trade to facilitate faster clearances. Other key proposals in line for implementation include the integration of all trade-related agencies through a "single window e-Trade initiative" and the development of port-related infrastructure. This demonstrates the commitment to further reforms aimed at reducing transaction costs, but such reforms need to be speeded up and pursued with greater conviction, as emphasized by Rajan and Gopalan (2011).

⁷⁶ During this period, China slipped four places from 87 in 2010 to 91 in 2011.

⁷⁷ See Rajan and Gopalan, 2011.

Table 19. Recent regulatory reforms undertaken by India to improve its business environment rankings

Year	Reform	Area
2011/2012	Reduced the administrative burden of paying taxes by abolishing fringe benefit tax and improving electronic payment, and later by making electronic filing and payment of VAT mandatory.	Paying taxes
2011	Eased business start-up by establishing an online value-added tax (VAT) registration system and replacing the previously required physical stamp with an online version.	Starting a business
2010	Procedures under the 2002 Securitization Act have become more effective, easing the processes and time required to close a business.	Resolving insolvency
2009	Electronic data interchange implemented, allowing exporters to submit documents to customs online. This system also enables customs to automatically assess export documents, making customs clearance more efficient and reducing time needed to export.	Trading across borders

Source: Compiled by the author from World Bank, 2011.

The hard “physical” infrastructure is also absolutely crucial for MNCs when considering efficiency-seeking FDI in manufacturing. Table 17 shows that India ranks behind most developing Asian economies in terms of transportation and communications infrastructure. However, India’s infrastructure development is at comparable levels with Indonesia and Philippines, and far behind China.

Thus, to plug into IPNs, there is not only a need to reduce transport costs at the border but also for information and communication technology (ICT) services, which provide complementary support to growth of physical infrastructure such as roads, railways and ports. Sally (2011) noted that India’s “hard” infrastructure as well as its “soft” regulatory infrastructure needed improvement. In fact, this appears applicable to most South Asian countries. Banik and Gilbert (2010) estimated that if the South Asian Association for Regional Cooperation (SAARC) countries were to improve trade facilitations to half of the East Asian levels, intraregional trade in South Asia could be increased by as much as 60 per cent of current intra-regional trade. In the South Asian subregion, port efficiency, customs environment, regulatory environment and service sector infrastructure need urgent attention if intra-regional trade is to be increased.

(c) Address labour market rigidities

Most of the countries involved in Asian IPNs have witnessed a massive structural change, with significant shifts in employment from agricultural sector to the manufacturing sectors. Manufacturing development will be of particular importance for India in increasing its potential to integrate into Asian IPNs. As suggested by Virmani and Hashim (2009), India’s manufacturing sector holds a unique importance mainly for two reasons. First, the ability of this sector to provide large-scale employment, and to be a driver of structural change as a developing economy such as India grows, is increasing

because the contribution of the agricultural sector to GDP is shrinking. Second, it can facilitate growth through forward and backward linkages with other sectors of the economy, particularly the services sector that is currently the driver of economic growth in the case of India.

India's employment structure has not significantly shifted towards the manufacturing sectors despite the fact that India possesses the advantages of low-cost labour and availability of skilled and scientific manpower. According to Basu (2005), the reason behind this is the fact that labour market rigidities⁷⁸ through existing legislation have resulted in India's failure to deploy her large labour resources to compete more strongly in the domestic and international markets. Relative to India, the East Asian and South-East Asian countries appear to have fewer protective laws.

Existing rigidities constrain the effective redeployment of labour in response to changes in demand and technology are acting as a disincentive towards employing workers, thereby resulting in jobless growth in organized manufacturing as well as increasing use of contract and temporary workers.⁷⁹ This also leads to capital-intensive methods in the organized sector and adversely affects the manufacturing sector's long-term demand for labour. In the Indian context, state-level labour regulations are also an important determinant of industrial performance. Therefore, labour market reforms both at national and state levels are essential if India is to witness growth in productivity by labour-intensive manufacturing and move away from the less productive agriculture sector.

Jha and Golder (2008) analysed the links between labour market reforms and economic performance, and argued that policymakers needed to devote attention to several aspects of labour market reformation. First, they need to simplify and streamline existing laws.⁸⁰ Second, there is a need to design these laws to encourage investment in human capital as well as training and skills development of workers. Third, there is a need to improve the social safety net, especially for unorganized workers. Fourth, the implementation mechanism has to be strong, and dispute resolution should be quick and transparent; this will also facilitate improvement of enforcement of contracts, which is currently weak. All these reforms should perform in parallel with a long-term strategy to create a more competitive skilled-labour market in India, in order to bring about strong integration of India with existing IPNs in Asia.

The recently approved draft national manufacturing policy includes labour market reforms and an exit policy as part of its objectives.⁸¹ It seeks to introduce policy measures

⁷⁸ These pertain to setting minimum wages above market clearing levels – especially in the organized sector

⁷⁹ See Ahsan and Pagés, 2008, Dutta, 2003, Gupta Hasan and Kumar, 2008, Ramaswamy, 2003, and Sharma, 2006.

⁸⁰ Chandra (2006) stated that close to 50 central laws and about 175 state laws existed that were related directly to labour, most of which were poorly designed and implemented.

⁸¹ See www.indianexpress.com/news/govt-oks-national-manufacturing-policy/865186/.

to facilitate the expeditious redeployment of assets belonging to “sick” or non-performing units, while giving full protection to the interests of the employees, with a focus on making it easy to close a business and provide appropriate insurance for job losses.⁸²

(d) *Effectively utilize PTAs as a tool to plug into global and Asian IPNs*

The deadlock in multilateral trade negotiations and rise of new regionalism in Asia has prompted Asian and Pacific countries, including India, to become very active in negotiating and entering into bilateral and regional PTAs. India’s PTA activity is comparable to that of the other major Asian countries that are strongholds of IPNs, viz. China and Japan. India has already implemented regional PTAs involving ASEAN, MERCOSUR and SAARC and bilateral PTAs with Afghanistan, Bhutan, Chile, the Republic of Korea, Japan, Nepal, Singapore and Sri Lanka. India is a member of the Asia-Pacific Trade Agreement (APTA) and is currently negotiating a PTA with the European Union while the PTAs with China and the United States are proposed for the not-too-distant future (ESCAP, 2011a and 2011b).⁸³

Can India’s PTAs influence policies for supporting the formation of production networks that provide links to other existing Asian IPNs? It can be argued that the impact of PTAs on policies affecting the participation of countries in production networks is very much dependant on the extent of comprehensive coverage of a PTA and its focus on areas that would deepen regional integration through production networks (Hew, Das and Sen, 2009, and Orefice and Rocha, 2011).

PTA policies will have effective impacts on building IPNs if they remove cross-border barriers as well as reduce behind-the-border impediments to trade and investment. Based on the framework of Hew, Das and Sen (2009), which identifies three types of costs related to IPNs (i.e., service link costs, network set-up costs and production costs), PTAs that only emphasize the liberalization of trade in goods and tariff reductions will reduce service-link costs, but will not be able to reduce network-set up and production costs. Thus, they are not sufficient to induce the participation of India in IPNs.

Trade and investment facilitations, liberalization of trade in services and investment, and strengthening competition policy and intellectual property protection are

⁸²The national manufacturing policy aims to increase manufacturing sector growth to 12-14 per cent in the medium term in order to (a) make it the growth engine of the economy; (b) create 100 million additional jobs by 2022; (c) create appropriate skill sets among the rural migrant and urban poor to make growth inclusive; (d) increase domestic value addition and technological depth in manufacturing; (e) enhancing global competitiveness of Indian manufacturing, particularly in the case of SMEs, through appropriate policy support; and (f) ensure sustainability of growth, particularly with regard to the environment (including energy efficiency, optimal utilization of natural resources and restoration of damaged/degraded eco-systems). The policymakers also plan to reduce the compliance burden on industry, and to improve and simplify procedural and regulatory formalities in order to make it easier for manufacturing industries to be technologically competitive and globally innovative (Department of Industrial Policy and Promotion, 2011)

⁸³ See www.unescap.org/tid/aptiad/agg_db.aspx

desired characteristics for enabling PTAs to be an effective tool for IPN encouragement. Trade facilitation initiatives, such as improving customs clearance and procedures, will help to reduce all three types of costs involved in setting up a production network. Liberalization of trade in services and investment, particularly the inclusion of MFN and national treatment obligations in a PTA, are also likely to have a favourable impact on policy in terms of reduction of investment costs, strengthening the competitiveness of potential business partners as well as on overcoming geographical distance and border effects. It is likely to significantly reduce network-set up costs and service link costs within a production network.

The analysis by Orefice and Rocha (2011) of 200 countries during 1987-2007 confirmed that trade through IPNs was fostered by those agreements that aimed for deeper integration. Their study captured such deeper integration through five measures. Two of the measures are WTO+ in nature and therefore aim for strengthening discipline on rules related to state trading enterprises and Trade Related Intellectual Property (TRIPS), while the other three (competition policy, intellectual property protection and movement of capital) are WTO-X in nature and therefore currently not under negotiation in WTO. Orefice and Rocha argued that inclusion of such deep integration measures was more likely among PTA partnerships involving developed and developing countries rather than among just developing countries.

In the context of Indian PTAs, potential benefits from encouraging India's participation in IPNs might be limited. India's PTAs with most Asian IPN members have mainly served as a tool for foreign policy rather than trade policy, and have been on a "trade-light approach to liberalization". India's PTAs with South Asian countries currently focus only on tariff reduction of goods, and do not cover comprehensive liberalization in services, investment and other non-border market-access issues. More than half of intra-regional trade is excluded through "sensitive lists", restrictive rules of origin (RoO), and assorted NTBs. This indicates that India has been following a "trade-light" approach to PTAs and that those PTAs are therefore unlikely to spur any IPN activity, since they do not include the deepening of regulatory measures related to the five measures identified above.

India's recent bilateral PTAs with Japan and the Republic of Korea, Malaysia and Singapore as well as its regional PTA with ASEAN are aimed at greater comprehensiveness, including services and investments, but most of these PTAs have not reached the stage of full implementation and are not supported by strong regulatory measures for strengthening intra-regional trade through IPNs. While tariffs are being eliminated in some cases for close to 90 per cent of products, there are long transition periods and restrictive RoO. As an example, India's recently concluded PTA with the Republic of Korea covers only 66 per cent of Indian tariff lines that are subject to duty elimination during an eight-year transition period, with agreements on services and investment being weaker when compared to what has been agreed upon by these countries in WTO. Sally (2011) noted that fear of Chinese competition was one of the main factors driving product exemptions and restrictive RoO in India's PTAs, resulting in

partial liberalization commitments that were unlikely to spur IPN activity, particularly on the export side.⁸⁴

Overlapping of PTAs and restrictiveness of RoO create concerns on actual utilization of PTAs between India and Asian trading partners. Varieties of RoO in overlapping PTAs makes it costly for businesses to comply with them, resulting in low actual utilization.⁸⁵ Nag and De (2011) analysed the impact of RoO on the development of IPNs. They concluded that simpler RoO work better for parts and components and intra-industry trade in an IPN.⁸⁶ In addition, complex RoO provide increasing avenues for corruption, since customs officials can exercise significant discretion in deciding on which tariff or rules to apply to a certain product (Newfarmer, 2005). An overarching East Asia-wide comprehensive regional PTA would have greater potential to improve the coordination and linkages than individual bilateral PTAs, and perhaps reduce the costs of compliance for the user if simpler region-based RoO are designed (ESCAP, 2011c).

Thus, PTA initiatives in India, as in rest of Asia, will need to be supported by unilateral liberalization and important domestic economic reforms as argued by Sally and Sen (2011). The engine of liberalization and regulatory reform by India and the rest of South Asia have to be home-driven, with PTAs playing, at best, a supportive role. Support will also be needed by institutional and infrastructural development that would be critical for the development of regional production networks involving India, and East and South-East Asia.

Some of these policy constraints are probably better addressed unilaterally through domestic reforms rather than bilaterally through PTAs. These include policies aimed towards institutional development in order to improve the business environment as well as developing infrastructure to support the same. The establishment of educational/occupational institutions for personnel training with the objective of securing various types of human resources, together with (a) the establishment of stable and elastic labour-related laws and institutions, (b) removing bottlenecks in infrastructure services such as the supply shortages of electricity and other types of energy, (d) improving industrial estate services (e) the establishment of institutional infrastructure such as transparent investment rules and laws on intellectual property-rights, are examples of

⁸⁴ Studies in auto-component sector by Nag (2011) and Ghosh, Ray and Makkar (2010) found that PTAs between India and Asian countries seem not enhancing greater participation of India in Asian auto-parts IPNs. Ghosh, Ray and Makkar (2010) studied free trade agreements between India and ASEAN, Republic of Korea, European Union, and Japan. They indicate that FTAs could harm Indian auto-part industries. They point that the proposed PTA between Korea and the European Union has prompted Hyundai Motor India Limited to suggest that the company may look to shift part of its production meant for export to the European Union from India to the Republic of Korea and this could imply significant decline in exports for suppliers based in India.

⁸⁵ Businesses have to consider using these PTAs and therefore adjust their strategies for compliance, or else continue to pay MFN tariffs for their goods, ignoring PTA preferences.

⁸⁶ This study analyses sectoral impact of RoOs on integrated circuits, auto-components and textiles and observes that ASEAN PTAs having simple RoOs have benefitted intra-industry trade in these products.

areas wherein domestic reforms would be crucial to supporting the introduction of a business-friendly environment that could potentially be created by India's PTAs.

6. Conclusion and policy recommendations

The analysis in this study has demonstrated that India has reoriented its growth strategy towards outward orientation during the past two decades; however, the pace of its reform has not caught up with this paradigm shift. As a result, the current levels of participation of India, both in global and in Asian IPNs, are low. Most of the exports comprise low-technology, labour-intensive goods that do not involve much fragmentation, such as textiles, gems and jewellery, animal and leather products.

The case studies of auto-parts and electronics component sectors reveal that integrating with global IPNs has begun emerging for some products, but the linkages of production and trade with global MNCs are still minimal. Therefore, the business environment needs improvement in several areas in order to encourage MNCs and SMEs to integrate India further into global and Asian IPNs.

Thus, six key policy recommendations are proposed, based on the current state of India's participation in IPNs and the associated policy challenges. These are:

1. Step up the pace of unilateral trade and investment liberalization, and strive towards further reducing trade and investment barriers, particularly in the area of reducing behind-the border restrictions on international trade and investment, with a focus on improving domestic regulation. This should facilitate reduction of service link costs, network set-up costs and production costs involved in setting up an IPN in India;
2. Reduce transaction costs of cross-border trade as soon as possible. This can be done by improving customs clearance, developing port-related infrastructure for faster customs clearance and creating a single window e-Trade initiative that integrates all agencies responsible for trade facilitation with total integrity;
3. Improve the current state of physical and institutional infrastructure for doing business in India; this would have a significant impact on the reduction of production and service-link costs involved in setting up an IPN. Private sector participation through domestic and foreign companies in improving physical infrastructure needs to be strongly encouraged. Elements of soft "institutional" infrastructure that supports development of IPNs, such as starting and closing a business, dealing with construction permits, paying taxes, trading across borders and enforcing contracts, needs to be made easier by policymakers. So far, reforms in this direction, although initiated recently, are still too few;
4. Develop an appropriate exit policy for labour in the manufacturing sector, and address current rigidities to make it more competitive vis-à-vis South-East and East Asian countries. Given the unionization of the organized workforce and associated political compulsions, implementing this effectively could be

challenging. However, a strong commitment to achieving this objective will have to be demonstrated if India is to be part of an IPN that selects it as the next global assembly centre;

5. Implement comprehensive-broad based PTAs covering services, investment, and the movement of labour, and allow them to play a supportive role with ongoing unilateral liberalization. There is also a need to design RoO that are simple and which do not increase the transaction costs of trade for PTA members. The current state of India's PTAs does not appear to be designed with the objective of reducing all costs involved in setting up an IPN. Therefore, a critical review is required of India's current PTAs, including more inputs from businesses to identify specific areas of gains from PTAs in order to create a business environment that makes India a potential assembly centre for global manufacturing activities in the near future.

The above recommendations also hold important implications for South Asia in general as most of the region's countries face policy challenges similar to those identified above and have yet to connect with global and Asian IPNs.

Given the size of the Indian economy, efforts to address the existing policy challenges to plug India into global and Asian IPNs will have to be pursued and coordinated at the national and State levels. With implementation integrity of these policies being the key to economic success, it is important that Indian policymakers do away with obsolete systems of governance and the compartmentalization mindset.⁸⁷ This will go a long way towards boosting India's position further in terms of its business environment, and to firmly establishing the country as one of the world's fastest-growing economies, making it attractive for both large and small MNCs to create a global manufacturing base as part of an IPN.

⁸⁷ See Asher, 2009.

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Annex

Estimating indices of trade overlap and intra-industry trade

1. Trade overlap

Abd-el Rahman (1991) and Ando (2006) broke down the trading of commodity j in terms of one-way trade or intra-industry trade. Trading of commodity j is regarded as one-way trade when equation (1) holds, while it is regarded as intra-industry trade if otherwise and intra-industry trade otherwise:

$$(1) \quad \text{Min}(X_{kj}, M_{kj}) / \text{Max}(X_{kj}, M_{kj}) \leq 0.1$$

where X_{kj} represents country k 's exports of commodity j to the world, and M_{kj} country k 's imports of commodity j from the world.

2. Intra-industry trade

The Grubel-Lloyd (G-L) index measures the ratio of net exports in a product category to its total trade in an index that takes values from 0 to 100. It also calculates the part of balanced trade (overlap between exports and imports) in all trade in a given industry i . The index is calculated by the following formula, with the G-L index for a given industry j denoted as

$$(2) \quad GL_{jx} = \frac{X_j + M_j - |X_j - M_j|}{X_j + M_j} = 1 - \frac{|X_j - M_j|}{X_j + M_j}$$

This index takes a value of zero if either X_i or M_i equals zero, implying no IIT, and if $X_i = M_i$, it implies a value of 100 and signifies complete IIT in that industry. However, this index is observed to measure an incorrect level of IIT, especially if trade imbalances are higher. Studies such as that by Rajan (1996) have argued that G-L is a degree of measure of IIT rather than the absolute amount. Distinction needs to be made between the level of IIT and the actual amount of IIT that takes place, and the degree or extent of IIT. Therefore the level of IIT is estimated separately for these two-way P&C manufacturing products as

$$(3) \quad L_i = 2 * \min(X_i, M_i)$$

for the i 'th industry where X_i is the amount of exports and M_i is the amount of imports in the same industry.

Brühlhart (1994) ascertained whether the change in trade volumes in these P&C manufacturing products during the periods analysed were due more to intra-industry or inter-industry trade. This measure, known as Marginal IIT (MIIT), is a transposition of the G-L index using first differences of trade flows, and is measured for the j 'th product as

$$MIIT_{jt} = 1 - \frac{|\Delta X_{jt} - \Delta M_{jt}|}{|\Delta X_{jt}| + |M_{jt}|}$$

(4)

where Δ stands for the difference between the values of exports and imports in the j 'th product over a specific period t . This index also takes values from 0 to 1, and in percentage terms goes from 0 to 100 as the G-L index. An MIIT value close to 100 indicates marginal trade during the periods analysed to be of the intra-industry variety, and inter-industry if the MIIT index is 0 or close to it.