

India's Participation in Electronics Industry Value Chains: A New Analytical Framework and A Case Study Analysis

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*Smitha Francis and Murali Kallummal**

[Abstract: *Several policy reforms carried out by successive Indian governments since the mid-2000s have focused on attracting FDI to promote global value chain (GVC) engagement by Indian electronics firms. The paper examines the nature of GVC participation of foreign-invested Indian electronics firms, based on a critique of existing approaches for assessing GVC participation. A new analytical framework is developed, which integrates macro policy aspects of trade and FDI liberalisation and micro-level policy incentives with firm-level business strategies. It is argued that 'importing-for-domestic sales' must be considered as one of the forms of GVC engagement, which the current conceptualisation of GVC participation as 'importing-to-export' excludes. The nature of value chain participation is assessed through an analysis of related and non-related party transactions using firm-level financial and customs trade data. This methodology is used to analyse the value chain engagement of a leading domestic market-oriented mobile phone and consumer electronics subsidiary, Samsung India Electronics Ltd. While the FDI-led production restructuring associated with FTAs has been expected to lead to improved efficiency for firms in the participating countries, the analysis found that the gains expected from greater inter- and intra-industry specialisation and economies of scale accrue predominantly to the lead firm, which controls and coordinates the network transactions within its subsidiaries and group associates. Domestic backward linkages for higher value added services were also with related parties. Consequently, there*

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has been rising net foreign exchange outflows from the Indian subsidiary. Sustainable FDI-productivity-investment nexus cannot be achieved with net foreign exchange outflows from foreign-invested companies, and the latter cannot be reversed without establishing the linkages of foreign-invested firms and imported technology with a homegrown supplier base. Several industrial policy suggestions are made towards incentivising local linkages and domestic innovation by foreign-invested firms.]

Keywords: *Electronics industry, FDI, global value chains (GVCs), technological upgrading, domestic value addition, exports, import dependence, intra-industry trade (IIT), trade in value added (TiVA), related party transactions, intra-firm trade, free trade agreements (FTAs), industrial policy, Samsung Electronics India Ltd, foreign investments, Make in India, Phased Manufacturing Program (PMP), Production-Linked Incentive (PLI) Scheme, mobile phone manufacturing*

I. Integrating into Global Value Chains

For nearly three decades now, successive Indian governments have continuously liberalised the national FDI regulatory framework in ambitious drives towards attracting foreign direct investments (FDI). These have been carried out presumably for achieving East Asian-like industrial development growth, which was perceived as FDI-driven export-led growth under passive industrial policies.¹ But in addition to unilateral liberalisation of FDI policies with these aims, India dramatically increased her participation in bilateral and regional free trade agreements (FTAs) from around the mid-2000s with the purported objective of enabling the country's integration into global value chains (GVCs). The argument has been that the reduction/elimination of tariffs and enlargement of markets through these FTAs will significantly help increase export-oriented FDI from multinational corporations (MNCs) linked to GVCs and enable India to expand exports (Francis and Kallummal 2013 and Francis 2015). India's FTAs, especially with the East and Southeast Asian economies, were argued to offer mutually beneficial linkages to the partner countries through dynamic industrial restructuring within the region. Both the India-ASEAN Free Trade Agreement (FTA) and the India-South Korea Comprehensive Economic Partnership Agreement (CEPA) came into force in January 2010, and was followed by India's CEPA with Japan in 2011. The ensuing production restructuring was expected to lead to greater competition and improved efficiency; as well as gains from greater inter- and intra-industry specialisation, economies of scale, and learning-by-doing.²

In particular, the electronics industry was expected to benefit from these FTAs with ASEAN, South Korea and Japan—countries deeply integrated into electronics value chains

¹ Francis (2019) called this the 'flying geese syndrome'. See Rao and Dhar (2018) for an analysis of the nature of the policy regime and its outcome on the kind of FDI inflows that India has attracted and Francis (2019) for an analysis of FDI policies in the specific context of GVCs.

² See the literature review in Francis (2015).

regionally and globally. For imports originating from South Korea, Japan and the ASEAN countries, the FTAs extended and deepened tariff liberalisation in the electronics industry (Francis 2016 and 2019).³ These FTAs were argued to improve India's export competitiveness through greater access to "more competitive" electronics parts and components from these countries and increased FDI-led global value chain integration.

However, when we account for the various types of incorrect classifications found in official FDI data, the electronics manufacturing sector has received only a tiny part of the total FDI into India. Rao and Dhar (2016) carried out a pioneering and comprehensive analysis based on individual FDI inflow data compiled from the newsletters of the Department for Promotion of Industry and Internal Trade (DPIIT). Analysis of "real FDI" inflows⁴ showed that such inflows into the electronics sub-sectors namely: (i) office, accounting and computing machinery; (ii) radio, television & communication equipment; and (iii) medical, precision and optical instruments and watches; were quite small. The study was based on an in-depth analysis of individual FDI inflow data compiled from the newsletters of the Department for Promotion of Industry and Internal Trade (DPIIT). Analysis by the authors based on similar individual FDI inflow data found that such inflows into 106 firms involved in either manufacturing or trading of electronics products totalled US\$ 2.7 billion during 2004-14. The number of foreign-invested firms in electronics manufacturing firms alone was 63, which attracted total foreign investment of about US\$ 1.8 billion. The remaining 43 firms were involved in only trading of electronic products. Based on official data from April 1, 2000 to June 30, 2015, Niti Ayog (2016) also found that the electronics industry received only \$1.68 billion or 0.66% of the total FDI inflow of \$258 billion FDI inflow.

Based on available evidence, some analysts had been pointing out that such low levels of inward FDI into India's electronics industry are in fact related to the liberal FDI policy regime in place since 1991 and the nature of trade liberalisation in the industry. The latter meant that large foreign original equipment manufacturers (OEMs) and electronics manufacturing service (EMS) providers have had no incentive to invest in local production in India (Ernst 2014, Saripalle 2015, and Francis 2016). As a result, they typically set up only final assembly plants (Ernst 2014, p.8). The low levels of average inflows led Rao and Dhar (2016) also to raise doubts about the extent of localisation of production by these foreign-invested companies. In fact, electronics had become the second largest import among India's imports by 2017-18.

³ Detailed analysis of the tariff liberalisation in the electronics industry under these three FTAs at the HS 6 digit level and HS 8 digit level can be found in Francis (2019) and Francis and Kallummall (2020) respectively.

⁴ Rao and Dhar (2016) consider foreign investors as belonging to two broad categories: one, who merely seek return on their investments and the other perceiving the host country operations as integral to their global operations. The first category essentially comprises a host of financial investors such as PE funds, FIIs, etc. The second category is considered as real FDI (RFDI).

The issue of the extent of local production undertaken by foreign-invested electronics firms is of critical significance in light of the fact that the Niti Ayog has continued to recommend that India needs to forge more FTAs to realise duty free markets for Indian electronic products, while attracting large-scale foreign investments to become globally competitive (Niti Ayog 2016, p. 23). The Niti Ayog study recommended to the government to introduce ten-year tax holiday to anyone investing \$1 billion and creating 15,000 jobs in electronics industry in order to bring much-needed large-scale manufacturing to India's electronics industry. The logic provided for the high investment thresholds is that only firms that promise to create substantial number of good jobs and help build up the industry will use the tax benefits. According to Niti Ayog, such firms also promise to support domestic small and medium enterprises (SMEs) as ancillaries (*ibid.*, p. 24). While several policies targeting increased domestic manufacturing and improving domestic value addition have been in place since the early 2010s,⁵ the above expectations appear to underlie several recent promotional schemes, including the Production-Linked Incentive (PLI) Scheme introduced in 2020. The hope has been of generating a large volume of export-oriented foreign investments into the industry with the expectation that the latter will build up the domestic supplier base. It is therefore very important to understand the impact that existing policies have had on foreign investors' operations in the country as reflected in their participation in electronics value chains and contribution to export performance, as well as the extent of their local linkages vis-a-vis import intensity.

There have been studies looking at the contribution of foreign-invested firms to exports, imports, productivity, foreign exchange earnings, etc. at the macro level and in specific industries. Such papers are reviewed in Rao and Dhar (2016 and 2018), Verma (2016 and 2019) and Francis (2019). Studies like Verma (2016 and 2019), Saripalle (2015), etc. established the heavy import dependence of foreign-owned firms in India, which points to the absence of significant backward linkage creation by them. Saripalle (2015) in fact found that import dependence in the electronics firms surveyed in Tamil Nadu increased with their size. In the specific case of mobile phones, Misra and Shankar (2018) and Mani (2019) showed that even as the imports of mobile phones showed a declining trend, the imports of parts and components have been steadily increasing. On the other side, the Annual Census on Foreign Liabilities and Assets (FLA) of Indian Direct Investment Companies published by the Reserve Bank of India (RBI) since 2012-13 has shown that the net export earnings of foreign subsidiaries in the manufacturing sector were negative, including in computer, electronic and optical products.

⁵ See Mani (2019) for a detailed discussion of several policies that have been introduced since the early 2010s beginning with the National Telecom Policy (2012), National Manufacturing Policy (2012), Preferential Market Access (PMA) Policy (2012) for domestically manufactured telecom equipment, Phased Manufacturing Programme (PMP), National Electronics Policy (2019), Digital Communications Policy (2019), etc.

From the perspective of the present study, the most relevant recent work is that of Verma (2019), which analysed 469 select manufacturing sector FDI firms to understand their intra-firm trade through related party transactions for 2014-15 and 2015-16. Related party transactions comprise trade in goods and services as well as other transactions such as royalty payments, between an Indian subsidiary and the firms affiliated with its parent firm or holding company across countries (more discussion follows in Section 3). Complementing studies like Rao and Dhar (2016 and 2018), Verma (2019) established that a majority of the selected FDI manufacturing firms, in particular, subsidiaries were associated with net foreign exchange losses on the current and trade accounts of balance of payments (BoP), even after more than 10 years of operations in India. Further, more than two-thirds (70-72%) of foreign exchange outflows and total foreign trade flows of the studied manufacturing sector subsidiaries were linked to some foreign related party. This in turn was found to be significantly associated with transfer pricing manipulation and profit shifting conduct associated with the emergence of tax havens. Again, electronic products and computers were among the high-technology sectors that experienced the highest levels of intra-firm trade. Verma (2019) also found that about 30 per cent of intra-firm exports and more than half of intra-firm imports during 2014-15 and 2015-16 by the sample FDI companies were conducted with India's FTA partners. The study mentioned that the major shares of intra-firm trade in goods and services for subsidiary firms in various high technology sectors can be interpreted as reflecting the possibly significant involvement of Indian subsidiaries in their parent firms' production networks as buyers of input or finished goods or technology.

However, there has been no systematic attempt in the literature to examine the nature of engagement of foreign-invested firms in industry value chains, including from the perspective of the implications of such FDI-led GVC integration for India's manufacturing sector development. Against this backdrop, the present paper explores Indian electronics industry's FDI-driven engagement with global value chains within a new analytical and methodological approach and presents a case study analysis of a major foreign subsidiary's engagement in electronics industry' value chains.

Following this introductory section, Section 2 presents a critique of the existing approaches in the literature on assessing GVC participation, which are based on analysis of intra-industry trade (IIT) or on trade in value added (TiVA). Section 3 presents an alternative framework for examining the nature of GVC participation by developing country firms and develops a methodology for assessing the same through an analysis of related and non-related party transactions using firm-level financial and customs trade data. Using this methodology, Section 4 presents the detailed case study analysis of a 100% foreign subsidiary, Samsung India Electronics Pvt Ltd, a leading domestic market-oriented mobile phone and consumer electronics subsidiary. Summing up the major findings, section 5 makes concluding observations on the implications of this type of FDI-led GVC engagement for the Indian electronics industry and makes policy suggestions on how to minimise the adverse outcomes.

II. A Critique of Existing Approaches for Assessing GVC Participation

Typically, developing country firms' engagement in GVCs has been considered to happen through any or a combination of the following possibilities:

1. Direct entry into export markets by indigenous firms;
2. Indirect entry of indigenous firms into export markets through sub-contracting or other non-equity forms of foreign alliance; or
3. An export strategy of foreign-invested firms located in the developing country.

Lead firms of value chains are continuously evolving strategies for generating and maintaining their core competencies and shareholder value, in response to, and often causing, policy changes across countries. They also dynamically change their organisational structures in response to multiple other factors, including technological changes. Given developments in organisational structures involving functional and geographic fragmentation these lead to, GVCs have grown in scale of operations and network complexity, involving multiple supplier-buyer relationships. There are various degrees of lead firm's investment, technical support, sub-contracting, and control in network firms. Increasingly dense networks have emerged, which involve arms-length market transactions, internalised transactions and those in between, geared to an increase in vertical and horizontal integration along value chains, with trade and investments organised within them (Francis 2019, p. 75). Whatever the form of relationship between lead firms and their network/value chain participants, the underlying business model built on asymmetric governance relations lies at the heart of lead firms' cost-cutting and rent maximisation strategies within GVCs, as William Milberg and Deborah Winkler established in their classic 2013 book 'Outsourcing Economics'.

There have been several advances in the FDI literature to deal with the constantly evolving complexities in value chains and different types of relationships between lead firms and other value chain participants including foreign affiliates. Yeaple (2003) had found that many firms engage in horizontal (market-seeking) and vertical (efficiency-seeking) FDI simultaneously, and placed them in a catch-all category called 'complex FDI'. Baldwin and Venables (2010) argued that most production disintegration processes are complex mixtures of two types of configurations—"spiders" and "snakes". Hanson, Mataloni and Slaughter (2001, 2005 cited in Baldwin and Okubo 2012) had already documented that sometimes foreign affiliates also act as wholesale distributors, while other affiliates produce for export to third markets (export platform FDI); or add value to inputs sourced from their parents/fellow subsidiaries/affiliates. Baldwin and Okubo (2012) considered all affiliates with intermediate levels of local sales and local sourcing as relating to 'networked FDI'. With the differentiation between vertical and horizontal FDI blurred, networked FDI concept seems to come the closest to understanding the various roles and forms of foreign affiliates within GVCs. However, this concept of networked FDI is still inadequate to

capture the prevalent GVC complexity, as it leaves out non-equity forms of engagement utilised by MNCs to engage and control various nodes of their value chains across different countries/industries.⁶

But even as internationalisation of both production and the services around it has given rise to complex value chains, the lack of reliable data on everything other than trade has traditionally meant that it is typically viewed as trade in goods that happens to be concentrated in parts and components. Thus it has been generally considered in the literature that production sharing between countries by MNCs involved in regional or global value chains typically leads to an expansion in two-way trade (simultaneous increase in exports and imports) between those countries, in particular, intra-industry trade (IIT) in intermediate goods. IIT has been differentiated as: IIT in horizontally differentiated (i.e. similar priced) products and IIT in vertically differentiated products (i.e. differing by quality, and hence, price) (Fontagné, Freudenberg and Gaulier 2005). Both HIIT and VIIT can be considered as part of GVC trade given that GVCs increasingly involve horizontal and vertical production sharing strategies.⁷ However, VIIT is considered to be characterised by differences in created capabilities (rather than static factor endowments). At a very disaggregated level, a comparison of unit prices in VIIT between bilateral partners has therefore been used to analyse the difference in technological capabilities between any two trading partners.

Detailed analysis of India's bilateral intra-industry trade (IIT) till 2014 was carried out by Francis (2019) using this methodology in the case of all the major electronics trade partners of India. This study showed that the observed rise in both horizontal and vertical IIT contributed to India's rising trade deficit with each of the partners. However, the analysis based on trade data even at the 6 digit level did not provide conclusive evidence to suggest that the observed increase in intra-industry trade (IIT) in the electronics industry was due to India's involvement in electronics industry GVCs.

There is a need therefore to re-consider our understanding of intra-industry trade and its usefulness in understanding value chain involvement, also because of the following aspects that have been neglected. As discussed in Francis (2019), not all increase in two-way trade observed in India's electronics trade at the HS 2 digit level is considered as IIT. An example of such a case is the following: even as there was significant two-way trade in HS Chapter 84 (non-electrical machinery), the country was importing HDDs as an intermediate into the production of a final good, computer, for the domestic market. This comes only under imports and therefore is a case of inter-industry trade when we use the above methodology (and therefore gets eliminated in the first step of delineating one-way trade from two-way trade). That is, intermediate imports used for final good production in India—for domestic consumption (or backward participation in GVCs) —are not

⁶ See the detailed critique and discussion in Chapter 3, Francis (2019).

⁷ See the detailed discussion in Chapter 4, Francis (2019).

considered as part of India's participation in GVCs in this methodology. On the other side, the computer input/output units exports (manufactured domestically) that go into foreign production/consumption, is actually part of GVC trade, but it does not get captured in this methodology because as they come only under exports (again, one-way trade). So this kind of forward participation in GVCs is also not considered in this methodology. Thus IIT analysis using even disaggregated trade data at the 6 digit level (and in some cases even at the 8 digit level) leaves out several forms of GVC engagement.

These problems in using IIT as the key feature in identifying GVC trade arise from the conceptualisation that GVC participation is erroneously considered only as 'importing-to-export'. Under the current understanding, foreign-invested firms in the Indian electronics industry contribute to the vertical integration strategy of their parent firms by importing raw materials or intermediate products into the country, either for exporting higher value added intermediate products to other countries or for exporting final products. However, we argue that imports for domestic production should also be considered as part of GVCs, even if the network is not coordinated centrally, especially in an industry like electronics. This is all the more critical given that the incentives offered to lead firms by overlapping FTAs with cumulative rules of origin can lead increased import intensity of their production for the domestic market (more later).⁸

Input-output (I/O) analyses has been considered to provide a useful alternative to trade data, given that they classify goods according to their use (as intermediate or as final good), and also include information on inputs of and in services sectors (Francis 2019). As Baldwin and Lopez-Gonsalvez (2013: 8) clarified, a nation's imported intermediates from a given partner usually contain intermediates from third nations and even from the nation itself. When the recursion is fully worked out—so that the origin of all primary factor inputs in exports is identified—we have “value-added trade”. This is how studies began examining gains from GVC engagement after the Trade in value-added (TIVA) dataset was jointly released by the OECD, WTO and UNCTAD in May 2013.

However, it must be noted that there is no internationally agreed methodological framework for measuring trade on a value-added basis (IMF 2013: 7). Measures of trade on a value-added basis have therefore focused on the use of international input-output (IO) tables, which have been constructed by combining the national input-output tables available from national statistical agencies. Given that trade in value added aims to capture only the domestic content/value that countries add to goods and services (and not the gross value of goods and services traded), it is expected to give a relatively better picture of the benefits of GVC participation. However, as noted by Baldwin and Lopez-Gonsalvez (2013, p. 11), value-added trade data differs from I2P 'importing-to-produce' and 'importing-to-export' measures in that they are much further removed from real world trade flows. Working out the recursion involves simultaneous manipulations of all nations' input-

⁸ See Chapter 3, Francis (2019), pp. 103-105. See also Francis and Kallummal (2020).

output tables. Further, errors in any of the national IO tables will produce errors in all value added trade flows.

An equally or more important drawback is again with the conceptualisation and definitions underlying the assessment of GVC participation using the TiVA database. Most studies define backward integration, backward participation index, etc. based on the value of imported inputs in the overall exports of a country or for exports of a particular industry. Even though later revisions began considering forward participation (domestic value addition going into exports),⁹ the major disadvantage is that imported inputs going into production for the domestic market or domestic consumption are excluded, as in the case of IIT. Including the latter into the assessment of GVC participation has significant implications for developing country policymaking.

III. A New Analytical Framework and Methodology

Assessing a country's participation in GVCs therefore consists of a number of conceptual and methodological aspects which need to be combined in a new analytical framework. In contrast to existing approaches, it is proposed that a new framework should combine macro policy aspects of trade and financial/investment liberalisation with firm-level business strategies for achieving competitiveness. This will enable us to derive information about value chain network relations that are currently missing in GVC analyses based on existing approaches.

Following Francis (2016 and 2019), it is hypothesised that rapid trade liberalisation under the ITA-1 and the subsequent WTO-plus liberalisation under India's comprehensive FTAs with East and Southeast Asian countries that are integrated into GVCs, have significantly changed the incentives facing producers in the Indian electronics industry. At one level, in the context of a liberal investment policy regime that had nil or ineffective industrial policy measures in place to develop competitive indigenous production, backward linkages and technological capability build-up, deep trade liberalisation under overlapping FTAs removes the tariff-hopping and other policy-driven incentives for MNCs to maintain parallel operations in India along with other countries for the same product lines (Francis and Kallummal 2013 and Francis 2015). Wherever MNCs can meet the demand in specific regional or even global markets in particular products through affiliates in particular countries, they will choose to close similar production facilities in others (Kumar 2007). That is, while enlarging the market, FTAs drive MNCs to rationalise their operations to exploit the locational advantages of existing operational base, in the absence of industrial policies that require local manufacturing in India. At another level, in the absence of industrial policies to build up national technological capabilities and a competitive domestic production and supplier base, deep and broad trade liberalisation changes the

⁹ See for instance, Banga (2013), Gupta (2016) and Banga (2016).

incentives for indigenous firms' also in different ways. Such tariff liberalisation sans industrial policy will:

- increase their incentives for importing intermediate products from FTA partners to carry out local assembly of final products; or
- completely remove their incentive to undertake any local production/assembly and lead to increased imports of final products; or/and
- increase incentives for outward FDI. (Francis 2019)

These in turn has implications for domestic firms' engagement in GVCs. If intensive and extensive trade liberalisation (as under India's overlapping FTAs with ASEAN, South Korea and Japan) has led to increased imports of intermediate products for final assembly in India, or imports of final products directly from partner countries to serve the domestic market by foreign-invested or indigenous firms, India will be serving largely as the market for final products in some value chains. This is also clearly a part of GVCs, especially when the import for domestic "production" in an Indian subsidiary or associate is part of the overall division of labour strategy of the parent firm. Electronics industry can be considered a typical example of this.

This means that the forms of developing country firms' engagement in GVCs discussed in the beginning of Section 2 must include MNCs' strategy to serve developing country domestic markets based on imports from their networks/supply chains. Similarly, indigenous firms importing-to- produce for the domestic market are also participating in the value chains. In this paper, the focus is on the former case of India's foreign-invested firms' GVC participation.

In order to be able to fathom the connections between trade and investment liberalisation, firm strategies, and the accompanying production and trade restructuring arising from GVC engagement, we therefore propose that GVC engagement needs to be examined at the firm-level through an analysis of intra-firm and inter-firm transactions of foreign-invested companies. This makes it possible to evaluate their equity and non-equity forms of value chain engagement, import intensity and domestic backward linkages, contributions to exports, technological upgrading, etc.

In this paper, we analyse the nature of value chain participation of a 100% foreign subsidiary, namely Samsung India Electronics Private Limited. Samsung has been an active player in consumer electronics and hand-held phones. In particular, the company has been among the largest TV and smart phone sellers in India since many years.¹⁰ The

¹⁰ Overall, Samsung has dominated the Indian smart phone market since 2013. Although it had lost market share and the top rank to the Chinese firm Xiaomi in between, by the second quarter of 2018, Samsung had accounted for the largest market share of 29% of the Indian smartphone market again. See Tech Desk (2018) 'Samsung beats Xiaomi as top smartphone vendor in India in Q2 2018: Counterpoint', Indian Express, 25 July, <https://indianexpress.com/article/technology/mobile-tabs/samsung-leads-xiaomi-in-q2-2018-smartphone-shipments-counterpoint-5274207/>. Although Xiaomi

choice of the firm is justified by the fact that the government has been focusing its promotional schemes (including the recently-launched PLI scheme) for developing a domestic electronics ecosystem by actively seeking FDI from lead MNCs and their sub-contractors into the mobile phone segment.

One of the major sources of data for the case study analysis are the foreign exchange transaction disclosures and related party transaction disclosures of the company available in its annual financial statements across years available from the Ministry of Corporate Affairs (MCA). Related parties cover holding company, ultimate holding company, fellow subsidiaries, associates, promoters, key management personnel and other related entities.

Typically, there are several transactions between a host country subsidiary with its parent firm/holding company as well as with fellow subsidiaries and associates. These intra-firm transactions involve:

- trade in goods (sale or purchase of fixed assets, finished goods, raw materials and components, etc.);
- trade in services (including software, communications, etc.);
- income transfer in other ways such as income from sales support undertaken by the Indian firm for the parent firm;
- expenses incurred by the Indian firm on account of royalty payments;
- expenses incurred by the Indian firm on account of remuneration (and other employee benefits) of key foreign management personnel;
- expenses incurred by the Indian firm as fee for technical assistance or consultancy received (legal and professional fees), advertisement, travelling, warranty, repairs and maintenance, etc.
- expenses incurred on account of financial transactions including dividend and interest payments related to inter-corporate deposits, equity infusion, loan guarantees, loans and advances, etc.

Given that related party transactions reflect not just the patterns of trade in goods, but also services, analysis of related party transactions can offer a holistic picture of the Indian subsidiary's relative position with the global value chain of the parent firm.

For capturing the trade within the related parties, we consider only the holding company, ultimate holding company, fellow subsidiaries and associates.¹¹ The firm having significant control over the Indian company holding more than 50 per cent ownership is considered as the holding company. In this case, the holding company is Samsung Electronics Co. (South Korea) and the Samsung Group is the ultimate holding company. Firms under common control by the parent/holding company in India and abroad, as well as the Samsung Group associates and their subsidiaries are all considered as fellow

had again topped the Indian mobile market subsequently, Samsung became the leader yet again in the third quarter of 2020.

¹¹ Related party disclosures also include payments to key personnel in managerial positions.

subsidiaries.¹² All other firms are considered as unrelated firms. A total of 105 related parties (that is, 104 fellow subsidiaries apart from the holding company) were identified on the basis of Samsung India's Annual Reports from different years.

However, the details of foreign exchange transactions and related party transactions are frequently under-reported or even unreported by many companies. Further difficulty arises from the fact that there are numerous ways in which foreign exchange transactions and related party transactions are reported by companies. There is no uniformity in the manner of reporting of the above listed categories, not just across countries, but often even between different years for the same company. Another disadvantage faced by researchers while using the forex and related party information in Annual Reports, even where the information is provided, is the aggregation of parts and components trade under "raw materials". Often, the break-up of traded goods between final goods and raw materials is not provided at all. Product information under raw materials, final goods etc. is also unavailable. Moreover, the break-up of expenses on the purchase of goods between imports and indigenous purchases, or the product-wise composition of exports or imports are also not available.

It must also be noted that while related party disclosures have been mandatory since April 1, 2004 under the Indian Accounting Standard (Ind AS) 18, these disclosures relate only to "material transactions" or transactions in excess of 10 per cent of total related party transaction of the same type. Moreover, these are all accounting statements, which only reflect the financial aspects of such transactions. Although the financial Statements contend that all related party transactions have been entered into in the ordinary course of business and have been carried out at an arm's length, studies have shown that these are significantly prone to transfer mis-pricing.¹³

To overcome the above mentioned issues with company reports, we supplemented the information on related party transactions and other firm-level information from the Annual Reports and CMIE Prowess database, with firm-level customs trade data for 2018-19 from a commercial market research firm. In addition to product details, the trade data included supplier and buyer names and their addresses, port of origin/destination, and their export and import values in 139 major HS 8 digit level electronics imports and exports belonging to HS chapters 84, 85 and 90 (hereafter referred to as "major electronics

¹² Globally, the holding company Samsung Electronics Co.'s subsidiaries totaled 240 in number as of December 31, 2019. It must be noted that the holding company Samsung Electronics Co. is itself only one of a total of 60 domestic affiliates of the Samsung Group headquartered in South Korea. Samsung India's 2018-19 Financial Statement lists Samsung Group associates and their subsidiaries as "Associates of holding and fellow subsidiaries", as a different category separate from "fellow subsidiaries". But for the purpose of this study, we have considered them together as part of the ultimate holding company's broader global value chain.

¹³ See the in-depth analysis in Verma (2019).

imports/exports”), wherever the firm has been among the top five importers or exporters in any of these products.¹⁴

Major electronics exports/imports were arrived at using the following methodology. In the first step, a list of 2056 products at the HS 8 digit level were identified as electronics products, which includes the OECD’s list of ICT products, the WTO’s ITA-1 and ITA-2 lists of products, and a few other products identified by the authors as electronics products following technological advancements. Out of these products, top 100 exports and top 100 imports were selected based on their average shares in the total exports and imports (for 2056 products) during 2017-18 and 2018-19, using trade data from the Department of Commerce.¹⁵ In the final step, all these top traded products belonging to HS Chapters 84, 85 and 90 were clubbed to arrive at a unique list of 139 “major electronics products” at the HS 8 digit level.¹⁶ In the case of the firm selected for the present case study, these major electronics products constituted 70% of the company’s total imports and about 59% of its total exports in 2018-19.¹⁷

IV. Nature of FDI-Driven GVC Participation: A Case Study of Samsung India Electronics Pvt Ltd

Samsung India Electronics Pvt Ltd is a 100 per cent subsidiary of the South Korean conglomerate, Samsung Electronics Company Limited.¹⁸ It was incorporated in India in 1995 and operates two factories, in Noida, Uttar Pradesh and Sriperumbudur, Tamil Nadu. The Delhi office is the regional headquarters for Southwest Asia, while Samsung India has a 100% subsidiary in Nepal, Samsung Nepal Services Pvt Ltd, for services. The company has engaged in manufacturing and trading of electronics products in the following five business segments:

- a) Audio Visual products: This segment covers operations relating to colour televisions, colour monitors, audios, digital video players, video disc players, camcorders and cameras.

¹⁴ It must be noted that while the Annual Reports give an assessment of the extent of related party transactions in services too, the trade data excludes services.

¹⁵ This was due to the financial constraints in purchasing the full set of data covering the 2056 products. The firm-level customs trade data was purchased under the ICSSR project from a commercial market research company.

¹⁶ These “major electronics products” constituted average shares of about 79% of India’s electronics imports and 66% of electronics exports during the two-year period 2017-18 to 2018-19. The lower share in the case of exports reflects the highly diversified nature of India’s electronics exports.

¹⁷ The lower share captured in the case of exports reflects the fact that Samsung Electronics India was a major exporter only in a few of the 139 major electronics products despite the rise in its exports in 2018-19.

¹⁸ According to the Annual Report, while Samsung Asia Pte. Ltd., Samsung’s Singapore-based subsidiary, is a second promoter of SIEL, it held just 18 out of the total number of 216,787,504 shares.

- b) Home appliances: This segment covers washing machines, air conditioners, refrigerators and microwave ovens.
- c) Network products: This segment covers operations relating to setting up of network infrastructure.
- d) Hand held phones: This segment covers mobile phones and accessories.
- e) Software development and export

Although audio visual products like colour TVs and household appliances such as refrigerators and washing machines used to dominate Samsung's operations in India traditionally, it emerged as a major mobile phone "producer" by the mid-2010s. In 2014-15, hand-held phones accounted for about 62% of the company's turnover, followed by network equipment (14%) and colour TVs (12%). In 2018-19, these shares stood at 61%, 16%, and 7% respectively.¹⁹ The other significant products in 2018-19 were refrigerators with 10.5% share, followed by software development & export with a share of 1.6%.²⁰

In the ensuing analysis, we first use the information available from the Annual Reports to examine the importance of the company's related party transactions for assessing the Indian subsidiary's value chain participation. This analysis covers trends in the years from 2006-07 to 2018-19. We then use detailed trade data for 2018-19 for examining the nature of the company's recent network transactions on the goods side.

IV.1 Findings from Annual Reports

Samsung has long been a domestic market-oriented subsidiary as seen from the fact the majority of its production and sales were directed towards the domestic market. The share of total revenue coming from domestic market sales, which was 95 per cent in 2006-07 went up to 97 per cent during 2009-11, before coming down to 95 per cent again in 2012-13. Thus foreign exchange earnings had accounted for just about 10 per cent of gross income in 2008-09, before halving to 5 per cent in 2012-13. While forex earnings mainly owed to software exports from 2009-10,²¹ there has been an increase in goods exports in recent years.

¹⁹ Samsung's share in the Indian smart phone market stood at 24% in Q3 2020. See <https://telecom.economictimes.indiatimes.com/news/samsung-pips-xiaomi-to-become-indias-top-smartphone-brand-after-2-years-report/78913110>. On the other side, Samsung held about 27% market share in the Indian TV market. In the case of refrigerators, in 2019, Samsung's share stood at about 34% overall, while it held about 43% share in the frost-free refrigerator market. It was also the largest brand in microwave ovens and the fastest growing in washing machines. See <https://economictimes.indiatimes.com/tech/hardware/samsung-has-become-the-countrys-largest-refrigerator-maker-in-the-second-half-of-last-calendar-year-senior-vp-samsung-india/articleshow/73523804.cms>

²⁰ Samsung also has operations in other segments covering information technology, health and medical equipment and memory segment; however, revenue from the other segment was not significant enough during 2018-19 to be reportable.

²¹ However, between 2006-07 and 2008-09, goods exports had comprised an average 76% of Samsung's total export earnings. This was linked to exports of home appliances.

Consequently, there has been a decline in the share of domestic sales to 92% of total revenue in 2017-18. With a dramatic rise in goods exports during 2018-19 dominated by mobile phones (as we will see later), the share of domestic sales in total revenue declined significantly to about 79% in 2018-19. Foreign exchange earnings thus comprised about 21% of gross income in 2018-19 (Table 1). In particular, goods exports comprised nearly 20% of total revenue in 2018-19. That is, domestic sales still constituted the majority (80%) of Samsung India's total revenue in 2018-19.

Table 1. Composition of Samsung India's revenue in terms of markets and products, 2017-19

<i>Revenue component</i>	<i>2017-18</i>	<i>2018-19</i>	<i>2017-18</i>	<i>2018-19</i>
	<i>Rs. Million</i>		<i>Per cent share</i>	
Turnover/Revenue from operations (1+2) / A+B	593709	706277	100.0	100.0
1. Domestic revenue (goods & services)	544073	558350	91.6	79.1
2. Export revenue (goods & services)	49343	147315	8.3	20.9
A. Total revenue from sale of goods (A.1+A.2)	568877	682780	95.8	96.7
A.1 Domestic turnover for goods (Share in A)	530244	546714	93.2	80.1
Domestic sale of manufactured goods (Share in A.1)	418097	379916	78.8	69.5
Domestic sale of traded goods (Share in A.1)	112147	166798	21.2	30.5
A.2 Export turnover for goods (Share in A)	38633	136066	6.8	19.9
Export sale of manufactured goods (Share in A.2)	5020	84829	13.0	62.3
Export sale of traded goods (Share in A.2)	33613	51237	87.0	37.7
B. Total revenue from sale of services (B.1+B.1)	24539	22885	4.1	3.2
B.1 Domestic revenue for services	13829	11636	56.4	50.8
B.2 Export revenue for services	10710	11249	43.6	49.2

Source: Authors' calculations based on Annual Report, 2018-19

But even as the share of foreign exchange earnings in Samsung India's gross income went up from only 5 per cent in 2012-13 to 21% in 2018-19, the company's total foreign exchange expenditure kept increasing continuously. Net foreign exchange outflows from Samsung India, which had continuously risen from Rs. 14.2 billion in 2007-08 to Rs. 169.9 billion in 2012-13, increased further to Rs. 431.2 billion in 2018-19.

Imports had constituted as much as 98 per cent of the total forex expenditure in 2006-07.²² Although this share declined slightly to 96.4% in 2011-12 and to 93.1% in 2014-15 (despite

²² In 2007-08 and 2012-13, this share came down on account of a rise in the share of royalty payments to the South Korean parent firm by the Indian subsidiary.

the jump in imports from 2011-12), by 2018-19 it had gone up again to nearly 96% of Samsung's forex expenditure, parallel with the increase in exports.

Breakup of the goods imports figures available for four years until 2010 revealed that they were dominated by raw materials and components in the range of 62–67 per cent in the earlier years, before dropping to 57 per cent in 2009–10. In fact, imports constituted about 76 per cent of the total raw materials and components consumed by the company in 2010–11, up from 66% in 2006-07.²³ The import intensity of parts and components consumed by the company increased further to about 84% in 2014-15. On the other side, the share of finished goods in total imports which ranged between 29 and 32 per cent in the first three years increased to 39 per cent in 2009–10. (In 2014-15, the share of raw materials and components in total imports stood at 55% and that of final goods stood at 42.3%)

In the case of Samsung's related party transactions also, it was observed that purchase of raw materials and components dominated total payments to related parties only until 2010-11. Its share in total related party expenses, which had stood at 71 per cent in 2006-07, decreased to 32 per cent by 2009-10.²⁴ As seen in the case of total imports, related party expenses too came to dominated by finished goods purchase in 2009-10 with a share of 60 per cent of the total.

Although purchases from fellow subsidiaries had dominated final goods imports until 2008-09, in 2009-10, Samsung India obtained as much as 78 per cent of its finished goods imports from the parent firm. The share of the parent firm in finished goods imports went up to 91 per cent in the subsequent years and stood at 99 per cent in 2012-13. Indeed, as a result of these shifts in the composition of purchases from the parent firm, the parent firm accounted for the majority of Samsung India's total related party expenditure from 2009-10 onwards. In 2018-19, parent firm's share in total related party expenses stood at about 60%.

In general, import of raw materials and components occurred from fellow subsidiaries abroad, except in 2011-12 when the share of the holding company was greater. Significantly, in 2009-10, all imports of raw materials and components were purchased from the parent firm.

The increased trend in the purchase of finished goods from 2009 onwards reflects the impact of production rationalisation carried out by the parent firm in anticipation and response to the preferential trade liberalisation that India was to initiate under the Free Trade Agreement (FTA) with ASEAN and the Comprehensive Economic Partnership Agreement (CEPA) with South Korea, both of which came into force in 2010. The shifts in Samsung India's procurement clearly indicate that the India-South Korea CEPA had

²³ Further, imported spare parts constituted an average share of 66 per cent of total spare parts consumed between 2006 and 2011.

²⁴ With the component 'trade payables' constituting nearly 21% of related party expenses, the final break-up of related party purchases between parts and components, and final products could not be estimated for 2012-13.

changed the parent firm's incentives to shift the procurements of the Indian subsidiary so dominantly in favour of itself. However, in 2018-19, the share of raw materials and components in total imports stood at 66%, which was the range in the pre-2010 years. This indicates that the intervening years between 2012-13 to 2018-19 saw further re-organisation of its value chain configuration by the lead firm to make use of the cumulative rules of origin under the ASEAN FTA, which sought to consolidate existing production bases in Vietnam, Thailand, China, etc. while expanding the production base in Vietnam in particular. This validates the arguments in Francis (2015 and 2019) that in the absence of pro-active industrial policies that create incentives to increase domestic value addition, these FTAs nullified incentives for local sourcing by large MNCs.

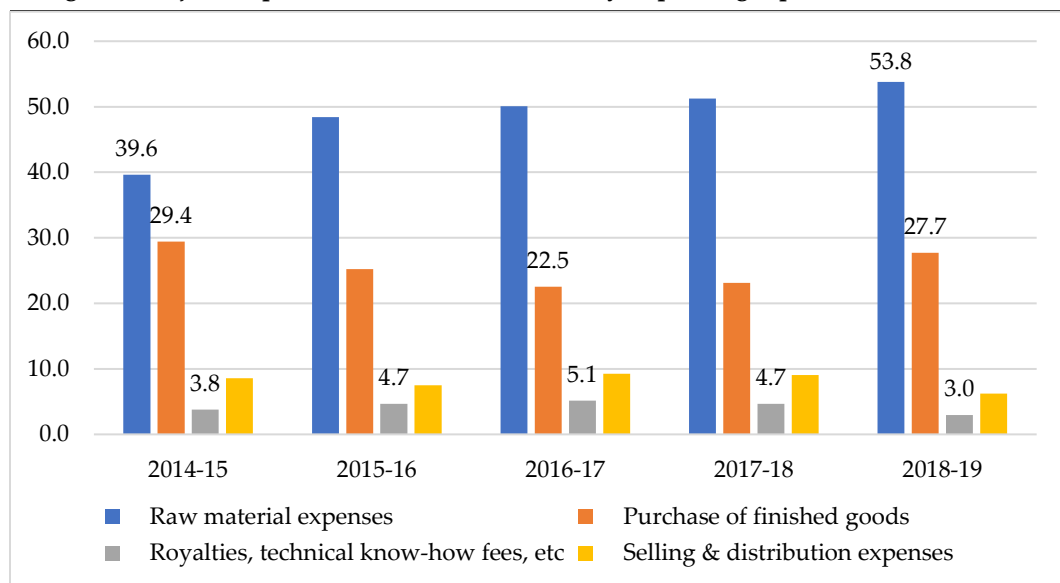
An example of the reorganization of production facilities accompanying trade liberalisation under FTAs is observed in the case of monitors. Samsung India was initially producing LCD monitors along with flat panel TVs, LED TVs, etc. But during 2007-08, the company discontinued its monitor line operating from its manufacturing facility at Noida (NCR) to gain cost advantage from imports of monitor (more later) while the ASEAN FTA was being finalised. Similarly, the company also started importing TVs and refrigerators from Thailand and other countries.

These observations are corroborated in Figure 1. Between 2014-15 and 2018-19, the share of raw materials in Samsung India's operating expenses increased steadily. At the same time, the share of finished goods also went up between 2016-17 and 2018-19. In 2018-19, the company's import intensity was still as high as 85%.²⁵

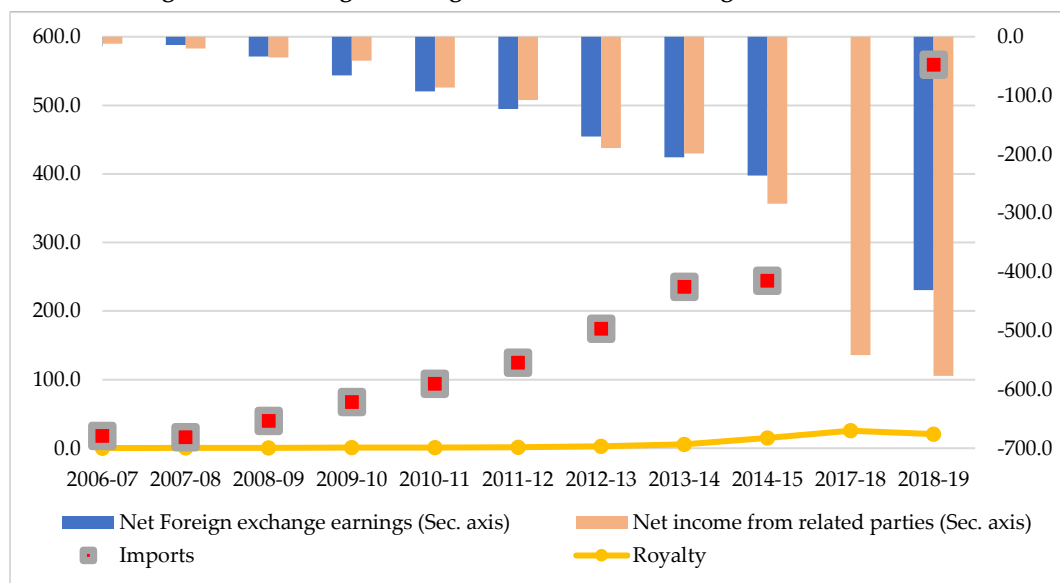
On the other side, in the case of income from related parties, there has been significant fluctuation in composition across years. Income from export sales and reimbursement of marketing, service and other expenses dominated total income from related parties in 2006-07 and 2007-08. Income from software exports dominated in 2009-10 and 2011-12, while it was again goods exports that dominated in 2009-10 and 2012-13. The share of income from related parties on account of reimbursement of marketing, service and other expenses was roughly steady and averaged about 35 per cent until 2010-11. This was distributed among the holding company and subsidiaries.

What is very significant to note is that when we consider the balance between purchases and income from related parties, there was net foreign exchange outflow from Samsung India. Net foreign exchange outflow to related parties, which amounted to about Rs. 12 billion in 2006-07 and Rs. 41 billion in 2009-10, increased manifold after that and amounted to about Rs. 577 billion in 2018-19. The rapid increase in net income outflow to related parties after 2009-10 is conspicuous in Figure 2.

²⁵ Import intensity is defined here as the share of total imports in the company's total expenses on the purchase of merchandise goods (combining raw materials and final goods).

Figure 1. Major components of the Indian subsidiary's operating expenses (Percent shares)

Source: Authors' calculations based on CMIE PROWESS data

Figure 2. Net foreign exchange outflow from Samsung India (Rs. billion)

Note: The company has not reported imports in its 2017-18 Annual Report.

Source: Authors' calculations based on Annual Reports

Clearly, while the findings relating to the earlier years and 2018-19 reflected different business strategies, the lead firm continued to consolidate its value chain transactions

involving goods and services within its group, despite the policy initiatives related to Make in India intended to increase domestic electronics production (whether for India, or the world), especially for mobile phones. In particular, the Phased Manufacturing Programme (PMP) in place since 2015-16 for mobile handsets and related sub-assemblies/components was introduced with the objective of progressively increasing the domestic value addition in the domestic mobile manufacturing ecosystem. The government also imposed countervailing duty on mobile phone imports and a differential excise duty structure for domestic mobile phone manufacturing. In addition, it exempted parts/components/accessories of mobile phones from basic customs duty. All these were meant to encourage domestic "manufacturing" of mobile phones. It is evident from the above analysis of the largest mobile phone manufacturer in India that the design of these policies were not successful in incentivising actual manufacturing.

In the ensuing analysis, we analyse the goods trade between the Indian subsidiary and its related parties in greater detail using firm-level customs trade data to corroborate the above findings.²⁶

IV.2 The Indian subsidiary's trade networks

It is evident from Table 2 that a significant share of Samsung's increased exports between 2016-17 and 2018-19 was on account of exports of mobile phones, both smart phones and push button type mobile phones. There were also re-exports of mobile phone parts and mobile phone sub-assembly from India.

It must be noted that according to the Annual Reports, in the late 2000s the Indian subsidiary was exporting colour monitors, colour televisions and washing machines to Bangladesh, Nepal and Sri Lanka and colour TVs to Maldives. However, the 2018-19 export data (Table 2) shows a distinct drop in TV exports compared to 2016-17. News reports reveal that Samsung had stopped local TV production in October 2018 after the government imposed 5% duty on open cell TV panels,²⁷ the single most important part in TV production. The policy change was meant to increase local value addition as part of government's Make in India program. But Samsung had started imports from Vietnam through the FTA route. These changes are reflected in Table 3 on the company's imports, which reveals that LED TV imports by the firm went up significantly between 2016-17 and 2018-19. It was after this duty was removed in June 2019 that the company re-started local TV "production" in 2019. Imports of refrigerator freezers had also increased in 2018-19, along with video monitors, base stations, etc.

²⁶ It must be mentioned that a significant amount of time was spent in cleaning the purchased trade data containing supplier and buyer names, for standardising their names and filling missing data (in those cases where entries could otherwise be matched using available information on products and addresses) and also in arriving at 'country of origin based on supplier/buyer address'.

²⁷ Arnab Dutta (2020), Centre's FTA norms led Samsung to resume local television production | Business Standard News (business-standard.com), 8 October.

Table 2. Top exports by the Indian subsidiary (HS 8 digit level)# (Million USD)

<i>SN.</i>	<i>Product</i>	<i>2016-17</i>	<i>2018-19</i>
1	Smart mobile phones	44.5	1107.1
2	Other ICs (other than memories & amplifiers; mobile phone parts re-exports)	1.5	31.8
3	Parts of telephone sets and telecom equipment other than PCBs (mobile sub-assembly for re-export)	NA	31.3
4	Other combined refrigerator freezers, fitted with separate external doors	4.7	10.2
5	Push button type mobile phones	1.4	9.4
6	LED TV	10.5	1.6
7	Other fixed capacitors (mobile phone parts)	NA	1.3
8	Liquid crystal devices (LCD panel)	0.1	0.9
9	Samsung's total exports of 139 major electronics products (Million USD)*	64	1194

Notes: # The analysis is based on products where Samsung India was one of the top five exporters of the 139 major electronics exports by India in each year. *As discussed in the earlier section, the 2018-19 total for 139 products constituted 59% of the company's total exports in 2018-19.

Source: Authors' calculations based on firm-level customs trade data

But the most significant change is the sharp increase in all types of mobile phone parts and components among the top 21 imports by the subsidiary, parallel to the sharp increase in mobile phone exports observed in Table 3. Mobile phone-related imports ranged from PCBs, ICs, camera modules, LEDs, etc. to different machines for mobile phone production lines, as well as headphones/earphones, cables/connectors, etc.

It is therefore evident that even as the share of exports in the firm's total revenue went up to about 21% in 2018-19 solely on account of increased mobile phone exports, such exports were accompanied by a corresponding sharp rise in particular in the imports of mobile phone parts and components as well as machinery for their production. This confirms the low value addition that was happening domestically for the expanded mobile phone production, not just for domestic sales, both also for exports. This contradicts the conclusion in Misra and Shankar (2019) that the PMP led move from the earlier consumption-driven imports to production-induced imports in the mobile segment was a desirable outcome. On the other hand, it is confirmed that the pattern identified in Verma (2019) that the Indian subsidiary contributed to the net foreign exchange outflows from India during 2014-15 and 2015-16 because of its high import intensity, continued into 2018-19 even after its exports increased significantly. In fact, even as it had received export incentives worth Rs 145 million in 2017-18 and as much as Rs. 4.3 billion in 2018-19, net foreign exchange outflows from Samsung India stood at Rs. 431.2 billion in 2018-19.

Table 3. Top imports by the Indian subsidiary (HS 8 digit level)# (Million USD)

<i>SN.</i>	<i>Product</i>	<i>2016-17</i>	<i>2018-19</i>
1	Parts of telephone sets other than PCBs	531.0	1797.0
2	Other machines for mobile phone production line	--	1301.4
3	Other ICs (other than memories & amplifiers)	419.5	1022.5
4	Digital cameras and their parts	--	383.0
5	LED TV ("For software testing & development purpose only")	5.6	308.0
6	Populated, loaded or stuffed printed circuit boards (Mounted PCBs)	--	211.3
7	Unmounted PCBs	81.9	117.0
8	Other combined refrigerator freezers, fitted with separate external doors	54.7	73.3
9	Other fixed capacitors (for mobile phones)	21.2	52.3
10	Other loud speakers, whether/not mounted in their enclosures (for LCD TV)	36.4	51.3
11	Headphones, earphones & combined microphone/speaker sets (for mobile phones)	41.9	43.1
12	Video monitors other than cathode-ray tube; n.e.c. ("for demo purpose only")	10.6	42.5
13	Other machines (for mobile phone production line)	--	40.6
14	Liquid crystal devices (LCD) (including panels)	137.0	33.0
15	Others (Automatic voltage regulators and stabilizers)	13.8	31.1
16	Other parts (for mobile phone)	13.9	25.4
17	Cable with connectors (for mobile phones)	2.5	18.2
18	Injection/compression type moulds for rubber/plastics	6.5	16.9
19	Diodes, other than photosensitive or light emitting diodes (for mobile phones)	9.4	16.5
20	Other motor with output ≤ 37.5 w (for mobile phones)	16.4	16.5
21	Base stations	--	11.3
22	The firm's total imports of 139 major electronics products (Million USD)*	1402	5612

Notes: # The analysis is based on products where Samsung India was one of the top five importers of the 139 major electronics imports by India in each year. The dashes in the table stand for lack of data for 2016-17, as the Indian subsidiary was not among the top five importers of those products in that year. * This total constituted 70% of the company's total imports in 2018-19.

Source: Authors' calculations based on firm-level customs trade data

Analysis of network relations based on import origin and export markets

An analysis of the country of origin of the subsidiary's major imports based on port and their originating country based on the supplier firms'²⁸ address gives us some valuable insights into the actual supplier networks of the Indian subsidiary.²⁹

Vietnam was the single largest import origin country based on port data with a 50% share in total major imports, followed by China (22%). However, when we considered origin country on the basis of the supplier firms' address, Vietnam's share stood at just about 15% (Table 3). This implies that a significant part of imports from Vietnam were being sourced from South Korea. That is, there was possibly a re-routing of South Korean exports via Vietnam, thus artificially inflating India's imports from Vietnam. Indeed, out of the 50% share registered from Vietnamese ports, as much as 30% was observed to originate from the holding company (South Korea), about 10% came from fellow subsidiaries in different countries (Singapore, Japan, South Korea, China, Netherlands, the US, etc. apart from Vietnam itself) and the remaining 10% came from unrelated Vietnamese firms.³⁰ This points to the misuse of the rules of origin under the ASEAN FTA. Until now, the latter was believed to have occurred mainly in the case of Chinese exports getting re-routed through Vietnam since 2017.³¹ In this case, it appears that the South Korean parent firm was utilising the ASEAN FTA more than it was using the South Korean CEPA with India — to re-route the group's exports to the Indian subsidiary through Vietnam.

When the supplier firms' country was considered, some part of the imports originating from China based on port was also observed to be sourced from South Korea as well as from Hong Kong and Singapore. Consequently, a total of about 65% of the Indian subsidiary's major electronics imports in 2018-19 originated in South Korea on the basis of the address of the supplier firms, while Vietnam's share stood at 15%.

Out of the 22% share registered from Chinese ports, about 5% was observed to originate from the holding company, about 15% came from fellow subsidiaries in different countries and 3% came from unrelated firms. As a result, China's share was just about 4% on the basis of supplier firms' address. On the other hand, the share of the US stood at 3.6% based on supplier address, while it was only 0.01% on the basis of port. All the major imports from the US were from one fellow subsidiary.

²⁸ The supplier information in the trade data threw up a total number of 215 firms as import suppliers to the Indian subsidiary. Supplier information on about 6% of the total imports was missing in the data.

²⁹ While trade data gives the actual port of origin country, shipping bill address gives the address of the company sending the consignment.

³⁰ According to Samsung Electronics' global supplier list, there were 3 Samsung subsidiaries in Vietnam (Samsung Display, Samsung Electro-Mechanics and Samsung SDI), while there were 24 other firms based in Vietnam among Samsung's Vietnamese suppliers.

³¹ See the discussion in Francis and Kallummal (2020).

Table 4. Indian subsidiary's major imports based on country of origin, 2018-19#

<i>Country of origin based on Port</i>	<i>Share in Samsung's major imports</i>	<i>Share in Samsung's major imports based on supplier firm's address</i>
Viet Nam	50.2	14.6
China	22.1	3.7
South Korea	19.9	64.9**
Taiwan, Province of China	1.8	NA
Japan	1.7	0.8
Thailand	1.0	0.1
Singapore	0.7	4.6
Hong Kong, China	0.5	6.1
Mexico	0.5	0.01
Malaysia	0.5	0.01
Philippines	0.4	0.03
Indonesia	0.4	0.3
Portugal	0.2	NA
Malta	0.1	0.00
Brazil	0.018	0.02
United States	0.009	3.6
Germany	0.005	NA
Slovakia	0.004	0.000004
Costa Rica	0.003	0.0001
France	0.002	NA
Netherlands	0.002	0.02
Hungary	0.001	0.0003
United Arab Emirates	0.001	NA
Egypt	0.0003	0.0003
United Kingdom	0.0002	0.4
Austria	0.0002	NA
South Africa	0.00004	0.00004
Denmark	0.00003	0.00003
The firm's major electronics imports in 2018-19 (Million USD)*	5612	5612

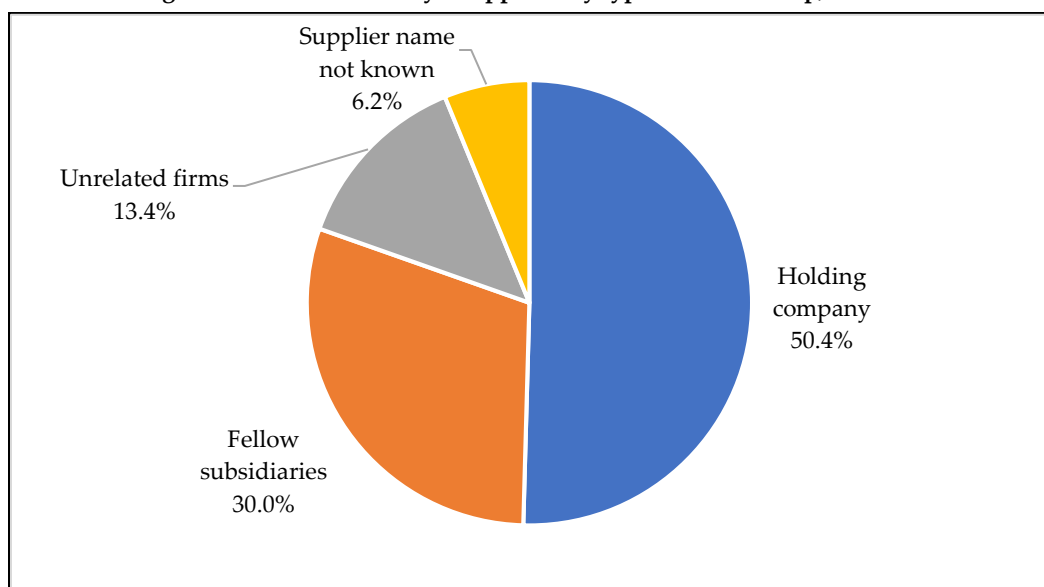
Notes: # The analysis is based on products where Samsung India was one of the top five importers of the 139 major electronics imports by India in 2018-19. *This total constituted 70% of the company's total imports in 2018-19. ** This includes products for which the country of origin based on port was South Korea and the same was maintained as origin based on supplier address even though supplier address was unavailable.

Source: Authors' calculations based on firm-level customs trade data

The discrepancies in the shares of the two types of origin revealed in Table 3 indicate that the actual production bases were possibly being disguised by the lead firm/holding company. In the case of South Korea, the lead firm itself accounted for more than 50% of the major imports by the Indian subsidiary, followed by about 7% by the Korean subsidiaries and another 8% from associate firms in South Korea.

Overall, while the parent firm accounted for more than 50% of the value of major imports by the firm in 2018-19, fellow subsidiaries across countries supplied another 30% (Figure 3). That is, a whopping total of 80% of the Indian subsidiary's major imports were supplied by related parties. At the firm level, after the South Korean lead firm, the second largest share of the major imports of the Indian subsidiary came from the Hong Kong subsidiary.

Figure 3. Indian subsidiary's suppliers by type of relationship, 2018-19*



Note: Same as Table 4.

Source: Authors' calculations based on firm-level customs trade data

While the holding company dominated in the case of South Korea, fellow subsidiaries dominated in the case of the US, Taiwan, Hong Kong and Singapore (Table 4). In the case of Japan, unrelated parties (other firms) were the dominant suppliers. The share of unrelated firms were significant in the case of China and Vietnam too.

Surprisingly, the huge discrepancies in the shares accounted by supplier country by port and by supplier address was not observed in the case of exports—between country of destination based on port and destination based on buyer's address. The UAE was the single largest market accounting for about 54% of the Indian subsidiary's exports in 2018-19, and Russia accounted for another 18%. The other major export markets were South Africa, followed by Morocco, Jordan and Sri Lanka.

Table 5. Markets for Indian subsidiary's major exports, 2018-19

<i>Country of destination based on Port</i>	<i>Share in the firm's 139 major exports</i>	<i>Share based on buyer firm's address</i>
United Arab Emirates	53.9	53.9
Russian Federation	17.6	17.6
South Africa	8.2	8.2
Vietnam	3.2	0.3
Morocco	2.6	2.6
Jordan	2.5	2.5
Sri Lanka	2.3	2.0
Kazakhstan	1.7	1.7
Turkey	1.6	1.6
Ukraine	1.4	1.4
Nepal	1.3	1.3
China	1.2	0.3
Bangladesh	0.5	0.5
The firm's major electronics exports in 2018-19 (Million USD)	1194	1194

Note: Based on customs trade data for 139 major electronics products, which accounted for 59% of the firm's total exports in 2018-19.

Source: Authors' calculations based on firm-level customs trade data

When we analysed the origins of imports in terms of the supplier firms' relationship with the Indian company, it is significant to note that the holding company, or the lead firm, was the single largest source for the imports of mobile phone production line machinery as well as for semiconductor chips (Table 6). Clearly, the latter segments account for the largest value share within the production chain. In the case of most mid-range parts and components, including in mounted PCBs, fellow subsidiaries dominated. On the other side, unrelated firms were significant import suppliers mainly for parts and components with lower values such as unmounted PCBs, speakers, etc. The Indian subsidiary's dependence on unrelated firms was the highest in the case of camera modules, even though it was procuring these components from one of the South Korean group subsidiary also.

It is well known that the upstream segments of applied R&D and design, and the downstream segments of marketing and retailing in electronics industry value chains are dominated by the lead firms. According to industry sources, if we leave out the marketing segment, the value chain decomposition for a high-tech electronics product consists of about 30-65% for product idea/innovation, R&D and product design; 30-50% for components; and 5-20% for assembly, depending on the complexity of the product. It is

evident that with such high import dependence in parts and components (in addition to production machinery) for the high and mid-value segments of the production chain for mobile phones, the Indian subsidiary's share in value addition remained very low, twelve years after it began "manufacturing" mobile phones in India and despite the increase in its mobile exports in 2018-19.

Table 6. Supplier firms for top ten imports by type of relationship, 2018-19

<i>Top ten imported products and their suppliers</i>	<i>Value and respective shares for each product (Million USD and per cent share)</i>
Parts of telephone sets other than PCBs	1797.0
Fellow subsidiaries	53.1
Holding company	28.7
Unrelated firms	18.2
Other machines for mobile phone production line	1301.4
Fellow subsidiaries	0.03
Holding company	95.7
Unrelated firms	4.3
Other ICs (other than memories & amplifiers)	1022.5
Fellow subsidiaries	27.9
Holding company	58.2
Unrelated firms	13.9
Camera modules	383
Fellow subsidiaries	8.6
Unrelated firms	91.4
LED TV ("For software testing & development purpose only")	308.0
Fellow subsidiaries	0.1
Holding company	93.1
Unrelated firms	6.8
Populated, loaded or stuffed printed circuit boards (Mounted PCBs)	211.3
Fellow subsidiaries	83.1
Holding company	9.7
Unrelated firms	7.3
Unmounted PCBs	117.0

<i>Top ten imported products and their suppliers</i>	<i>Value and respective shares for each product (Million USD and per cent share)</i>
Fellow subsidiaries	62.0
Holding company	0.9
Unrelated firms	37.1
Other combined refrigerator freezers, fitted with separate external doors	73.3
Fellow subsidiaries	1.9
Holding company	98.0
Unrelated firms	5.9
Other fixed capacitors (for mobile phones)	52.3
Fellow subsidiaries	61.5
Holding company	7.9
Unrelated firms	30.5
Other loud speakers, whether/not mounted in their enclosures (for LCD TV)	51.3
Fellow subsidiaries	60.9
Holding company	3.3
Unrelated firms	35.9

Note: Same as Table 4.

Source: Authors' calculations based on firm-level customs trade data

IV.3 Local sourcing and technology absorption by Samsung India

The analyses above brought out the very heavy dependence of the Indian subsidiary particularly on the holding company and fellow subsidiaries, especially in the mobile phone segment as well as in LED TV, refrigerators, etc. This is because the kinds of localisation achieved by the company in 2018-19 for mobile production related mainly to: increase in the localisation of die cut parts by adding new vendors; printed vinyl localization for export buyer; new parts localization for mobile CAM Deco and thermoplastic polyurethane (TPU) covers; and increase in the percentage of mold localisation to support instant launching of new models.³² There was also improvement in localisation in the case of air-conditioners, which included: increasing the percentage of mold localisation to support instant launching of new refrigerator models, and

³² Although the 2018-19 Annual Report reports localisation of earphone/battery, there were still significant imports in these product lines according to the customs data.

strengthening jig localization by adding new local vendor. The company also shifted from in-house assembly to outsourcing of assembly to local vendor in case of both air-conditioners and washing machines.

While the above kind of information on localisation and local related parties is available from the financial statement of the company, the lack of compulsory requirement on Indian companies to disclose their transactions with local unrelated parties becomes a serious disadvantage in this analysis. For example, the parent company's global supplier list disclosed a foreign contract manufacturer, Elentec India Pvt Ltd, as one of the Indian suppliers among global suppliers constituting 80% of the parent's transaction volume. However, this company was not mentioned in the Indian subsidiary's Financial Statement, because it is not a related party. Elentec India is a 100% subsidiary of the South Korean firm Elentec Co Ltd and is involved in the manufacture of mobile components (HS 85171290). While Elentec India's supplies to Samsung India would contribute to the latter's local procurement, importantly, Elentec India's 2018-19 Financial Statement revealed a pattern of assembly operations based on imports from its own foreign related parties.

On the other hand, Samsung India did report transactions with a significant number of local micro, small and medium enterprises (MSMEs) under the requirements of the MSME Development Act 2006. But these were mostly lower-end services transactions related to local operations involving lighting, cooling/air conditioning, travel & tours, design and packaging, repair and maintenance, etc. and its large network of retailers.

Importantly, another kind of Samsung India's "local" transactions involved those with a few other related parties themselves—companies belonging to the Samsung group operating in India.³³ As given in Table 7, nineteen Indian companies were listed in the South Korean parent company's Business Report as fellow subsidiaries (includes the other Indian subsidiaries of Samsung Electronics Co as well as the Indian subsidiaries of other Samsung Group affiliates). However, Samsung India's Financial Statement for 2018-19 listed only 10 of these and recorded transaction values for only 7 of these.³⁴ The transactions in 2018-19 mainly involved sale of goods on the income side, while the expense side related to the purchase of fixed assets and payments for services rendered such as IT consultancy or other technical assistance. That is, domestic backward linkages for higher value added services were also with related parties. Consequently, there was net outflow from the Indian subsidiary towards its Indian related parties in 2018-19, which amounted to about Rs. 48.2 billion (or USD 720 million).

³³ The authors are grateful to Chalapati Rao for pointing to Samsung India's local related parties and subcontractors.

³⁴ Three Indian related parties without transaction values were Samsung Medison India, Samsung Heavy Industries India and Samsung Engineering India.

Table 7. Samsung Group companies operating in India, as of December 2019

<i>SN.</i>	<i>Fellow subsidiaries of Samsung India Electronics Pvt Ltd</i>	<i>Investor</i>	<i>Investor relationship with Samsung India</i>
1	Samoo Designers & Engineers India Pvt Ltd	Samwoo Architects & Engineers (100%)	Holding company associate
2	Harman Connected Services Corp. India Pvt Ltd.	Global Symphony Technology Group Private Ltd	Fellow subsidiary & Holding company
3	Harman International (India) Pvt Ltd	Harman Industries Holdings Mauritius Ltd (100%)	Fellow subsidiary & Holding company
4	AMX Products and Solutions Pvt Ltd (Merged into Harman International (India) in 2019)	Harman International Korea (100%)	Holding company associate
5	Samsung Medison India Pvt Ltd (Liquidated during 2019)	Samsung Electronics (68.5%), Samsung Medison (31.5%)	Holding company & Holding company associate
6	Samsung R&D Institute India-Bangalore Pvt Ltd	Samsung Electronics (100%)	Holding company
7	Samsung SDI India Pvt Ltd	Samsung SDI (100%), Samsung SDI (Hong Kong) Ltd (0%)	Holding company associate
8	Samsung Electro-Mechanics Software India Bangalore Pvt Ltd	Samsung Electro-Mechanics (99.9%), Samsung Electro-Mechanics Pte Ltd. (0.1%)	Holding company associate
9	Samsung Nepal Services Pvt Ltd (Subsidiary)	Samsung India Electronics Pvt Ltd (100%)	Self (Samsung India)
10	Samsung Heavy Industries India Pvt Ltd	Samsung Heavy Industries (100%)	Holding company associate
11	Samsung C&T India Pvt Ltd	Samsung C&T Corporation (100%)	Holding company associate
12	Samsung Data Systems India Pvt Ltd	Samsung SDS (100%)	Holding company associate
13	Samsung SDS India Pvt Ltd	Samsung SDS (100%)	Holding company associate
14	Samsung Engineering India Pvt Ltd	Samsung Engineering (100%)	Holding company associate
15	Cheil India Pvt Ltd	Cheil Worldwide (100%), Cheil USA Inc. (0%)	Holding company associate
16	Samsung Hospitality India Pvt Ltd	SBTM (100%)	Holding company associate
17	Experience Commerce Software Pvt Ltd	Cheil India Pvt Ltd (100%)	Holding company associate
18	One RX India Pvt Ltd	One Agency FZ-LLC (100%), ONE RX Interior Decoration L.L.C (0%)	Holding company associate
19	Samsung Display Noida Pvt Ltd (set up in July 2019)	Samsung Display (100%)	Holding company associate

Source: Authors' compilation based on Samsung Electronics Co Business Report 2019 and Samsung India's annual reports.

News reports on the production side suggest that despite having the world's largest mobile factory in Noida, Samsung India began outsourcing mobile phone assembly to a local contract manufacturer, DBG Technology India Pvt Ltd, in 2019, after feeling the need to meet the high demand for some of its popular models. DBG Technology India is a Chinese majority owned joint venture between DBG Holdings Ltd of Hong Kong and Karbonn Mobiles chairman Pardeep Jain,³⁵ wherein DBG Holdings Limited, is a leading Chinese EMS providers (headquartered in Hong Kong). This development can be seen as integrally linked to the parent firm's change in strategy globally driven by the maturation of the smartphone market. With innovation in smart phones having shifted to display, cameras and other features, lower-middle-segment smart phone devices have attained commoditization.³⁶ As it happened in the case of computers, TVs, etc., in the case of matured technologies/products, the application of common parts and low-cost design expertise from original design manufacturers (ODMs) helps bring down production costs for the brand-owning company. In fact, although the parent firm Samsung Electronics Co was keeping all stages from design to production in house, it was already outsourcing some models to Chinese ODMs since 2017. Roughly 20% of the South Korean conglomerate's annual global shipments were outsourced models after it started outsourcing on a large scale in the second half of 2019, having shut down its mobile manufacturing operations in China.³⁷ Given that the parent company has lost market share in China, the parent firm's strategy to consolidate its share in India (the world's single largest mobile phone market) could see an expansion in local outsourcing by Samsung India for the production of low-end to mid-segment models, for both the Indian and export markets.

Samsung India has already been subcontracting some production of washing machines and feature phones to a domestic EMS provider, Dixon Technologies India Ltd., a listed company. According to the announcement in January 2020, Dixon was expected to start manufacturing LED TV also for Samsung from its manufacturing facility located at Tirupati, Andhra Pradesh. In October 2020, the two companies also agreed that Dixon will manufacture Samsung's phones out of its facility in Noida.³⁸ Dixon has got approval under the PLI Scheme launched by the government in April 2020 under which domestic companies are incentivised for local mobile phones in the less than Rs. 15,000 category.

³⁵ Karbonn Mobile India, an unlisted private company incorporated in 2009 was "making" phones, smartphones, tablets and mobile phone accessories, and had ceased to exist in 2019.

³⁶ See 'Hideaki Ryugen and Kotaro Hosokawa (2020), Outsourced smartphone development soars with Samsung's shift' October, <https://asia.nikkei.com/Business/Technology/Outsourced-smartphone-development-soars-with-Samsung-s-shift>, accessed on 11 December 2020.

³⁷ As a result, the parent firm Samsung Electronics Co. already sells Chinese ODM-made smartphones in lower-income regions like South America and Southeast Asia. See, Mario McKellop (2019) <https://www.theburnin.com/market-watch/samsung-outsources-20-percent-of-handset-production-2019-12/>, accessed on 10 December 2020

³⁸ <https://www.livemint.com/companies/news/dixon-technologies-to-manufacture-led-tvs-for-samsung-11578117158273.html>

While Samsung India's expansion in subcontracting to Dixon Technologies may appear to be vindication of the PLI Scheme's ability to expand domestic mobile manufacturing, the financial statements of Dixon Technologies show that it purchased significant amount of goods from its subsidiary Dixon Global Pvt Ltd. during 2017-18 and 2018-19. While the financial statement of the latter confirmed this, it also revealed that Dixon Global recorded a large foreign exchange outflow (Rs. 2,853.9 crore) and no forex earnings. While imports were not reported by the company, the huge forex outflow points to import-based assembly operations by Dixon Global.³⁹

While the parent company focuses on premium consumer electronics products such as the QLED TV, Smart TVs, The Frame, Family Hub Refrigerators, etc. in addition to high-end mobiles, local electronics subcontractors' involvement in Samsung India's (and its parent firm's) GVC of different products could possibly expand. If that happens, the level of aggregate domestic value addition may show a gradual improvement if we consider Samsung India's production figures in isolation. But this is the case only if indeed there is significant local manufacturing of electronics parts and components too, which so far has not happened to any major degree. Moreover, the largest share of the value addition from an increase in product sales will still accrue to the brand-owning parent firm. Equally importantly, even with increased local outsourcing, it will remain critical to assess the net foreign exchange outflows from the Indian subsidiary.

On the other side, according to the Annual Report, technology absorption in Samsung India's plants largely related to increasing the efficiency of operations, energy conservation, etc. and appear relatively minor in the case of product innovations, apart from some software R&D that was happening. Strikingly, the share of R&D in total turnover of the company declined from 0.27% in 2008-09 to 0.15 in 2012-13 and to just 0.05% in 2018-19.^{40,41} Meanwhile, royalties amounting to Rs. 25.6 billion and Rs. 20.3 billion were paid by the Indian subsidiary to its South Korean parent firm in 2017-18 and 2018-19 (see Figure 2 earlier). All these findings buttress the arguments in Francis (2019) that trade liberalisation (especially ITA-1 and FTAs) and FDI liberalisation without vertical industrial

³⁹ This could be confirmed easily if the firm-level customs trade data were made available by the Department of Commerce as a significant research input for policy purpose, rather than researchers having to purchase the same through commercial research firms.

⁴⁰ This is despite the fact that the company has two R&D centers in Bangalore and Delhi (according to Samsung Business Report for 2019), although Samsung India's report lists only the Bangalore entity. Globally, the parent company's total R&D expenses/sales ratio stood at 8.8% in 2019 (inclusive of government subsidies).

⁴¹ The company describes a number of training activities under its CSR reporting section in the 2018-19 financial statement. Mainly training programs carried out in collaboration with industrial training institutes (ITIs), IITs and technical universities figured in this, apart from other support for healthcare and school-level education. The overall CSR spending amounted to the prescribed 2% of the average net profit of the company for the previous three financial years.

policies had created perverse incentives against both domestic manufacturing as well as the innovation ecosystem in the Indian electronics industry.

V. Conclusion

The paper developed a new analytical framework for assessing the nature of GVC participation by developing country firms, which integrates the macro policy aspects of trade and FDI liberalisation and micro-level policy incentives with firm-level business strategies. We argued that ‘importing-for-domestic sales’ needs to be considered as one of the forms of GVC engagement in developing countries, which the current conceptualisation of GVC participation as ‘importing-to-export’ excludes. The case study analysis of the network transactions of a principally domestic market-oriented foreign subsidiary, Samsung India Electronics Ltd, validates this argument.

The implications of linking into GVCs change for developing countries when we use this alternative, more holistic way of measuring participation in GVCs using firm-level data. While the production restructuring associated with FTAs is expected to lead to improved efficiency in the participating countries, the case study points out that the gains expected from greater inter- and intra-industry specialisation and economies of scale accrues basically to the lead firm (the holding company), which controls and coordinates the network transactions within its subsidiaries and group associates. Even in a producer-driven GVC expected to deliver more to participating firms in terms of dynamic gains (relative to buyer-driven GVCs), the largest part of the value creation throughout the production process as well as in services was done and captured by the holding company, followed by its subsidiaries abroad and in India. There has been very heavy dependence of the Indian subsidiary particularly on the holding company and fellow subsidiaries, especially in the mobile phone segment as well as for LED TV, refrigerators, etc. This value share of the holding company in the production chain is in addition to the value share arising from its ownership of the design and branding of the various products. It was also seen that even when the share of exports in the firm’s total revenue went up, such exports were accompanied by a sharp rise in imports of parts and components. On the other side, domestic backward linkages for higher value added services were also with related parties operating in India. The findings support the argument made in Francis (2015 and 2019) that in the absence of already existing factors that make local procurement “attractive”,⁴² tariff liberalisation sans vertical industrial policy reduces or nullifies incentives for local sourcing—including and especially in the case of large MNCs. Pro-active vertical industrial policies are required to create the incentives for increasing domestic value addition.

⁴² This primarily involves the presence of a technologically advanced local parts and components supplier base and larger numbers of high skilled production engineers. In addition, the drag of the energy and logistics sector on India’s manufacturing sector competitiveness has been well acknowledged.

When the literature considers GVCs as offering an opportunity for developing countries to integrate faster into the global economy and achieve rapid export growth and industrial upgrading, the latter is expected to materialise as supplier firms learn from the association with the MNCs. However, sustainable FDI-productivity-investment nexus cannot be achieved with net foreign exchange outflows from foreign-invested companies, and the latter cannot be reversed without establishing the linkages of foreign-invested firms (and imported technology) with a homegrown supplier base. The policy expectation that providing incentives to attract and facilitate a large volume of export-oriented foreign investments into the industry for local assembly will in itself lead to the build-up of the domestic supplier base is found to be misplaced. The liberalisation of tariffs under FTAs without the concomitant pursuit of a coherent industrial policy aimed at increasing domestic value addition by creating such backward linkages does not lead to the sustainable development of a domestic production base. Despite having the advantage of a large domestic market, unlike China, India had no policies linking foreign-invested firms and the domestic supply base, which could have led to spillage effects, competition and technological upgrading among domestic firms. Consequently, tariff-only trade liberalisation and FDI liberalisation sans industrial policy have seen government's policies for facilitating local electronics assembly lead to continuing high import dependence on parts and component imports, instead of final goods imports. At the same time, the lack of focussed policy thrust needed for overcoming foreign producers' incentives for imports adversely impacts the ability of domestic parts and components suppliers to achieve economies of scale.

Breaking this cycle requires the ownership of productive assets and internalisation of knowledge to be built up indigenously through the pro-active, vertical type of industrial policies, which have been practised by the countries which have originated lead firms and tier-1 suppliers, including South Korea, Taiwan, China, etc. At one level, the government needs to promote R&D-intensive companies, both indigenous and foreign-invested ones,⁴³ and at another level, domestic backward linkages by foreign-invested firms needs to be promoted through ingenious incentivisation.

This calls for revamping the recent PLI Scheme to take care of the above aspects.⁴⁴ The incentives must be linked directly to a company's investments of 5-6% of annual turnover

⁴³ There have been many policy failures in the Indian electronics industry's development trajectory. Some of these are analysed in detail in Francis (2019). See also the literature cited therein. In the telecom sphere specifically, Mani (2007) had highlighted how a lack of technology foresight in the telecom sphere eventually undermined the critical and fundamental role played by the public sector agency, Centre for Development of Telematics (C-DoT) in generating and transferring technologies to public and private enterprises.

⁴⁴ As we have argued in the first section, the serious design failures in recent policy efforts are due to the continued faith by policymakers on large MNCs to establish a domestic parts and components manufacturing base on the one hand, while keeping out the advanced indigenous

on R&D. They must also be progressively tied to the number of patents filed in India based on research in India (especially on new, greener materials and processes). Moreover, the findings about possible mis-use of the ASEAN FTA by re-routing of the parent firm and subsidiaries' exports to the Indian subsidiary through Vietnam highlights the need for tightening and re-formulating the rules of origin under the ASEAN FTA, as we have been arguing for some time.⁴⁵ Wherever required, tariff liberalisation must also be adjusted to be in sync with the protection accorded by PTA partners to their indigenous firms through national standards and other policies.⁴⁶

Simultaneously, government must handhold indigenous producers in high-end parts and components in prototype development after competitive selection processes, by facilitating their commercialisation and scaling up through guaranteed domestic market access for fixed time periods. Further, regulatory bodies must ensure that these firms remain dynamically competitive through regular evaluation and modification of all the relevant policy incentive structures. The criticality of government support for the scaling up of R&D-intensive indigenous companies in advanced electronics parts and components production cannot be overemphasised as they are the backbone of all digital devices and digital equipment, existing and yet to come.

India must also re-visit the role played by our public sector telecom research laboratories, the Centre for the Development of Telematics (C-DoT), the Centre for Development of Advanced Computing (C-DAC), etc. They have made valuable direct and indirect contributions to the development of the domestic electronics industry by developing technologies and licensing them to indigenous companies for commercial production. An additional mandate for C-DoT or C-DAC to validate and collaborate with (and even acquire) indigenously designed and manufactured products with embedded software/new technologies from start-ups, SMEs and other domestic firms can save them from having to sell their technologies to foreign investors of various hues. This would enable us to retain the ownership of new technologies with India.

For India as an FDI host country, the manner in which localisation is achieved for increasing domestic value addition will decidedly determine the extent of beneficial impact of FDI-led GVC participation, beyond the short-term gains from the employment of assembly workers. Only those forms of GVC engagement that increase domestic value addition and technology absorption will help to reverse the foreign exchange leakages from the country and enable the build-up of investment and aggregate demand required to make such an industrial development strategy sustainable for the country.

SME parts and components and product firms from these focused policy initiatives and also from government procurement on the other hand. See Menon and Francis (2020).

⁴⁵ See Francis (2020) for a detailed discussion of the issues related to re-routing.

⁴⁶ See the discussion in Kallummal (2019).

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The Institute for Studies in Industrial Development (ISID), successor to the Corporate Studies Group (CSG), is a national-level policy research organization in the public domain and is affiliated to the Indian Council of Social Science Research (ICSSR). Developing on the initial strength of studying India's industrial regulations, ISID has gained varied expertise in the analysis of the issues thrown up by the changing policy environment. The Institute's research and academic activities are organized under the following broad thematic areas:

Industrialization: Industrial policy, manufacturing sector, MSMEs, technology development, production networks, industrial clusters/corridors, SEZs, land acquisition, natural resources, regional development, entrepreneurship, sustainability, etc.

Internationalization: Cross-border flows of capital flows, FDI, technology transfer, IPRs, balance of payments, trade and investment agreements, etc.

Corporate Sector: Ownership and control, finance and governance, financial institutions, company law, securities legislation, regulatory bodies, M&As, business groups, public enterprises, public-private partnership, business ethics, CSR, etc.

Labour and Employment: Employment growth and structural transformation; labour force; skill development; quality of employment, labour flexibility; differentiations and disparities; informal sector and un-organised workers; etc.

Public Health: Social, cultural and economic determinants of health; structure of health systems; research and capacity building in the areas of pharmaceuticals, medical devices and healthcare sectors; IPRs and other areas of industry-health interface, etc.

Media & Communication: Studies in the area of media, communication and advertising.

ISID has been maintaining databases on corporate and industrial sectors in particular and other areas of developmental and social and economic issues in general. Its Online Reference Services includes On-Line Index (OLI) of 252 Indian Social Science Journals as well as 18 Daily English Newspapers Press Clippings Archive on diverse social science subjects which are widely acclaimed as valuable sources of information for researchers studying India's socio-economic development.

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