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ADBI Working Paper Series

**WHAT MATTERS FOR THE
GVC ENTRY AND EXIT OF
MANUFACTURING SMES
IN THE PHILIPPINES?**

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Abstract

This study explores firm-level data from the Philippines to uncover new stylized facts about the participation of manufacturing small and medium enterprise (SMEs) in global value chains (GVCs). The empirical analysis shows that manufacturing SMEs are weakly connected to foreign markets, especially to GVCs. Compared to large manufacturers, SMEs also trade fewer products with a smaller set of foreign partners. The evidence also suggests that self-selection into exporting and importing may be more relevant for SMEs than for large manufacturers. The logistic regressions partly support this view, with TFP being a significant contributor to the GVC entry of SMEs but not of large manufacturers. In general, the factors driving GVC entry are not exactly the same for small and large manufacturers. For large firms, employment size and R&D are significant. On the other hand, age and TFP seem to be the variables that uniquely determine the GVC participation of Philippine SMEs. Foreign ownership, past importing activities, and proximity to economic zones can be considered universal factors important to all establishments. The regressions also indicate that SMEs may be disproportionately affected by changes in the policy environment. Finally, the results highlight some asymmetries in the factors that affect the GVC entry and exit of manufacturing SMEs. Only size and foreign ownership make significant positive contributions to survival.

Keywords: SMEs, Philippine manufacturing, global value chains, firm entry and exit

JEL Classification: F14, F23, L20, L25

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1. INTRODUCTION

Since the 1980s, international trade has been increasingly organized inside global value chains (GVCs) where fragmented production activities are carried out by firms in scattered locations. This international unbundling of production has opened up various opportunities not only for large multinationals but also for small and medium enterprises (SMEs) in developing countries. There are several ways through which GVCs have facilitated the foreign market entry of SMEs. The disintegration of production into geographically dispersed activities has allowed input manufacturers to specialize in stages where entry barriers are not very high. In fact, the World Bank and OECD (2015) report that the GVC participation of SMEs in low-income countries is concentrated in labor-intensive and low value-adding functions. In certain cases, SMEs with strategic advantages (e.g., ownership of special assets, resources, knowledge, or skills) gain faster access to production networks as partners or acquired subsidiaries of multinationals (Dunning and Lundan 2008).¹ Other SMEs are “born global,” being already trade oriented from the very start. While some SMEs participate directly in international markets, many others export and import indirectly through larger manufacturers and traders that already have established foreign linkages. For instance, SMEs usually supply raw materials and inputs to export-oriented industries. They also participate in downstream stages as local distributors and retailers of multinational brands. With the emergence of e-commerce and modern logistics, technology-enabled SMEs have also adopted new business models that have allowed them to export to and import from a larger number of foreign partners.

GVCs offer various growth and learning opportunities for participating SMEs. For instance, importing may increase productivity through the use of cheaper and better-quality inputs (Wagner 2011). Depending on their absorptive capacity, firms may also benefit from technology transfers and knowledge spillovers from other value chain participants.² Lead firms may assist SMEs in adopting new processes and product designs in order to comply with stringent international standards (WTO 2016). Due to scale economies, large GVC transactions may also allow SMEs to increase output and lower production costs. SMEs that actively participate in GVC trade may also learn about regulations and consumer tastes in foreign markets. In addition, they may gather new insights into the input sources, production techniques, and marketing practices of other firms. SMEs may also be encouraged to innovate in order to remain competitive in their niche functions. Successful innovators may grow in scale and/or scope and eventually upgrade to more complex and higher value-adding GVC activities.

However, realizing these potential benefits is not without constraints. Due to their small size and limited capabilities, small and medium firms are often insecure about their ability to approach international markets (OECD 2008). Based on a review of evidence from developing countries, the WTO (2016) also notes that SMEs’ trade participation is mainly restricted by limited knowledge about foreign operations, costly requirements of product standards and quality certifications, burdensome customs and border procedures, inefficient logistics and transport networks, tariff and nontariff trade regulations, and limited access to credit. This is partly traced to the fact that market

¹ SMEs may also internationalize through FDIs and other business arrangements with foreign partners (e.g., mergers and joint ventures). However, compared to traditional trade transactions, these advanced forms of internationalization are less common for SMEs in developing countries since they entail huge fixed costs (WTO 2016).

² Damijan and Kostevc (2015) and Castellani and Fassio (2017) find that this effect is more relevant to SMEs than bigger firms.

surveillance, learning administrative procedures in foreign countries, completing documentary requirements, and complying with international product standards entail huge sunk costs that disproportionately burden SMEs (OECD 2013).

Despite the shifted focus of trade analysis from countries and industries to firm-level transactions, micro- studies on the factors affecting the success or failure of SMEs inside GVCs remain largely unexamined. In fact, the WTO (2016) notes that the GVC participation of SMEs, especially in developing countries, is neither well documented nor well understood due to inconsistent definitions of firm size, data limitations, and gaps in the measurement of GVC trade. In addition, Lu and Beamish (2001) argue that SMEs are not simply smaller counterparts of large establishments. Often, resources, ownership, and organizations in small firms are very different from the complex structures of big enterprises and multinational corporations. Hence, empirical findings based on large establishments may not necessarily apply to SMEs. Nevertheless, existing firm-level studies provide useful insights that may improve our understanding of the nature of SMEs' GVC linkages. For instance, the new "new trade theory" (NNTT) suggests that huge sunk entry costs preclude extremely low-productivity (and possibly small) firms from entering domestic and foreign markets (Roberts and Tybout 1997; Bernard and Jensen 1999; Melitz 2003). To the extent that size is associated with productivity, these findings explain why SMEs might be expected to participate less, and only indirectly, in large-scale GVC transactions. In this regard, it is interesting to analyze how some SMEs were able to internationalize despite the limitations set by their size, experience, and networks.

Against this background, this paper analyzes firm-level data from the Philippines with a view to contributing to the still small empirical literature on the nature and drivers of SMEs' GVC participation. In particular, this research is motivated by the following key questions:

1. What are the characteristics of Philippine SMEs inside GVCs?
2. What determines the GVC entry of Philippine SMEs?
3. What are the factors that affect the exit of SMEs from GVCs?
4. Are there systematic differences in the characteristics of SMEs that survived and exited GVCs?
5. What is the role of multinationals in the GVC participation and survival of Philippine SMEs?
6. What is the role of policy in the GVC entry and exit of SMEs?

These questions are explored using a rich micro data set that combines the Philippines' annual establishment surveys/censuses from 1996 to 2012 and the firm-level export and import transactions compiled by the Philippine Statistics Authority (PSA) from 1991 to 2012. Our statistical analyses mostly focused on the years after the global recession (i.e., 2008, 2009, 2010, and 2012) due to missing data on key variables in earlier surveys.

The rest of this paper is organized as follows. Section 2 briefly describes the characteristics of SMEs in the Philippines. Section 3 analyzes the characteristics of manufacturing SMEs connected to GVCs. Section 4 looks at the factors that affect the GVC entry and exit of manufacturing SMEs. Finally, Section 5 summarizes the results and discusses some policy implications.

2. SMEs IN THE PHILIPPINES

In the Philippines, firm size is defined in two ways: The PSA categorizes establishments based on employment while the Department of Trade and Industry (DTI) follows the Magna Carta for Micro, Small and Medium Enterprises that classifies businesses according to asset size.³ For comparability purposes, this study adopts the employment-based grouping, which is the usual basis of international classifications. In the PSA definition, enterprises are grouped into four categories: micro (1 to 9 employees), small (10 to 99 employees), medium (100 to 199 employees), and large (200 or more employees). In this study, “SMEs” and “MSMEs” are used synonymously to refer to establishments with less than 200 workers.

Table 1: Distribution of Philippine Establishments by Employment Size

Year	Total	Share (%)			
		Micro	Small	Medium	Large
1995	495,057	90.89	8.05	0.55	0.49
2000	821,060	91.07	8.18	0.37	0.36
2006	783,165	91.96	7.33	0.36	0.33
2010	777,687	91.28	7.97	0.37	0.39
2015	900,914	89.53	9.59	0.43	0.45
2018	1,003,111	88.45	10.58	0.49	0.48

Source: PSA.

Small and medium enterprises are important drivers of the Philippine economy. As summarized in Table 1, SMEs take up the largest share in the population of all businesses in the country. In a span of two decades, the number of SMEs documented by the PSA more than doubled. However, there is little dynamism in terms of size distribution, with the share of SMEs in total establishments remaining stable at 99.5%. In sharp contrast, large enterprises typically account for less than 0.50% of all businesses.

In 2018, SMEs accounted for 99.52% of the 1,003,111 businesses in the PSA’s updated List of Establishments (LE).⁴ Out of this share, 99.04% are micro and small firms while only 0.49% are medium-sized enterprises. As indicated in Table 2, this highly skewed distribution can be observed across all major industries. Most notably, large employers represent less than 1% of the top three most populous sectors in terms of number of establishments (i.e., wholesale and retail trade and repair of motor vehicles and motorcycles; accommodation and food service activities; and manufacturing). Incidentally, 72.38% of all SMEs are found in these three sectors.⁵

³ According to the latest DTI definition, establishments are grouped as: micro (up to 3,000,000 pesos’ worth of fixed assets), small (3,000,001 pesos to 15,000,000 pesos), medium (15,000,001 pesos to 100,000,000 peso) and large (100,000,001 pesos or higher). One major weakness of the asset criterion is the need for periodic adjustments of the cutoffs due to inflation.

⁴ The List of Establishments (LE) is a database of establishments that are operating in the Philippines at the time of updating. An establishment, which is the statistical unit of the LE, is defined by the Philippine Statistics Authority as “an economic unit, which engages, under a single ownership or control, i.e. under a single legal entity, in one or predominantly one kind of economic activity at a single fixed physical location” (PSA 2013).

⁵ Based on the 2009 Philippine Standard Industrial Classification, some common examples of activities in wholesale trade include wholesaling of agricultural raw materials and live animals; food, beverages, and tobacco; household goods; and machinery and equipment. In retail trade, many establishments are retail

Since wholesaling and retailing are important steps in the distribution process, the foregoing discussion suggests that SMEs play an important role of linking the production sector to the final consumers.

Table 2: Distribution of Philippine Establishments by Sector and Size, 2018

Sector	Total	Size			
		Micro	Small	Medium	Large
Philippines	1,003,111	88.45	10.58	0.49	0.48
Agriculture, Forestry, and Fishing	8,679	67.25	28.94	1.81	1.99
Mining and Quarrying	850	57.88	35.53	2.47	4.12
Manufacturing	117,468	88.19	9.94	0.91	0.96
Electricity, Gas, Steam, and Air Conditioning Supply	1,298	36.83	48.77	7.55	6.86
Water Supply; Sewerage, Waste Management, and Remediation Activities	1,466	46.18	48.50	3.34	1.98
Construction	4,507	51.12	38.05	5.01	5.81
Wholesale and Retail Trade; Repair of Motor Vehicles and Motorcycles	462,349	92.38	7.26	0.24	0.13
Transport and Storage	11,200	64.86	31.35	2.06	1.73
Accommodation and Food Service Activities	144,640	86.70	13.00	0.23	0.07
Information and Communication	29,687	92.37	6.65	0.52	0.47
Financial and Insurance Activities	46,216	81.82	17.42	0.36	0.40
Real Estate Activities	11,595	81.74	17.03	0.68	0.54
Professional, Scientific, and Technical Activities	15,974	85.24	13.55	0.65	0.56
Administrative and Support Service Activities	18,713	75.20	16.15	2.53	6.11
Education	18,079	50.36	45.98	2.16	1.50
Human Health and Social Work Activities	28,824	90.47	8.07	0.69	0.77
Arts, Entertainment, and Recreation	15,393	89.36	10.15	0.22	0.27
Other Service Activities	66,173	94.90	5.06	0.03	0.02

Source: PSA.

The average employment of all establishments in the 2018 LE was only nine, confirming our earlier observation that small and medium businesses dominate Philippine industries. In fact, SMEs host 63.19% of the total number of employees documented in the LE. SMEs also account for a significant portion of the Philippines' aggregate output. In 2016, 35.7% of the country's gross domestic product (GDP) originated from SME activities (OECD and ERIA 2018). Out of this share, 20.5% is attributed to small establishments, 10.3% is traced to medium-sized firms, and only 4.9% is contributed by microbusinesses. SMEs in manufacturing represent 6.87% of total output. Two interesting observations are worth noting. First, the contribution of SMEs to GDP hasn't changed significantly from a decade ago, indicating a lack of strong growth drivers in this segment. Second, the fact that 99.5% of establishments only contributed a third of Philippine GDP suggests that SME productivity is very low.

sellers in nonspecialized stores (e.g., "sari-sari," groceries, and convenience stores) and retail sellers of manufactured goods (e.g., textile and wearing apparel, household equipment, computer and telecommunication devices, automotive fuel) in specialized stores.

Table 3: Regional Distribution of Philippine SMEs in 2018

Region	Number of SMEs	Number of SME Employees	Average SME Employment	SMEs per Large Establishment
Philippines	998,342	5,714,262	5.7	209.3
National Capital Region	203,312	1,621,685	8.0	104.9
Cordillera Administrative Region	20,417	88,753	4.3	416.7
Region I (Ilocos Region)	50,807	236,856	4.7	725.8
Region II (Cagayan Valley)	30,718	134,074	4.4	877.7
Region III (Central Luzon)	116,073	605,056	5.2	301.5
Region IV-A (CALABARZON)	148,196	824,283	5.6	182.7
MIMAROPA Region	23,919	110,874	4.6	724.8
Region V (Bicol Region)	40,444	191,111	4.7	577.8
Region VI (Western Visayas)	61,590	318,467	5.2	319.1
Region VII (Central Visayas)	70,395	449,775	6.4	131.1
Region VIII (Eastern Visayas)	30,749	140,269	4.6	768.7
Region IX (Zamboanga Peninsula)	33,177	139,313	4.2	495.2
Region X (Northern Mindanao)	37,274	207,600	5.6	270.1
Region XI (Davao Region)	58,459	317,316	5.4	258.7
Region XII (SOCCSKSARGEN)	44,822	197,331	4.4	379.8
Region XIII (Caraga)	19,823	98,696	5.0	396.5
Autonomous Region in Muslim Mindanao	8,167	32,803	4.0	907.4

Source: Author's illustration based on PSA data.

In line with the national pattern, SMEs dominate the production sector in all regions. However, SMEs are unevenly distributed across the country. Close to 53% of SMEs are found in the most industrialized regions, such as the National Capital Region (NCR) where Manila is located, Central Luzon, Calabarzon, and Central Visayas. These regions also account for 69.19% of the total SME employment in the country. The largest SMEs are also concentrated in these areas. As shown in Table 3, SMEs in the NCR, Calabarzon, Central Visayas, and Northern Mindanao have 5.6 to 8 workers on average while the rest of the country employ less. On the other hand, the regions of Ilocos, Cagayan Valley, MIMAROPA, Bicol, Eastern Visayas, and Autonomous Region in Muslim Mindanao (ARMM) have the largest ratio of SMEs to large establishments; that is, large businesses in these regions are relatively scant compared to SMEs. Most notably, SMEs outnumber large businesses 907 to 1 in ARMM. The SMEs in these areas are also relatively smaller than those in industrial hubs. For instance, the average SME in ARMM only employs four workers. It is interesting to note that these regions host some of the poorest provinces in the country. The picture emerging from the foregoing discussion is that relatively “smaller” SMEs seem to be the most common employers in the poor countryside. This highlights the importance of SME development as a major strategy for job creation, poverty reduction, and inclusive growth.

The Philippines has a long history of policy support for SME development. The country's approach to SME development has been motivated by increasing domestic competitiveness and promoting more equitable distribution of productive activities, both across sectors and across regions. Considered as a landmark legislation for SME development, the Republic Act (RA) 6977 or the Magna Carta for Small Enterprises was passed in 1991 to consolidate all government programs related to SMEs (OECD and ERIA 2018). This law created the SME Development (SMED) Council and the Small Business Guarantee and Finance Corporation (SBGFC). The Council was designated

as the primary agency responsible for SME development “by way of facilitating and closely coordinating national efforts to promote the viability and growth of small and medium enterprises.”⁶ On the other hand, the law mandated the SBGFC to “provide, promote, develop, and widen the reach of various alternative modes of financing for small enterprises.” The corporation may guarantee up to 100% of the loans obtained by qualified SMEs, local or regional SME associations, and private voluntary organizations or cooperatives. The law also directed all lending institutions to allocate 5% of their total loan portfolios to SMEs.

Since its implementation, the law has been amended at least twice, once in 1997 through RA 8289 and once in 2008 through RA 9501, to adjust the asset-based definition of firm size, expand the scope of the SMED Council and the SBGFC’s functions, and institutionalize the formulation of a periodic medium-term development plan for the SME sector. In particular, the SMED Council was renamed the MSMED Council to explicitly incorporate microenterprises. The Small Business Corporation (SBC) was also formed to replace the SBGFC. The new agency was tasked to implement comprehensive MSME policies and programs in areas such as finance, information services, training, and marketing.⁷ RA 9501 also increased the earmarked loans to MSMEs from 5% to 8% of the total loan portfolios of lending institutions. In addition, the law explicitly encouraged credit to eligible export and import traders.

There is a wide range of other policies and programs initiated by various government agencies to improve SMEs’ access to finance. For example, several state-run financial institutions⁸ teamed up in 2003 to create the SME Unified Lending Opportunities for National Growth (SULONG) Program, which provided funds for export financing, working capital, and investments in equipment, buildings, and warehouses (Aldaba 2012).⁹ To enhance the existing credit guarantee system in the country, the central bank also established in 2008 the Credit Surety Fund (CSF) that pools contributions from cooperatives in good standing, nongovernment organizations, local governments, and other partner institutions (BSP 2018a). This fund aims to increase the creditworthiness of MSMEs that lack the necessary credentials (e.g., collateral and good credit track records) to obtain bank loans.¹⁰ In addition to public and private financial institutions, microfinance organizations also play an important role in extending credit to MSMEs. They usually collaborate with private, multilateral, and government agencies to provide lending facilities that are more accessible to micro- and small businesses (DTI 2013).¹¹

⁶ In particular, the Council was tasked to support SMEs through direct interventions such as trainings, labor management guidance, a relief system for distressed enterprises, and technical assistance regarding product research and development, commercialization of technologies, marketing, distribution, and access to credit.

⁷ As of 2016, the SBC is the national government’s third-largest provider of financing for SMEs. With a lending portfolio of Php3 billion, it serves 10,000 clients in 65 provinces across the country. In 2017, the SBC launched the *Pondo sa Pagbabago at Pag-asenso* (P3) or “Fund for Change and Progress” in English. As of 2018, this program has already released P1.8 billion to 61,204 microenterprises (source: <https://www.sbgfc.org.ph/about-us/history>).

⁸ I.e., Land Bank of the Philippines (LBP), the Development Bank of the Philippines (DBP), SBC, Quedan and Rural Credit Corporation (Quedancor), Philippine Export-Import Credit Agency (PhilEXIM), and the National Livelihood Support Fund.

⁹ In English, “sulong” literally means “move forward.”

¹⁰ The CSF effectively serves as a guarantor that first assesses the loan and surety proposals of qualified member MSMEs and then endorses successful applications to the target banks.

¹¹ Within the banking system, 151 banks reported having extended a total amount of P15.4 billion to 1.5 million microenterprises as of June 2018. Outside the banking system, cooperatives have 6.4 million member-depositors and P162.4 billion in outstanding loans as of 2015 while microfinance NGOs have 4.3 million clients and P28.6 billion in outstanding loans as of 2017 (BSP 2018b).

Despite the myriad of government programs to improve credit access, many studies note that MSMEs still consider financial access a major constraint to growth and survival. In fact, the Philippines' SME loans reached only 3.1% of GDP in 2014, much lower than Thailand's 36.6%, Malaysia's 22.4%, and Indonesia's 7.2% (ADB and ADBI 2015). As of June 2018, Philippine SMEs account for only 6.6% of the total loaned amount by the banking system (BSP 2018b). Aldaba (2012) also noted that the majority of SMEs still rely on internal resources and informal credit for their current financing requirements while only 15% to 21% use bank loans. This partly reflects the huge transaction costs faced by both small businesses and banks in processing MSME-related financing. On the one hand, MSMEs are constrained by the lack of collateral, stringent documentary requirements, restrictive loan repayment and restructuring rules, high interest rates, and limited financial packages in the countryside, among other things. On the other hand, banks have concerns about the risks of lending to MSMEs, especially those whose proposed projects don't qualify as bankable or viable. Banks also have a general aversion to processing numerous small transactions.

The Department of Science and Technology is the lead agency for improving SMEs' technological access. In particular, the Small Enterprises Technology Upgrading Program (SETUP) is a nationwide effort to help SMEs adopt "technological innovations to improve their products, services, and operations and increase their productivity and competitiveness." According to its official website,¹² the program aims to improve the efficiency and capabilities of SMEs through the following key strategies: a) infusion of appropriate technologies to improve products, services, and/or operations; b) human resource training, technical assistance, and consultancy services; c) design of functional packages and labels; d) assistance in the attainment of product standards including testing; e) a database management system; and f) provision of assistance for technology acquisition.¹³

Although increasing foreign market access has been a key objective of SME policy in the Philippines since the 1980s, the exporting and importing activities of micro- and small businesses remain limited. According to the DTI, 60% of all exporters in the Philippines are in the small and medium category. Collectively, these SMEs contributed 25% to the Philippines' total export revenues in 2016. To increase the international participation of SMEs, the Philippines' current Micro, Small, and Medium Enterprise Development Plan 2017–2022 explicitly pushes for "more globally competitive SMEs that are regionally integrated, resilient, sustainable, and innovative, thereby performing as key drivers of inclusive Philippine economic growth" (MSMED Council 2018). In particular, the Plan targets increasing SME employment to 8.284 million and the contribution to value added from 50% to 55% by 2022. To close the gap between these goals and the most recent numbers (i.e., 5.717 million SME employees as of 2018 and a 35.7% share in value added as of 2016) the government plans to roll out programs and projects that are anchored in five major strategies, namely: improving the business climate, increasing access to finance, enhancing management and labor capacities, improving access to technology and innovation, and expanding access to markets. Currently, the DTI is the main government institution in charge of supporting the internationalization of SMEs. Through its various bureaus and attached agencies, the DTI pushes for greater SME

¹² http://setup.dost.gov.ph/program_setup.php.

¹³ However, whether the program achieved its goals is another issue. For instance, the state auditors who reviewed the program in 2018 observed that: a) many MSMEs that received SETUP funding failed and were unable to repay; b) much of the equipment bought for the program remained unutilized and not properly stored; and c) there was inadequate monitoring and a lack of thorough evaluation of important decision factors such as the financial capacity of the beneficiaries and the agency's preparedness in handling the SETUP equipment (Buan 2019).

participation in global markets through programs such as export promotion, trade fairs, one-stop shops to reduce red tape, technical assistance on doing business in free trade areas, and e-commerce (OECD and ERIA 2018).¹⁴ Flagship programs such as the Philippines Export Competitiveness Program (PECP), the Regional Interactive Platform for Philippine Exporters (RIPPLES), and the Export Pathways Program (EPP) support SMEs through assistance in innovation, product designs, capacity building, and compliance with market requirements. In addition, there are business support (or “Negosyo”) centers that help SMEs by providing information on training, financing, marketing, e-commerce, etc. These centers also provide a physical venue where SMEs can connect to potential buyers such as large domestic and multinational corporations.

3. PHILIPPINE SMEs IN GVCs: SOME STYLIZED FACTS

This study adopts the definition of GVC-connected establishments used in Mendoza (2019). In particular, GVC operation is described as the production of a final good (or service) through fragmented stages performed by firms that are spatially dispersed but connected by complementary backward and forward trade linkages. Accordingly, producers involved in this process are referred to as “GVC firms.” Table 4 summarizes the description and provides some examples of the GVC typology adopted from Mendoza (2019).

Table 4: Description and Examples of Common Activities in Different Firm Types

Type	Trade Activities	Common Production Activities
Type 1	Not importing, not exporting	Manufacturer of locally sold banana and cassava chips, manufacturer of purified tube ice, manufacturer of locally sold fruit preserves and candies (e.g., mango, pineapple, and durian), manufacturer of locally sold fruit and alcoholic beverages (e.g., calamansi juice and tubâ)
Type 2	Importing, not exporting	Manufacturer of animal feed, manufacturer of fertilizers, flour miller that sells to local bakeshops, manufacturer of locally sold plastic kitchenware, manufacturer of LPG, manufacturer of locally sold plywood that used imported materials
Type 3	Not importing, exporting	Exporter of coconut-based products, exporter of dried mangoes, exporter of processed seafood, exporter of semi-processed ores; exporter of rattan-based furniture
Type 4	Importing and exporting, outside SEZ+	Exporter of branded breads and snacks that used imported flour, exporter of garments and apparel that used imported textiles, exporter of furniture that used imported wood and paint
Type 5	Importing and exporting, inside SEZ+	Manufacturer of printed circuit boards, manufacturer of wire harnesses, manufacturer of metal parts for electronics assembly, manufacturer of camera parts and components, manufacturer of hard disk drives, manufacturer of semiconductors

Source: Mendoza (2019).

In this study, SEZ+ is defined as a city or municipality that hosts a special economic zone (SEZ). This criterion is included since many industrial parks in the Philippines are actually created to attract investments from multinationals and other export-oriented enterprises. Mendoza (2019) argues that the ordering of firm types broadly corresponds to the

¹⁴ In particular, the Bureau of Micro, Small, and Medium Enterprises Development (BMSMED) is designated as the lead office to assist the MSMED Council in its policymaking functions. The Center for International Trade Expositions and Missions (CITEM) is tasked to promote information and market access while the Philippine Trade and Training Center (PITC) offers trainings on business management and entrepreneurial development. On the other hand, the Philippine Product Development and Design Center (PDDC) and the Bureau of Export Trade Promotion (BETP) provide technical support aimed at improving product quality, supplier capability, and overall competitiveness.

strength of each group's GVC integration. This suggests that partially internationalized manufacturers (i.e., Types 2 and 3) have relatively weaker GVC linkages than the subset of firms that both export and import (i.e., Types 4 and 5). Accordingly, the "true" participants in globally fragmented production are most likely involved in Type 4 and 5 transactions. Equation 1 also suggests that Type 5 traders may be regarded as the "archetypal GVC firms" since manufacturers in economic zones are usually deeply embedded in production networks that are organized by large multinationals.¹⁵

The proposed classification improves the identification of GVC-linked SMEs in several ways. First, no arbitrary lower bound for size, revenue, or trade transactions is imposed here given that even small establishments can potentially join GVCs. In fact, many value chain operations rely on the efficient networking of producers in a multilevel setup where bigger firms collect, consolidate, and process the inputs from lower-tier suppliers. Hence, the exclusion of firms below an arbitrary cutoff may fail to capture GVC-related activities where SMEs are able to participate, either directly or indirectly, due to supposedly lower entry barriers. Second, this typology is inclusive enough to cover the GVC activities of typical firms in developing countries, especially SMEs that may not be captured by classifications based on the ability to attract FDIs and perform large-scale trade transactions.

To operationalize the proposed typology, this study utilizes firm-level data on export revenues, import costs, and location. The SEZ+ indicator is developed from the list of manufacturing and agroindustrial economic zones of the Philippine Economic Zone Authority as of July 2016.¹⁶ The exports and imports data are obtained from the PSA's panel of trade transactions from 1991 to 2012.¹⁷ Information on direct and indirect exports from the PSA's Annual Establishment Survey of Philippine Business and Industry (ASPBI) and Censuses of Philippine Business and Industry (CPBI) conducted from 1996 to 2012 are also used as additional identifiers of trading activities.¹⁸ The analysis focuses on manufacturers to make sure that the GVC transactions most probably involve raw materials, parts, and components instead of final goods. However, the statistical analyses are mostly limited to the years 2008 to 2012 due to insufficient data on important variables (such as foreign equity participation and capital stock) prior to 2008. Nevertheless, this subset already contains 19,271 observations from 9,860 Philippine establishments in the manufacturing sector.¹⁹

The distribution of Philippine manufacturers in Table 5 shows that the combined shares of Type 2 to 5 firms in all manufacturing generally increased after the mid-1990s, a period

¹⁵ The emphasis on two-way trade as the key identifier of more intensive GVC participation follows directly from the concept of backward and forward linkages in the inter-country input-output literature. Given that production networks are designed to link the activities of geographically distant manufacturers, it is not unusual for a typical GVC supplier to import in order to export; that is, they mainly use imported materials to perform a particular stage of production, then re-export the semi-finished output for further processing in a different country.

¹⁶ For simplicity, the coverage of the PEZA list is assumed to be invariant throughout the sample, although economic zones are actually established in different years. This is necessary to make sure that changes in GVC incidence rates reflect the dynamics in participation rather than mere creation of new SEZs.

¹⁷ Only nonoil trade transactions are included to make sure that the goods being traded are used as actual components of the final products.

¹⁸ This study benefited from the data-cleaning exercise conducted at the PSA under the Escaping the Middle Income Trap (EMIT) research program. EMIT is an international research consortium organized to study the "middle-income country trap" phenomenon. The consortium is composed of Erasmus University Rotterdam (EUR) and the Rotterdam School of Management (RSM) in the Netherlands, the University of the Philippines, and the Asian Institute of Technology (AIT) in Thailand.

¹⁹ In this study, the terms "establishment," "firm," "producer," "supplier," and "manufacturer" are used interchangeably.

characterized by intensified global fragmentation of production due to more liberal trade policies and major advances in communication and transportation technologies. Most notably, the share of Type 5 traders almost doubled from 7.97% in 1996 to 13.86% in 2012, peaking at 16.62% in 2009. In addition, the data also indicate that two-way trade has become more prevalent than either pure exporting or pure importing. This may be an indication of more trading activities inside production networks where exporting and importing are complementary. Nevertheless, there is still a significant fraction of local producers with no international transactions. This suggests that SEZs don't seem to have facilitated the large-scale entry of domestic producers into international operations. Despite the decreasing trend, 56.47% of Philippine manufacturers remained purely domestic oriented in 2012.

Table 5: Distribution of the Sampled Manufacturers by Firm Type, 1996 to 2012

Year	No. of Firms	% Share of:				
		Type 1	Type 2	Type 3	Type 4	Type 5
1996	3,112	63.08	4.05	16.55	8.35	7.97
2001	2,982	64.02	8.12	3.39	9.99	14.59
2003	3,336	63.28	9.20	2.85	8.90	15.74
2006*	7,956	62.03	9.16	9.36	7.42	12.04
2008	5,722	51.85	11.87	12.27	8.34	15.68
2009	4,782	50.79	11.31	12.71	8.55	16.62
2010	4,843	52.96	10.72	12.80	7.95	15.57
2012*	3,924	56.47	8.36	14.58	6.73	13.86

*Census year.

Source: Author's calculation based on PSA data.

In terms of international activities, the clear pattern suggested by Table 6 is that SMEs are prevalent in Type 1 businesses while large manufacturers are more common in Type 4 and 5 transactions. This implies that most SMEs are involved in purely domestic-oriented operations while large manufacturers are usually involved in exporting and/or importing activities. For Type 1 activities, the risk ratio²⁰ is consistently above 1, indicating a very high likelihood that manufacturers with purely domestic operations are small or medium rather than large. However, there is a declining trend in the risk ratios as we move away from Type 1. This indicates that the “relative risk” of being an SME is very low when we are looking at manufacturers with more complex trade transactions. As expected, the risk ratios for Types 4 and 5 are below unity. This is consistent with the WTO's (2016) observation that manufacturing SMEs in developing countries are underrepresented in GVCs. This also corroborates the existing empirical literature showing that firms that export and/or import are bigger, more capital- and skills-intensive, and more productive than nonexporting firms within the same industry (Bernard et al. 2012; Melitz and Redding 2014).

Table 6: Risk Ratio of SMEs to Large Manufacturers by Firm Type and Year

Year	Type 1	Type 2	Type 3	Type 4	Type 5
1996	2.67	0.46	0.54	0.18	0.16

²⁰ Computed as $RR_{it} = \frac{n_{SME,it} / \sum_{i=1}^5 n_{SME,it}}{n_{LARGE,it} / \sum_{i=1}^5 n_{LARGE,it}}$, where RR_{it} is the risk ratio of SMEs versus large manufacturers for Type i in year t ; $n_{SME,it}$ and $n_{LARGE,it}$ are the numbers of SMEs and large manufacturers under Type i in year t , respectively; $i = 1, \dots, 5$. An $RR_{it} > 1$ suggests an “increased risk” of SMEs being Type i .

2001	2.35	0.78	0.93	0.31	0.21
2006*	4.72	1.27	0.61	0.29	0.18
2008	2.73	1.76	0.80	0.56	0.43
2009	3.08	1.34	0.84	0.53	0.26
2010	3.39	1.44	0.73	0.41	0.24
2012*	2.42	1.11	0.63	0.40	0.27

*Census year.

Source: Author's calculation based on PSA data.

Across major manufacturing sectors, Table 7 shows that the risk ratios of SMEs to large manufacturers in Type 1 are consistently above 1, both in 1996 and 2012. This confirms our earlier observation that manufacturers with purely domestic operations are relatively smaller than exporters and importers. In contrast, the relative risks for Types 4 and 5 are generally low, indicating that small and medium enterprises are less likely than large firms to engage in simultaneous exporting and importing. Nevertheless, it is interesting to note that the risk ratios are not zero for Types 2 to 5. This means that it is still possible for SMEs to participate in various trade and GVC-oriented activities.

Table 7: Risk Ratio of SMEs to Large Manufacturers by Firm Type and Sector, 1996 vs. 2012

Sector	1996					2012				
	1	2	3	4	5	1	2	3	4	5
All Sectors	2.67	0.46	0.54	0.18	0.16	2.42	1.11	0.63	0.40	0.27
Food, Beverages, and Tobacco	1.71	0.25	0.46	0.21	0.09	1.66	0.46	0.57	0.28	0.25
Textiles, Garments, and Leather	4.54	0.45	0.46	0.14	0.11	2.18	1.38	0.56	0.49	0.25
Wood and Furniture	2.00	0.73	1.08	0.15	0.15	1.89	0.95	1.88	0.26	0.21
Paper and Printing	2.47	0.57	0.30	0.11	0.17	1.73	1.94	0.22	0.31	0.20
Petroleum	2.25	–	–	0.00	0.00	–	–	0.25	0.25	–
Chemicals and Pharmaceuticals	2.67	0.78	0.59	0.14	0.95	1.71	0.78	0.52	0.39	0.69
Rubber and Plastics	2.70	0.29	0.68	0.34	0.29	4.08	1.03	0.92	0.40	0.32
Nonmetals	2.14	0.15	0.71	0.05	0.37	3.14	0.50	0.74	0.25	0.28
Basic and Fabricated Metals	1.81	0.22	0.84	0.21	0.16	3.56	1.00	0.91	0.24	0.26
Electronics and Electrical Eqpt.	4.17	2.39	0.69	0.30	0.26	3.53	12.41	0.79	1.06	0.61
Machinery and Equipment	5.08	–	0.46	0.00	0.12	1.80	–	0.89	0.23	0.58
Motor Vehicles and Transport Eqpt.	2.73	0.12	0.39	0.12	0.31	2.92	2.31	1.02	0.77	0.35
Others	12.04	–	0.78	0.36	0.27	5.05	–	0.51	0.84	0.39

Source: Author's calculation based on PSA data.

A closer look at the merged trade and survey data set reveals that compared to large manufacturers, the group of SMEs with matched trade records exported fewer products to a smaller number of destinations. Similarly, SMEs import a less diverse range of products from fewer sources than large establishments (see Table 8). These figures suggest that the extensive margin of SMEs' activities might be narrower than that of large firms. This may also reflect the fact that SMEs' capabilities and networks are too limited to perform large-scale trade transactions. In terms of top products, the major export items of SMEs are traditional and relatively low-tech, such as tin, animal and vegetable fats and oils, alcohol, soap, metals, fruit and nuts, yarns and textile fabrics, and furniture. A similar pattern was observed for imports. In particular, SMEs' main foreign purchases are food and agro-based products (e.g., bovine meat, wheat, foodstuff for animals, animal and vegetable fats and oils, and maize), paper and cardboard, metals, and chemical products (e.g., polymers of ethylene, inorganic chemicals, insecticides).²¹ In terms of trading partners, both SMEs and large enterprises have the US and East and Southeast Asia as major export destinations and import sources, although the transactions are expectedly asymmetric in size.

**Table 8: Number of Traded Products and Trading Partners:
SMEs vs. Large Manufacturers**

Year	Exports				Imports			
	SMEs		Large Manufacturers		SMEs		Large Manufacturers	
	Markets	Products	Markets	Products	Sources	Products	Sources	Products
1996	82	608	145	1,070	60	1,884	124	3,479
2001	108	990	165	1,349	83	2,430	123	3,987
2006	152	2,139	179	1,905	92	4,437	117	5,225
2008	149	1,862	165	16,31	94	4,214	115	4,857
2009	133	1,675	164	1,638	82	3,947	111	4,591
2010	147	1,557	187	1,497	82	3,778	111	4,684
2012	136	1,464	197	2,010	76	3,386	111	4,738

Source: Author's calculation based on PSA data.

What explains the differences between the trading profiles of SMEs and large manufacturers? The large body of firm-level evidence accumulated over the last two decades formed the foundation of two core features of the NNTT: first, that firms are highly heterogeneous; and second, that exporters are systematically different from nonexporters. In the presence of sunk entry costs, bigger and more productive firms tend to self-select into international markets. For example, aspiring exporters and importers have to incur the costs of doing market research, adapting to foreign regulations and standards, marketing and promotion, and contracting with foreign partners. Similarly, numerous studies provide evidence that importing is positively related to productivity improvements.

²¹ In contrast, the top exports of large manufacturers came from medium- to high-tech sectors such as electronics-related parts and components, electrical power machinery, automatic data processing machines, auto parts, and motorcycles. Large firms also have a more diversified set of top imports, such as petroleum, electronics-related parts and components, natural rubber, plastics, machinery and equipment, automotives and parts, motorcycles, metal products, and milk products.

Table 9: Test of Equality of Means: Type 1 vs. Type 2 to 5 Firms

Characteristics	Unit	Type 1	Type 2	Type 3	Type 4	Type 5
SMEs						
Age (as of 2012)	Years	16.12	20.71***	15.08	22.12***	13.87
Employees	Persons	39.70	63.82***	63.18***	84.59***	89.22***
Wage	'000/Person	64.71	94.82***	86.44***	116.10***	131.01***
Capital-Labor Ratio	'000/Person	249.73	347.74***	325.40**	451.15***	681.08***
R&D Intensity	%	0.06	0.05	0.22***	0.13**	0.15***
Revenues	Million	52.21	136.94***	127.70***	250.50***	238.70***
Labor Productivity	'000/Person	347.74	518.95***	731.58***	884.77***	1,035.53***
TFP	In	5.25	5.58***	5.51***	5.68***	5.78***
Large Manufacturers						
Age (as of 2012)	Years	23.12	26.85***	17.04	26.54	16.01
Employees	Persons	547.60	433.90	851.73***	623.36*	969.56***
Wage	'000/Person	114.57	99.32	111.87	141.95***	133.15***
Capital-Labor Ratio	'000/Person	527.35	544.55	645.60	598.26	907.81**
R&D Intensity	%	0.90	0.05	0.13	0.14	0.15
Revenues	Million	1,062.54	765.75	2,268.44***	3,193.29***	2,472.92***
Labor Productivity	'000/Person	977.96	721.34	2,042.12	1,470.37**	1,094.27
TFP	In	5.83	5.82	5.98***	5.98***	6.05***

*p < 0.10, **p < 0.05, *** p < 0.01.

Notes: All monetary amounts are in pesos and expressed in constant 2000 prices using the GDP deflator.

Total factor productivity is estimated using the approach of Levinsohn and Petrin (2003).

The null hypothesis for the left-tailed t-test is that the mean values for a particular firm type are greater than or equal to the mean values for the baseline category (i.e., Type 1).

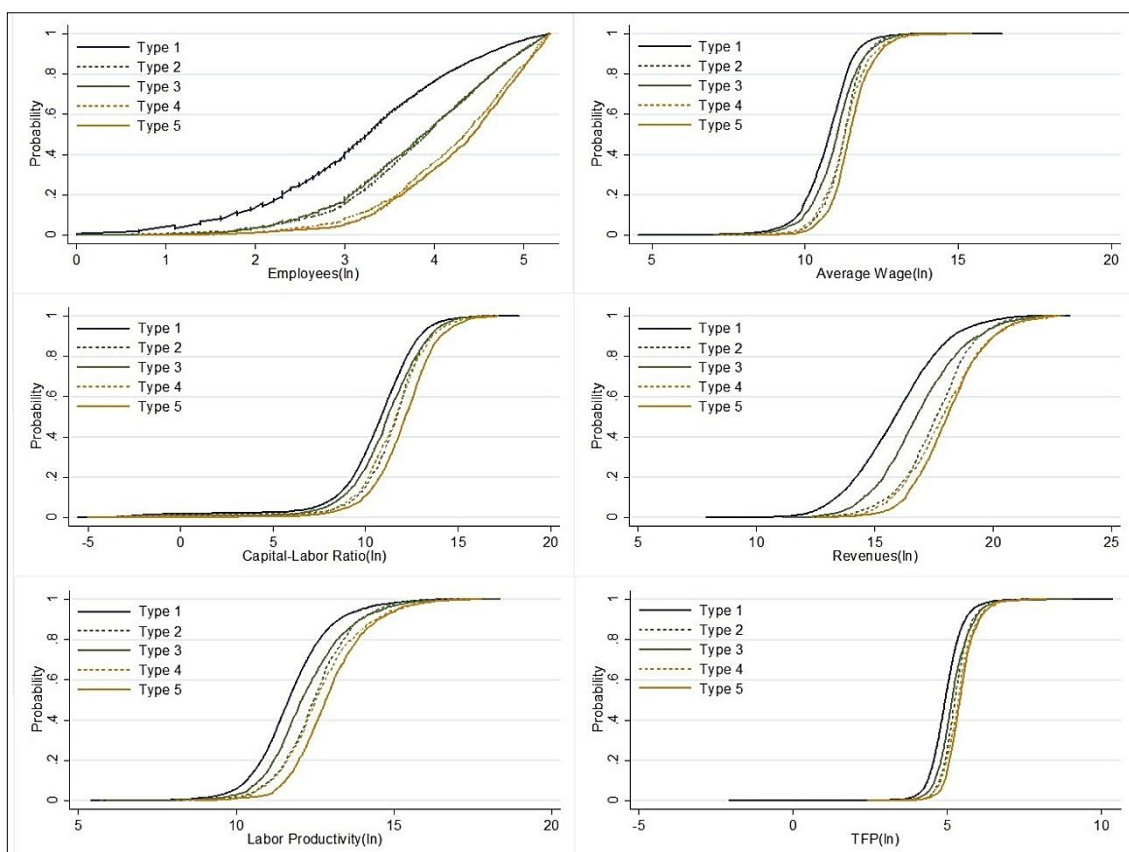
Source: Author's calculation based on PSA data.

Previous empirical investigations often demonstrate firm heterogeneity by comparing the characteristics of the average exporter and importer and the average nontrading firm. Table 9 summarizes the simple pairwise comparisons of the average Type 1 firms against the other groups of manufacturers in the pooled 2008 to 2012 sample. Separate analyses are made for the subset of SMEs and the subset of large manufacturers.²² The results of the separate t-tests for small and medium-sized firms suggest that on average, SMEs with exporting and importing activities generally have superior attributes (e.g., employment size, average wage, capital-labor ratio, and R&D intensity) than their purely domestic counterparts. Across all characteristics, the differentials generally increase as we move closer to Type 5, suggesting that two-way traders in SEZ+ are the most dissimilar producers from the typical domestic-oriented SMEs. Table 9 also shows that SMEs with foreign transactions have better performance indicators (e.g., revenues and productivity) than domestic-oriented establishments. In general, the picture emerging from the above findings is that GVC-oriented SMEs (i.e., Types 4 and 5) typically outperform those in domestic-oriented production (i.e., Type 1) in many important dimensions. In addition, compared to Type 2 and 3 SMEs that are only partially internationalized, small and medium establishments in two-way trade have superior attributes, such as size, capital intensity, revenues, and productivity.

²² Although not shown here due to space constraints, pairwise t-tests between SMEs and large firms are also conducted for each attribute and type. Except for the capital intensity of Type 4 firms and the labor productivity of Type 5 firms, the results show that the average large manufacturer is significantly better than the typical SME in every characteristic and firm type at $\alpha = 5\%$.

While the t-tests for the subset of SMEs are broadly consistent with the results in Mendoza (2019), which used the overall sample, the results for large manufacturers are mixed. Across attributes, large Type 4 and 5 firms appear to be the most distinct groups from their Type 1 counterparts. However, the results are weaker for large Type 3 exporters. There is also no strong evidence that large Type 2 importers are significantly better than purely domestic-oriented large producers. This suggests that the earlier evidence of heterogeneity among Philippine manufacturers may be driven by the wide disparity in the characteristics of SMEs across types.

Figure 1: Divergence in the Empirical Cumulative Distributions of Different SME Types



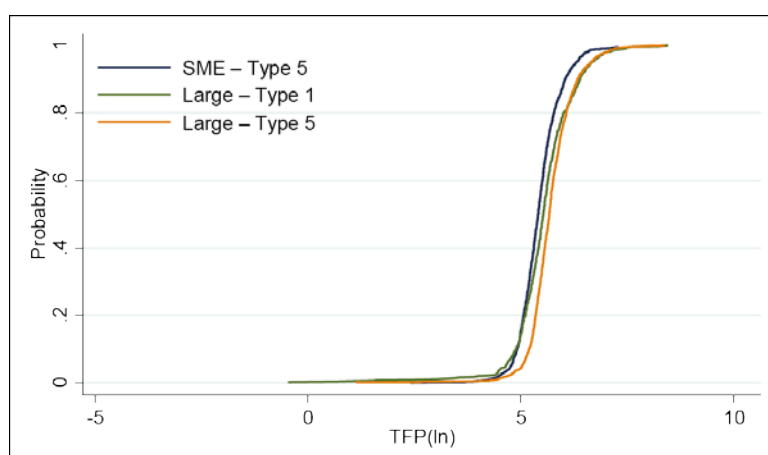
Source: Author's calculation based on PSA data.

Following Delgado, Fariñas, and Ruano (2002), the succeeding discussion extends the previous analysis by examining the divergence of different SME types along the distributions of the firm characteristics in question. In particular, the empirical cumulative distributions (ECDs) of the various categories are plotted to check whether Type i firms stochastically dominate Type $i - 1$ manufacturers; i.e., whether the ECD of Type i does not cross and lies to the right of the ECD of Type $i - 1$, $i = 2, 3, 4, 5$. Therefore, the ECDs can be used to graphically validate the two key propositions of the NNTT that firms are not homogeneous (i.e., they follow a certain distribution) and that manufacturers with stronger GVC linkages have better characteristics (i.e., the distribution of Type i stochastically dominates the distribution of Type $i - 1$).

Figure 1 consistently shows that the various firm categories systematically diverge across all characteristics, with small and medium manufacturers with foreign transactions always lying to the right of Type 1 SMEs. This lends further support to the view that international activities, whether exporting or importing or both, often involve huge entry costs that only manufacturers with superior attributes can afford to pay. This also suggests that between being connected to GVCs and not, the probability of the former is higher when we are looking at bigger and more productive SMEs chosen at random. Another interesting pattern is that the ECDs of Type 2 to 4 SMEs often cross, suggesting that the stochastic ordering may not be conclusive for these groups. However, the graphs show that Type 5 SMEs are normally ranked higher than all other groups. This confirms our earlier observation that Type 5 SMEs tend to have features that are most distinct from their Type 1 counterparts. These findings are comparable with the results of related studies showing that two-way traders have better attributes than firms that only import or only export or don't trade at all (e.g., Muñiz and Pisu 2009; Seker 2012). To the extent that larger, more capital-intensive, and more productive firms tend to self-select into exporting and importing, these findings imply that GVC participation involves bigger sunk entry costs that only self-selecting superior producers can afford to pay. This may partly explain the declining trend in the relative risks shown in Tables 5 and 6; that is, only a few SMEs have enough capability to perform complex Type 4 and 5 transactions.

Although not shown here, the ECDs for large manufacturers do not point to the stochastic dominance of a particular firm type. This suggests that large firms appear to be more alike even if they have varying degrees of GVC participation. Comparing this to our previous findings for SMEs, the foregoing results suggest that the self-selection effect may be stronger for small and medium firms than for large manufacturers. Máñez-Castillejo, Rochina-Barrachina, and Sanchis-Llopis (2010) had a similar result, suggesting that the productivity threshold proposed by Melitz (2003) is only binding for smaller firms. Using Spanish data, they found that the productivity distributions of large manufacturers, whether exporting or not, stochastically dominate exporting SMEs. This is partially corroborated by our own evidence from Philippine data. As shown in Figure 2, the TFP distribution of the most productive SMEs (i.e., Type 5) is only comparable to that of Type 1 large establishments and is strictly dominated by Type 5 large traders.

Figure 2: Divergence in the TFP Distributions of SMEs and Large Firms



Source: Author's calculation based on PSA data.

Table 10 summarizes the nonparametric Kolmogorov-Smirnov (KS) tests for equality of distributions to formally verify the divergence between the TFP distributions of SMEs and

large manufacturers. Following Delgado, Fariñas, and Ruano (2002), the two-sided tests simply analyze whether the different groups of firms belong to the same distribution or not. Additionally, the one-sided tests check the relative positions of the ECDs, i.e., if $D_i(a_t) \leq D_{i-1}(a_t)$, with strict inequality for some values of a_t , where $D_i(a_t)$ is the ECD of Type i firms for a particular attribute a_t . For a particular pair of adjacent firm types, rejecting the two-sided test but not the one-sided test confirms the stochastic dominance of the “higher-order” category. The stepwise KS tests were implemented to empirically check our hypothesis that the ordering of the firm types generally coincides with their supposed degree of GVC integration. Note that the KS tests are performed separately for each year t in the sample since this procedure requires the tested observations to be independent.

Table 10: Stepwise Kolmogorov-Smirnov Tests of the TFP Distributions of Different Firm Types

	2008	2009	2010	2012
Two-Sided Test				
SME Type 1 vs. SME Type 2	0.3379***	0.3011***	0.3451***	0.3086***
SME Type 2 vs. SME Type 3	0.0055	0.0484	0.0021	0.0836
SME Type 3 vs. SME Type 4	0.2469***	0.2128***	0.2321***	0.1344**
SME Type 4 vs. SME Type 5	0.1022**	0.0954**	0.0959*	0.1096
SME Type 5 vs. Large Type 1	0.2153***	0.2017***	0.1503**	0.0983
Large Type 1 vs. Large Type 2	0.0083	0.0794	0.1474	0.1493
Large Type 2 vs. Large Type 3	0.2281***	0.1679*	0.1751*	0.1080
Large Type 3 vs. Large Type 4	0.0848	0.1205	0.0848	0.0378
Large Type 4 vs. Large Type 5	0.0891	0.1113	0.0823	0.1451
One-Sided Test				
SME Type 1 vs. SME Type 2	-0.0008	-0.0032	0.0021	-0.0030
SME Type 2 vs. SME Type 3	-0.1434***	-0.1093	-0.1532	-0.1134**
SME Type 3 vs. SME Type 4	0.0000	-0.0221	-0.0046	-0.0255
SME Type 4 vs. SME Type 5	-0.0089	-0.0236	-0.0218	-0.0096
SME Type 5 vs. Large Type 1	-0.0127	-0.0149	-0.0195	-0.0812
Large Type 1 vs. Large Type 2	-0.2315***	-0.1636	-0.1528	0.1493
Large Type 2 vs. Large Type 3	-0.0107	-0.0200	-0.0354	-0.0701
Large Type 3 vs. Large Type 4	-0.0576	-0.0196	-0.0352	-0.1060
Large Type 4 vs. Large Type 5	-0.0459	-0.0584	-0.0303	-0.0305

Source: Author's calculation based on PSA data.

The KS tests for TFP generally validate the divergence suggested by the t-tests and the ECDs above. In particular, the results in Table 9 show that Type 2 SMEs stochastically dominate Type 1 SMEs across all years studied. However, the KS tests show no clear ordering between Type 2 and 3 SMEs. This is consistent with our previous observation that their ECDs in Figure 2 often cross, suggesting that neither of the two is strictly dominant over the other. Further, the tests show that Type 4 SMEs stochastically dominate their Type 3 counterparts. This confirms that SMEs in two-way trading are more productive than those that only export or only import. Finally, there is some evidence that Type 5 SMEs dominate their Type 4 counterparts. This proves that the two groups are distinct from each other.²³ Comparing Type 1 large firms to Type 5 SMEs reveals that the former stochastically dominated the latter from 2008 to 2010. This implies that the

²³ However, the two-sided tests indicate that this distinction seemed to have weakened in 2010 and 2012.

productivity of purely domestic-oriented large firms is comparable to, or even slightly better than, the most productive category of SMEs. Lastly, comparisons between different categories of large manufacturers yield mixed results. This confirms that large establishments across types tend to be less differentiated. What, then, determines the sorting of large firms into different types? This is an interesting question worth examining in future research.

Table 11: Multinomial Logit Model for the Characteristics of SMEs in GVCs

Dependent Variable: $P(\text{Type}_{jt} = i)$	Type 2	Type 3	Type 4	Type 5
Type 2 last period	162.89*** (30.93)	1.65 (1.49)	190.41*** (11.80)	138.84*** (11.72)
Type 3 last period	2.53*** (2.92)	40.85*** (28.03)	80.97*** (9.82)	47.72*** (9.15)
Type 4 last period	256.62*** (13.96)	79.71*** (10.94)	13,577.67*** (17.33)	148.93*** (7.46)
Type 5 last period	257.51*** (12.99)	88.15*** (10.72)	129.22*** (6.40)	11,893.80*** (17.29)
Lagged employees (ln)	1.21** (2.40)	1.14* (1.93)	1.63*** (4.49)	1.48*** (3.72)
Lagged capital intensity (ln)	1.06* (1.95)	1.01 (0.19)	1.05 (1.23)	1.08 (1.57)
Lagged TFP (ln)	1.34** (2.01)	1.47*** (3.11)	2.06*** (3.87)	1.77*** (3.04)
Lagged R&D spending (dummy)	1.06 (0.27)	1.86*** (3.66)	1.37 (1.30)	1.70** (2.17)
Lagged foreign equity share	1.00 (0.45)	1.01*** (5.00)	1.00 (1.10)	1.01*** (5.78)
Industry Control	Yes	Yes	Yes	Yes
Region Control	Yes	Yes	Yes	Yes
Year Control	Yes	Yes	Yes	Yes
Number of observations	6,026			
Log likelihood	-3,308.49			
Pseudo R-Squared	0.62			
Wald χ^2	10,660.50***			

*p < 0.10, **p < 0.05, *** p < 0.01.

Notes: Numbers in parentheses are z-statistics associated with robust standard errors.

Source: Author's calculations based on PSA data.

Finally, Table 11 summarizes the relative risk ratios (RRRs) from the multinomial logistic regression for the determinants of SMEs' GVC participation. The explanatory variables are lagged to reduce endogeneity problems. Note that if the RRR is significantly higher (lower) than 1, an increase in the variable of interest, *ceteris paribus*, increases (decreases) the odds of participating in a particular type of GVC activity instead of being purely domestic oriented. The results validate the hypothesis that all forms of past exporting and importing experience significantly contribute to the likelihood of a firm being in Types 4 or 5 in the current period. The heterogeneity literature commonly interprets this as the existence of sunk participation costs. In other words, firms that have hurdled the entry barriers in the last period will no longer be burdened by the same participation constraint in the current period. The results also formalize our previous findings that larger and higher-productivity SMEs are more likely to enter GVCs when

there are huge entry barriers. However, R&D intensity and foreign ownership are significant contributors to Type 3 and 5 participation only. Interestingly, capital intensity is not significant when other firm-level characteristics are controlled for. This suggests that SMEs' GVC participation may be more labor- than capital-intensive.

4. ENTRY AND EXIT OF PHILIPPINE SMEs IN GVCs

This section begins with a description of the dynamics of Philippine exporters and importers. Figure 3 illustrates the historical trend in firms' entry into and exit from international operations between 1992 and 2012. An entrant is defined as a firm present in t but not in $t - 1$ while a dropout at time t is present in $t - 1$ but not in the current period. Net entry is simply the difference between the number of entrants and the number of dropouts at time t . Note that this simple definition does not make a distinction regarding whether firms have a previous history of entry and exit.²⁴

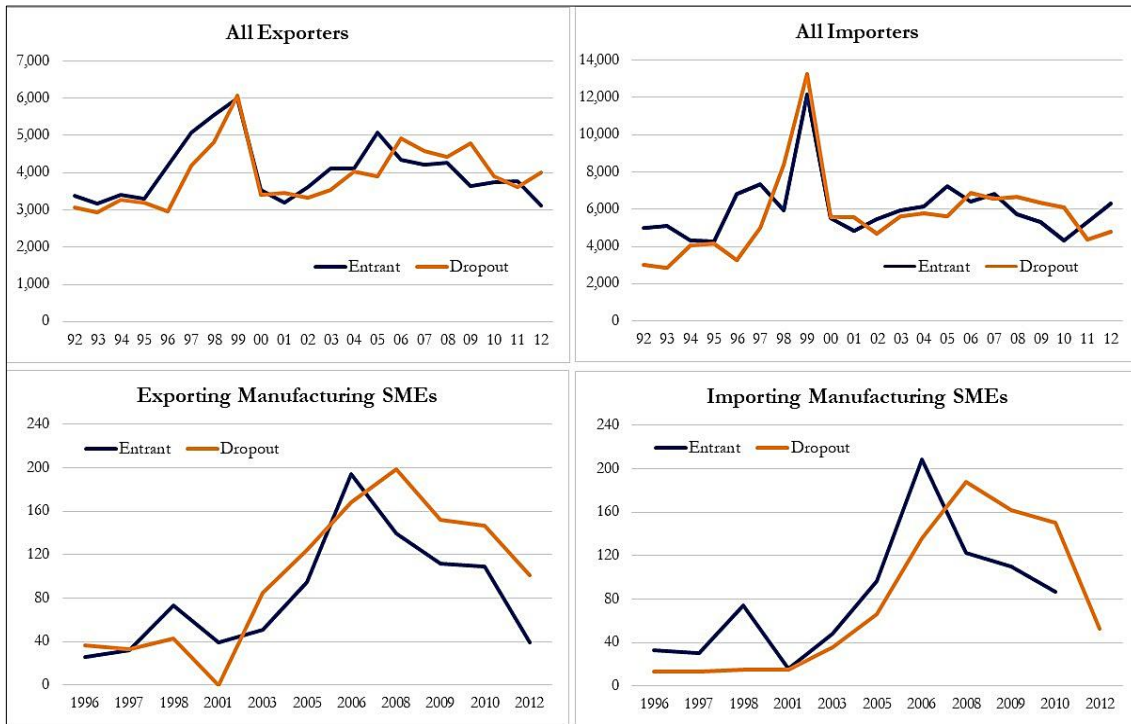
The top left panel shows that the number of export entrants increased through 1999 but suddenly dropped in the succeeding two years. After the dot-com crisis in 2001, the number of entering exporters consistently increased up to 2005 but declined from 2006 to 2012. From 1992 to 2005, export entrants normally exceeded the number of dropouts, albeit by a small margin. However, net entry has been generally negative since 2006 due to the continuous decline of export entrants and the above average number of dropouts. From 1991 to 2012, the cumulative net entry was only 2,406 or 5.83% of all recorded entrants during the 22-year period. Unless this has been reversed in more recent years, this trend points to a serious erosion of the country's export base and aggregate trade performance. Using the same data set, Balaoing-Pelkmans (2017) also observed that not only has the share of new entrants in total exporters been declining in recent years, but many of these firms also belong to the subset of one-time exporters or those firms that immediately exit a year after entry. For importers, the top right panel indicates that there were more entrants than dropouts prior to 1997 and from 2002 to 2005. Similarly to exports, net entry was generally negative from 2006 to 2011. However, in 2012, the firms that started to import outnumbered those that stopped direct sourcing from abroad. From 1991 to 2012, the net entry to importing was 7,777 or 6.16% of all import entrants during the period.

The bottom panels show the entry and exit of traders with matched information from the firm-level data. Unlike the top panels, these are not necessarily the "universal" demographics since they only capture the trade participation of SMEs sampled in the manufacturing surveys. In line with the trend for all traders, the graphs show that for both exports and imports, the number of sampled SMEs that started to export or import has been declining since 2008. Further, the number of sampled dropouts has outnumbered the sampled entrants starting in 2008. What's the reason behind this trend? One possible explanation is that small businesses were more badly hit by the great recession in 2008–2009. SMEs probably took longer to recover after the crisis as they grappled with low demand, restricted credit access, and a limited safety net. The lingering global uncertainty after the crisis may have also made small firms more cautious. Less competitive SMEs might also be the ones kept out of foreign operations in the face of more liberal market policies pursued by the Philippines during the period coinciding with major trade agreements (e.g., the ASEAN Free Trade Area). To the extent that these trends reflect the trading dynamics of the entire population of SMEs in manufacturing, the patterns above suggest that the erosion of the country's export and

²⁴ See Balaoing-Pelkmans (2017) for a more elaborate classification of entrants into and exitors from the export market.

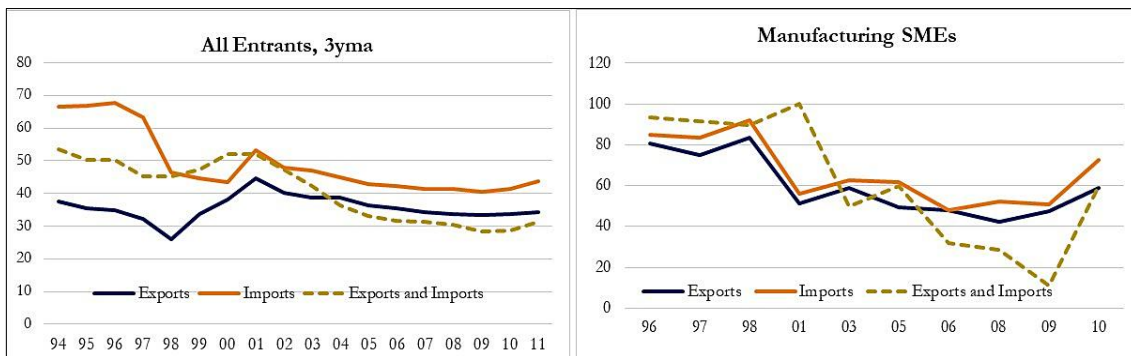
import base may be partly traced to the negative net entry of SMEs in international operations. This may also explain why Philippine SMEs continue to make disproportionately low contributions to total exports and imports despite their dominance in terms of number.

Figure 3: Dynamics of Philippine Firms in International Markets



Source: Author's calculation based on PSA data.

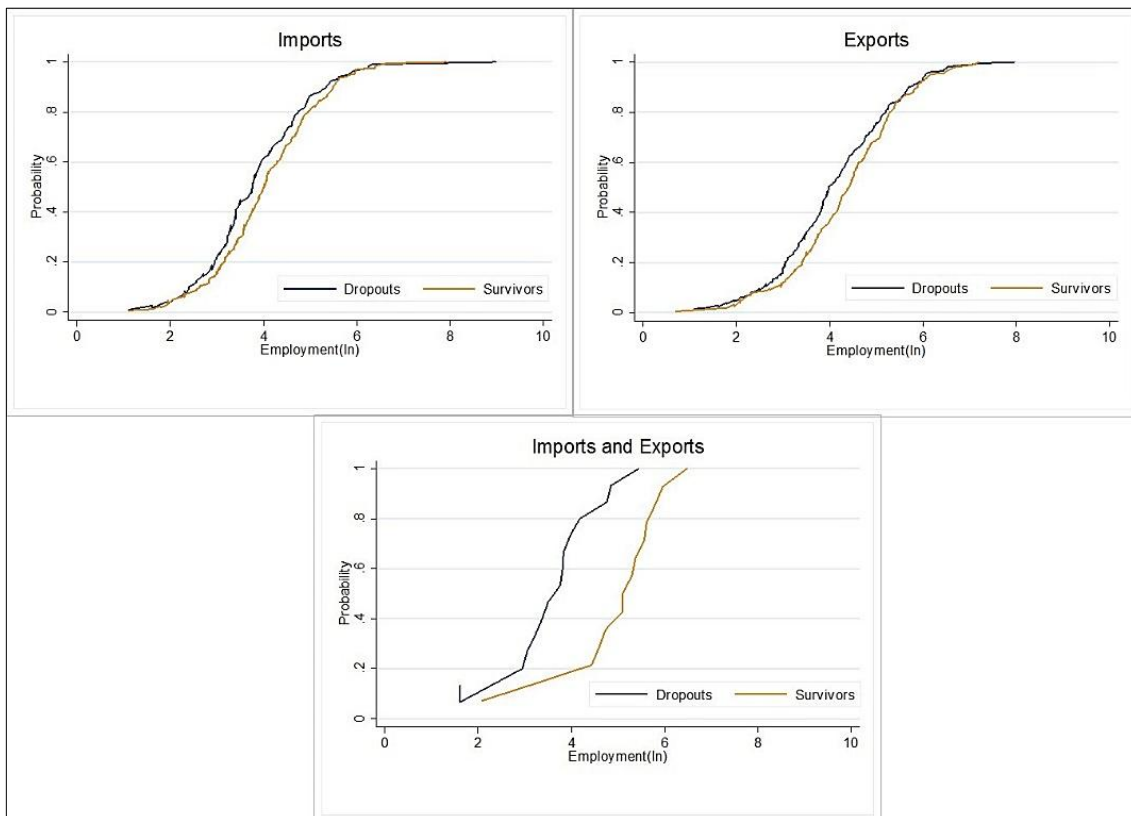
Figure 4: Entrants' Second-Year Survival Rate



Source: Author's calculation based on PSA data.

Figure 4 shows the percentages of firms that survived in year t after entering foreign markets in $t - 1$. The graphs indicate that the second-year survival rate is generally higher for entrants in importing than in exporting. This suggests that it may be easier to continue importing than to keep exporting due to the higher costs of the latter. In addition, below-par export entrants have a high risk of exit in the face of strong foreign competition. Interestingly, the persistence of the sampled manufacturing SMEs in exporting or importing is higher than the overall survival rate. This is consistent with Balaoing-Pelkmans' (2017) earlier observation that the export survival rate of manufacturers is higher than the overall average. It can also be observed that the second-year survival rates have declined after 2000, although there was a slight reversal in 2010. After 2003, the proportion of new two-way traders that maintained the same status in their second year fell below the survival rates for all export and import entrants. This is consistent with our proposition that it is more difficult to engage in simultaneous exporting and importing since it requires more complex capabilities. Finally, it is worth noting that manufacturing SMEs that entered exporting and importing simultaneously in the midst of the global financial crisis also seemed more badly hit than other types of traders, with only one survivor out of the nine documented entrants in 2008. This reflects the fact that firms integrated into GVCs are more sensitive to global demand and supply shocks.

Figure 5: Employment ECDs of Manufacturing SMEs: Dropouts vs. Survivors in Foreign Markets



Source: Author's calculation based on PSA data.

A closer look at manufacturing SMEs from 2008 to 2012 shows that survivors are mainly different from dropouts in terms of employment size. As illustrated in Figure 5, the employment distributions of survivors in importing, exporting, and two-way trading stochastically dominate the respective distributions of dropouts. This suggests that among SMEs that entered foreign markets, the larger ones are more likely to survive after their first year. Interestingly, there is no similar compelling evidence for other firm attributes such as capital intensity and productivity. One possible explanation is that SMEs are not highly heterogeneous in these dimensions to begin with.

What factors affect these SMEs' entry into and exit from international operations? Following Baldwin and Yan (2017), the probability of GVC entry or exit is modeled as a function of lagged firm-level determinants.²⁵ In particular, letting $ENTRY_{jt}(\mathbf{v}_{jt-1}) = P(G_{jt} \geq 4 | G_{jt-1} < 4; \mathbf{V}_{jt-1} = \mathbf{v}_{jt-1})$, the probability of GVC entry can be expressed as:

$$ENTRY_{jt}(\mathbf{v}_{jt-1}) = \frac{\exp(\mathbf{v}'_{jt-1}\boldsymbol{\beta})}{1 + \exp(\mathbf{v}'_{jt-1}\boldsymbol{\beta})} \quad (1)$$

Similarly, letting $EXIT_{jt}(\mathbf{v}_{jt-1}) = P(G_{jt} < 4 | G_{jt-1} \geq 4; \mathbf{V}_{jt-1} = \mathbf{v}_{jt-1})$, the probability of GVC exit can be modeled as:

$$EXIT_{jt}(\mathbf{v}_{jt-1}) = \frac{\exp(\mathbf{v}'_{jt-1}\boldsymbol{\gamma})}{1 + \exp(\mathbf{v}'_{jt-1}\boldsymbol{\gamma})} \quad (2)$$

where $\mathbf{v}_{jt} = (\mathbf{x}_{jt}, \mathbf{y}_t, \mathbf{z}_j)$; \mathbf{x}_{jt} is the vector of firm characteristics such as age, size, productivity, innovativeness, foreign equity ownership, and past international experience; \mathbf{y}_t is the vector of macro-level policy variables; \mathbf{z}_j is the vector of industry fixed effects; and $\boldsymbol{\beta}$ and $\boldsymbol{\gamma}$ are vectors of coefficients. SMEs that are in GVCs in periods $t - 1$ and t are dropped from the entry regressions. On the other hand, SMEs not in GVCs in periods $t - 1$ and t are excluded from the exit model.

The results of the logistic regressions for GVC entry are summarized in Table 12. Interestingly, the estimates consistently show that age is negatively related to the probability of entering GVCs, holding other things constant. This suggests that younger SMEs are more likely than older ones to engage in two-way trading. According to Love, Roper, and Zhou (2016), age may be linked with inflexible strategies or sclerotic behavior (i.e., the "liability of ageing"). For instance, older SMEs that have already established a strong presence in domestic markets may find it less attractive to go through the costly process of entering GVCs.

The estimates also point to a positive contribution of lagged TFP to the probability of SMEs' GVC entry. This is consistent with the argument that highly productive firms self-select into production networks when there are huge entry costs. Choosing highly qualified producers is also important for lead firms given that even small errors by incompetent suppliers may cause serious supply chain disruptions. The results also indicate that past importing experience increases the likelihood of GVC entry, partly through its productivity-enhancing effect. The dummy for past importing also represents the sunk costs associated with this activity. Firms that import not only benefit from the superior quality and technology embedded in foreign inputs, they also learn how to navigate foreign markets. This finding is in line with Damijan and Kostevc (2015) and Castellani and Fassio's (2017) findings that importing allows SMEs to "dress up" for their eventual export market entry. Interestingly, after controlling for importing, the positive

²⁵ See Mendoza (2019) for a survey of determinants used in past empirical studies.

effect of past exporting activities on SMEs' GVC entry becomes insignificant. One possible explanation is that there are sunk costs common to both activities; hence, controlling for both effectively makes the other redundant. This finding is also consistent with the general lack of empirical support for learning by exporting.

Table 12: Determinants of Manufacturing SMEs' GVC Entry

	1	2	3	4
Lagged age	-0.035*** (0.009)	-0.037*** (0.010)	-0.037*** (0.009)	-0.037*** (0.010)
Lagged employment (ln)	0.151 (0.134)	0.124 (0.139)	0.117 (0.141)	0.117 (0.141)
Lagged TFP (ln)	0.367** (0.157)	0.370** (0.157)	0.372** (0.158)	0.372** (0.158)
Lagged foreign ownership (dummy)	0.595*** (0.226)	0.596*** (0.227)	0.596*** (0.227)	0.596*** (0.227)
Lagged R&D spending (dummy)	0.281 (0.277)	0.301 (0.278)	0.293 (0.277)	0.293 (0.277)
Lagged SEZ+ indicator	0.984*** (0.250)	0.965*** (0.250)	0.965*** (0.249)	0.965*** (0.249)
Lagged importer status (dummy)	1.018*** (0.214)	1.035*** (0.213)	1.033*** (0.213)	1.033*** (0.213)
Lagged exporter status (dummy)	-0.072 (0.253)	-0.073 (0.253)	-0.072 (0.253)	-0.072 (0.253)
Financial institutions access index		15.845* (8.716)		
Simplicity of customs procedure			2.172* (1.146)	
Tariff rate (weighted average)				-0.205* (0.108)
Industry Controls	Yes	Yes	Yes	Yes
No. of observations	5,155	5,155	5,155	5,155
Wald's χ^2	195.25***	206.56***	212.95***	212.84***
Goodness-of-fit χ^2	4,869.77	4,740.57	4,694.84	4,695.40
Pseudo R-squared	0.098	0.101	0.101	0.101

* p < 0.10, ** p < 0.05, *** p < 0.01.

Numbers in parentheses are robust standard errors.

Source: Author's calculations based on data from the PSA, IMF, WEF, and World Bank.

Foreign-owned manufacturing SMEs are more likely to participate in GVCs. In fact, this has the largest marginal effect among all significant variables. There are several reasons why MNC linkages could facilitate an SME's internationalization. First, Jongwanich and Kohpaiboon (2008) suggest that foreign-owned firms are better able to overcome the sunk entry costs than purely domestic producers. This is not surprising given that affiliates and subsidiaries often receive technology transfers, loans, and technical support from parent companies. For instance, MNCs may assist their local partners in complying with international product standards. Second, having access to MNCs' extensive network of exporters and importers means that local manufacturers may skip the costly search for foreign buyers and suppliers. In fact, lead MNCs may facilitate the matching themselves if the transactions involve key inputs. Lastly, Baldwin (2014) suggests that cross-border movements of goods and investment intertwine because

FDIs are increasingly used as an instrument of the global unbundling of production. In other words, multinationals put up foreign affiliates and subsidiaries precisely to build a pool of suppliers for their globally dispersed value chains.

In connection with foreign ownership, the results also show that SEZs are a major gateway into international production networks. This is not surprising given that many economic zones in the Philippines are created to attract large multinationals, hoping that their backward linkages will stimulate greater GVC participation among local firms. There are several ways in which SEZs may facilitate the GVC entry of SMEs. First, the relocation of foreign multinationals and their original suppliers (i.e., follow sourcing) may generate new demand for the inputs produced by SMEs. Second, the various fiscal and nonfiscal incentives²⁶ offered to SEZ locators may also encourage local firms to start trading. Lastly, transactions inside industrial parks may create demonstration effects and knowledge spillovers that SMEs may use to facilitate their own foreign market entry. Interestingly, lagged employment size becomes insignificant after controlling for lagged TFP and foreign ownership. In other words, among foreign-owned SMEs with similar productivity profiles, the larger SMEs are not necessarily the ones that join production networks.

Table A1 in the Appendix suggests that the GVC entry of large manufacturers is driven by factors not exactly similar to the determinants of SMEs' GVC participation. For large firms, lagged R&D dummy and past exporting experience are highly significant, lagged employment is weakly significant, and lagged age and lagged TFP are not significant. Foreign ownership, past importing activities, and proximity to SEZs are important for both SMEs and large establishments. These three variables can be classified as universal factors that positively contribute to the GVC participation of any establishment. On the other hand, age and productivity seem to be the variables that uniquely determine the entry of Philippine SMEs into production networks. This is consistent with our previous argument that the TFP threshold for foreign market participation à la Melitz (2003) is only binding for smaller firms because they are less productive to begin with. Large businesses tend to be above this threshold regardless of whether they are domestic or foreign oriented. In terms of policy, this finding suggests that SMEs, especially promising startups, will benefit from productivity-enhancing programs and interventions. Following the growth literature, this means providing massive support to stimulate R&D and innovation activities among small businesses, widen technological and information access, and boost human capital through technical training and continuing education. At the same time, SMEs wanting to internationalize will benefit from a deeper access to foreign networks, investments, inputs, technology, and information. To this end, more liberal investment policies, lower input tariffs, and logistics and ICT development should be pursued.

Due to data limitations, the response of SMEs' GVC participation to policy changes was analyzed using several macro-level variables. Model 2 in Table 12 adds the IMF's financial institutions access index as a proxy for the ease of credit access in the Philippines. Intuitively, internationalization may require financing for new skills, physical and technological investments, market research, and networking. Model 3 adds the Philippines' score in the World Economic Forum's subindex for the simplicity of customs procedure as a broad indicator of trade facilitation. In theory, making customs procedures and administrative regulations simpler and less costly for SMEs should encourage them to increase their participation in foreign markets. Model 4 includes the average tariff rate of the Philippines as a proxy for the openness of the country's trade policy. The estimated

²⁶ E.g., corporate income tax holidays, tax- and duty-free importation of raw materials, machineries, and equipment, and simplified customs procedures.

coefficients for the three variables yield the expected signs, although they are weakly significant. This is not surprising given that the indicators lack variability across time and especially across firms. The proxies for ease of access to finance and efficient trade facilitation have positive coefficients, indicating that improvements in these areas may help reduce the barriers to GVC entry. On the other hand, average tariff rate has a negative sign since less restrictive trade policy should encourage more SMEs to participate in production networks. Given that GVC firms typically import in order to export, lower tariff rates mean greater access to cheaper and better-quality inputs, and potentially higher output and profits.

Interestingly, these policy variables are not significant in the large firm regressions. Given the imperfections of our proxies, this does not necessarily mean that the GVC entry of large establishments will not benefit from improvements in credit access, trade openness, and trade facilitation. Instead, what these results suggest is that although SMEs face the same barriers as large businesses, they are often disproportionately affected by both positive and negative changes in the policy environment. For instance, the OECD and ERIA (2018) note that while well-functioning financial markets benefit all firms, access to finance (or the lack of it) is more important for smaller enterprises. Put differently, financial constraints are more detrimental to the growth of SMEs than large firms. This is partly because small establishments usually operate within harsher business conditions. In the presence of information asymmetries, lending to SMEs also entails larger transaction costs due to the need to conduct more rigorous appraisal and monitoring. This, in turn, may result in higher borrowing rates, or worse, credit rationing. Within the context of GVC participation, an ADB survey that covered Philippine firms noted that improvements in nonfinancial aspects such as product quality and human capital are the critical factors required to successfully integrate SMEs into GVCs (ADB and ADBI 2015). For instance, supplying to competitive foreign markets is almost impossible for firms unable to hurdle the costly process of securing quality certifications. However, the study also identified access to finance as the most pressing factor in enabling SMEs to address their nonfinancial problems. In a survey of Philippine SMEs in production networks, Aldaba et al. (2010) also found that firms rank financing as the most important type of assistance they need in order to overcome the constraints to their business operations. Nevertheless, ADB and ADBI (2015) also emphasized the importance of promoting financial literacy since the credit access problem may be exacerbated by SMEs' preconceptions that they cannot comply with the tedious and costly requirements of external financing.

Similarly, inefficient logistics, cumbersome administrative and regulatory procedures, complex documentation, and numerous customs formalities tend to disproportionately burden small firms. This is because SMEs often lack the financial and human resources to deal with the costly, highly technical, and time-consuming processes associated with exporting and importing. In general, López-González and Sorescu (2019) argue that among various trade facilitation reforms, "measures such as streamlining of procedures, automation of the border process, simplification of fees, and consultations with traders" appear to benefit SMEs more than larger firms. They also found that the trade facilitation environment in export destinations or in import sources matter as much as the domestic condition. This highlights the importance of harmonized international reforms in trade facilitation measures. In this regard, multilateral efforts such as the WTO's Trade Facilitation Agreement (TFA) may provide the common guiding principles to ensure coherence and uniformity. Among the measures in the TFA, the ITC (2018) identify the following as the most important for SMEs: publication and availability of information in a timely manner and in a less complex format and language; enquiry points where traders can file information requests; advance ruling (e.g., on tariff classification, customs valuation method,

and admissibility of goods); single window; risk management; publication of release times; limiting mandatory use of customs brokers; and expedited shipments. In general, these measures seem to promote easy access to information and streamlining and automation of procedures. In the Philippines, specific programs on SME trade facilitation are not well defined in the current MSME Development Plan 2017–2020. The OECD and ERIA (2018) also commented that the country's trade facilitation initiatives for SMEs are often fragmented. Nevertheless, the Philippines made recent progress with TRADENET.gov.ph finally going live on 31 December 2019. TradeNet is the country's online platform that connects the National Single Window to the ASEAN Single Window. The platform hopes to reduce communication costs by 10% by linking 78 trade regulatory agencies and simplifying the documentary process for around 7,400 products (Laforga 2020).

Table 13: Determinants of Manufacturing SMEs' GVC Exit

	1	2	3
Lagged age	–0.000 (0.012)	–0.000 (0.012)	–0.000 (0.012)
Lagged employment (ln)	–0.270** (0.119)	–0.297** (0.120)	–0.302** (0.120)
Lagged TFP (ln)	–0.289 (0.212)		
Lagged productivity (ln)		–0.165* (0.087)	
Lagged unit labor cost (ln)			0.178* (0.106)
Lagged foreign ownership (dummy)	–0.732*** (0.205)	–0.737*** (0.208)	–0.775*** (0.204)
Lagged R&D spending (dummy)	–0.103 (0.282)	–0.066 (0.283)	–0.090 (0.283)
Lagged SEZ+ indicator	–0.144 (0.203)	–0.088 (0.208)	–0.099 (0.208)
Industry Controls	Yes	Yes	Yes
No. of observations	1,098	1,085	1,085
Wald's χ^2	55.26***	55.56***	55.36***
Goodness-of-fit χ^2	1,073.57	1,063.52	1,063.73
Pseudo R-squared	0.062	0.065	0.064

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Numbers in parentheses are robust standard errors.

Source: Author's calculations based on data from the PSA, IMF, WEF, and World Bank.

Finally, Table 13 suggests that there is some asymmetry in the factors that affect the GVC entry and exit of SMEs. Age, TFP, and nearness to SEZs are not significant deterrents to GVC exit, although they are important determinants of entry. On the other hand, foreign ownership significantly reduces the likelihood that firms will leave two-way trading. This suggests that stable linkages with multinationals may be the most important factor in staying connected to GVCs. Especially during bad times, lead firms may assist their key suppliers by extending financial and managerial support, trainings, and technological upgrading. Unlike arm's-length suppliers, affiliates and subsidiaries of MNCs cannot just exit since they usually perform specialized functions that are integral to value chain operations. For captive suppliers, the decision to cease production is not

theirs to make but is determined at the headquarters. Interestingly, controlling for foreign ownership made lagged TFP insignificant, indicating that higher productivity makes no additional contribution to the survival of foreign-owned SMEs. On the other hand, the results indicate that larger SMEs are less likely to exit production networks, other things held constant. This is consistent with our previous finding that survivors and dropouts from foreign markets are primarily distinguished by size but not necessarily by productivity level. This result also implies that since SMEs tend to specialize in labor-intensive functions, their ability to stay competitive may depend on having a large and highly efficient workforce. True enough, the regressions obtained intuitive but weakly significant effects when TFP was replaced by labor productivity and unit labor cost.

5. CONCLUDING REMARKS

This paper explores firm-level data from the Philippines to uncover new stylized facts about the participation of manufacturing SMEs in production networks. The empirical analysis shows that manufacturing SMEs are weakly connected to foreign markets, especially GVCs. Compared to large manufacturers, SMEs also trade fewer products with a smaller set of foreign partners. The evidence also suggests that self-selection into exporting and importing may be more relevant for SMEs than for large manufacturers. The logistic regressions partly support this view, with TFP being a significant contributor to the GVC entry of SMEs but not of large manufacturers. In general, the factors driving GVC entry are not exactly similar for small and large manufacturers. For large firms, employment size and R&D are significant. On the other hand, age and TFP seem to be the variables that uniquely determine the entry of Philippine SMEs into production networks. Foreign ownership, past importing activities, and proximity to economic zones can be considered universal factors important to all establishments. The regressions also indicate that SMEs may be disproportionately affected by changes in the policy environment. Finally, the results highlight some asymmetries in the factors that affect the GVC entry and exit of manufacturing SMEs. Only size and foreign ownership make significant positive contributions to survival.

The above results have important policy implications. First, the empirical support for SME heterogeneity calls for a more nuanced approach to industrial and export policy. This requires a deeper understanding of the structures and compositions of different sectors to ensure that the interventions are designed according to the specific need of a particular industry. Given that SMEs are not simply smaller versions of large establishments, programs and projects targeted at big firms may not necessarily apply to SMEs. Similarly, interventions that work for large businesses may generate mixed results for SMEs. Thus, it may be imperative for policymakers to always make a distinction between SMEs and large firms when formulating export promotion, competitiveness, and trade facilitation policies. Given that superior SMEs normally self-select into international operations, the government should pay more attention to programs that can help weaker SMEs acquire the capabilities necessary to overcome the barriers to GVC participation. Since small firms have limited access to financial and technological resources, policy should focus more on building an institutional infrastructure (e.g., the policy framework assembled in the MSME Development Plan) that will support the growth of small local manufacturers with international potential. In the words of Mayer and Ottaviano (2007), do not waste time helping the incumbent superstars “but instead nurture the superstars of the future.” However, given that even large GVC suppliers in the Philippines are concentrated in unsophisticated activities, a more appropriate strategy would be to help graduate existing GVC firms to better functions and pave the way for the eventual GVC entry and long-run upgrading of

promising SMEs. This may include specific policy support to help local producers overcome the various fixed costs identified above. Nevertheless, proactive policy is still important to ensure that big manufacturers operate within a stable business environment, both domestic and abroad. The ideal scenario may be characterized by an efficient networking of domestic producers in a multilevel setup where bigger GVC firms collect, consolidate, and process the inputs from lower-tier small suppliers. The wider access to these indirect channels of exporting and importing where entry costs are lower may stimulate a greater GVC participation of local SMEs. This may also result in higher domestic value added to GVC trade. It is also worth noting that while multinational linkages may facilitate greater GVC integration, the government should still adopt a more strategic trade and investment policy that will promote diversification outside labor-intensive activities and towards more sophisticated and higher-value-adding GVC activities.

In terms of exit and survival, the results suggest that local SMEs connected to GVCs need to develop new competencies other than their multinational linkages and labor advantage. In particular, the positive but insignificant contributions of TFP and R&D to survival indicate that SMEs must exert purposeful effort to build stronger technological capabilities, nurture innovative tendencies, increase absorptive capacity, and boost overall productivity. These are important steps in making sure that SMEs not only survive but also eventually move up the value chain. While survival is a necessary short-run objective, SMEs should strive to fully capture the long-term benefits of global integration by upgrading to complex GVC activities where technologies and inputs are more sophisticated and value creation is larger.

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APPENDIX

Table A1: Determinants of Large Manufacturers' GVC Entry and Exit

	Entry	Exit
Lagged age	-0.001 (0.013)	-0.008 (0.011)
Lagged employment (ln)	0.393* (0.221)	-0.163 (0.132)
Lagged TFP (ln)	-0.269 (0.345)	0.074 (0.265)
Lagged foreign ownership (dummy)	0.782** (0.322)	-0.620* (0.337)
Lagged R&D spending (dummy)	0.769** (0.356)	0.302 (0.286)
Lagged SEZ+ indicator	0.899** (0.432)	0.221 (0.265)
Lagged importer status (dummy)	1.228*** (0.350)	
Lagged exporter status (dummy)	-1.179*** (0.345)	
Industry Controls	Yes	Yes
No. of observations	1,210	849
Wald's χ^2	55.56***	38.38***
Goodness-of-fit χ^2	1,248.03	802.68
Pseudo R-squared	0.1274	0.0570

* p < 0.10, ** p < 0.05, *** p < 0.01.

Numbers in parentheses are robust standard errors.

Source: Author's calculations based on PSA data.