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GLOBAL VALUE CHAINS IN THE PACIFIC ISLAND COUNTRIES: PATTERNS AND STRUCTURE

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Abstract

This study investigates the patterns of global value chain (GVC) participation of Pacific island countries (PICs) at the country, industry, and firm levels, utilizing UNCTAD-Eora GVC data (1999–2018) and the World Bank's Enterprise Survey data (2009 and 2015). It also uses the survey data to examine the relationship between firm and country characteristics and firm-level GVC participation. At the country level, the study found a limited role of the PICs in global and regional production networks, hindering foreign technological and knowledge transfer, industrialization, and economic development, while, at the industry level, the PICs generally engage in low-value-added activities. The firm-level analysis reveals that the PICs' domestic firms, particularly SMEs, face difficulties joining value chains. Although firm characteristics, i.e., labor productivity and quality certification, are essential for firms to engage in GVCs initially, they are insufficient to deepen the GVC participation level. The analysis also emphasizes the significance of macro-level business-enabling environment factors, including good governance, trade openness, and foreign direct investment.

Keywords: global value chain, islandness, Pacific island, production network, trade in value added

JEL Classification: F13, F14, O24

Contents

1. INTRODUCTION

The Pacific Island countries (PICs) face several issues in their quest for economic and sustainable development due to their characteristic of "islandness," i.e., economic and geographical smallness, remoteness, and dispersion (e.g., Juswanto and Ali 2016; Malua 2003; UNESCAP 2006; World Bank 2021). Small domestic markets constrain their economic activities and, in turn, reduce the possibility of realizing economies of scale, specialization, and industrialization (Kumar and Stauvermann 2021). Moreover, remoteness and dispersion imply high transportation and, in turn, production costs, while smallness indicates a small domestic market size and a hurdle to overcome in realizing economies of scale. Together, the characteristics of islandness make the region unattractive to foreign direct investment (FDI), posing challenges to the PICs in joining global value chains (GVCs). Without FDI and GVC participation, the PICs' domestic firms and industries lose several opportunities, including: 1) enhancement of capabilities and competitiveness; 2) improvement of product quality; 3) financial stability; and 4) market expansion (Korwatanasakul and Paweenawat 2021). Consequently, the manufacturing sector is underdeveloped, and the PICs have become detached from the global market and value chains.

Even though participation in GVCs is significant for economic development (e.g., Korwatanasakul and Baek 2021; Korwatanasakul, Baek, and Majoe 2022), there is very little stand-alone literature regarding GVCs in the PICs. Most discussions are in the context of Asia and the Pacific and, in turn, offer thin analyses and policy implications that may not be specific to the PICs' context. On the one hand, the literature provides macro-level descriptive analyses of the PICs' GVCs, covering issues such as the importance of the services sector in GVCs (Anukoonwattaka, Mikic, and Zhang 2017), the benefits and the drivers of GVC participation (Sawada et al. 2020), and connectivity and GVCs (Shepherd 2016; Vickers, Keane, and Palit 2019). On the other hand, Chand (2017) and Angelucci and Conforti (2010) employ case studies at the firm and industry levels to examine the characteristics of garment and food value chains in Fiji and Vanuatu.

Among the limited amount of literature, the existing literature is almost exclusively limited to gray literature, such as reports by international organizations (e.g., the Asian Development Bank (ADB) (Juswanto and Ali 2016), the International Monetary Fund (IMF 2022), the United Nations Conference on Trade and Development (UNCTAD) (Malua 2003), the United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP 2017), and the World Bank (World Bank 2021), national governments (e.g., the Commonwealth Secretariat [Shepherd 2016; Vickers, Keane, and Palit 2019]), and research institutes (e.g., the International Institute for Environment and Development (IIED) (Bass and Dalal-Clayton 1995). In addition, GVC data availability is often a technical issue, even in advanced economies, leading to analytical limitations, e.g., restrictive levels of analysis.

To address the gap in the literature, this study investigates the patterns of GVC participation of the PICs at the country, industry, and firm levels. It also examines the relationship between firm and country characteristics and GVC participation of firms in the PICs. The study utilizes: 1) UNCTAD-Eora industry-level and country-level GVC data on Fiji, Papua New Guinea (PNG), Samoa, and Vanuatu, for the period 1999–2018; and 2) pooled cross-sectional data from the World Bank's Enterprise Surveys, covering 245 firms from seven PICs (namely the Federated States of Micronesia, Fiji, PNG, Samoa, Solomon Islands, Tonga, and Vanuatu) for 2009 and 2015. To the best of the author's knowledge, this study is the first empirical study to

employ firm-level, industry-level, and country-level data to examine GVC participation patterns and structure in the context of the PICs. It provides a novel analysis through the lens of the GVC framework with empirical data on trade in value added. Matching GVC trends at the firm, industry, and country levels with the economic development path helps in identifying the linkage between firm-level GVC participation patterns and different stages of industry-level and country-level GVC integration. Hence, the study contributes to more solid findings on the issues related to GVCs and provides relevant policy recommendations that potentially help support the Pacific firms and industries in smoothly integrating into GVCs and improving market access.

At the country level, the study found that the PICs had a limited role in global and regional production networks, hindering foreign technological and knowledge transfer, industrialization, and economic development. Moreover, the PICs generally engage in low-value-added activities at the industry level, despite the different levels of the PICs' industrial development. In addition, the firm-level analysis reveals that the PICs' domestic firms, particularly SMEs, face difficulties joining value chains. Although firm characteristics, i.e., labor productivity and quality certification, are essential for firms to engage in GVCs initially, they are insufficient to deepen their GVC participation level. The analysis also emphasizes the significance of macro-level business-enabling environment factors, including good governance, trade openness, and foreign direct investment. In conclusion, subnational and national industrial development and regional cooperation policy measures are critical for the PICs to participate in global and regional production networks, boost GVC and regional value chain participation levels, and overcome the challenges of islandness through the realization of production networks, economies of scale, specialization, and industrialization.

The remainder of the paper is organized as follows. Sections 2 and 3 utilize the UNCTAD-Eora database on GVCs to empirically examine the patterns and structure of the PICs' GVCs at the country and industry levels, respectively. Section 4 provides a firm-level analysis to study the pattern of engagement in value chains at the firm level by employing pooled cross-sectional data from the World Bank's Enterprise Surveys and Global Development Indicators. Each section briefly discusses related literature, methodology, and data used in the analysis. Section 5 concludes the study and provides policy implications based on the analyses.

2. COUNTRY-LEVEL ANALYSIS

This section utilizes the UNCTAD-Eora database on GVCs, employing value-added trade data derived from the Eora global multiregional input-output table to empirically examine the patterns and structure of the PICs' GVCs at the country level. The data include information on the foreign value-added content of exports (FVA), domestic value-added content of exports (DVA),[1] value added integrated into other countries' exports (DVX), and gross exports in Fiji, PNG, Samoa, and Vanuatu, covering the period 1990–2019.[2]

[1] Domestic value-added content of exports (DVA) is the part of a country's exports created within the country, i.e., the part of exports that contributes to GDP (Intarakumnerd and Korwatanasakul 2020). The sum of FVA and DVA equates to gross exports.

[2] Trade in value-added data are only available for Fiji, Papua New Guinea, Samoa, and Vanuatu.

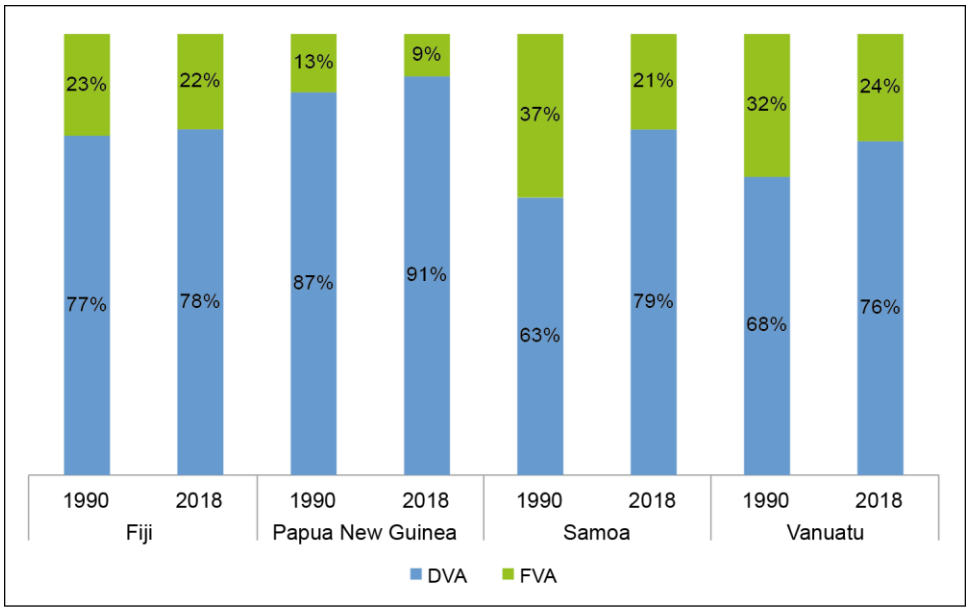
According to Korwatanasakul, Baek, and Majoe (2022), individual economies can participate in GVCs through either backward or forward participation, reflecting the chain's upstream and downstream links. Backward GVC participation (backward linkage) is measured by the FVA share of total exports, indicating the part of a country's gross exports that consists of inputs produced in other countries. Thus, the FVA share does not add to the national gross domestic product (GDP). On the other hand, forward GVC participation (forward linkage) occurs when exporting domestically produced intermediate goods or services to another economy that re-exports them through the value chain to third economies as embodied in other goods or services for further processing. The DVX share of total exports captures the forward linkage.

The UNCTAD-Eora GVC data demonstrate that, in general, the PICs' FVA share is smaller than that of DVA and declined between 1990 and 2018, implying limited and diminishing participation in backward GVCs (Figure 1.A). Without sufficiently engaging in backward linkage, the PICs lost opportunities to gain from foreign technology and knowledge and, in turn, faced timid economic growth (Intarakumnerd and Korwatanasakul 2020; Korwatanasakul and Paweenawat 2021). Figure 1.B shows that the PICs' volume of value-added content of exports (both DVA and FVA), except that of PNG, has grown slightly during the past three decades, reinforcing the argument regarding the adverse effect of underutilization of backward linkage. Limited backward GVC participation leads to the underdevelopment of local workers, firms, industries, and sectors, particularly the manufacturing sector. Therefore, it explains the slow development of trade in value added among the PICs. Even though PNG, with the lowest FVA share of exports, demonstrates the largest export volume among the PICs, its exports are primarily exports of natural resources, such as gold, copper, liquefied natural gas, and petroleum, which cannot sustain economic growth in the long run once these natural resources are used up.

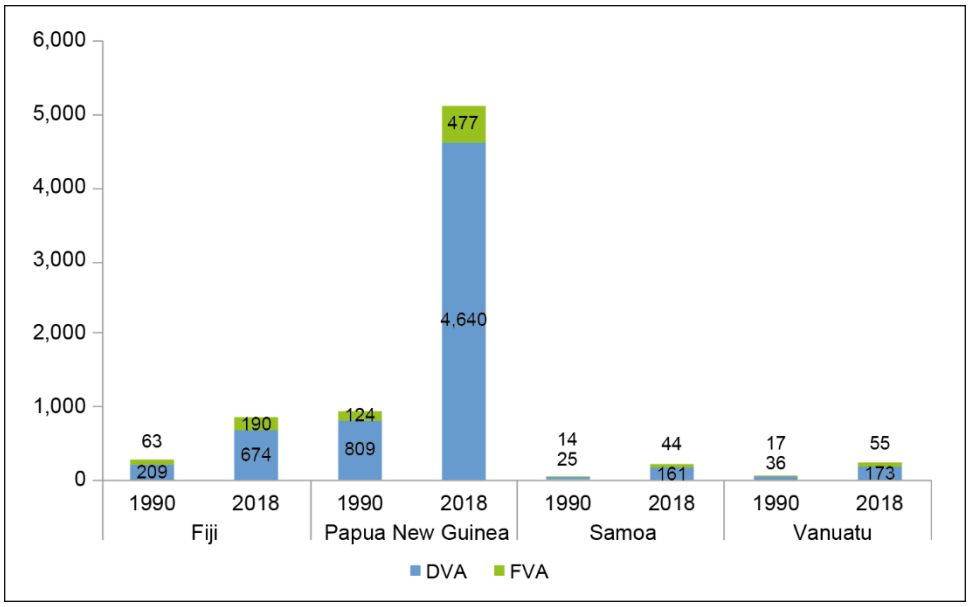
With regard to the PICs' forward GVC participation, except for PNG, the DVX share of exports is smaller than that of FVA but has been rising over time (Figure 2.A). Similarly to the DVA and FVA volumes, the volume of DVX, however, has not increased much during the same period (Figure 2.B). The relatively low DVX share of exports and volume indicates that the PICs have a restricted role in a global production network where other countries do not rely on the PICs' raw and intermediate materials. In other words, the PICs have an insignificant influence on other countries' trade and production. As previously discussed, PNG took advantage of its abundance of local natural resources to boost its trade in value added, particularly the volume of DVX, which is higher than that of the other PICs. Nevertheless, its DVX volume is still meager compared to larger economies outside the region.

Figure 1: Trade in Value Added of the Pacific Island Countries

A. Value-added content of exports (%)



B. Value-added content of exports (value in million USD)

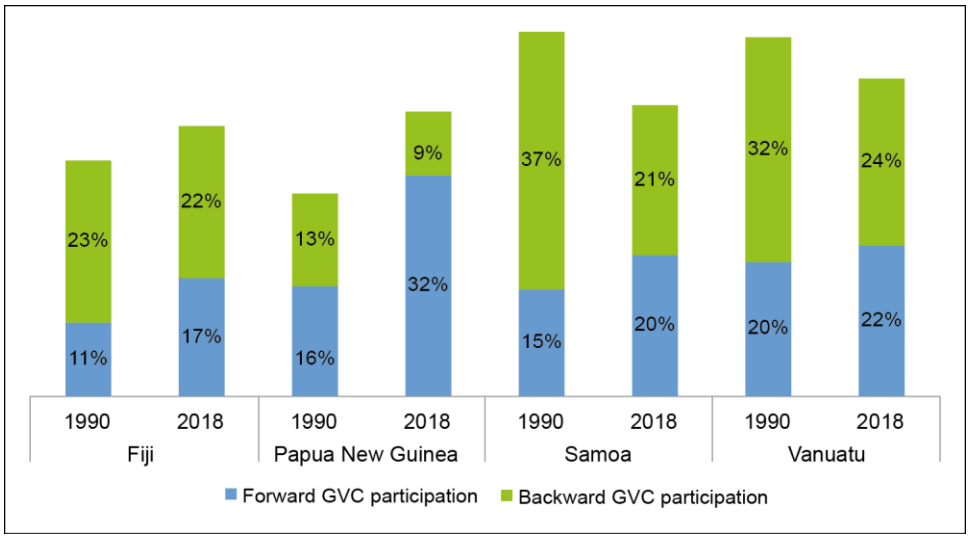


Notes: DVA = domestic value-added content of exports; FVA = foreign value-added content of exports; Total exports = DVA + FVA; USD = United States dollars.

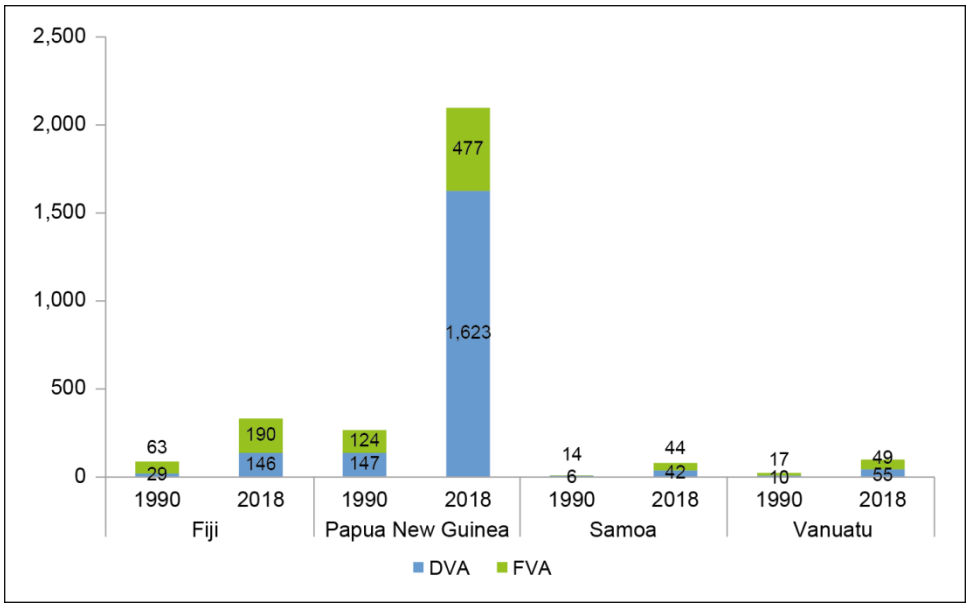
Source: Author, based on the UNCTAD-Eora Global Value Chain Database.

Figure 2: Global Value Chain Participation of the Pacific Island Countries

A. Backward and forward GVC participation (%)



B. Backward and forward GVC participation (value in million USD)



Notes: DVX = domestic value-added content of exports used in other countries' exports; FVA = foreign value-added content of exports; GVC participation = FVA + DVX; USD = United States dollars.

Source: Author, based on the UNCTAD-Eora Global Value Chain Database.

The proximity and technological advancement of partner countries possibly explain the pattern of backward linkage in 1990. The PICs mainly sourced their inputs and technologies to produce their exports from Australia, Japan, New Zealand, and the United States (US). However, comparing the GVC data between 1990 and 2019 gives a somewhat different picture of the backward linkage pattern (Table 1). The People's Republic of China (PRC) and India became critical players in providing production inputs (1%–13% increase in FVA share of exports), while the former key players lost their importance (1%–17% reduction in FVA share of exports). PNG shows a significant decline in Australia's FVA share of exports (17%) and a sharp rise in the PRC's FVA

share of exports (13%). The advantage of competitive inputs and technology costs due to the lower cost of domestic production in the PRC and India may offset the benefits of advanced technology and low international transportation costs due to proximity. Thus, the PICs' recent backward linkage pattern possibly indicates that "lower (domestic production) costs" are another crucial characteristic of partner countries.

Table 1: Foreign Value-Added Content of Exports (FVA) by Destination Countries and its Growth between 1990 and 2019

	Fiji				Papua New Guinea		
	1990	**2019**	**Growth**		**1990**	**2019**	**Growth**
Australia	26.4%	20.8%	2.6%	Australia	35.8%	18.9%	5.9%
New Zealand	16.1%	15.3%	3.2%	PRC	2.0%	14.7%	3.4%
PRC	1.7%	9.4%	9.8%	Indonesia	2.8%	7.2%	9.2%
India	1.4%	8.6%	10.0%	Singapore	6.3%	6.8%	4.0%
US	7.3%	4.1%	1.3%	Japan	7.0%	5.9%	2.8%
Japan	6.2%	4.0%	1.9%	Malaysia	2.2%	4.9%	4.0%
Indonesia	2.0%	3.4%	5.3%	US	6.5%	4.9%	4.6%
Singapore	2.2%	2.6%	4.1%	New Zealand	4.6%	3.3%	5.1%
Thailand	1.9%	2.2%	3.9%	Thailand	2.0%	3.3%	6.8%
Rep. of Korea	1.0%	2.1%	6.0%	Germany	2.0%	2.6%	6.0%
Other	33.7%	27.4%		Other	28.9%	27.4%	

	Samoa				Vanuatu		
	1990	**2019**	**Growth**		**1990**	**2019**	**Growth**
New Zealand	5.9%	8.6%	10.6%	India	1.0%	8.5%	–0.4%
US	11.1%	8.0%	1.9%	Australia	9.4%	7.0%	9.0%
PRC	1.7%	6.3%	7.9%	PRC	1.7%	6.7%	5.2%
Australia	6.3%	5.4%	2.0%	Japan	8.7%	6.7%	2.1%
Japan	7.0%	4.3%	4.0%	New Zealand	4.1%	5.5%	1.2%
UK	3.9%	3.4%	6.3%	Rep. of Korea	1.0%	2.5%	4.5%
Germany	2.2%	2.2%	1.5%	UK	3.6%	2.4%	0.7%
Thailand	1.5%	1.8%	–1.2%	US	7.8%	2.4%	0.7%
India	0.9%	1.8%	2.8%	Germany	2.2%	2.2%	3.6%
Rep. of Korea	1.0%	1.5%	3.8%	Thailand	1.6%	2.0%	2.6%
Other	58.6%	56.8%		Other	59.0%	54.0%	

Source: Author, based on the UNCTAD-Eora Global Value Chain Database.

The forward linkage shows increasing trading volumes between 1990 and 2019 (Table 2). Nevertheless, the pattern of the DVX share of exports is not apparent. Overall, Australia and Germany have been the main markets for inputs from the PICs since 1990. Moreover, Australia's DVX share of exports increased significantly between 1990 and 2019, as compared to the declining shares of other major markets, e.g., Belgium (for Vanuatu), Germany (for Fiji and PNG), Japan (for PNG), the Netherlands (for Samoa), and the Russian Federation (for Fiji). Similarly, the other partner countries' DVX shares of exports have been steadily rising. Increasing DVX volumes of all partner countries, shrinking DVX shares of exports of significant partner countries, and growing DVX shares of exports of the rest imply the PICs' greater market expansion and diversification.

Table 2: Domestic Value-Added Content of Exports Used in Other Countries' Exports (DVX) by Destination Countries and its Growth between 1990 and 2019

	Fiji				Papua New Guinea		
	1990	2019	Growth		1990	2019	Growth
Australia	12.0%	16.9%	6.6%	Australia	16.4%	22.5%	10.8%
Japan	18.2%	12.9%	4.1%	Germany	20.2%	14.1%	8.3%
UK	12.2%	11.3%	5.0%	Rep. of Korea	7.5%	8.9%	10.3%
New Zealand	5.3%	7.6%	6.7%	Belgium	5.9%	8.7%	11.1%
Germany	5.4%	6.4%	5.9%	Japan	16.1%	7.8%	6.9%
US	3.7%	4.5%	6.1%	PRC	1.4%	6.1%	15.3%
Netherlands	2.7%	3.5%	6.2%	Netherlands	4.3%	4.1%	9.5%
PRC	0.4%	2.7%	12.6%	Italy	2.1%	3.5%	11.6%
Singapore	1.5%	2.0%	6.3%	UK	4.2%	2.9%	8.2%
Rep. of Korea	1.6%	1.9%	5.8%	Singapore	1.4%	1.9%	10.7%
Other	37.0%	30.4%		Other	20.5%	19.4%	
	Samoa				**Vanuatu**		
	1990	**2019**	**Growth**		**1990**	**2019**	**Growth**
Australia	7.2%	15.7%	9.5%	Germany	23.4%	7.5%	1.7%
Russian Federation	4.4%	7.2%	8.4%	Russian Federation	2.8%	6.9%	9.1%
Germany	4.2%	5.6%	7.6%	Belgium	17.7%	5.9%	1.8%
Belarus	2.7%	4.8%	8.7%	Indonesia	1.3%	5.4%	11.0%
PRC	0.7%	3.5%	12.8%	Belarus	1.8%	4.7%	9.2%
Japan	2.4%	3.0%	7.3%	Japan	3.2%	4.6%	7.1%
Belgium	8.0%	2.9%	3.0%	Singapore	1.4%	3.5%	9.2%
UK	4.2%	2.6%	4.8%	Netherlands	3.3%	3.1%	5.5%
New Zealand	2.2%	2.6%	7.2%	PRC	0.0%	3.0%	22.7%
Singapore	2.2%	2.3%	6.8%	UK	2.9%	2.5%	5.2%
Other	61.7%	49.8%		Other	42.2%	52.9%	

Source: Author, based on the UNCTAD-Eora Global Value Chain Database.

Although the PICs export their production inputs to more advanced economies, such as Australia, Germany, and Japan (with a few exceptions: Belarus, the PRC, Indonesia, and the Russian Federation), the country mix varies across the PICs (Table 2). For instance, the main importing partners of Fiji are Australia, Japan, and the United Kingdom (UK), whereas the principal sourcing partners of Samoa include Australia, Germany, and the Russian Federation. This observation, together with the fact that the PICs' backward linkage partner countries are those outside the region, suggests low intraregional connectivity among the PICs. Table 3 reinforces the fact that trade in value added among the PICs is insignificant, with 0.1% in 1990 and 0.05% in 2019. In contrast, they rely more on GVCs, whose participation was 32% in 1990 and 52% in 2019. In other words, the role of regional value chains (RVCs) among the PICs has declined despite increased GVC participation. The low connectivity results from lacking industrial agglomeration and production networks, unlike other economic blocs, e.g., the Association of Southeast Asian Nations (ASEAN) and the Southern Common Market (Mercosur).

The country-level analysis reveals the uniqueness of the PICs' GVC participation pattern, possibly due to different confounding factors, e.g., islandness and the underdeveloped manufacturing sector, contrasting with the typical characteristics of GVCs pointed out by Baldwin (2013). First, the different mixture of trading partners

between FVA and DVX suggests that the PICs' GVC participation pattern does not follow either the headquarter and factory economies hypothesis or the hub-and-spoke asymmetry hypothesis. The PICs do not import inputs to produce exports and feed their exports back to the same trading partners. Furthermore, the nearly inactive RVC (0.05%–0.1%) among the PICs confirms that GVCs are not very regional but global for the PICs, going against Baldwin's claim that GVCs are not very global but regional (2013). Thus, the unique GVC participation pattern of the PICs warrants industry- and firm-level examination.

Table 3: The PICs' GVC and RVC Participation

	FVA			DVX			GVC	RVC
Year	Non-PICs	PICs	Total	Non-PICs	PICs	Total	Participation	Participation
Volume (Million USD)								
1990	219.41	0.63	220.04	194.01	0.63	194.65	414.69	1.27
2019	459.87	1.45	461.31	2,343.39	1.45	2,344.83	2,806.15	2.89
Share (%)								
1990	17%	0.05%	17%	15%	0.05%	15%	32%	0.10%
2019	9%	0.03%	9%	44%	0.03%	44%	52%	0.05%

Notes: DVX = domestic value-added content of exports used in other countries' exports; FVA = foreign value-added content of exports; GVC = global value chain; GVC participation = Total FVA volume/share + Total DVX volume/share; PICs = Pacific Island countries (Fiji, Papua New Guinea, Samoa, and Vanuatu); RVC = regional value chain; RVC participation = FVA volume/share by the PICs + DVX volume/share in the PICs; USD = United States dollars.

Source: Author, based on the UNCTAD-Eora Global Value Chain Database.

3. INDUSTRY-LEVEL ANALYSIS

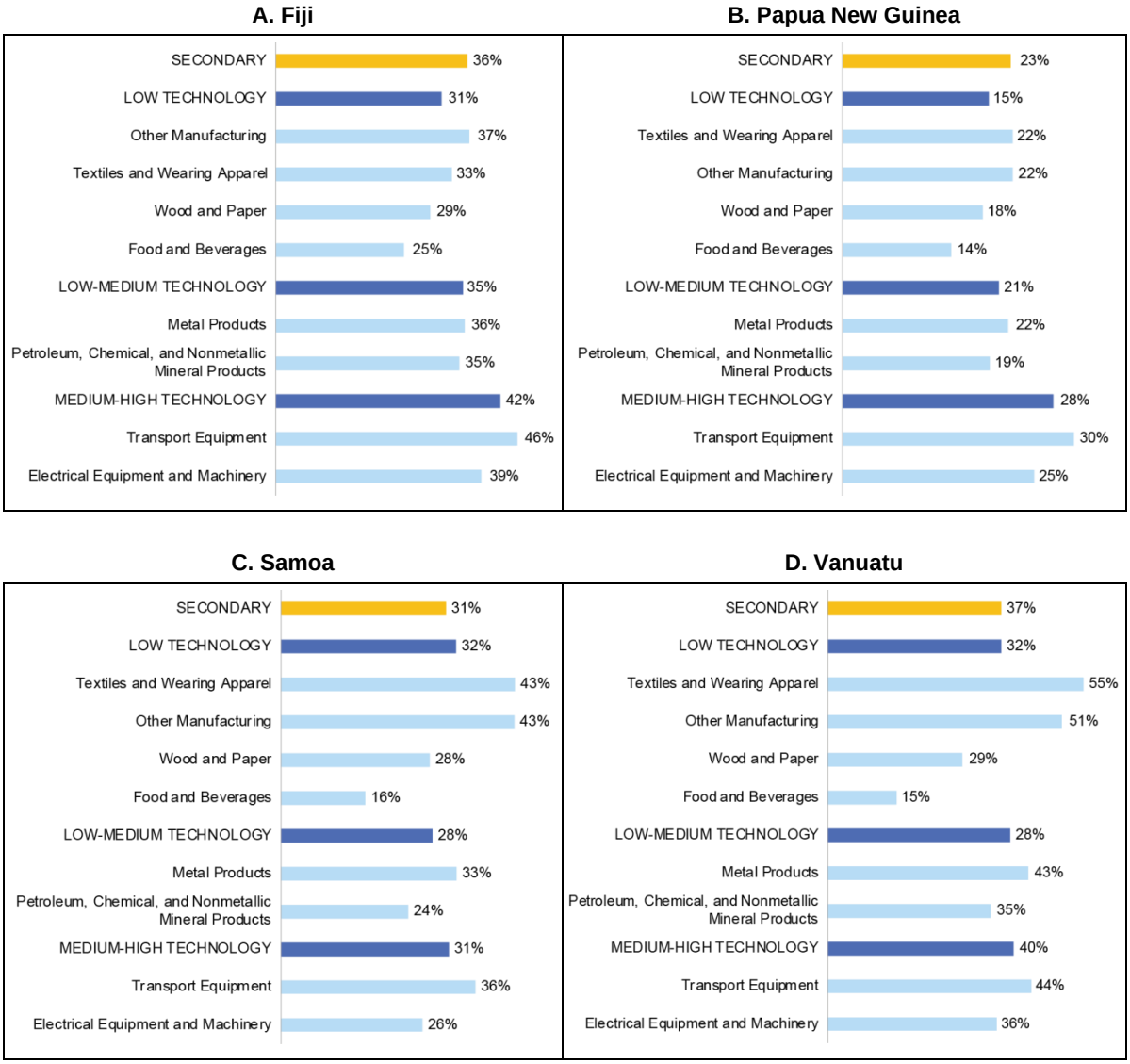
Similarly to the country-level analysis, this section employs the UNCTAD-Eora database on GVCs, covering 27 industries, to empirically examine the PICs' GVC participation pattern and structure at the industry level between 1990 and 2017. This study focuses on the PICs' manufacturing sector and strategic industries as they are the most relevant to the PICs' GVC participation. Overall, the PICs' strategic industries, i.e., food and beverages (Fiji, Samoa, and Vanuatu), metal and nonmetallic mineral products (PNG), textiles and clothing (Fiji and PNG), transport equipment (Samoa), and wood and paper (Fiji and Vanuatu) (Commonwealth Network 2022; Investment Fiji 2021; Vanuatu Foreign Investment Promotion Agency 2022), are primarily concentrated in the middle of global value chains. The countries engage in low-value-added activities, including supplying raw materials (upstream industry) and sourcing parts and components (e.g., Samoa's automotive wiring harness).

On average, the PICs' FVA share of the manufacturing sector is 32%. In general, the medium-high technology industrial group, covering transport equipment and electrical equipment and machinery, demonstrates the highest FVA share, approximately 35% (Figure 3). The top industries that rely on foreign materials and technology are textiles, wearing apparel, metal products, and transport equipment. However, the degree of industrial FVA shares varies across the PICs, implying different degrees of industrial development. Countries engage in backward GVC participation to improve domestic industries, particularly their strategic industries, through the benefits of imported production inputs, technology, and knowledge (Korwatanasakul and Paweenawat 2021). On the one hand, more advanced economies, i.e., Fiji and PNG, show the highest FVA shares in industries utilizing medium-high technology, such as transport equipment and electrical equipment and machinery. On the other hand, smaller economies, i.e., Samoa and Vanuatu, demonstrate the largest FVA shares in the

low-technology industrial groups, such as textiles and wearing apparel and other manufacturing.

Industries such as food and beverages, wood and paper, and metal and nonmetallic mineral products require simple technologies; therefore, they rely relatively less on foreign inputs and technologies and get involved in simpler value chains. Figure 3 shows that the FVA shares of those industries are among the lowest: on average, 17.5%, 26%, and 28%, respectively. In contrast, products from industries such as textiles and clothing and transport equipment engage in more complex value chains requiring different technology levels (Korwatanasakul and Intarakumnerd 2020; Saito 2020). Thus, higher FVA shares are observable in these industries: on average, 39% for both industries.

Figure 3: Share of Foreign Value Added in Exports by Sector, Industrial Group, and Industries, 2017

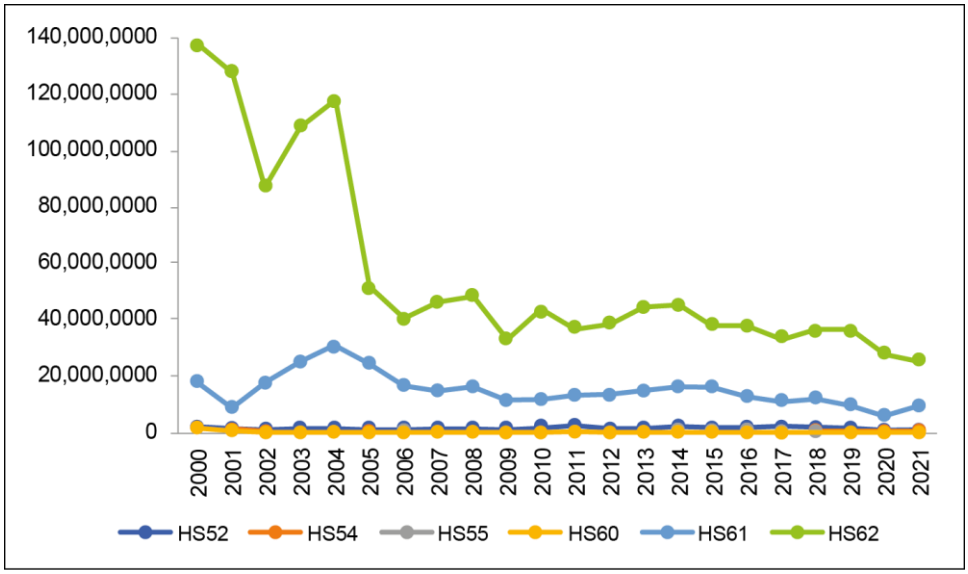


Note: The classification of manufacturing industries is based on R&D intensities or ISIC REV.3 Technology Intensity Definition (OECD 2011).

Source: Author, based on the UNCTAD-Eora Global Value Chain Database.

The textiles and clothing industry is relatively less capital-intensive (low technology). It allows labor-intensive economies to participate in GVCs and industrialize. Higher backward GVC participation in less developed PICs, e.g., Samoa and Vanuatu, is observable (Figure 4), even though the industry is not prioritized. For more advanced economies, e.g. Fiji and PNG, the industry depends relatively less on foreign inputs as it has been developed to the extent that it can utilize more domestic inputs to produce exports. According to Investment Fiji (2021), Fashionating World (2017), and Fibre2Fashion News Desk (2017), the industry is one of the strategic industries of Fiji and PNG. However, this study focuses on Fiji due to PNG's limited data.[3]

Figure 4: Textiles and Clothing Exports of Fiji, 2000–2021 (US$)



Notes: HS52 = Cotton; HS54 = Man-made filaments, strip and the like of man-made textile materials; HS55 = Man-made staple fibers; HS60 = Fabrics, knitted or crocheted; HS61 = Apparel and clothing accessories, knitted or crocheted; HS62 = Apparel and clothing accessories, not knitted or crocheted.

Clothing = HS61 + HS62; Textiles = HS52 + HS54 + HS55 + HS60.

Source: Author, based on the United Nations Statistics Division.

The textiles industry and clothing industry are substantially different in terms of technology and capital intensity (Korwatanasakul 2023). The clothing industry's main activities are cut, make, and trim (CMT) operations, indicating a highly labor-intensive nature. In contrast, the textiles industry involves a broader range of operations, e.g., spinning, yarn producing, weaving, knitting, dyeing, and finishing, implying a more capital- and technological-oriented nature. Although Fiji's industrialization is more advanced than that of other PICs, the country's textiles and clothing industry operations are still behind countries outside the region, such as the PRC, Germany, Italy, Japan, the Republic of Korea, and the US. Since 2000, Fiji's competitiveness has lain mainly in the clothing industry (HS61 and HS62) or labor-intensive and low-value-added activities, while the textiles industry (HS52, HS54, HS55, and HS60) has not developed, as its exports have remained significantly low (Figure 4). Figure 4 also reveals that the textiles and clothing industrys' exports are generally constant over

[3] The limited data are possibly explained by the recent development of the industry in PNG. In 2017, the domestic textiles and clothing industry began to develop through the support of the government as the government saw the need to reduce its dependence on imported products, including manufactured garments (Fashionating World 2017).

time. The typical issue of the textiles and clothing industry is its heavy reliance on foreign inputs (e.g., imported fabrics), particularly for a country specializing in low-value-added activities (e.g., CMT operations) and one that cannot achieve functional upgrading or move up value chains (Korwatanasakul 2023).

Similarly to the textiles and clothing industry, although the transport equipment industry is regarded as a medium-high industry, the PICs' transport equipment industry is located in a lower tier or value chain. For example, Samoa participated in the automotive value chain in 1991 by establishing Yazaki EDS, a Japanese-owned automotive wiring harness company. Samoa suppliers are in either Tier 2 or Tier 3 of the value chain, signifying low-value-added activities and products. In 2017, Yazaki EDS stopped its operation due to the withdrawal of the original equipment manufacturer in the automotive manufacturing sector within Australia. The incident reflects the vulnerability of the domestic suppliers that relied heavily on their labor rather than improving domestic technologies. Consequently, domestic suppliers cannot upgrade their operations and fall into the vicious cycle where the small domestic automobile market has led to underdeveloped automobile and supporting industries.

4. FIRM-LEVEL ANALYSIS

This section examines the pattern of engagement in value chains at the firm level by utilizing pooled cross-sectional data from the World Bank's Enterprise Surveys and Global Development Indicators. The data cover 245 manufacturing firms from seven PICs, namely the Federated States of Micronesia, Fiji, PNG, Samoa, the Solomon Islands, Tonga, and Vanuatu, for 2009 and 2015.[4] Following Urata and Baek (2021) and Korwatanasakul and Paweenawat (2021), this study constructs two indicators of GVC participation, a GVC participation dummy and a GVC participation index. The GVC participation dummy indicates whether firms join GVCs. In contrast, the GVC participation index, calculated by multiplying the ratio of exports to total sales and the ratio of foreign input to total input, represents the level of GVC participation.

4.1 Patterns and Structure of GVC Participation

Table 4 categorizes firms into six types based on domestic and international sales and input procurement. The first column (Column 1) represents firms engaging entirely in domestic sales and procurement, accounting for 7% of the sample firms, whereas the largest share of firms, 51%, rely on foreign inputs for domestic sales (Column 2). This is consistent with the characteristic of islandness discussed in the introduction: a high degree of import dependence (Bass and Dalal-Clayton 1995; World Bank 2021) while showing a sharp contrast to the world average GVC participation pattern presented by Urata and Baek (2021)[5]: 45.5% do not engage in foreign trade, and 24.4% engage in imports but not exports. The contrast of the results emphasizes the unique characteristics of the PICs' foreign trade and GVC participation, which is worth further examination. The rest of the firm types (Columns 3–6) illustrate similar results to those of Urata and Baek (2021): Firms engaging in exports but not imports (sum of Columns 3 and 4) occupy 4%; GVC firms (sum of Columns 5 and 6) represent a quarter of the sample (25%). Columns 5 and 6 indicate the number of firms engaging in backward GVC participation (hereafter, "GVC firms"). GVC firms utilize imported

[4] See Appendix for the number of sample firms by country and year.

[5] Urata and Baek (2021) employed the same data set, the World Bank's Enterprise Surveys, to study the pattern of engagement in foreign trade at the firm level, covering 111 countries.

inputs to produce their products and then export their products to the international market directly or indirectly.

In regard to firm size, the largest proportion of small businesses (fewer than 20 employees) and medium businesses (20–99 employees),[6] 53.6% and 53.1%, respectively, depend on imported inputs but only feed their products to the domestic market. The second-largest category of small and medium-sized enterprises is GVC firms, accounting for 22.7% of small enterprises and 21.9% of medium enterprises. In contrast, three-quarters of the enterprises are considered GVC firms, signaling that large enterprises (more than 99 employees) tend to engage in GVCs. The findings reveal that small and medium-sized enterprises (SMEs) may face greater barriers to participating in GVCs. Previous studies, e.g., Korwatanasakul (2019), Korwatanasakul and Intarakumnerd (2020), and Korwatanasakul and Paweenawat (2021), suggest that requirements, such as international standards, greater managerial and financial resources, and intellectual property hinder SMEs' GVC participation as they face constraints in terms of economies of scale, access to finance and information, and technological capacity.

Table 4: Patterns of Engagement in Foreign Trade for the Sample Firms in the Pacific Island Countries, 2009 and 2015

		1	2	3	4	5	6	Missing	GVC Firms (5+6)	Total
Sales	Domestic	O	O	X	O	X	O	.	X/O	
	Exports	X	X	O	O	O	O	.	O	
Inputs	Domestic	O	O	O	O	O	O	.	O	
	Imports	X	O	X	X	O	O	.	O	
Firm size	Small (<= 19)	13	97	1	6	3	38	23	41	181
	Medium (>= 20 and <= 99)	1	17	1	1	3	4	5	7	32
	Large (>= 100)	0	0	0	1	3	3	1	6	8
	Missing	3	12	0	0	3	5	1	8	24
	Total	17	126	2	8	12	50	30	62	245
Firm size	Small (<= 19)	76.5	77.0	50.0	75.0	25.0	76.0	76.7	66.1	73.9
	Medium (>= 20 and <= 99)	5.9	13.5	50.0	12.5	25.0	8.0	16.7	11.3	13.1
	Large (>= 100)	0.0	0.0	0.0	12.5	25.0	6.0	3.3	9.7	3.3
	Missing	17.6	9.5	0.0	0.0	25.0	10.0	3.3	12.9	9.8
	Total	100	100	100	100	100	100	100	100	100
Firm size	Small (<= 19)	7.2	53.6	0.6	3.3	1.7	21.0	12.7	22.7	100
	Medium (>= 20 & <= 99)	3.1	53.1	3.1	3.1	9.4	12.5	15.6	21.9	100
	Large (>= 100)	0.0	0.0	0.0	12.5	37.5	37.5	12.5	75.0	100
	Missing	12.5	50.0	0.0	0.0	12.5	20.8	4.2	33.3	100
	Total	6.9	51.4	0.8	3.3	4.9	20.4	12.2	25.3	100

Notes: GVC = global value chain; PICs = Pacific Island countries; O = Having exports of products/imports of foreign inputs; X = Not exports of products/imports of foreign inputs; . = not applicable (missing).

PICs include Fiji, Micronesia, Papua New Guinea, Samoa, Solomon Islands, Tonga, and Vanuatu.

Source: Author, based on the World Bank's Enterprise Surveys data.

[6] The study follows the firm size criteria of the World Bank Enterprise Survey.

4.2 GVC-Firm Characteristics

Given the PICs' data limitation, this section investigates firm-level and country-level characteristics possibly *correlated* with the probability of participating in GVCs and the level of such participation. Therefore, no causal relations are established behind those relationships. The section follows the studies of Urata and Baek (2021) and Korwatanasakul and Paweenawat (2021) in selecting firm-level and country-level characteristics (variables) correlated with the possibility of GVC participation (GVC participation dummy) and the level of GVC participation (GVC participation index). Thus, two kinds of regression analyses are performed for two dependent variables, the GVC participation dummy and GVC participation index. Table 5 provides summary statistics.

A probit estimation (1) is performed for the GVC participation dummy, while a tobit estimation (2) is employed for the GVC participation index:

$$\begin{aligned}\Pr(GVC_{ict}=1|Z_{ict}) = \Phi(&\alpha+\beta_1 Labor\ Productivity_{ict}+\beta_2 Firm\ Size_{ict}+\\&\beta_3 Firm\ Age_{ict}+\beta_4 Foreign\ Ownership_{ict}+\beta_5 Quality\ Certification_{ict}+\\&\beta_6 Financial\ Access_{ict}+\gamma_1 Tariffs_{ct}+\gamma_1 Tariffs_{ct}+\gamma_2 FDI_{ct}+\gamma_3 Education_{ct}+\\&\gamma_4 Logistics\ Performance_{ct}+\gamma_5 Governance_{ct}+\eta_c+\delta_k+\mu_t+\varepsilon_{ict})\end{aligned} \quad (1)$$

$$\begin{aligned}GVCindex_{ict} = &\alpha+\beta_1 Labor\ Productivity_{ict}+\beta_2 Firm\ Size_{ict}+\beta_3 Firm\ Age_{ict}+\\&\beta_4 Foreign\ Ownership_{ict}+\beta_5 Quality\ Certification_{ict}+\beta_6 Financial\ Access_{ict}+\\&\gamma_1 Tariffs_{ct}+\gamma_1 Tariffs_{ct}+\gamma_2 FDI_{ct}+\gamma_3 Education_{ct}+\\&\gamma_4 Logistics\ Performance_{ct}+\gamma_5 Governance_{ct}+\eta_c+\delta_k+\mu_t+\varepsilon_{ict}\end{aligned} \quad (2)$$

where GVC_{ict} indicates whether firm *i* of country *c* in year *t* participates in GVCs, whereas $GVCindex_{ict}$ represents the degree of GVC participation of firm *i*. Firm-characteristic variables include: 1) *Labor Productivity* computed by dividing annual sales by the number of employees; 2) *Firm Size* proxied by the number of total employees; 3) *Firm Age* represented by the number of years in operation; 4) the share of foreign ownership (*Foreign Ownership*); 5) ownership of internationally recognized quality certification (*Quality Certification*); and 6) proportion of external funds to purchase fixed assets (*Financial Access*). On the other hand, country-characteristic variables cover: 1) most favored nation, simple mean, manufactured products (*Tariffs*); 2) net inflows of foreign direct investment (% of GDP) (*FDI*); 3) secondary school enrollment (% gross) (*Education*); 4) *Logistics Performance*; and 5) *Governance*. *Logistics Performance* is proxied by the logistics performance index measuring the quality of trade and transport-related infrastructure (1 = low to 5 = high), while *Governance* is measured by Country Policy and Institutional Assessment (CPIA) property rights and rule-based governance rating (1 = low to 6 = high). ε_{ijt} is the disturbance term. Industry-, country-, and year-fixed effects (η_c, δ_k, and μ_t) are imposed in the estimation to control for unobserved heterogeneity across industrial groups, countries, and times. According to previous literature (e.g., Harvie, Narjoko, and Oum 2010; Wignaraja 2013; Kowalski et al. 2015; Lu et al. 2018; Ignatenko, Raei, and Mircheva 2019), the expected signs of the coefficients for all variables, except *Tariffs* and *Firm Age*, are positive.[7]

[7] For a theoretical discussion on the relationship between the GVC participation dummy and index and each firm-characteristic and country-characteristic variable, see Urata and Baek (2021) and Korwatanasakul and Paweenawat (2021). Some variables are omitted due to unavailability of data on the PICs.

Table 5: Summary Statistics

Level	Variable	Description	Observation	Mean	Standard Deviation	Min	Max
Firm	GVC participation	GVC participation dummy – whether firms join GVCs	215	0.2884	0.4541	0	1
	GVC participation index	A GVC index is computed as (exports/total sales)×(procurements from foreign countries/total procurements). It indicates the level of GVC participation	215	0.0821	0.2078	0	1
	Labor productivity	Logarithm of labor productivity based on value added	191	12.3015	2.1801	7.87	19.8
	Firm size	Logarithm of total employees	221	2.1944	1.1078	0	8.01
	Firm age	Number of years in operation	235	20.9830	17.1776	0	116
	Foreign ownership	The share of equity owned by foreign firm (%)	240	0.2364	0.3732	0	1
	Quality certification	Ownership of internationally recognized quality certification	225	0.2444	0.4307	0	1
	Financial access	Proportion of external funds to purchase fixed assets	235	0.2370	0.3303	0	1
Country	Tariffs	Tariff rate, most favored nation, simple mean, manufactured products (%)	245	10.3689	2.8944	2.46	13.9
	Foreign direct investment	Foreign direct investment, net inflows (% of GDP)	245	3.6091	4.0826	0.08	10.7
	Education	School enrollment, secondary (% gross)	245	78.4405	22.5372	42.8	103
	Logistics performance	Logistics performance index: Quality of trade and transport-related infrastructure (1 = low to 5 = high)	245	2.1455	0.1544	1.98	2.46
	Governance	CPIA property rights and rule-based governance rating (1 = low to 6 = high)	245	3.2102	0.5017	2	4

Note: CPIA = Country Policy and Institutional Assessment; GDP = gross domestic product; GVC = global value chain.

Source: Author, based on the World Bank's Enterprise Surveys data and World Bank Open Data (World Bank 2022).

Table 6 shows the regression results of both estimation models. The estimated coefficients for labor productivity, firm size, foreign ownership, and quality certification are positive and statistically significant for the probit estimation model, in line with the existing literature. Nevertheless, labor productivity and quality certification lose statistical significance in the tobit estimation model. Moreover, in both models, firm age, financial access, and logistics performance are not statistically significant, giving somewhat contrasting results to the previous studies.

The estimated results of labor productivity illustrate that firms with labor productivity have a higher chance of participating in GVCs, in line with Harvie, Narjoko, and Oum (2010) and Lu et al. (2018). However, only labor productivity may not help firms increase the level of GVC participation as involvement in value chains requires \greater technology, managerial skills, and financial resources (Korwatanasakul and Paweenawat 2021). Similarly, the same argument applies to firms with quality certification. The firms are likelier to join value chains because they may pass minimum international standards. Nevertheless, the quality certification may not significantly improve the GVC participation level.

Table 6: Regression Results – GVC Participation (Probit Estimation) and GVC Participation Index (Tobit Estimation)

	Dependent Variables			
Independent Variables	**GVC Participation (probit)** **1**	**GVC Participation Index (tobit)** **2**	**GVC Participation (probit)** **3**	**GVC Participation Index (tobit)** **4**
		Firm characteristics		
Labor	0.0529***	0.00618	0.0321**	0.00194
productivity	(0.00585)	(0.00920)	(0.0126)	(0.00898)
Firm size	0.116***	0.0681***	0.178***	0.0657***
	(0.0289)	(0.0129)	(0.0456)	(0.0141)
Firm age	0.00361	–0.000220	0.00983	–0.000145
	(0.0123)	(0.000191)	(0.0143)	(9.80e-05)
Foreign	0.0924	0.0719***	0.149***	0.0691***
ownership	(0.0790)	(0.00539)	(0.0150)	(0.00725)
Quality	1.116*	–0.000965	1.083*	0.00428
certification	(0.628)	(0.00331)	(0.651)	(0.00273)
Finance	–1.677	–0.0419	–1.374	–0.0412
access	(1.429)	(0.0445)	(1.157)	(0.0471)
		Country characteristics		
Tariffs			–0.245***	–0.0178***
			(0.0142)	(0.00227)
Foreign			0.173***	0.00974***
direct investment			(0.0550)	(0.000334)
Governance			2.713***	0.172***
			(0.488)	(0.00995)
Logistics			2.121	–0.000174
performance			(2.069)	(0.0609)
Constant	–2.090***	–0.207**	–13.87**	–0.576***
	(0.310)	(0.0857)	(6.786)	(0.0346)
Observations	157	134	157	134

Note: GVC = global value chain; Robust standard errors are in parentheses. * p < 0.1, ** p < 0.05, *** p < 0.01. All models control for industry- and year-fixed effects.

Source: Author, based on the World Bank's Enterprise Surveys data and World Bank Open Data.

In terms of firm age, the result is consistent with that of Harvie, Narjoko, and Oum (2010, in revealing no relationship between firm age and GVC participation and the participation level while contrasting with that of Lu et al. (2018) and Wignaraja (2013) who found a statistically significant negative relationship. On the one hand, older firms are possibly more competitive as they have accumulated experience, market information, and networks, which can help them participate in GVCs. On the other hand, younger firms may have better opportunities to join value chains since they are more agile and quicker to adopt new technology and knowledge (Wignaraja 2013; Lu et al. 2018; Urata and Baek 2021). Hence, the positive and negative effects of firm age may cancel each other out due to the opposing directions.

The coefficients of financial access and logistics performance are not statistically significant, possibly due to the characteristics of islandness, i.e., remoteness and dispersion. As discussed in the introduction, remoteness and dispersion present high transportation costs to the PICs' firms, reflecting the low logistics performance of firms across the PICs. On average, the logistics performance index of the PICs is approximately 2.1, with a minimum value of 1.9 and a maximum value of 2.2 (World Bank Open Data), showing a similar level of logistics performance among the PICs. Furthermore, regardless of GVC status, PIC firms face difficulties acquiring external funds, particularly from abroad, to purchase fixed assets and operate their businesses. Therefore, the unique characteristics of the PICs are in sharp contrast to the previous literature on non-PICs (e.g., Harvie, Narjoko, and Oum 2010; Kowalski et al. 2015; Lu et al. 2018; Urata and Baek 2021) that illustrates the positive relationship between GVC participation and financial access and logistics performance.

Lastly, country characteristics, namely openness to trade and FDI and governance, manifest positive relationships with a tendency towards, and a level of engagement in, value chains. Openness to trade encourages GVC participation since firms have better incentives to source foreign inputs and export their products abroad (Kowalski et al. 2015; Ignatenko, Raei, and Mircheva 2019). Furthermore, openness to FDI and good governance attract foreign firms to invest in a country due to a reliable, fair, and transparent business environment (Ignatenko, Raei, and Mircheva 2019; Kowalski et al. 2015). The findings are also consistent with the firm-level characteristics, i.e., foreign ownership and firm size, as firms with relatively higher levels of both characteristics tend to enjoy the benefits of FDI.

5. CONCLUSION

This study examines the patterns of GVC participation of the PICs at the country, industry, and firm levels and the relationship between firm and country characteristics and GVC participation of firms in the PICs. The study employs: 1) UNCTAD-Eora industry-level and country-level GVC data on Fiji, Papua New Guinea (PNG), Samoa, and Vanuatu, for 1999–2018; and 2) pooled cross-sectional data from the World Bank's Enterprise Surveys, covering 245 firms from seven PICs (namely the Federated States of Micronesia, Fiji, PNG, Samoa, Solomon Islands, Tonga, and Vanuatu) for 2009 and 2015.

First, the country-level analysis reveals that the role of the PICs in global and regional production networks is limited, thereby hampering foreign technological and knowledge transfer, industrialization, and economic development. Thus, there is a need to boost the level of GVC and RVC participation among the PICs. Building economic and political coordination among the PICs, together with foreign investment promotion measures, may help overcome the challenges of islandness through the realization of production networks, economies of scale, specialization, and industrialization. The existing mechanisms, e.g., the Pacific Agreement on Closer Economic Relations (PACER) Plus, need to strengthen their roles in promoting the capacity of the members to benefit from regional and international trade, particularly with assistance from more advanced economies, i.e., Australia and New Zealand.

Second, the industry-level analysis shows that the PICs' strategic industries engage in low-value-added activities. Therefore, policy measures, e.g., capacity building programs and research and development for domestic technology, potentially help the PICs to gradually achieve different stages of upgrading, including process upgrading, product upgrading, functional upgrading, and, ultimately, chain upgrading. Moreover, the analysis indicates different degrees of industrial development among the PICs from the degree of industrial FVA shares. This information is necessary when considering regional coordination since it informs policymakers regarding the specialization and division of labor among the PICs. Better industrial coordination among the PICs may contribute to greater GVC and RVC participation levels, reinforcing the first policy suggestion regarding integration and regional cooperation.

Lastly, the firm-level analysis emphasizes the unique characteristics of the PICs' foreign trade and GVC participation. For instance, the analysis shows that the largest share of PIC firms relies on foreign inputs for domestic markets (a high degree of import dependence), implying vulnerabilities to external shocks. Furthermore, the analysis reveals different firm and country characteristics correlated with the possibility of participating in GVCs and the GVC participation level. First, the PICs' domestic firms, particularly SMEs, face difficulties joining value chains. SMEs may find it challenging to enter GVCs for several reasons, such as a lack of ability to meet international standards, lack of managerial and human capital resources, limited access to credit and loans, and limited access to information and innovation. Therefore, it is worth further examining PIC SMEs' challenges in engaging in GVCs and, in turn, formulating policies that can practically address the challenges to help local SMEs enter GVCs smoothly. The study also points out that improvements in labor productivity and the acquisition of quality certification are essential for firms to engage in GVCs initially but insufficient to deepen their GVC participation level. Thus, a mix of policy tools for promoting greater technology, managerial skills, and financial resources for domestic firms, especially SMEs, is necessary to ensure smooth value chain participation and upgrade domestic firms within and among value chains. In addition to firm-level characteristics, the analysis stresses the significance of macro-level business-enabling environment factors, including good governance and openness to trade and FDI. A business-enabling environment not only helps local firms to participate in GVCs but also encourages foreign investors to invest in the PICs. In conclusion, the country-, industry-, and firm-level analyses suggest that subnational and national industrial development and regional cooperation policy measures are critical for the PICs to participate in global and regional production networks, boost GVC and regional value chain participation levels, and overcome the challenges of islandness.

REFERENCES

Angelucci, F. and P. Conforti. 2010. Risk Management and Finance Along Value Chains of Small Island Developing States. Evidence from the Caribbean and the Pacific. Food Policy 35: 565–575.

Anukoonwattaka, W., M. Mikic, and Y. Zhang. 2017. Services and Global Value Chains: The Asia-Pacific Reality. *Studies in Trade, Investment and Innovation* No. 89. Bangkok: UNESCAP.

Baldwin, R. 2013. Changing Features of Global Value Chains. In *Global Value Chains in a Changing World* (pp.13–60), edited by D. K. Elms and P. Low, Geneva: World Trade Organization.

Bass, S., and B. Dalal-Clayton. 1995. Small Island States and Sustainable Development: Strategic Issues and Experience. Environmental Planning Issues No. 8, September 1995. International Institute for Environment and Development.

Chand, A. 2017. Proposing a Framework to Extend the Global Commodity Chain Theory: A Case-Based Study with Evidence from Garment Supply Chain. *Modern Applied Science* 11(11): 1–34.

Commonwealth Network. 2022. Find Industry and Manufacturing Expertise in Samoa. https://www.commonwealthofnations.org/sectors-samoa/business/industry_and_manufacturing/.

Fashionating World. 2017. Papua New Guinea Builds Textile and Garment Industry. https://www.fashionatingworld.com/new1-2/papua-new-guinea-builds-textile-and-garment-industry.

Fibre2Fashion News Desk. 2017. Papua New Guinea Govt to Help Set Up Garment Industry. https://www.fibre2fashion.com/news/apparel-news/papua-new-guinea-govt-to-help-set-up-garment-industry-207448-newsdetails.htm.

Harvie, C., D. Narjoko, and S. Oum. 2010. Firm Characteristic Determinants of SME Participation in Production Networks, ERIA Discussion Paper Series, ERIA-DP-2010-11.

Ignatenko, A., R. Faezeh, and M. Borislava.. 2019. Global Value Chains: What Are the Benefits and Why Do Countries Participate? IMF Working Paper 19/18, January.

IMF. 2022. Pacific Islands Monitor. Issue 1. IMF.

Intarakumnerd, P., and U. Korwatanasakul. 2020. Business Impacts and Government Supports for Firms' Upgrading and Innovation Under COVID-19 in Southeast Asia. *STEPI S&T Policy Journal* (과학기술정책) 3(2): 21–53.

Investment Fiji. 2021. Manufacturing. https://www.investinfiji.org/sector-opportunities/manufacturing.

Juswanto, W., and A. Zulfiqar. 2016. Economic Growth and Sustainable Development in the Pacific Island Countries. No. 2016-6 (December). ADB.

Korwatanasakul, U. 2019. Thailand (Global Value Chains in ASEAN Paper 10). Tokyo: AJC.

Korwatanasakul, U. 2023. Global Value Chains and the Vietnamese Economic Development: A Path to Perils or Prosperity? In *The Dragon's Underbelly: Dynamics and Dilemmas in Vietnam's Economy and Politics* (pp.73–107), edited by T. Vu and N. Truong, Singapore: Institute of Southeast Asian Studies (ISEAS)–Yusof Ishak Institute.

Korwatanasakul, U., and Y. Baek. 2021. The Effect of Non-tariff Measures on Global Value Chain Participation. *Global Economic Review: Perspectives on East Asian Economies and Industries* 50(3): 193–212. https://doi.org/10.1080/1226508X.2020.1862694.

Korwatanasakul, U., Y., Baek, and A. Majoe. 2022. Analysis of Global Value Chain Participation and Workers' Wages in Thailand: A Micro-level Analysis. *The Singapore Economic Review*. https://doi.org/10.1142/S021759082250045X.

Korwatanasakul, U., and P. Intarakumnerd. 2020. Automobiles (Global Value Chains in ASEAN Paper 12). Tokyo: AJC.

Korwatanasakul, U., and S. W. Paweenawat. 2021. Trade, Global Value Chains and SMEs in Thailand: A Firm-level Panel Analysis. In *Enhancing SME Participation in Global Value Chains* (pp.166–191), edited by S. Urata, Tokyo: ADBI.

Kowalski, P., J. Lopez Gonzalez, A. Ragoussis, and C. Ugarte. 2015. Participation of Developing Countries in Global Value Chains: Implications for Trade and Trade-related Policies, OECD Trade Policy Papers No. 179.

Kumar, R. R. and P. J. Stauvermann. 2021. Tourism and Economic Growth in the Pacific Region: Evidence from Five Small Island Economies. *Journal of the Asia Pacific Economy*. DOI: 10.1080/13547860.2021.1944796.

Lu, Y., H. Shi, W. Luo, and B. Liu. 2018. Productivity, Financial Constraints, and Firms' Global Value Chain Participation: Evidence from China. *Economic Modelling* 73: 184−194.

Malua, M. B. 2003. SIDS and Multilateral Trade Liberalisation in Agriculture: The Pacific Islands Case Study. UNCTAD.

OECD. 2011. ISIC REV.3 Technology Intensity Definition. Paris: OECD Directorate for Science, Technology and Economic Analysis and Statistics Division.

Saito, M. 2020. Agribusiness (Global Value Chains in ASEAN Paper 15). Tokyo: AJC.

Sawada, Y., C. Y. Park, F. H. Khan, and C. J. Justo. 2020.Trade, Global Value Chains and Inclusive Growth in Asia and the Pacific. In T*he Handbook of Global Trade Policy* (pp.379–417), edited by A. Klasen, New Jersey: John Wiley & Sons Ltd.

Shepherd, B. 2016. Value Chains and Connectivity in the Pacific. International Trade Working. Paper 2016/23. London: The Commonwealth Secretariat.

UNCTAD-Eora Global Value Chain Database. https://worldmrio.com/unctadgvc/.

UNESCAP. 2006. Economic and Social Survey of Asia and the Pacific 2006: Energising the Global Economy. UNESCAP. https://www.unescap.org/publications/economic-and-social-survey-asia-and-pacific-2006-energizing-global-economy.

UNESCAP. 2017. Services and Global Value Chains: The Asia-Pacific Reality. UNESCAP.

United Nations Statistics Division. UN Comtrade Database. https://comtrade.un.org/data/.

Urata, S., and Baek, Y. 2021. The Determinants of Participation in Global Value Chains: A Cross-Country, Firm-Level Analysis. In *Enhancing SME Participation in Global Value Chains* (pp.25–86), S. Urata, Tokyo: ADBI.

Vanuatu Foreign Investment Promotion Agency. 2022. Manufacturing Sector Industries. https://investvanuatu.vu/manufacturing-sector-industries/

Vickers, B., J. Keane, and A. Palit. 2019. Trade, Connectivity and Global Value Chains: An Asia-Pacific Perspective. Trade Hot Topics 153. London: The Commonwealth Secretariat.

Wignaraja, G. 2013. Can SMEs Participate in Global Production Networks? Evidence from ASEAN Firms. In Global Value Chains in a Changing World, edited by D. K. Elms, and P. Low, World Trade Organization Publications.

World Bank. 2021. The World Bank In Pacific Islands. World Bank. https://www.worldbank.org/en/country/pacificislands/overview.

World Bank's Enterprise Surveys data. https://www.enterprisesurveys.org/en/enterprisesurveys.

World Bank Open Data. 2022. https://data.worldbank.org/.

APPENDIX

Table A1: Sample Countries and Number of Sample Firms

	Year		
Country	**2009**	**2015**	**Total**
Fiji	52	0	52
Federated States of Micronesia	5	0	5
Papua New Guinea	0	23	23
Samoa	24	0	24
Solomon Islands	0	40	40
Tonga	78	0	78
Vanuatu	23	0	23
Total	**182**	**63**	**245**

Source: Author, based on the World Bank's Enterprise Surveys data.