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Diversification in Trade and Foreign Investment and Resilience to the COVID-19 Shock: Firm-level Evidence Using Japanese Customs Data

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Abstract

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Diversification in trade and foreign investment and resilience to the COVID-19 shock: Firm-level evidence using Japanese customs data

Running title: Resilience to the COVID-19 shock Toshiyuki Matsuura[†]

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Abstract

Using data from the COVID-19 period, this study examines whether firms' participation in global value chains (GVCs) makes them more resilient to external negative shocks, distinguishing between multinational and non-multinational firms and between trading and non-trading firms. Using Japanese customs data matched with firm-level data and a survey on foreign direct investment (FDI) we construct a dataset that contains export destinations, import origins, and investment destinations. We then examine which firms were more affected by the COVID-19 pandemic. We find that export growth rates are higher for firms with more diversified export destinations and import origins, and the result is more pronounced for the intermediate goods trade. However, no such effect is seen for diversification of FDI destination countries.

Keywords: COVID-19 pandemic; Multinational firms; Global Value Chains **JEL code**: F23; F14

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1. Introduction

International trade declined significantly in 2020 due to the spread of COVID-19. The pandemic led to lockdowns in many countries that halted manufacturing activities, and shocks spread to other countries as the supply of intermediate goods was disrupted across global value chains (GVCs). The COVID-19 pandemic was not the first time GVCs were disrupted; similar shocks occurred during the global financial crisis (GFC) of 2008–2009 and the great East Japan earthquake (GEJE) of 2011. The effects of external shocks are amplified through GVCs because many firms and countries involved in GVCs are interdependent, so an external shock in one part of a GVC will have a cascading effect on other parts.¹ Therefore, understanding the mechanisms of such spillovers has attracted attention not only among academic researchers but also policymakers. However, if intermediate goods are sourced from multiple countries it may be easier to procure them from other countries if production stops in one location due to a shock. Similarly, if exports are made to multiple countries it may be relatively easy for exporters to find alternative export destinations if faced with a drastic reduction in demand in one country due to a shock. In other words, firms that engage with a more diverse range of countries and industries in their GVCs may recover relatively quickly from temporary shocks, even if the initial impact is significant.

In addition, given that multinational enterprises (MNEs) play an essential role in GVCs the question of whether those MNEs are vulnerable or resilient to external shocks to GVCs is also a policy issue. On the one hand, MNEs are often considered resilient to shocks as they operate in multiple countries and can diversify such risks. Still, the impact of shocks is likely to be more severe if a firm engages in intrafirm trade of intermediate goods that are difficult to procure from other suppliers.

In fact, numerous empirical analyses using country-level trade data suggest reductions in the supply of intermediate goods due to the COVID-19 shock were amplified through supply chains, leading to a decrease in domestic exports (e.g., Friedt and Zhang, 2020, Kejzar and Velic, 2020, Hayakawa and Mukunoki, 2021a). However, most of these studies are based on country-level monthly trade data, while there is little empirical evidence based on firm-level data. A few exceptions include Jordaan (2023) and Lafrogne-Joussier et al. (2023). While Jordaan (2023) analyzes firms in many countries using firm-level data compiled by the World Bank Enterprise Survey (WBES) project, he mainly examines the impact of firm-level export and import intensity on sales

¹ Studies such as Acemoglu et al. (2012), Calvalho et al. (2021), and di Giovanni et al. (2024) show that as economic shocks propagate through inter-firm and/or inter-industry input-output relationships, they are amplified to become larger shocks.

but due to data constraints does not take diversification of export destinations and import sources into account. Using detailed firm-level trade data for French firms, Lafrogne-Joussier et al. (2023) focus on the short-run impact of the January 2020 lockdown in China on French firms' imports, exports, and domestic sales. Although they are interested in diversification with respect to sourcing and compare firms that import from China with those that import from other countries, their study does not consider diversity in export destinations. Thus, there is not yet sufficient empirical evidence at the firm level to determine whether firms that are part of GVCs that diversified their risks recovered faster from the COVID-19 trade shock. Against the backdrop, this study uses firm-level data from Japan combined with detailed export and import customs data to examine changes in firm performance due to the COVID-19 pandemic and compare resilience to external shocks among firms participating in GVCs, both MNEs and non-MNEs.²

The following two features distinguish this study from previous research. First, we examine the resilience of firms that participate in GVCs to shocks by focusing on diversity among both importing and exporting countries. While previous studies on shock propagation, such as Todo et al. (2023) and Barrot and Sauvagnat (2016), use original firm surveys or trade partner data for listed firms, this study uses comprehensive firm-level customs data. The second distinguishing feature of this study is that we analyze the resilience of MNEs to shocks by taking into account the number of foreign direct investment (FDI) destination countries. Many studies that compare MNEs with non-MNEs, such as Alfaro and Chen (2012), do not consider differences in MNEs' trade patterns and production locations in different countries. We use the number of FDI destination countries to consider the diversity of MNEs' production locations, thereby examining the effects of diversification in terms of countries where MNEs operate.

Our key findings can be summarized as follows: diversity in export and import destinations contributes to export recovery during a pandemic, and this effect is more pronounced for the trade of intermediate goods. Given that the number of export-import destinations is particularly large for MNEs, the improved performance of MNEs during pandemic periods analyzed in previous studies is explained by the diversity of MNEs' export-import destinations. By contrast, the number of MNEs' investment destinations has no significant impact on export and import growth rates.

² Zhang (2021) analyzes the impact of COVID-19 on sales, exports, and imports of foreign affiliates of Japanese multinational firms. However, his study relies on quarterly aggregate-level data for Japanese affiliates in foreign countries, not on firm-level data. Moreover, while he focuses on affiliates of Japanese MNEs, our study focuses on parent firms of Japanese MNEs.

This study is related to three strands of the literature: the first focuses on shock transmission mechanisms in supply chains. Barrot and Sauvagnat (2016) use data on U.S. listed firms to analyze the extent to which natural disasters in the U.S. spill over to trading partners through supply chains and find that spillover effects are significant in industries that produce differentiated goods. Kashiwagi et al. (2021) analyze how damage from a hurricane in the U.S. spreads through global supply chains to domestic and international trading partner firms, finding that the impact is smaller for firms doing business with overseas firms.³ Using French firm-level trade transaction data, Bricongne et al. (2022) find the decline in macro-level trade during the GFC and the COVID-19 pandemic period is mainly attributable to the decrease in exports by top exporters. In particular, they point to the high sensitivity of top exporters to changes in foreign demand.

Second, several studies focus on the COVID-19 pandemic.⁴ Among them, Ando and Hayakawa (2022) examine the relationship between the geographic diversity of importing countries and exports of machinery in 35 countries and find that the impact of the pandemic was smaller for transportation machinery and precision machinery in countries that import intermediate goods from more geographically diverse countries. Todo et al. (2023) analyze the geographic distribution of suppliers and customers and the impact of COVID-19 shocks based on original firm-level surveys in ASEAN and India. Using firmtransaction-level data they analyze the geographic concentration of suppliers and customers and the robustness of trading relationships. They show supply chains are more robust when suppliers and customers are geographically dispersed. Our study is similar to Ando and Hayakawa (2022) and Todo et al. (2023) regarding the diversity of sales and procurement sources. We extend previous studies by distinguishing trade of final goods versus intermediate goods and examining the characteristics of MNEs using Japanese customs data combined with comprehensive firm-level data. This is the first study to utilize firm-level data matched with the Japanese customs data to analyze the impact of the COVID-19 pandemic on firm activities. An advantage of using customs data is that one can observe the level of engagement in trade (both import and export), including the number of trading partner countries, at the firm-product level. Thus, we can consider details of GVC participation.

The third stream of the literature focuses on how MNEs respond to shocks. Using

³ Others include Ando and Kimura (2012) and Abreha et al. (2020) for the global financial crisis and GEJE, Todo et al. (2015) and Boehm et al. (2019) for the GEJE in 2011, Hayakawa et al. (2015) for the Thai flood in 2011.

⁴ For example, see Hayakawa and Mukunoki (2021b), Meier and Pinto (2020), Ando et al. (2021), Borino et al. (2021).

data on Irish firms, Görg and Stroble (2003) show MNEs are more footloose, having a higher probability of exit than non-MNEs. In a recent study, Kiyota et al. (2020) compare employment volatility across firms and find it is higher in MNEs engaged in intrafirm trade. They interpret this to mean that because MNEs engaging in intrafirm trade transact intermediate goods via firm-specific investment within firms, an external shock would disrupt intrafirm trade in these intermediate goods, hurting firms' performance.

Conversely, a body of literature suggests MNEs exhibit greater resilience to economic shocks. For example, Alfaro and Chen (2012) use establishment-level data on MNEs to analyze whether MNEs and non-MNEs responded differently to the GFC and find that MNEs are more resilient to shocks. Jordaan (2023), using a World Bank survey of firms, analyzes changes in firm performance during the COVID-19 pandemic and finds the negative effects are smaller for MNEs engaged in imports and exports. Benguria (2021) uses firm-level trade transaction data for Colombia matched with firm balance sheet information to examine patterns of declining trade values, finding that subsidiaries of MNEs experience a smaller decline in trade. Our study differs from prior research by examining the resilience of MNEs to shocks, incorporating factors such as the number of countries in which they invest, as well as the number of exporting and importing countries.

The remainder of this study is organized as follows. Section 2 presents the analytical framework. Section 3 explains our data sources and data construction procedure, and presents a data overview. We present the estimation results in Section 4, and Section 5 concludes.

2. Analytical framework

To examine the impact of the COVID-19 pandemic on global trade through GVCs, we estimate the following equation using data for the period from 2017 through 2020:

$$\Delta Y_{ijt} = \alpha Y_{ij_{0}} + \beta X_{ijt-1} + \beta^{2020} \cdot D^{2020} \cdot X_{ijt-1} + \mu_{j} + \lambda_{t} + \epsilon_{ijt} (1)$$

where, ΔY_{ijt} are annual changes in the performance indicators for firm *i* in industry *j* in year *t*, and Y_{ijt_0} is the level at the beginning of the sample period, i.e., 2017. X_{ijt-1} is a vector of firm characteristics, including indicators of a firm's internationalization. To control for the link between pre-pandemic firm performance indicators and firm attributes, we include a pre-pandemic sample in the analysis, and examine the pandemic's impact by including a cross-term between the firm attribute variables and a 2020 dummy variable, i.e., D^{2020} , that takes a value of one for the year 2020, and zero otherwise. μ_j , λ_t , and ϵ_{it} are industry fixed effects, year-fixed effects, and an error term, respectively.

We use total sales, domestic sales, and export and import values in logarithmic form as firm performance indicators. Export and import values are decomposed into final and intermediate goods. Final goods are defined using the United Nations' Broad Economic Category product codes, and goods other than final goods are classified as intermediate goods. Variables for firm characteristics are firm size, measured by the number of employees, firm age, and exporter, importer, foreign-owned company, and MNE dummies. We also control for the number of FDI destination countries, export-destination countries, and import-source countries as a measure of the involvement of GVCs at the firm-level. All firm characteristics variables are lagged by one year.

3. Data and data overview

3.1 Data

We combine three datasets for our analysis. The first is a firm-level survey, the Basic Survey of Japanese Business Structure and Activities (BSJBSA, *Kigyo Katsudo Kihon Chosa*, in Japanese) conducted by Japan's Ministry of Economy, Trade and Industry (METI). This survey covers all firms operating in the target industries with over 50 employees and capital exceeding 30 million yen. The target industries include Mining, Manufacturing, Wholesale and Retail, and some service sectors. The BSJBSA is a comprehensive survey of Japanese corporations and offers valuable insights into their diversification, globalization, and R&D strategies. It contains data on firms' sales, expenses, debts, assets, profits, employment, exports and imports, outsourcing, and R&D activities. Although the BSJBSA offers data on the amounts of exports and imports, it does not include information on export destinations, import-source countries, exported or imported products.

To obtain this level of detail we use a second dataset, from Japan Customs, that contains firm-product-destination-level trade transaction data. This dataset has recently been made available to academic researchers through collaborative research projects with the Policy Research Institute (PRI) of Japan's Ministry of Finance (MOF). It contains detailed trade transaction information, such as the value and quantity of exports and imports at the HS 9-digit level, export-destination, import origin, invoice currency, and the importer's or exporter's name and location.

Third, we use the METI's survey on FDI, namely the Basic Survey on Overseas Business Activities (hereafter BSOBA, *Kaigai Jigyou Katsudou Kihon Chosa* in Japanese), conducted annually, to capture Japanese MNEs' production networks through their foreign affiliates. The BSOBA is based on a questionnaire distributed to all Japanese companies with overseas affiliates, except those in the financial and insurance industries. The BSOBA contains basic information on overseas affiliates including sales, expenses, levels of exports and imports, and employment.

The procedure for data construction is as follows: BSJBSA and BSOBA use the same firm identification number; thus, we can easily match firm-level data from these two datasets. We match BSJBSA and trade transaction data from Japan Customs by referring to corporate numbers provided by the National Tax Agency (NTA), as these two data sets have had NTA's corporate numbers since 2018. However, firms that ceased their trade transactions before 2018 do not have an NTA corporate number; therefore, we match the two data sets by referring to company name, location, and phone number.⁵ Our study focuses on manufacturing firms over the period 2017–2020.

To identify involvement in GVCs we use two groups of measures. First, we use trade transactions data from Japan Customs to identify exporter and importer status, and we calculate the number of exporting and importing countries. Second, following Kiyota et al. (2020) we distinguish two types of MNEs: foreign-owned companies (FOCs) and Japanese MNEs. Using BSJBSA, we define FOCs as firms with a foreign capital share greater than 50% and a headquarters outside of Japan. Japanese MNEs are defined as firms that own at least one foreign manufacturing affiliate based on BSOBA's data.⁶ The remaining firms are classified as domestic firms. The number of FDI countries, also obtained from BSOBA, is defined as the number of countries where MNEs' manufacturing subsidiaries are located. The definitions of the variables, summary statistics, and correlation matrix are presented in Appendix Table A1.

3.2 Data overview

Table 1 shows the number of exporters, importers, and MNEs in the BSJBSA data in 2019. Since two-way trading firms are often referred to as GVC firms (e.g., Baek and Urata 2021; Reddy et al. 2022), we distinguish two-way trading, export-only, and import only firms in Table 1 (a). Two-way trading firms account for just 43% (4,714/10,842) of the total number of firms but they dominate in terms of import and export value, accounting for 99.7% of all manufacturing firms in terms of export value (43,226/43,351) and 97% in terms of import value (20,417/21,001). Similarly, Table 1(b) shows the number of MNEs, FOCs, and domestic firms and the value of their exports and imports. MNEs account for 11% of the total number of firms (1207/10842), 77% of total exports (33,597/43,351), and 49% of total imports (10,350/21,001). FOCs account for 1%

⁵ For more details of matching procedures, see Ito et al. (2024).

⁶ A foreign-owned companies with foreign manufacturing affiliates are classified as FOCs not as MNEs.

(122/10842) of the total number of firms but 6% of total exports (2,617/43,351) and 12% of total imports (2,531/21,001). Focusing on two-way trading MNEs and FOCs, we find 92% of MNEs (1,114/1,207) and 93% of FOCs (114/122) are engaged in two-way trading and are responsible for more than 99% of MNEs' and FOCs' export and import values (33,589/33,597 and 10,333/10,350 for MNEs' export and import values and 2,615/2,617 and 2,530/2,531 for FOCs' export and import values). Roughly 74% of the two-way trading firms are domestic firms (3,486/4,714), but they account for only 16% of total export value (7,022/43,226) and 37% of total import value (7,554/20,417) for two-way trading firms. We confirm that that Japanese manufacturing exports and imports are dominated by MNEs and two-way trading firms.

== Table 1 ==

Table 2 compares the number of exporting and importing countries across MNEs, FOCs, and domestic firms. FOCs and MNEs export to an average of 14.15 and 16.93 countries, respectively, and import from 11.52 and 9.03 countries, respectively. The number of both exporting and importing countries is even higher for two-way trading FOCs and MNEs, at 15.12 and 18.23 countries, and 12.23 and 9.74 countries, respectively. However, domestic firms export to just 2.81 countries and import from only 1.79 countries. When limited to domestic firms engaged in two-way trading, the number of exporting and importing countries increases significantly to 7.12 and 4.31, respectively. This reveals significant differences in the diversity of export and import destinations among domestic firms.

== Table 2 ==

Figure 1 Panel (a) compares the growth rates of sales, imports, and exports in 2019-2020 for MNEs, FOCs, domestic firms, and exporting and importing firms.⁷ The -11.2% decline in sales for FOCs over this period is larger than the -9.0% decline for domestic firms. However, the sales decline for importing-only firms was only -8.0%. Other firms show a similar decline of roughly -9%. Interestingly, a comparison of trading and nontrading firms shows the decline in sales for nontrading firms was similar to that of trading firms, suggesting that even firms not directly engaged in exporting or importing were indirectly affected by the pandemic through their transaction relationships with trading firms. Panel (b) shows changes in the value of exports and imports. The decreases for MNEs for the period are -13.7% and -15.5%, respectively, showing smaller declines

⁷ The status of MNEs, FOCs, and exporting-importing firms is based on information as of 2019.

than those for domestic firms. In contrast, exports and imports for FOCs declined by -16.1% and -22.3%, respectively. For other firms, there is no significant difference in the rate of decline for exports versus imports. In sum, Figure 1 suggests that MNEs and import-export firms except FOCs, did not suffer worse declines during the COVID-19 pandemic. MNEs performed better than other types of firms in terms of export and import growth rates.

== Figure 1 ==

4. Results

Table 3 shows the estimation result of the baseline regression presented in Section 2. Controlling for before-pandemic performance (2017 performance indicators), we see that sales growth rates are higher for younger firms and firms with more employees (column 1). The growth rates for domestic sales (column 2) and exports (column 3) are also positively associated with the number of employees. For the growth rate of imports (column 4), none of the coefficients without interaction terms are significant.

When the coefficient of import status in the export growth rate estimation equation of column (3) (and the coefficient of export status in the import growth rate estimation equation of column (4)) were positive, it would suggest that engaging in both imports and exports would result in higher growth rates. However, for both export and import growth rates, the coefficient on the lag term for import and export status was insignificant, with or without the 2020 dummy.

Looking at the coefficient of the cross-terms with 2020 dummies, which captures the difference in effects before and during the pandemic, no statistically significant variables were obtained for the growth rate of total sales, domestic sales, and export and import. One exception is the coefficients of the cross-term between the employee size and the 2020 dummy are positive and significant for the growth rates of imports (columns 4). It suggests that larger firms tend to increase (reduce) imports more (less) than smaller firms during the pandemic.⁸

== Table 3 ==

Table 4 introduces the number of import-source/export-destination countries and the number of FDI-destination countries where manufacturing subsidiaries are located. Since the number of import-source/export-destination countries is highly correlated with each other, they are added as independent variables one by one. Columns (1) and (2) of Table

⁸ One may be interested in the performance of two-way trading, export-only and import only firms. Appendix Table A2 presents the estimation results with the dummy variable for these firms but we do not find any systematic differences with baseline results.

4 examine the correlation between export growth rates and a firm's degree of diversity of import-source/export-destination and FDI-destination countries. Focusing on the coefficients for the pandemic period, i.e., the cross term with the 2020 dummy, the coefficients for the number of exporting and importing countries are positive and significant. These results indicate that firms that diversify their export destinations and procurement origins are more likely to recover their exports more quickly during a negative shock. Ando and Hayakawa (2022) point out that the diversity of import sources contributed to the recovery of machinery exports during the pandemic. Our result is consistent with their findings. Furthermore, we find this diversity is important not only on the import side of a business but also on the export side.

With respect to diversification of firms' investment destinations, the coefficient on the cross-term between the diversification of FDI destinations and the 2020 dummy variable is not significant, suggesting that diversification of FDI destination countries has no systematic effect on export recovery.

Columns (3) through (4) in Table 4 present the results for import growth. The crossterms for the number of exporting/importing countries, and the number of FDI countries with the 2020 dummy variable are all insignificant, indicating that diversification of destinations for exports, imports, and FDI did not affect the recovery of import values during the pandemic period.

== Table 4 ==

Table 5 compares exports of final goods and intermediate goods. Columns (1) and (2) present the determinants of the growth rate of final goods exports. Looking at the coefficient of the cross-terms, the results are the same as in Table 4 except for the number of importing countries, suggesting that the recovery in export growth for final goods is related to diversification of a firm's export destinations. For intermediate goods exports as shown in columns (3) and (4), the coefficients on the number of export-destination and import-source countries are both positive and significant. However, the coefficients on the number of FDI destination countries are insignificant both for final goods and intermediate goods exports.

== Table 5 ==

Table 6 compares the results for final versus intermediate goods imports. For the growth in final goods imports in the pre-pandemic period, the effect of diversity of import sources and export destinations is positive and significant. However, the cross-term of these variables with the 2020 dummy is insignificant, as shown in Table 3. In contrast, for the growth rate of intermediate goods imports, as shown in columns (3) and (4) of Table 6, the cross-term between the number of export-destination and import-source

countries and the 2020 dummy is positive and significant. Comparing the coefficients of the cross-terms for the number of trading countries in columns (3) and (4), the value for import-sourcing countries is larger, suggesting that diversity in procurement sources is more important for a recovery of imports of intermediate goods.

== Table 6 ==

Figure 1(b) shows MNEs' perform better in terms of export-import growth, but neither the MNE dummy nor the diversity of FDI destinations is statistically significant in the results shown in Table 3 through Table 6. To check the robustness of these results, we exclude diversity of FDI destinations or diversity of export/import countries. The results, presented in Appendix Tables A6 and A7, confirm our main results do not change regardless of the combination of the diversification measures. Table 2 shows MNEs tend to export to and import from a large number of countries. Thus, their better performance as shown in Figure 1(b) can be attributed to diversity of both their export-destination and import-source countries.

5. Conclusion

This study uses comprehensive firm-level customs data to investigate the resilience of firms participating in GVCs to shocks caused by the COVID-19 pandemic, focusing on diversity in the firms' import-source and export-destination countries. We also examine the resilience of MNEs to shocks by considering the number of FDI destination countries. Our findings suggest that diversity in export destinations and import sources helps firms to recover their export levels during a pandemic, explaining the better performance of MNEs. This effect is particularly pronounced for the trade of intermediate goods.

While this study presents interesting evidence, it also raises several questions to be addressed in future research. The first is the long-term impact of COVID-19 on firm-level trade. While this study focuses on firm performance in 2019-2020, analyzing performance through 2021 and beyond is necessary to examine post-pandemic firm strategies. Second, analyzing firms' responses to other external negative shocks could provide useful insights for policymakers. For example, our dataset would allow us to explore how firms reacted to U.S.-China trade frictions. Such studies could help shed light on the mechanisms of international shock spillovers through supply chains.

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Data availability statement

Due to confidentiality requirements, research data are not shared.

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Panel (a)	
D 1()	
Table 1 Number of firms and trade values by type of firms in 20	19

	# of firme	Export	Import
	# 01 1111115	values	values
Two-way traders	4,714	43,226	20,417
Export only	772	125	0
Import only	1,127	0	583
No traders	4,229	0	0
Total	10,842	43,351	21,001

Panel (b)											
	All firms			Twoway trac	lers						
	# of firms	Export	Import	# of firms	Export	Import					
	# 01 111118	values	values	# 01 111115	values	values					
Domestic firms	9,513	7,137	8,120	3,486	7,022	7,554					
FOC	122	2,617	2,531	114	2,615	2,530					
MNEs	1,207	33,597	10,350	1,114	33,589	10,333					
Total	10,842	43,351	21,001	4,714	43,226	20,417					

Source: Authors' calculation based on BSJBSA and trade transaction data by Japan Customs. Units: Billion yen

	Domestic							
All firms	Total	firms	FOCs	MNEs				
Number of exporting countries	4.51	2.81	14.15	16.93				
Number of importing countries	2.71	1.79	11.52	9.03				
Number of firms	10842	9513	122	1207				
		Domestic						
Two-way traders	Total	firms	FOCs	MNEs				
Number of exporting countries	9.94	7.12	15.12	18.23				
Number of importing countries	5.78	4.31	12.23	9.74				
Number of firms	4714	3486	114	1114				

Table 2 Number of export-destination/import-source countries in 2019

Source: Authors' calculation based on BSJBSA and trade transaction data by Japan Customs

	(1)	(2)	(3)	(4)
	$\Delta ln(Sales)$	$\Delta ln(DSales)$	$\Delta ln(Export)$	∆ln(Import)
ln(Sales)t0	-0.0107**			
	(0.00485)			
ln(DSales)t0		-0.0164***		
		(0.00459)		
ln(Export)t0			-0.0165***	
			(0.00288)	
ln(Import)t0				-0.0130***
				(0.00393)
MNE dummy	-7.93e-05	0.00392	0.0146	0.00572
	(0.00292)	(0.00366)	(0.0143)	(0.0146)
FOC dummy	-0.00811	-0.0230	-0.00406	0.0600
	(0.0137)	(0.0324)	(0.0449)	(0.0424)
Exporter dummy	-0.00163	-0.00147		-0.0285
	(0.00329)	(0.00361)		(0.0280)
Importer dummy	0.00247	0.00470	-0.0110	
	(0.00324)	(0.00363)	(0.0309)	
ln(Age)	-0.00530**	-0.00267	0.00542	-0.00221
	(0.00246)	(0.00287)	(0.0138)	(0.00999)
ln(Emp)	0.0114**	0.0175***	0.0198**	0.0108
	(0.00558)	(0.00547)	(0.00894)	(0.00710)
MNE dummy*D2020	-0.00138	-0.0131	-0.00972	0.0328
	(0.00781)	(0.00979)	(0.0302)	(0.0293)
FOC dummy*D2020	-0.0185	0.0479	0.103	-0.118
	(0.0306)	(0.0901)	(0.103)	(0.0757)
Exporter dummy*D2020	-0.00566	-0.00629		0.0313
	(0.00687)	(0.00726)		(0.0577)
Importer dummy*D2020	0.00602	0.000110	0.0569	
	(0.00803)	(0.00717)	(0.0616)	
ln(Age)*D2020	-0.00614	-0.00145	-0.0250	-0.0218
	(0.00669)	(0.00901)	(0.0329)	(0.0266)
ln(Emp)*D2020	0.00445	0.00188	0.0263	0.0270*
	(0.00449)	(0.00598)	(0.0167)	(0.0138)
	22.52(22.272	11 700	10.402
Observations	32,526	52,575	11,/08	10,402
K-squared	0.096	0.060	0.025	0.035
N of firms	10842	10809	3975	3524

Note: ***,**, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively. Figures in parentheses are robust standard errors clustered at the 2-digit industry level. Year and 3-digit level industry fixed effects are included.

	(1)	(2)	(3)	(4)
	$\Delta ln(E)$	xport)	∆ln(In	iport)
	0.00117	0.00200	0.00278	0.000020
Number of FDI countries	0.00117	0.00200	-0.00278	0.000820
	(0.00184)	(0.00183)	(0.00202)	(0.00166)
Number of Exporting countries	-9.06e-06		0.000795	
	(0.000392)		(0.000554)	
Number of Importing countries		-0.00130		-0.00321*
		(0.00132)		(0.00185)
Number of FDI countries*D2020	-0.00209	-0.00350	0.00446	0.000544
	(0.00307)	(0.00324)	(0.00362)	(0.00325)
Number of Exporting countries*D2020	0.00171*		-0.00138	
	(0.000888)		(0.00105)	
Number of Importing countries*D2020		0.00548*		0.00185

11,708

0.025

3975

Table 4 Diversification of export, FDI destinations, and import origins

Observations

R-squared

N of firms

Note: ***, **, and * indicate statistical significance at the 1%, 5%, and 10%, levels, respectively. Figures in parentheses are robust standard errors clustered at the 2-digit industry level. Year and 3-digit level industry fixed effects and variables for firm characteristics are included. Full results are presented in Table A3 in the Appendix.

10,402

0.034

3524

(0.00262)

10,402

0.035

3524

(0.00274)

11,708

0.025

3975

	(1)	(2)	(3)	(4)
VARIABLES	$\Delta ln(Export-Final Goods)$		∆ln(Export-Interm	ediate Goods)
Number of FDI countries	0.00487*	0.00467*	0.00338	0.00584
	(0.00268)	(0.00257)	(0.00515)	(0.00536)
Number of Exporting countries	0.00366***		0.00770***	
	(0.000851)		(0.00177)	
Number of Importing countries		0.00701***		0.0125***
		(0.00208)		(0.00378)
Number of FDI countries*D2020	-0.000771	0.00354	-0.00146	-0.000177
	(0.00591)	(0.00595)	(0.00628)	(0.00592)
Number of Exporting countries*D2020	0.00400***		0.00565**	
	(0.00139)		(0.00276)	
Number of Importing countries*D2020		0.00296		0.0102*
		(0.00325)		(0.00574)
Observations	10,735	10,735	14,125	14,125
R-squared	0.036	0.035	0.026	0.025
N of firms	3855	3855	4923	4923

Table 5 Diversification of export, FDI destinations, and import origins: export of final goods vs. export of intermediate goods.

Note: ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively. Figures in parentheses are robust standard errors clustered at the 2-digit industry level. Year and 3-digit level industry fixed effects and variables for firm characteristics are included. Full results are presented in Table A4 in the Appendix.

	(1)	(2)	(3)	(4)
VARIABLES	∆ln(Import-Final Goods)		$\Delta ln(Import-Inter$	mediate Goods)
Number of FDI countries	0.00434	0.00411	0.000678	-0.00116
5	(0.00331)	(0.00319)	(0.00373)	(0.00256)
Number of Exporting countries	0.00168*	× ,	0.00234	× /
	(0.000952)		(0.00146)	
Number of Importing countries		0.00433*		0.00772**
		(0.00229)		(0.00349)
Number of FDI countries*D2020	0.00185	0.00213	-0.00166	-0.00457
	(0.00550)	(0.00485)	(0.00718)	(0.00594)
Number of Exporting countries*D2020	-0.00207		0.00478*	
	(0.00191)		(0.00252)	
Number of Importing countries*D2020		-0.00510		0.0141***
		(0.00447)		(0.00522)
Observations	10,195	10,195	14,835	14,835
R-squared	0.028	0.028	0.031	0.031
N of firms	3676	3676	5186	5186

Table 6 Diversification of export, FDI destinations, and import origins: import of final goods vs. import of intermediate goods.

Note: ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively. Figures in parentheses are robust standard errors clustered at the 2-digit industry level. Year and 3-digit level industry fixed effects and variables for firm characteristics are included. Full results are presented in Table A5 in the Appendix.

Figure 1



Panel (a) Growth rate of sales from 2019 to 2020



Panel (b) Growth rate of Export and Import Value from 2019 to 2020

Variable		# of obs	Mean	SD	p10	p90
$\Delta ln(Sales)$	Changes in log sales	32526	-0.030	0.167	-0.195	0.116
$\Delta ln(DSales)$	Changes in log domestic sales	32373	-0.030	0.218	-0.200	0.120
$\Delta ln(Export)$	Changes in log export	11708	-0.046	0.716	-0.633	0.534
Δln(Import)	Changes in log import	10402	-0.046	0.655	-0.585	0.470
MNE dummy	Dummy for firms that own manufacturing foreign affiliates	32526	0.109	0.312	3.237	4.350
FOC dummy	Dummy for firms whose foreign capital share is greater than 50% and their headquarters outside of Japan.	32526	0.011	0.104	4.226	6.619
Exporter dummy	Dummy variable for exporting firms	32526	0.506	0.500	0.000	0.318
Importer dummy	Dummy variable for importing firms	32526	0.535	0.499	0.455	1.455
ln(Age)	logged firm age	32526	3.890	0.531	0.000	1.000
ln(Emp)	logged the number of employees	32526	5.254	1.001	0.000	0.000
ln(Sales)t0	logged sales in year in 2017	32526	8.556	1.358	0.000	1.000
ln(DSales)t0	logged domestic sales in year in 2017	32373	8.556	1.357	7.017	10.222
ln(Export)t0	logged exports in year in 2017	11708	6.240	2.470	3.155	9.357
ln(Import)t0	logged imports in year in 2017	10402	5.692	2.297	2.800	8.597
Number of FDI countries	Number of countries where manufacturing foreign subsidiaries are located	32526	0.367	1.809	0.000	1.000
Number of Exporting countries	Number of exporting countries, calculated with Customs data	11708	11.146	13.338	1.455	25.455
Number of Importing countries	Number of importing countries, calculated with Customs data	11708	5.711	6.764	1.455	13.455

Appendix Table A1 Descriptive Statistics: Panel (a) Variable Definitions and Summary Statistics

Source: Authors' calculation based on BSJBSA and trade transaction data from Japan Customs. The values of p10 and p90 are averages of 10 samples around the p10 and p90 firms to avoid confidentiality violations.

Panel (b) Correlation	Matrix
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		[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]	[15]
[1]	$\Delta ln(Sales)$	1.000														
[2]	$\Delta ln(DSales)$	0.518	1.000													
[3]	$\Delta ln(Export)$	0.265	0.086	1.000												
[4]	$\Delta ln(Import)$	0.284	0.142	0.215	1.000											
[5]	MNE dummy	-0.012	0.000	-0.003	0.007	1.000										
[6]	FOC dummy	0.001	0.006	-0.002	0.003	-0.113	1.000									
[7]	ln(Age)	-0.034	-0.006	-0.007	-0.015	0.134	-0.157	1.000								
[8]	ln(Emp)	-0.015	-0.015	0.005	0.011	0.332	0.004	0.120	1.000							
[9]	ln(Sales)t0	-0.022	-0.021	0.009	0.009	0.329	0.043	0.091	0.921	1.000						
[10]	ln(DSales)t0	-0.007	-0.041	0.016	0.011	0.275	0.025	0.113	0.888	0.952	1.000					
[11]	ln(Export)t0	-0.046	-0.012	-0.030	0.004	0.366	0.071	0.057	0.633	0.687	0.527	1.000				
[12]	ln(Import)t0	-0.028	-0.011	-0.008	-0.018	0.256	0.098	0.061	0.549	0.646	0.579	0.542	1.000			
[13]	Number of FDI countries	-0.024	-0.005	-0.007	-0.004	0.519	0.005	0.137	0.468	0.449	0.385	0.440	0.349	1.000		
[14]	Number of Exporting countries	-0.010	0.006	-0.012	0.004	0.327	0.066	0.118	0.541	0.519	0.426	0.638	0.393	0.526	1.000	
[15]	Number of Importing countries	-0.020	-0.007	-0.011	-0.015	0.319	0.143	0.069	0.654	0.649	0.573	0.616	0.561	0.548	0.746	1.000

Source: Authors' calculation based on BSJBSA and trade transaction data from Japan Customs.

	(1)	(2)	(3)	(4)
VARIABLES	$\Delta ln(Sales)$	$\Delta ln(DSales)$	$\Delta ln(Export)$	$\Delta ln(Import)$
ln(Sales)t0	-0.0107**			
	(0.00485)			
ln(DSales)t0		-0.0164***		
		(0.00457)		
ln(Export)t0			-0.0165***	
			(0.00288)	
ln(Import)t0				-0.0130***
				(0.00393)
MNE dummy	-0.000218	0.00375	0.0146	0.00572
	(0.00288)	(0.00369)	(0.0143)	(0.0146)
FOC dummy	-0.00828	-0.0232	-0.00406	0.0600
	(0.0135)	(0.0323)	(0.0449)	(0.0424)
Two-way dummy	0.000870	0.00326	-0.0110	-0.0285
	(0.00379)	(0.00423)	(0.0309)	(0.0280)
Ex-Only dummy	-0.00286	-0.00294		
	(0.00531)	(0.00575)		
Im-Only dummy	0.00151	0.00355		
	(0.00356)	(0.00423)		
log(Age)	-0.00529**	-0.00265	0.00542	-0.00221
	(0.00246)	(0.00287)	(0.0138)	(0.00999)
log(Emp)	0.0114**	0.0175***	0.0198**	0.0108
	(0.00558)	(0.00543)	(0.00894)	(0.00710)
MNE dummy *D2020	-0.000944	-0.0125	-0.00972	0.0328
	(0.00791)	(0.00981)	(0.0302)	(0.0293)
FOC dummy*D2020	-0.0181	0.0486	0.103	-0.118
	(0.0305)	(0.0901)	(0.103)	(0.0757)
Two-way dummy*D2020	0.000256	-0.00632	0.0569	0.0313
	(0.0105)	(0.0105)	(0.0616)	(0.0577)
Ex-Only dummy*D2020	-0.00191	-0.000833		
	(0.00907)	(0.00928)		
Im-Only dummy*D2020	0.00882	0.00418		
	(0.00971)	(0.00858)		
log(Age)*D2020	-0.00619	-0.00152	-0.0250	-0.0218
	(0.00667)	(0.00900)	(0.0329)	(0.0266)
log(Emp)*D2020	0.00452	0.00198	0.0263	0.0270*
	(0.00449)	(0.00597)	(0.0167)	(0.0138)
Observations	32,526	32,373	11,708	10,402
R-squared	0.096	0.060	0.025	0.035
N of firms	10842	10809	3975	3524

Table A2 Includes two-way, export-only, import only dummies

See Table 3 for table notes.

	(1)	(2)	(3)	(4)
	$\Delta ln(E)$	xport)	∆ln(In	iport)
In(Export)t0	-0.0174***	-0.0166***		
m(Expone)ro	(0.00305)	(0.00311)		
ln(Import)t0	(******)	(1111)	-0.0126***	-0.0108**
			(0.00390)	(0.00408)
FOC dummy	-0.00673	9.54e-05	0.0537	0.0743
	(0.0440)	(0.0443)	(0.0427)	(0.0465)
Exporter dummy	-0.00778	-0.00460		
	(0.0308)	(0.0307)		
Importer dummy			-0.0329	-0.0253
			(0.0287)	(0.0278)
log(Age)	0.00590	0.00600	-0.00207	-0.00148
	(0.0136)	(0.0137)	(0.00962)	(0.00993)
log(Emp)	0.0215**	0.0244**	0.00956	0.0202**
	(0.0102)	(0.0112)	(0.00766)	(0.00865)
Number of FDI countries	0.00117	0.00200	-0.00278	0.000820
	(0.00184)	(0.00183)	(0.00202)	(0.00166)
Number of Exporting countries	-9.06e-06		0.000795	
	(0.000392)		(0.000554)	
Number of Importing countries		-0.00130		-0.00321*
		(0.00132)		(0.00185)
FOC dummy*D2020	0.0955	0.0720	-0.119	-0.138*
	(0.102)	(0.103)	(0.0757)	(0.0802)
Exporter dummy*D2020	0.0502	0.0375		
	(0.0612)	(0.0616)		
Importer dummy*D2020			0.0463	0.0343
			(0.0586)	(0.0584)
log(Age)*D2020	-0.0276	-0.0259	-0.0188	-0.0202
	(0.0325)	(0.0326)	(0.0259)	(0.0265)
log(Emp)*D2020	0.0170	0.00849	0.0342**	0.0236
	(0.0203)	(0.0213)	(0.0168)	(0.0185)
Number of FDI countries*D2020	-0.00209	-0.00350	0.00446	0.000544
	(0.00307)	(0.00324)	(0.00362)	(0.00325)
Number of Exporting countries*D2020	0.00171*		-0.00138	
	(0.000888)		(0.00105)	
Number of Importing countries*D2020	. ,	0.00548*		0.00185
		(0.00274)		(0.00262)
Observations	11,708	11,708	10,402	10,402
R-squared	0.025	0.025	0.034	0.035
N of firms	3975	3975	3524	3524

Table A3 Full results of Table 4

Table A4 Full results of Table 5

	(1)	(2)	(3)	(4)
VARIABLES	$\Delta ln(Export-Final Goods)$		$\Delta ln(Export-Interm$	ediate Goods)
	0.07(5***	0 0727***		
In(Export-Final Goods)10	-0.0/65***	-0.0/2/***		
In (From and Intermediate Canada) +0	(0.00564)	(0.00599)	0 105***	0 101***
in(Export-Intermediate Goods)10			-0.105****	-0.101***
	0.0270	2.02.05	(0.0155)	(0.0149)
FOC dummy	0.0278	-2.02e-05	0.189***	0.149**
	(0.0684)	(0.06/1)	(0.0583)	(0.0627)
Importer dummy	0.0984*	0.0807	0.0818	0.0540
	(0.0512)	(0.0510)	(0.0784)	(0.0789)
log(Age)	0.0146	0.0205	0.0374	0.0451*
	(0.0165)	(0.0160)	(0.0270)	(0.0269)
log(Emp)	0.0594***	0.0514***	0.0914***	0.0845**
	(0.0125)	(0.0130)	(0.0311)	(0.0326)
Number of FDI countries	0.00487*	0.00467*	0.00338	0.00584
	(0.00268)	(0.00257)	(0.00515)	(0.00536)
Number of Exporting countries	0.00366***		0.00770***	
	(0.000851)		(0.00177)	
Number of Importing countries		0.00701***		0.0125***
		(0.00208)		(0.00378)
FOC dummy*D2020	-0.0213	-0.0283	-0.0697	-0.108
, ,	(0.179)	(0.185)	(0.159)	(0.172)
Importer dummy*D2020	-0.0116	-0.00945	-0.103*	-0.0944
	(0.0965)	(0.0970)	(0.0579)	(0.0580)
log(Age)*D2020	-0.0568	-0.0497	0.00590	-0.000742
108(1180) 102020	(0.0644)	(0.0649)	(0.0383)	(0.0417)
log(Emn)*D2020	0.0114	0.0183	-0 104	-0.120
10g(Emp) 02020	(0.0101)	(0.0221)	(0.154)	(0.146)
Number of FDI countries*D2020	0.000771	0.00251	0.00146	0.000177
Number of 1 Di countries D2020	-0.000771	(0.00505)	-0.00140	-0.000177
Number of Francisco and the second star * D2020	(0.00391)	(0.00393)	(0.00028)	(0.00392)
Number of Exporting Countries D2020	(0.00120)		(0.00303**	
N 1 CL *D2020	(0.00139)	0.00000	(0.00276)	0.0102*
Number of Importing countries*D2020		0.00296		0.0102*
		(0.00325)		(0.00574)
Observations	10.735	10.735	14.125	14,125
R-squared	0.036	0.035	0.026	0.025
Noffirms	3855	3855	4923	4923

Table A5 Full results of Table 6

	(1)	(2)	(3)	(4)
VARIABLES	$\Delta ln(Import-Final Goods)$		$\Delta ln(Import-Inter$	mediate Goods)
In(Import_Final Goods)t0	-0.0679***	_0.0601***		
in(import-1 indi Goods)10	(0.0079)	(0.0091)		
In(Import-Intermediate Goods)t()	(0.00574)	(0.00017)	-0 102***	-0 105***
m(mport metmeature Goods)to			(0.0169)	(0.0176)
FOC dummy	0.146*	0.130	0.225***	0.198***
	(0.0829)	(0.0854)	(0.0667)	(0.0630)
Exporter dummy	0.105***	0.109***	0.139***	0.146***
2.up 01101 uuminiy	(0.0377)	(0.0383)	(0.0521)	(0.0542)
log(Age)	-0.00567	-0.00293	-0.0501	-0.0470
	(0.0205)	(0.0194)	(0.0344)	(0.0349)
log(Emp)	0.0406***	0.0362**	0.109***	0.101***
	(0.0131)	(0.0138)	(0.0233)	(0.0220)
Number of FDI countries	0.00434	0.00411	0.000678	-0.00116
, , , , , , , , , , , , , , , , , , ,	(0.00331)	(0.00319)	(0.00373)	(0.00256)
Number of Exporting countries	0.00168*	(0.000 0.00)	0.00234	(0.001200)
	(0.000952)		(0.00146)	
Number of Importing countries	(0.00433*		0.00772**
<i>J T G G</i>		(0.00229)		(0.00349)
FOC dummy*D2020	-0.221	-0.201	0.0835	0.0220
, ,	(0.183)	(0.183)	(0.0901)	(0.0964)
Exporter dummy*D2020	-0.0951	-0.100	-0.0137	-0.00483
1 2	(0.0752)	(0.0729)	(0.135)	(0.130)
log(Age)*D2020	-0.0402	-0.0438	0.0505	0.0591
	(0.0375)	(0.0367)	(0.0849)	(0.0855)
log(Emp)*D2020	0.0660***	0.0722**	0.0278	0.00723
	(0.0239)	(0.0287)	(0.0328)	(0.0361)
Number of FDI countries*D2020	0.00185	0.00213	-0.00166	-0.00457
	(0.00550)	(0.00485)	(0.00718)	(0.00594)
Number of Exporting countries*D2020	-0.00207	. ,	0.00478*	
	(0.00191)		(0.00252)	
Number of Importing countries*D2020		-0.00510		0.0141***
		(0.00447)		(0.00522)
Observations	10,195	10,195	14,835	14,835
R-squared	0.028	0.028	0.031	0.031
N of firms	3676	3676	5186	5186

	(1)	(2)	(3)	(4)
	$\Delta ln(E)$	xport)	$\Delta ln(In$	nport)
ln(Export)t0	-0.0178*** (0.00309)	-0.0169*** (0.00314)		
ln(Import)t0	(0.0050))	(0.00511)	-0.0130***	-0.0111***
MNE dummy	0.0165	0.0181	(0.00391) 0.00236	(0.00412) 0.0113
	(0.0139)	(0.0137)	(0.0151)	(0.0142)
FOC dummy	-0.00219	0.00430	0.0557	0.0774
Exporter dummy	(0.0449) -0.00909	(0.0449) -0.00658	(0.0439)	(0.0466)
Importor dumm	(0.0307)	(0.0305)	0.0216	0.0267
Importer dummy			(0.0287)	(0.0281)
ln(Age)	0.00523	0.00551	-0.00299	-0.00184
	(0.0136)	(0.0136)	(0.00974)	(0.00994)
ln(Emp)	0.0211**	0.0241**	0.00791	0.0197**
	(0.00969)	(0.0111)	(0.00747)	(0.00866)
Number of Exporting countries	-6.00e-06		0.000557	
	(0.000406)		(0.000528)	
Number of Importing countries		-0.00115		-0.00317*
		(0.00130)		(0.00178)
MNE dummy*D2020	-0.0192	-0.0217	0.0408	0.0293
	(0.0300)	(0.0287)	(0.0301)	(0.0300)
FOC dummy*D2020	0.0906	0.0679	-0.108	-0.128
	(0.105)	(0.105)	(0.0773)	(0.0824)
Exporter dummy *D2020	0.0523	(0.0409)		
Important dumment D2020	(0.0013)	(0.0013)	0.0202	0.0206
Importer dummy D2020			(0.0593)	(0.0582)
ln(Age)*D2020	-0.0271	-0.0257	-0.0198	-0.0220
	(0.0325)	(0.0326)	(0.0261)	(0.0266)
ln(Emp)*D2020	0.0173	0.00856	0.0339**	0.0220
	(0.0198)	(0.0213)	(0.0164)	(0.0183)
Number of Exporting countries*D2020	0.00168*	× ,	-0.00133	· · · ·
	(0.000894)		(0.00104)	
Number of Importing countries*D2020		0.00516**		0.00151
		(0.00252)		(0.00259)
Observations	11,708	11,708	10,402	10,402
R-squared	0.025	0.025	0.035	0.035
N of firms	3975	3975	3524	3524

Table A6 Panel (a) results excluding the number of FDI destination countries

	(1)	(2)	(3)	(4)
	$\Delta ln(Export-Final Goods)$		$\Delta ln(Export-Inter$	rmediate Goods)
In(Export-Final Goods)t()	-0 155***	-0 147***		
	(0.0112)	(0.0114)		
ln(Export-Intermediate Goods)t0	(0.0112)	(0.011.)	-0.107***	-0.103***
			(0.0155)	(0.0150)
MNE dummv	0.0761***	0.0843***	0.124***	0.132***
	(0.0248)	(0.0245)	(0.0409)	(0.0408)
FOC dummv	0.0407	-0.0244	0.222***	0.186***
	(0.0745)	(0.0721)	(0.0601)	(0.0634)
Importer dummy	0.109**	0.0696	0.0747	0.0474
1	(0.0542)	(0.0527)	(0.0776)	(0.0781)
ln(Age)	-0.00395	0.0116	0.0307	0.0381
	(0.0212)	(0.0204)	(0.0273)	(0.0275)
ln(Emp)	0.108***	0.0920***	0.0845***	0.0787**
	(0.0170)	(0.0172)	(0.0302)	(0.0324)
Number of Exporting countries	0.0102***	X	0.00714***	
	(0.00134)		(0.00182)	
Number of Importing countries	× ,	0.0181***		0.0119***
		(0.00296)		(0.00359)
MNE dummy*D2020	-0.00725	0.00424	0.0300	0.0401
	(0.0450)	(0.0465)	(0.0817)	(0.0799)
FOC dummy*D2020	-0.0140	-0.0305	-0.0596	-0.0936
	(0.169)	(0.178)	(0.161)	(0.172)
Importer dummy*D2020	-0.0374	-0.0440	-0.111	-0.128
	(0.0891)	(0.0906)	(0.153)	(0.145)
ln(Age)*D2020	-0.0549	-0.0467	-0.105*	-0.0981
	(0.0595)	(0.0607)	(0.0590)	(0.0591)
ln(Emp)*D2020	0.00882	0.0134	0.00370	-0.00300
	(0.0180)	(0.0228)	(0.0378)	(0.0422)
Number of Exporting countries*D2020	0.00337***		0.00532**	
	(0.00123)		(0.00261)	
Number of Importing countries*D2020		0.00339		0.00973*
		(0.00347)		(0.00531)
Observations	11,201	11,201	14,125	14,125
R-squared	0.087	0.083	0.026	0.026
N_firm	4180	4180	4923	4923

Table A6 Panel (b) results without the number of FDI destination countries

	(1)	(2)	(3)	(4)
VARIABLES	$\Delta ln(Import-F$	$\Delta ln(Import-Final Goods)$		mediate Goods)
In(Import-Final Goods)t()	-0.0674***	-0 0690***		
in(import 1 inut Goous)to	(0.00589)	(0.00615)		
ln(Import-Intermediate Goods)t0	(0.00000))	(-0.133***	-0.105***
····(I ·······························			(0.0202)	(0.0176)
MNE dummv	-0.0316	-0.0290	0.0486	0.0128
	(0.0337)	(0.0329)	(0.0483)	(0.0391)
FOC dummv	0.135	0.116	0.244***	0.203***
	(0.0857)	(0.0880)	(0.0808)	(0.0646)
Importer dummv	0.106***	0.112***	0.257**	0.145**
r · · · · · · ·	(0.0375)	(0.0379)	(0.121)	(0.0555)
ln(Age)	-0.00225	0.00127	-0.0627	-0.0483
	(0.0196)	(0.0184)	(0.0468)	(0.0349)
ln(Emp)	0.0455***	0.0401***	0.124***	0.0992***
	(0.0131)	(0.0139)	(0.0281)	(0.0219)
Number of Exporting countries	0.00232**	· · · ·	0.00180	· · · ·
<i>y</i> 1 0	(0.000959)		(0.00172)	
Number of Importing countries		0.00556**	· · · · ·	0.00734**
		(0.00228)		(0.00331)
MNE dummy*D2020	0.130**	0.126**	0.0576	0.0345
-	(0.0520)	(0.0515)	(0.0982)	(0.0919)
FOC dummy*D2020	-0.185	-0.161	0.194*	0.0375
	(0.191)	(0.192)	(0.108)	(0.105)
Importer dummy*D2020	-0.112	-0.120*	0.153	-0.00951
	(0.0729)	(0.0707)	(0.309)	(0.135)
ln(Age)*D2020	-0.0490	-0.0538	0.0432	0.0546
	(0.0370)	(0.0361)	(0.112)	(0.0853)
ln(Emp)*D2020	0.0581**	0.0651**	0.0350	0.00358
	(0.0234)	(0.0284)	(0.0426)	(0.0355)
Number of Exporting countries*D2020	-0.00297		0.00453*	
	(0.00184)		(0.00257)	
Number of Importing countries*D2020		-0.00655		0.0128**
		(0.00441)		(0.00512)
Observations	10,195	10,195	10,658	14,835
R-squared	0.028	0.028	0.046	0.031
_N_firm	3676	3676	4125	5186

Table A6 Panel (c) results excluding the number of FDI destination countries

	(1)	(2)	(3)	(4)	(5)	(6)
		∆ln(Export-	∆ln(Export-		∆ln(Import-	∆ln(Import-
	$\Delta ln(Export)$	Final	Intermediate	∆ln(Import)	Final	Intermediate
VARIABLES		Goods)	Goods)		Goods)	Goods)
ln(Export)t0	-0.0160***					
	(0.00292)					
ln(Export-Final Goods)t0		-0.0673***				
		(0.00508)				
ln(Export-Intermediate Goods)t0			-0.0965***			
			(0.0146)			
ln(Import)t0				-0.0128***		
				(0.00389)		
ln(Import-Final Goods)t0					-0.0663***	
					(0.00546)	
ln(Import-Intermediate Goods)t0						-0.104***
						(0.0180)
FOC dummy	-0.00898	0.0488	0.225***	0.0557	0.160*	0.245***
	(0.0443)	(0.0677)	(0.0548)	(0.0421)	(0.0833)	(0.0662)
ln(Age)	0.00629	0.0195	0.0444	-0.00179	-0.00185	-0.0391
	(0.0137)	(0.0159)	(0.0269)	(0.00982)	(0.0212)	(0.0374)
ln(Emp)	0.0198**	0.0721***	0.118***	0.0117	0.0495***	0.127***
	(0.00927)	(0.0125)	(0.0307)	(0.00718)	(0.0102)	(0.0212)
Number of FDI countries	0.000787	0.00864***	0.0152**	-0.00141	0.00675*	0.00295
	(0.00200)	(0.00236)	(0.00599)	(0.00187)	(0.00345)	(0.00396)
FOC dummy*D2020	0.109	-0.00787	-0.0507	-0.123	-0.239	0.0826
	(0.100)	(0.184)	(0.149)	(0.0748)	(0.185)	(0.0935)
ln(Age)*D2020	-0.0273	-0.0523	-0.0938	-0.0196	-0.0474	-0.000576
	(0.0324)	(0.0652)	(0.0579)	(0.0260)	(0.0392)	(0.0835)
ln(Emp)*D2020	0.0270	0.0275	0.0250	0.0302**	0.0589**	0.0433
	(0.0170)	(0.0184)	(0.0316)	(0.0150)	(0.0221)	(0.0365)
Number of FDI countries*D2020	0.000821	0.00553	0.00723	0.00218	-0.00201	0.0107
	(0.00342)	(0.00562)	(0.00810)	(0.00347)	(0.00488)	(0.00791)
Observations	11,708	10,735	14,125	10,402	9,109	12,693
R-squared	0.025	0.033	0.024	0.034	0.028	0.032
N of firms	3975	3855	4923	3524	3369	4595

Table A7 results without the number of export-destination and import-source countries