

NOTE

INTERMEDIARIES IN INTERNATIONAL TRADE: PRODUCTS AND DESTINATIONS

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Abstract—This paper examines the factors that give rise to intermediaries in exporting and explores the implications for trade volumes. Export intermediaries such as wholesalers serve different markets and export different products than manufacturing exporters do. Wholesalers are more prevalent in markets with higher destination-specific fixed costs and focus on products that are less differentiated, have lower contract intensity, and have large sunk entry costs. Aggregate exports to destinations with high shares of indirect exports are less responsive to changes in the real exchange rate than are exports to markets served primarily by direct exporters.

I. Introduction

AMONG firms that export, there are direct manufacturing exporters and intermediaries that assist manufacturing producers in reaching overseas markets.¹ While the literature in international trade has largely focused on manufacturers that export their own products, an emerging body of research has emphasized the existence of producers that export indirectly and the role played by intermediaries in facilitating exports. Recent theoretical models of trade introduce an intermediation technology that allows wholesalers to lower the per product fixed costs and exploit economies of scope in exporting.² One of the main predictions of these models is that the size of the fixed costs of exporting, which in turn depends on country and product characteristics, is crucial in determining the export mode of manufacturing firms. Intuitively, markets with relatively high fixed export costs offer an opportunity for wholesalers to act as trade intermediaries.

This paper contributes to the emerging literature on export intermediaries by analyzing the role of country and product characteristics in determining whether a cross-border transaction is handled by wholesalers or direct exporters. The paper then explores the implications for aggregate exports and their responsiveness to exogenous shocks.

We use newly available Italian firm-level trade data to document the differences between manufacturer and wholesaler exports across products and countries. More than one-quarter of Italian exporters are intermediaries, and they account for over 10% of exports. However, there is substantial variation in the importance of intermediaries across destinations and products. The share of exports generated by Italian intermediaries in New Zealand or China is near 9% (25th percentile),

while in Paraguay and in Malawi, the shares exceed 23% (75th percentile). Our evidence suggests that wholesalers overcome barriers to international trade at a lower cost than manufacturers for some range of goods and for some countries. Relative to manufacturing exporters, they are more likely to sell to smaller markets with high export entry costs.³ Exports through an intermediary are more likely when the quality of the general contracting environment of the country is weak. Also the characteristics of products handled by wholesalers are different from those exported directly. Intermediaries focus on products that are less differentiated, have lower contract intensity, and with a higher level of sunk costs.

Wholesalers are more prevalent in markets with higher destination-specific fixed costs. The presence of high fixed costs means that exporters will be less likely to enter or exit the market in response to exogenous shocks. This in turn means that aggregate export elasticities may vary systematically across markets served by direct and intermediary exporters. We investigate the responsiveness of exports to the exchange rate for countries with high and low shares of intermediated exports. Responses to exchange rate changes are substantially greater in destinations served primarily by direct exporters. These results provide the first evidence on the importance of wholesalers in international markets for the aggregate trade flows.

Within the large literature on firm heterogeneity in international trade, our work directly relates to the emerging body of research on the role of intermediaries in foreign markets. Early theoretical work, such as Rauch and Watson (2004) and, more recently, Petropoulou (2011), models trade as an outcome of search and networks. However, several new papers have taken a more technological perspective based on models of heterogeneous firms (Ahn et al., 2011; Akerman, 2010; Felbermayr and Jung 2011).⁴

There exist few empirical analyses that look at the role of intermediaries in trade. Ahn et al. (2011), Akerman (2010), and Bernard et al. (2010) examine various aspects of intermediaries in exports for China, Sweden, and the United States, respectively.⁵ All three papers examine the differences between intermediaries and firms that export directly. Bernard et al. (2010) find that 35% of U.S. exporters are wholesalers accounting for 10% of exports by value. Their work emphasizes the differences in the attributes between exporters of different types. Akerman (2010) reports slightly more exporting intermediaries than manufacturers, and intermediaries are smaller in terms of total turnover and especially export value, but they export more products and ship to more destinations. Akerman (2010) finds that country sector intermediary

³ Akerman (2010), Ahn et al. (2011), and Bernard et al. (2010) report evidence of a greater role for intermediaries in such markets.

⁴ Blum, Claro, and Horstmann (2009, 2010) look at the role of intermediaries largely from the perspective of the importing country, while Rauch and Watson (2004) discuss when intermediary firms actually take possession of the goods.

⁵ The definition of an exporting intermediary varies across all the papers, so the results are not directly comparable to each other. Ahn et al. (2011) define an intermediary as a firm with certain Chinese characters in its name, Akerman (2010) uses the main activity of the firm and includes both wholesalers and retailers, and Bernard et al. (2010) distinguish pure wholesalers, pure retailers, and two types of firms that mix manufacturing with wholesaling and retailing. We consider only firms with wholesaling as their main activity as intermediaries.

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¹ Bernard et al. (2010) provide evidence that there also exist firms engaged in a mix of those activities.

² Theoretical frameworks on intermediaries include Ahn, Khandelwal, and Wei (2011), Antràs and Costinot (2011), and Akerman (2010).

TABLE 1.—EXPORTS AND NUMBER OF EXPORTING FIRMS: SHARE BY TYPE OF FIRMS, 2003

	Share (%)				
	Manufacturers	Wholesalers	Retailers	Others	Total
Exports	85.52	10.71	0.86	2.91	254.91 (billion euros)
Exporters	55.57	27.41	7.72	9.3	143,421 (firms)

Source: Our elaboration on Italian microdata.

export shares increase in distance and measures of fixed costs and fall with destination GDP. In contrast with the other studies, Ahn et al. (2011) find much higher exports per firm for intermediaries than for direct exporters. Intermediaries are also active in many more products than direct exporters. Intermediary export shares are positively related to distance, tariffs, and a measure of fixed costs and negatively correlated with destination GDP.

This paper builds on this growing empirical literature and extends it by documenting how destinations and product characteristics shape export volumes by intermediaries and manufacturers. Finally, we investigate the implications of the existence of intermediaries for aggregate trade flows.

II. Data

The analysis of exports by manufacturers and wholesalers is based on firm-level annual trade data augmented with product and country-level characteristics.

A. Trade and Firm Data

We use two firm-level data sets collected by the Italian statistical office (ISTAT): *Statistiche del Commercio Estero (COE)* and *Archivio Statistico Imprese Attive (ASIA)*.⁶ The COE data set consists of all cross-border transactions performed by Italian firms from 2000 to 2007. COE includes the annual value and quantity of export transactions by firm-product-country.⁷ A product is defined as a six-digit category in the Harmonized System (HS6). Using the firm ID, we link the firm-level export data to ISTAT's registry of active firms, ASIA. In ASIA, firms are classified according to their main activity as identified by ISTAT's standard codes for sectoral classification of business (five-digit ATECO). We create four broad categories of firms: manufacturers, wholesalers, retailers, and a residual group including the remaining sectors.⁸ The combined data set used for the analysis is not a sample but includes all active firms.

Table 1 reports the total value of exports and the relative share of the four broad categories of firms. A preponderance of exports, more than 85%, is performed directly by manufacturing firms. Manufacturing firms also represent more than 55% of exporters. The 27% of exporters that are wholesalers account for more than 10% of Italian exports in 2003. These figures are in line with those reported for the United States in Bernard et al. (2010), where wholesalers are 35% of exporting firms and control just over 10% of U.S. exports. As in other countries, retailers

are relatively minor players in exporting, accounting for less than 1% of exports by value. As a result, the remainder of the paper focuses on the role of wholesalers as export intermediaries and uses the two terms interchangeably.

B. Countries and Products Data

According to the models of intermediaries in international trade, exports by wholesalers are expected to be more prevalent in difficult markets characterized by high costs of entry and small relative size (Ahn et al., 2011; Akerman, 2010; Felbermayr & Jung, 2011).⁹ To examine this prediction, we complement the firm-level trade data by country proxies for market size and variable and fixed trade costs.

We create two measures of country-level fixed costs. To proxy for the market-specific fixed costs of exporting to a country, we use three measures from the World Bank Doing Business data set: number of documents for importing, cost of importing, and time to import (Djankov, Freund, & Pham, 2010). Given the high correlation between these variables, we use the primary factor (*Market Costs*) derived from principal component analysis as that factor accounts for most of the variance of the original indicators.

The second measure of country-level fixed costs relates to the quality of governance and contracting. Data on the contracting environment are available from a variety of sources (e.g., World Bank, Heritage Foundation, and Transparency International). To proxy for institutional quality, we use the six variables in the World Bank's Governance data set (Kaufman, Kraay, & Mastruzzi, 2009): Voice and Accountability, Political Stability and Absence of Violence/Terrorism, Government Effectiveness, Regulatory Quality, Rule of Law, and Control of Corruption. As these six measures are highly correlated, we again use the primary factor obtained from principal component analysis, *Governance*, as the proxy for country governance quality.¹⁰ If firms must invest in fixed resources to export to countries with weaker contracting environments, one would expect better *Governance* to be associated with lower intermediary export shares.

Variable trade costs may be due to either policy barriers, such as tariffs and nontariff barriers, or the cost of moving goods across borders, such as transportation costs. As is standard, we proxy transportation costs by geographic distance calculated using the great circle formula (de Sousa, Mayer, & Zignago, 2012). In order to account for the effect of policy barriers on the presence of intermediaries and manufacturers we also use HS6 product-country import tariffs, taken from World Integrated Trade System (WITS).¹¹ For market size we use total GDP from the World Bank World Development Indicators database.

⁹ Higher country-level fixed costs of exporting and weaker governance are associated with smaller total levels of exports (Lawless, 2010; Djankov et al., 2010), here we consider their relationship to the composition of exports by firm type.

¹⁰ The results of the principal component analysis (PCA) on standardized variables for *Market Costs* and *Governance* are available on request.

¹¹ WITS contains the TRAINS database on bilateral tariffs at the six-digit level of the HS product classification for about 5,000 products and 200 countries. We use the effectively applied tariffs (AHS) tariff, which is the MFN Applied tariff, unless a preferential tariff exists.

⁶ This paper represents the first use of these data on Italian trade transactions at the firm level. The database has been made available for work after careful screening to avoid disclosure of individual information. The data were accessed at the ISTAT facilities in Rome.

⁷ ISTAT collects data on exports based on transactions. The European Union sets a common framework of rules but leaves some flexibility to member states. Details for Italy are provided in the online appendix.

⁸ In particular, we classify firms in sectors from 151 to 372 as manufacturers and firms in sectors from 501 to 519 (with the exclusion of 502 which concerns the activity of repair of motor vehicles) as wholesalers. Retailers are firms in sectors 521 to 527, and Others contains the remaining sectors.

In addition to country attributes, product characteristics should be relevant for the prevalence of export intermediation. Wholesalers handle products where the direct interaction between producers and customers is less important. If goods with higher relation specificity have larger product-country fixed costs of exporting, the share of exports by wholesalers is likely to be lower. Transactions involving complex goods, whose production process is intensive in the use of highly specialized and customized inputs, may require specific knowledge and tasks because of the effort associated with the identification of potential customers, more detailed contracts, postsale service, and so on. For those goods, the product-market component of fixed costs is relatively large, and such goods are more likely to be exported directly by the firms that produce them. In the empirical analysis, we consider product characteristics that are related to both the specificity of the product and market structure.

We use a measure of industry contract intensity developed by Nunn (2007) to quantify the importance of relationship-specific investment in intermediate inputs across industries. Nunn's original data, corresponding to US I-O industries, is concorded to HS6 products.¹² Industries that require more relationship-specific investments are expected to be less easily served by intermediaries since the product-market component of fixed costs is large. Exports through intermediaries will prevail if the good does not require a relation-specific investment, as for commoditized products. This prediction is in line with the hypothesis put forward by Peng and Ilinitch (2001): "the higher the commodity content of the product, the more likely that export intermediaries will be selected by manufacturers."

In order to account for differentiation within an HS6 product class, we employ the coefficient of price dispersion (Ahn et al., 2011).¹³ Lower price dispersion is assumed to be associated with more homogeneous products. For homogeneous products, the product-market component of fixed costs will be lower, and thus it is more likely that the export transactions will be carried out by an intermediary.

The ease with which firms can start and stop exporting a product is directly related to product-level sunk export costs. Products that have higher sunk costs of entry are more likely to be handled by intermediaries. We adapt a measure of product-level sunk entry costs developed by Bernard and Jensen (2007) to the export market. In steady state, a product with high sunk costs of entry into export markets should have a low entry rate and an equally low exit rate. During transitions between steady states, either the entry rate (expanding product) or the exit rate (shrinking product) may be unusually high. However, the minimum of the two rates should still correspond to steady-state entry or exit, $\min(\text{entry}, \text{exit})$.¹⁴ A higher minimum level of entry and exit indicates lower sunk costs of exporting and a lower likelihood that the product will be exported through an intermediary.

¹² To obtain the information on contract intensity at the level of HS6 product, we exploit the concordance between HS codes and NAICS industries developed by Pierce and Schott (2012).

¹³ The coefficient of price variation is computed on COE data as the coefficient of variation in the unit values of any of the HS6 products across all firm-product-country transactions. In the empirical analysis, we use data from 2003, but the product ranking in terms of price dispersion does not vary much over the years.

¹⁴ The entry rate is the number of new exporters of the product between year t and $t + s$ divided by the average number of exporters in the two years. The exit rate is the number of firms that stop exporting the product between t and $t + s$ divided by the average number of exporters in the two years. The $\min(\text{entry}, \text{exit})$ in a given product is computed on COE data for years 2003 and 2007. Considering different years for the computation of the rates does not significantly affect the results.

III. Empirical Results

New models of firms in international trade introduce an intermediation technology that allows wholesalers to exploit economies of scope in exporting. These models imply a productivity sorting of producers into different export modes: less productive manufacturing firms export indirectly by paying an intermediary fixed cost that is smaller than the fixed cost they would incur for direct exporting. The productivity thresholds of the different export modes depend on variable and fixed trade costs, which in turn also depend on country and product characteristics. In what follows, we examine the role of country and product attributes in determining the amounts of exports handled by intermediaries and direct exporters. We then exploit the variation in the share of intermediated trade across products and destinations to examine the implications of an exogenous shock on aggregate trade flows. In the empirical analysis, we restrict the focus to Italian exports outside the EU.¹⁵

C. Wholesale Exports across Products and Destinations

To examine the relationship between the country and product characteristics and export levels by wholesalers and manufacturers, we regress the log of country-product exports by exporter type, $\ln X_{cp}^i$, on country, product, and product-country characteristics, C_c , P_p , and τ_{pc} , together with a full set of interactions with the wholesaler dummy, D^W :

$$\begin{aligned} \ln X_{cp}^i = & c + \alpha D^W + \beta_1 C_c + \beta_2 C_c * D^W \\ & + \gamma_1 P_p + \gamma_2 P_p * D^W + \delta_1 \tau_{pc} \\ & + \delta_2 \tau_{pc} * D^W + d_j + \varepsilon_{cp}. \end{aligned} \quad (1)$$

Table 2 reports the results. Columns 1 and 2 add product and country fixed effects, respectively, and column 3 includes all the available product and country characteristics.¹⁶

Results on country characteristics in columns 1 and 3 show that the level of exports of both manufacturers and wholesalers is positively correlated with GDP; however, the effects are significantly lower for wholesalers. The results on Market Costs and Governance are also in line with the theoretical predictions. Intermediaries' exports increase with market costs, suggesting that wholesalers are better able to spread fixed costs across products. The country governance indicator yields a similar pattern of results: better governance is associated with higher exports from manufacturers, but that effect is greatly reduced or disappears entirely for wholesalers.

Both measures of variable trade costs, greater distance and higher tariffs, significantly reduce exports. However, neither shows a significant differential effect between manufacturers and wholesalers.¹⁷

Columns 2 and 3 of table 2 report the results on product characteristics. We focus on the sign and significance of the interaction terms with the wholesaler dummy. Wholesalers export relatively less in products with lower sunk entry costs: greater $\min(\text{entry}, \text{exit})$, higher price dispersion, and higher relationship specificity. All of these coefficients have the expected signs and point to product characteristics playing an important part in the endogenous choice of firms to export directly or through an intermediary.

¹⁵ Due to the differential reporting requirements for Intra-EU and Extra-EU trade, it is not desirable to pool all export destinations together. See the online appendix for details on the trade reporting cutoffs.

¹⁶ In column 3 we cluster on both countries and products.

¹⁷ In contrast to Ahn et al. (2011), geographical distance affects negatively the value of trade equally for both types of firms. Their specification is slightly different as they include a smaller set of covariates and do not include the interacted wholesale dummy.

TABLE 2.—TOTAL EXPORTS BY COUNTRY-PRODUCT, 2003, EXTRA-EU

	(1)	(2)	(3)
D^W	3.208*** (0.847)	-0.869*** (0.141)	4.432*** (0.900)
$\ln GDP_c$	0.487*** (0.102)		0.370*** (0.073)
$*D^W$	-0.189*** (0.039)		-0.194*** (0.039)
$\ln Distance_c$	-0.503*** (0.120)		-0.276*** (0.086)
$*D^W$	-0.012 (0.060)		0.003 (0.060)
Market Costs _c	-0.117 (0.105)		-0.100 (0.085)
$*D^W$	0.111* (0.072)		0.103* (0.060)
Governance Indicator _c	0.264*** (0.099)		0.134** (0.070)
$*D^W$	-0.181*** (0.063)		-0.189*** (0.063)
Tariff _{cp}			-0.165** (0.068)
$*D^W$			0.058 (0.043)
min(entry,exit) _p		-0.710*** (0.155)	-0.660*** (0.171)
$*D^W$		-0.305** (0.119)	-0.309** (0.128)
Coefficient of Variation _p		0.101*** (0.013)	0.103*** (0.014)
$*D^W$		-0.028*** (0.008)	-0.040*** (0.009)
Relation Specificity _p		1.212*** (0.226)	1.223*** (0.275)
$*D^W$		-0.798*** (0.140)	-0.929*** (0.186)
Country FE	No	Yes	No
Product FE	Yes	No	No
Clustering	Country	HS6 product	Country-product
Adjusted R ²	0.44	0.25	0.24
Observations	117,112	117,112	117,112
Countries	142	142	142
HS6 products	3,623	3,623	3,623

Table reports OLS regression of logarithm of aggregate exports by type for Extra-EU. D^W is a dummy for wholesale, and $*D^W$ is the interacted dummy. Robust standard errors are in parentheses below the coefficients. Asterisks denote significance levels: *** $p < 1\%$; ** $p < 5\%$; * $p < 10\%$. Data are for 2003. Source: Our elaboration on Italian microdata.

Country-specific fixed export costs are correlated with the use of export intermediaries. We further show that the quality of the general contracting environment is related to the choice of mode of export. Exports through an intermediary are more likely when the quality of the general contracting environment of the country is weak. Characteristics of the product play a role in determining the choice of export mode. Lower contract intensity, greater product homogeneity, and higher product-level sunk costs of exporting are associated with a greater reliance on intermediaries in exporting.

D. Exchange Rates and Aggregate Exports

Wholesalers are more prevalent in markets with higher destination-specific fixed costs. The presence of high fixed costs means that exporters will be less likely to enter or exit the market in response to exogenous shocks. This in turn means that aggregate export elasticities may vary systematically across markets served by direct and intermediary exporters. We explore this variation by estimating aggregate

TABLE 3.—EXCHANGE RATES AND PRODUCT-COUNTRY EXPORTS, EXTRA-EU

	Annual Differences			
	$\ln X_{pct}$ Median	$\ln X_{pct}$ Mean	$\ln X_{ct}$ Median	$\ln X_{ct}$ Mean
\ln Real Exchange Rate _{ct}	-0.538*** (0.180)	-0.539*** (0.180)	-0.531** (0.269)	-0.522** (0.287)
$*D^W_{cp}$	0.116** (0.052)	0.116** (0.053)		
$*D^W_c$			0.851* (0.478)	0.734* (0.437)
* Market Costs _c	-0.017 (0.041)	-0.017 (0.041)	-0.456 (0.333)	-0.462 (0.339)
* Governance Indicator _c	-0.089** (0.035)	-0.089** (0.035)	-0.179 (0.374)	-0.253 (0.375)
* min(entry,exit) _p	-0.266* (0.148)	-0.266* (0.149)		
* Relation Specificity _p	0.294* (0.175)	0.294* (0.176)		
Year FE	Yes	Yes	Yes	Yes
Product-country FE	Yes	Yes		
Country FE			Yes	Yes
Adjusted R ²	-0.083	-0.084	-0.121	-0.123
R ²	0.133	0.134	0.051	0.058
Observations	755,114	755,114	990	990
Countries	143	143	143	143
Products	4,768	4,768		

Table reports results of regressions at the product-country-year and country-year level, using data on exports between 2000 and 2007. Exports and real exchange rates are defined as annual differences. D^W_{cp} (D^W_c) is a dummy that takes value 1 if the intermediary export share to product-country cp (country c) is above the median (mean) value of intermediary export share across products-countries (countries). Robust clustered standard errors are reported in parenthesis below the coefficients. Asterisks denote significance levels: *** $p < 1\%$; ** $p < 5\%$; * $p < 10\%$.

Source: Our elaboration on Italian microdata.

exchange rate elasticities separately for markets with high and low shares of intermediated exports.

In columns 1 and 2 of table 3 we consider a simple specification of the form

$$\begin{aligned} \Delta \ln Y_{cpt} = & c + \alpha D^W_{cp} + \gamma \Delta \ln RER_{ct} + \delta \Delta \ln RER_{ct} * D^W_{cp} \\ & + \lambda \Delta \ln RER_{ct} * FC_c + \beta \Delta \ln RER_{ct} * FC_p \\ & + d_{cp} + \varepsilon_{cpt}, \end{aligned} \quad (2)$$

where $\ln Y_{cpt}$ is the log of country-product exports, D^W_{cp} is a dummy that equals 1 if the product-country share of wholesale exports is greater than the median (mean), FC_c stands for country fixed costs as proxied by the market costs and governance measures, and FC_p stands for product fixed costs as proxied by the relation specificity and min(entry, exit) measures. The RER_{ct} is the product of the nominal exchange rate (foreign currency per home currency) and the ratio of the domestic and foreign CPIs. Both the dummy D^W_{cp} and the proxies for the fixed costs are then interacted with the real exchange rate. Our interest lies in the value of the coefficient δ , which captures the effect of an exchange rate appreciation on the exports of those country-products with relatively high shares handled by wholesalers. We include interactions of the RER changes with the country and product fixed costs of exporting to alleviate possible omitted variable bias.¹⁸ In columns 3 and 4 of table 3 we perform the analysis at the aggregate, country level. The dependent variable is the (log of) total exports to country c , and D^W_c identifies countries with a share of wholesale exports greater than the median (mean).

¹⁸ Concerns about omitted variables remain as the share of indirect exports may be picking up effects of omitted country characteristics, as put forth in the literature on exchange rate pass-through (Goldberg & Knetter, 1997; Goldberg & Campa, 2010).

In every case, the results confirm the importance of the mode of export in shaping the aggregate responses to changes in the real exchange rate. The exchange rate export elasticity for country-products and countries with low wholesale shares is negative and significant, ranging from -0.522 to -0.539 across the specifications. In contrast, country-products and countries with wholesale export shares above the mean or median have significantly lower elasticities.

IV. Conclusion

We examine the role of intermediaries in exporting and the consequences of intermediary exporters on trade value. Using Italian firm-level trade data, we investigate the importance of wholesalers in exports across destinations and products. We find that wholesalers are more likely to export to countries with high fixed export costs and to smaller markets. However, exporting by wholesalers is also more common in destinations with weak contracting environments and in products that are more homogeneous, have higher sunk entry costs, and have lower relationship specificity.

Given the big difference in the share of intermediated exports across countries and products, there are potentially large differences in how aggregate exports will respond to changes in the value of the domestic currency that are linked to the type of the exporting firm. We find significantly lower responses of aggregate exports to changes in the exchange rate for products and destinations served primarily by wholesale exporters.

These findings raise questions for future research. Firms in smaller, lower-income countries may be more likely to use intermediaries to reach foreign countries. Rapidly growing countries with rising productivity may see a large shift from intermediated trade to direct exports. Our results suggest that such a shift might be associated with greater responsiveness of aggregate exports to exchange rate changes.

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