

Intermediaries in International Trade: margins of trade and export flows

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New Perspectives

- From trade flows at country and industry level to the central role of firms
- Interaction of firm characteristics and export status play an important role in shaping aggregate productivity and industry dynamics
- Characteristics of trading firms also matter for aggregate trade

Intermediaries in International Trade: Our Contribution

- Who is trading?
- What do they look like?
 - Differences between Wholesalers and Manufacturers
- What are the product and destination markets characteristics that determine the choice of Ws versus Ms?
- What are the implications for aggregate trade flows?
 - Adjustments of product portfolio - product adding and dropping
 - Response to exogenous shocks - exchange rate

Related Literature: Intermediaries in International Trade

Wholesale firms account for:

- 10% of exports in Italy
- 10% of exports in the US (Bernard, Jensen and Schott, 2009)
- 14% of exports in Sweden (Akerman, 2010)
- 20% of exports in China (Ahn, Khandelwal, and Wei, 2011)
- 20% of exports in France (Crozet et al, 2011)

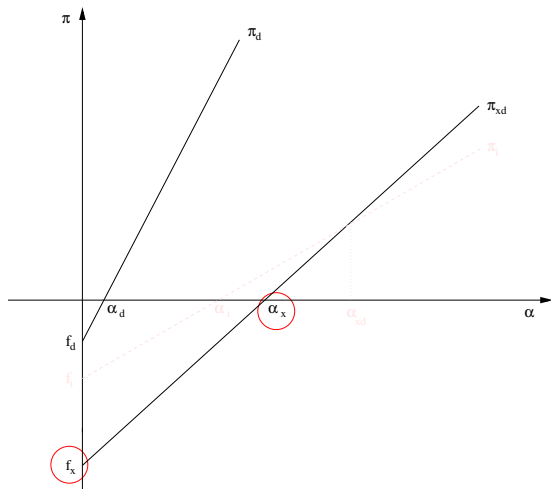
Related Literature: Empirics

- Wholesalers are smaller and have lower exports
 - Bernard, Jensen, Redding and Schott (2010) [US]; Ahn, Khandelwal and Wei (2011) [China]; Akerman (2010) [Sweden]; Crozet et al (2011)[France]
- Wholesalers help solving market fixed export costs
 - Ahn, Khandelwal and Wei (2011); Akerman (2010)
- Wholesalers export share positively related to distance and negatively to GDP
 - Akerman (2010); Ahn, Khandelwal and Wei (2011); Crozet et al (2011)[France]

Related Literature: Theory

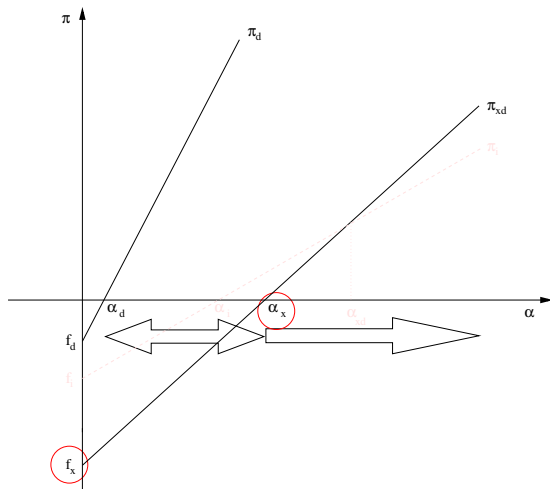
- International trade as an outcome of search and networks
 - Rauch, Watson (2004); Petropoulou (2007)
- Wholesalers facilitate the matching between exporters in country of origin and importers in destination countries
 - Blum, Claro and Horstmann (2011)
- Intermediary as an alternative technology to direct exporting
 - Akerman (2010), Ahn, Khandelwal and Wei (2011), Felbermayr, Jung (2011); Crozet et al (2011)[France]
- **Intermediaries \neq indirect exporters**
 - Only intermediaries show up in customs trade data

Direct Exporters



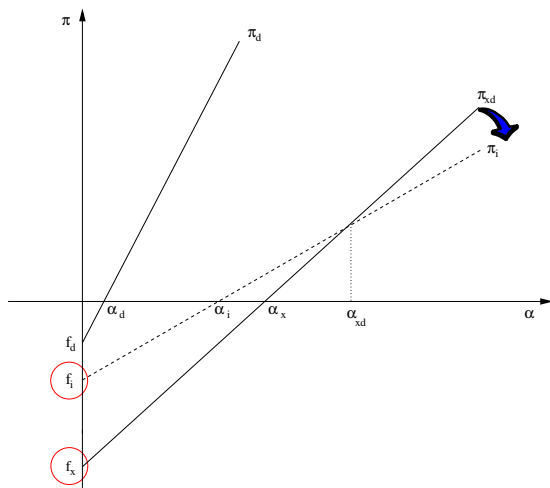
- Export occurs only directly

Direct Exporters



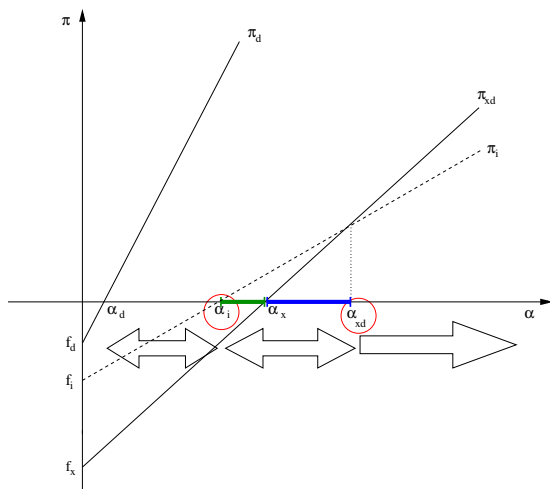
- Productivity sorting: direct exporters and non exporters

Direct and Indirect Exporters



- Indirect exporters face lower fixed cost,
- but the profit function is less steep

Direct and Indirect Exporters



- Three productivity thresholds: α_d , α_i and α_{xd}
- Firms whose productivity is too low to export directly (green segment)
- Firms that now prefer to go through intermediaries (blue line)

WB (Enterprise Survey) Evidence on Productivity sorting

	World	Latin American	CEEC
exp dum	0.281*** (0.029)	0.303*** (0.041)	0.209*** (0.062)
* % dir	0.405*** (0.033)	0.421*** (0.046)	0.209*** (0.066)
Country FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Sector FE	Yes	Yes	Yes
N. Obs	31384	13316	4858
Countries	119	29	29

And the number of exporters increases by 25%

- **Statistiche del Commercio Estero (COE) Custom data**
 - Transactions level data: export values and quantity of the firm for HS6 product-country destination pairs
 - All cross-border transactions, 2000-2007

- **Archivio Statistico delle Imprese Attive (ASIA)**
 - Census of all operating businesses: sales, employment, main activity of the firm (NACE code)
 - Manufacturers (M) and Wholesalers (W) defined according to their primary NACE 3 digit industry

Country data

- GDP – World Bank Development Indicators
- Distance – CEPII
- Market Cost (cost of Exporting) – World Bank Doing Business
- Governance – World Bank governance dataset

Product data

- Entry/Exit Rate: min (entry, exit) (Source: computation on custom data)
- Coefficient of Variation (Source: price dispersion computed on custom data)
- Relation Specificity (Source: Nunn, 2007)
- Tariffs: HS6 product-country level import tariffs (Source: WITS)

Export volumes and Number of Exporters

Table 1

Year	Total Exports (billion)	Manuf	Whol Share (%)	Retail	Others
2000	246.79	85.09	9.85	0.74	4.32
...
...
2007	350.57	85	11.27	0.84	6.91

Year	Exporters (N. of firms)	Manuf	Whol Share (%)	Retail	Others
2000	137347	57.3	26.43	7.67	8.6
...
...
2007	128472	54.77	27.91	6.88	13.3

Differences between type of exporters

- Sales, Employment

$$\ln(Y_f) = c + \delta D_f^W + \beta D_f^X + \gamma(D_f^W \cdot D_f^X) + \varepsilon_f$$

Table 3

	In Sales _f	In Employment _f	In Sales/Empl. _f	In Exports _f
D_f^W	-0.111***	-0.533***	0.433***	-1.047***
D_f^X	2.775***	1.533***	1.229***	
$D_f^W \cdot D_f^X$	-0.081***	-0.489***	0.388***	

- Ms are 12% larger in terms of sales and 70% in terms of employment

Differences between type of exporters

- Sales, Employment

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- Exporters are larger – both Ms and Ws

Differences between type of exporters

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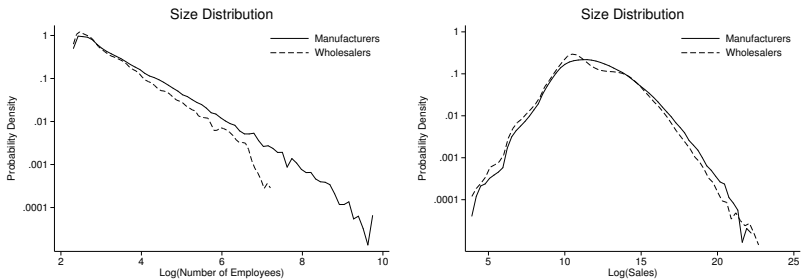
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$D_f^W \cdot D_f^X$	-0.081***	-0.489***	0.388***	

- Sales per employee are higher at Ws, especially for exporters

Size Distribution: Wholesalers and Manufacturers

Figure 2 (a)



- We are much smaller in terms of employment
- Difference is reduced for sales

Size Distribution: Ws and Ms exporters

Figure 2 (b)



- Same ranking when focusing on Ws and Ms exporters

Differences Between Export Types

- Countries, Products

$$Y_f = c + \delta D_f^W + \varepsilon_f \quad \text{if } D_f^X = 1$$

Table 4

	Products _f	Products _f	Products _f	Countries _f	Countries _f	Countries _f
D_f^W	-1.269***	3.005***	1.668***	-4.562***	-0.158***	-1.630***
In Employment		4.180***			4.307***	
In Exports			2.805***			2.801***

- We unconditionally export fewer HS6 products and reach a smaller set of countries

Differences Between Export Types

- Countries, Products

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In Employment		4.180***			4.307***	
In Exports			2.805***			2.801***

- Controlling for size, coefficient for number of HS6 products is positive
- We serve fewer countries also when adjusting for firm size

Differences between type of exporters: summary

- Ms are 12% larger in terms of sales and 70% in terms of employment
- Exporters are larger. Holds both for Ms and Ws
- Sales per employee are higher at Ws, especially for exporters
- Ws unconditionally export fewer HS6 products and reach a smaller set of countries
- Controlling for size, coefficient for number of HS6 products is positive
- Ws serve fewer countries also when adjusting for firm size

A dynamic extensions

- The existing frameworks only consider single-product firms in a static environment
- What happen in a dynamic setting given that sunk export costs vary across firm types?
- Lower per unit sunk costs should result in higher probabilities of both entry into exporting and exit from exporting
- Are Wholesalers more likely to add and drop products than Manufacturers?

Product Dropping

- Unconditional firm-product drop rate outside the EU: 48% Manufacturers and 53% Wholesalers
- Probability of dropping conditional on firm-product characteristics:

$$Drop_{fpt} = c + \delta D_{ft}^W + \beta_1 \ln Sales_{ft} + \beta_2 Deviation_{fpt} + \beta_3 \ln Products_{ft} + d_p + d_t + \varepsilon_{fpt}$$

- Firm-Product level regression
- *Deviation* captures the relative importance of the firm in the exports of the product

Product Dropping

Table 6

	Drop _{<i>fpt</i>} (1)	Drop _{<i>fpt</i>} (2)	Drop _{<i>fpt</i>} (3)	Drop _{<i>fpt</i>} (4)
D_{ft}^W	0.069***	0.043***	0.017***	0.021***
In Sales _{<i>ft</i>}		-0.034***	-0.010***	-0.004***
Deviation _{<i>fpt</i>}			-0.099***	-0.099***
In Products _{<i>ft</i>}				-0.013***

Year and Product FE, Clustering at firm-product level

- We are more likely to drop a product (6.9 percentage points)

Product Dropping

Table 6

	Drop _{fpt} (1)	Drop _{fpt} (2)	Drop _{fpt} (3)	Drop _{fpt} (4)
D_{ft}^W	0.069***	0.043***	0.017***	0.021***
In Sales _{ft}		-0.034***	-0.010***	-0.004***
Deviation _{fpt}			-0.099***	-0.099***
In Products _{ft}				-0.013***

Year and Product FE, Clustering at firm-product level

- Robust to inclusion of controls

Product Adding

- Who is more likely to add products?

$$Add_{ft} = c + \delta D_{ft}^W + \beta_1 \ln Sales_{ft} + \beta_2 \ln Products_{ft} + d_{ind} + d_t + \varepsilon_{ft}$$

- Firm level regression
- Controlling for firms with the same mix of products d_{ind} (HS2)
- Single Vs Multi-Product firms

Product Adding

Table 7

	All firms Add _{ft} (4)	SPF Add _{ft} (5)	MPF Add _{ft} (6)	All firms Add _{ft} (7)	MPF Add _{ft} (8)
D_{ft}^W	0.031***	0.071***	0.017***	0.036***	0.022***
In Sales _{ft}	0.023***	0.009***	0.026***	0.013***	0.012***
In Products _{ft}				0.057***	0.085***

Year and Product-Mix FE, Clustering at product-mix

- We more likely to add products than Ms

Product Adding

Table 7

	All firms Add _{ft} (4)	SPF Add _{ft} (5)	MPF Add _{ft} (6)	All firms Add _{ft} (7)	MPF Add _{ft} (8)
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Year and Product-Mix FE, Clustering at product-mix

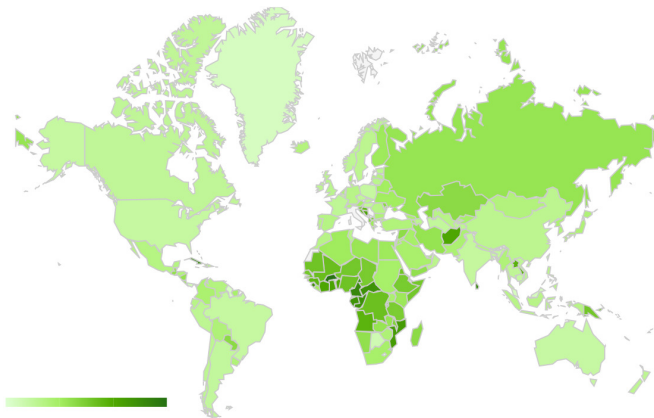
- The effect is more pronounced when comparing Ws and Ms among SPF

Export by Intermediaries

- Product dropping and adding regressions suggest that Wholesalers face lower per unit sunk costs of participation in the export market
- Which are the implications in terms of the countries they serve and the products they export?
- Are the country and product specific fixed costs relevant for the choice of export mode?

Intensity map of Wholesalers shares around the world

Google Chart Tools - Intensity map

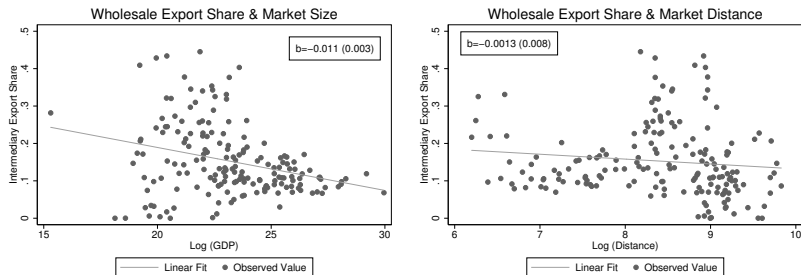


Markets characteristics

- What market characteristics make it more likely that Ws are chosen for exporting?
- Market characteristics
 - Size - GDP
 - Distance
 - Markets specific costs of exporting - Market Costs
 - Contracting environments - Governance Indicator

Intermediary Export Share: markets size and distance

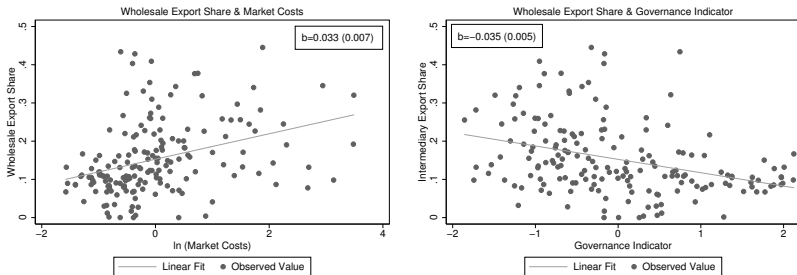
Figure 5



- Wholesale export share is declining in GDP → in smaller markets fixed costs have to be spread over fewer units
- No relationship with distance

Intermediary Export Share: market costs and governance

Figure 6



Wholesalers export share

- increases with the market specific fixed costs
- falls with the level of contracting environments

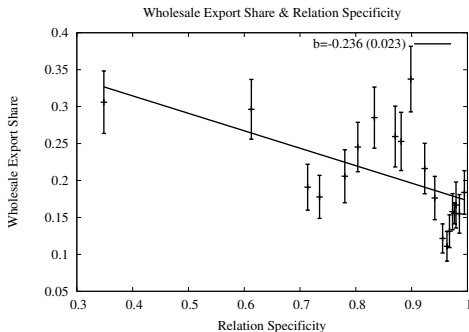
Product characteristics

- First evidence of the role of product-specific factors in the choice of indirect exporting
- What product characteristics make it more likely that Ws are chosen for exporting?
- Product characteristics
 - Complex goods whose production requires highly specialized inputs are more likely to be handled by Ms
 - The share of exports managed by Ws and Ms is related to the degree of product differentiation
 - The magnitude of product sunk costs of entry matters for the choice of the export mode

Intermediary Export Share and relation-specificity

- Relation-specificity variable (Nunn, 2007) to measure the commodity contents of the product

Figure 7 (top left)

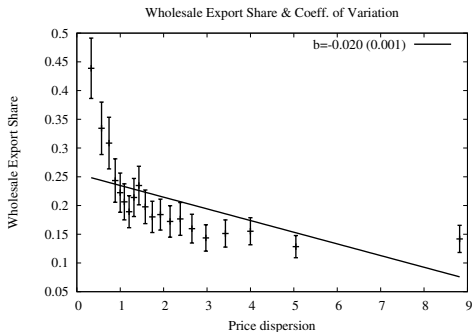


- Wholesalers are more likely to handle less complex products → low level of relation-specificity

Intermediary Export Share and price dispersion

- Coefficient of variation of export unit values as a proxy of product differentiation

Figure 7 (top right)

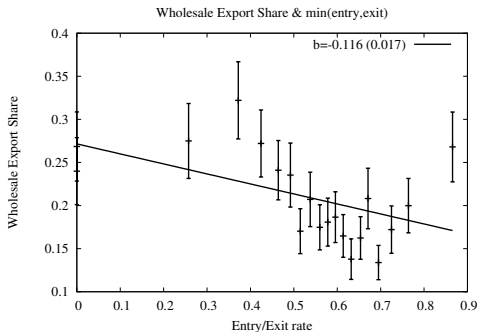


- Wholesalers have higher export shares in homogeneous products → low coefficient of variation

Intermediary Export Share and entry/exit

- Min(entry, exit) to measure product sunk costs of entry

Figure 7 (bottom left)



- Wholesalers export share increases with the sunk costs of entry → low rates of entry/exit

Product-Country Exports

- The effects of country and product characteristics on the level of exports of M and W:

$$\ln X_{cp}^i = c + \delta D^W + \beta_1 C_c + \gamma_1 C_c * D^W + \beta_2 P_p + \gamma_2 P_p * D^W + \beta_3 \tau_{pc} + \gamma_3 \tau_{pc} * D^W + d_j + \varepsilon_{cp}$$

- C_c : GDP, Distance, Market Costs, Governance
- P_p : Min(entry, exit), Price dispersion, Relationship Specificity
- τ_{pc} : Tariff
- Full set of interactions with wholesale dummy
- d_j : Product or Country Fixed effects

Country Characteristics

Table 9 column 1

	$\ln X_{pc}^i$
D^W	3.208***
$\ln GDP_c$	0.487***
* D^W	-0.189***
$\ln Distance_c$	-0.503***
* D^W	-0.012
Market Costs _c	-0.117
* D^W	0.111*
Governance Indicator _c	0.264***
* D^W	-0.181***

Regression includes Product FE

Wholesaler exports:

- rise less with market size
- increase with higher country fixed costs
- rise less with improved country governance

Product Characteristics

Table 9 column 2

	$\ln X_{pc}^i$
D^W	-0.869***
$\min(\text{entry}, \text{exit})_p$	-0.710***
$*D^W$	-0.305**
Coefficient of Variation $_p$	0.101***
$*D^W$	-0.028***
Relation. Specificity $_p$	1.212***
$*D^W$	-0.798***

Regression includes Country FE

Wholesaler export less in products with lower sunk entry costs, i.e.

- greater $\min(\text{entry}, \text{exit})$
- higher price dispersion
- higher relation specificity

Product and Country Characteristics

Table 9 column 3

	$\ln X_{cp}^i$	Cont'	
D^W	4.432***		
$\ln GDP_c$	0.370***	$\min(\text{entry,exit})_p$	-0.660***
$*D^W$	-0.194***	$*D^W$	-0.309**
$\ln \text{Distance}_c$	-0.276***	$\text{Coefficient of Variation}_p$	0.103***
$*D^W$	0.003	$*D^W$	-0.040***
Market Costs_c	-0.100	$\text{Relation Specificity}_p$	1.223***
$*D^W$	0.103*	$*D^W$	-0.929***
$\text{Governance Indicator}_c$	0.134**		
$*D^W$	-0.189***		
Tariff_{cp}	-0.165**		
$*D^W$	0.058		

Results hold including all the available country/product characteristics

Intermediaries and exogenous shocks

- Do W s and M s respond differently to exogenous shock? Along which margins W s and M s adjust?
- Fluctuations in real exchange rates as measures of exogenous changes

$$RER_{ct} = ER_{ct} \frac{CPI_t}{CPI_{ct}}$$

- Extensive and intensive margins of firm's exports to a destination:

$$\ln X_{fc} = \ln Prod_{fc} + \ln avgX_{fc}$$

- The estimation equation:

$$\Delta \ln Y_{fct} = c_1 + \delta_1 D_f^W + \beta_1 \Delta \ln RER_{ct} + \gamma_1 \Delta \ln RER_{ct} * D_f^W + d_j + \varepsilon_{ct}^1$$

Intermediaries and exogenous shocks

Table 10

Annual Differences						
	$\ln X_{fc}$	$\ln X_{fc}$	$\ln \text{Prod}_{fc}$	$\ln \text{Prod}_{fc}$	$\ln \text{Avg } X_{fc}$	$\ln \text{Avg } X_{fc}$
	(1)	(2)	(3)	(4)	(5)	(6)
D_i^W	-0.015***		-0.001		-0.014***	
In Real Ex Rate	-0.519***	-0.461***	-0.186***	-0.086**	-0.333***	-0.375***
$*D_i^W$	0.042*	0.017*	-0.046**	-0.046*	0.087**	0.064*
Country FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	No	Yes	No	Yes	No	Yes

Clustering at Country-Year level

- An appreciation of the euro currency is associated with a decrease of firm exports
- Exports fall less for Ws than for Ms (3.7-8.4%)

Intermediaries and exogenous shocks

Table 10

Annual Differences						
	$\ln X_{fc}$ (1)	$\ln X_{fc}$ (2)	$\ln \text{Prod}_{fc}$ (3)	$\ln \text{Prod}_{fc}$ (4)	$\ln \text{Avg } X_{fc}$ (5)	$\ln \text{Avg } X_{fc}$ (6)
D_f^W	-0.015***		-0.001		-0.014***	
In Real Ex Rate	-0.519***	-0.461***	-0.186***	-0.086**	-0.333***	-0.375***
$*D_f^W$	0.042*	0.017*	-0.046**	-0.046*	0.087**	0.064*

- Fall in exports is driven by both a decrease in the number of products exported and by a decline in firm's average exports per country

Intermediaries and exogenous shocks

Table 10

Annual Differences

	$\ln X_{fc}$ (1)	$\ln X_{fc}$ (2)	$\ln \text{Prod}_{fc}$ (3)	$\ln \text{Prod}_{fc}$ (4)	$\ln \text{Avg } X_{fc}$ (5)	$\ln \text{Avg } X_{fc}$ (6)
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$*D_f^W$	0.042*	0.017*	-0.046**	-0.046*	0.087**	0.064*

- For Wholesalers the adjustment on the extensive margin is greater, while the response of average exports is more muted
- Ws face lower fixed costs and are able to adjust more easily along the extensive margin

Intermediaries and exogenous shocks

- What is the sensitivity of the firm's response within a country-product pair to annual exchange rate movements?
- Export value, quantity (Q) and unit value (UV)
- The estimation equation is:

$$\Delta \ln Y_{fpc,t} = c_1 + \delta D_{ft}^W + \beta_1 \Delta \ln RER_{ct} + \gamma \Delta \ln RER_{ct} * D_f^W + d_j + \varepsilon_{fct}$$

Intermediaries and exogenous shocks

Table 11

	Annual Differences					
	$\ln X_{fcpt}$ (1)	$\ln X_{fcpt}$ (2)	$\ln Q_{fcpt}$ (3)	$\ln Q_{fcpt}$ (4)	$\ln UV_{fcpt}$ (5)	$\ln UV_{fcpt}$ (6)
D_{ft}^W	-0.020***		-0.018***		-0.002***	
$\ln \text{Real Ex Rate}_{ct}$	-0.321***	-0.385***	-0.287***	-0.353***	-0.035***	-0.032***
$*D_{ft}^W$	0.072*	0.065*	0.092**	0.090**	-0.020*	-0.025*
Country FE	Yes	Yes	Yes	Yes	Yes	Yes
Product FE	Yes	No	Yes	No	Yes	NO
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Firm-Product FE	No	Yes	No	Yes	No	Yes

Clustering at Country-Year level

- Exports within a country-product pair fall less for Ws than for Ms (15-30%)

Intermediaries and exogenous shocks

Table 11

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	$\ln X_{fcpt}$ (1)	$\ln X_{fcpt}$ (2)	$\ln Q_{fcpt}$ (3)	$\ln Q_{fcpt}$ (4)	$\ln UV_{fcpt}$ (5)	$\ln UV_{fcpt}$ (6)
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$*D_{ft}^W$	0.072*	0.065*	0.092**	0.090**	-0.020*	-0.025*

- For direct exporters the adjustment is primarily due to reductions in export quantities rather than in unit value

Intermediaries and exogenous shocks

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	$\ln X_{fcpt}$ (1)	$\ln X_{fcpt}$ (2)	$\ln Q_{fcpt}$ (3)	$\ln Q_{fcpt}$ (4)	$\ln UV_{fcpt}$ (5)	$\ln UV_{fcpt}$ (6)
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$*D_{ft}^W$	0.072*	0.065*	0.092**	0.090**	-0.020*	-0.025*

- We drop their unit values more as the currency rises, pass through is lower, and quantities less

Intermediaries and exogenous shocks

$$\Delta \ln Y_{ct} = c_1 + \delta D_c^W + \beta_1 \Delta \ln RER_{ct} + \gamma \Delta \ln RER_{ct} * D_c^W + d_j + \varepsilon_{ct}$$

Table 12

Annual Differences				
	$\ln X_{ct}$	$\ln X_{ct}$	$\ln X_{ct}$	$\ln X_{ct}$
(Above)	Median	Median	Mean	Mean
	(1)	(2)	(3)	(4)
D_c^W	0.0215		-0.004	
$\ln \text{Real Exchange Rate}_{ct}$	-0.269**	-0.499***	-0.232**	-0.460***
$*D_c^W$	0.253*	0.511***	0.224**	0.497***
	Year FE	Year-Country FE	Year FE	Year-Country FE

- Destinations with wholesale export share above the mean or median have elasticities that are insignificantly different from zero

Conclusion

- The work on intermediaries points out that there are multiple ways to access foreign markets
- The results highlight the importance of the joint determination of firm-type, product mix and destination country
- The evidence indicate that intermediary exporters face lower sunk costs of participation in the export market
 - Wholesalers are less responsive to common external shocks to profitability because they are better able to adjust along the extensive margin
- Part of the ongoing 'Who is trading' project. To understand short and long run responses of trade flows to aggregate shocks and policy, we must understand who is trading