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WHOLESALE AND RETAILERS IN U.S. TRADE (LONG VERSION)

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ABSTRACT

We combine data on individual trade transactions from U.S. customs records with comprehensive information on firms' employment from the Census Bureau's business register to examine wholesalers and retailers in U.S. exports and imports. Exporters and importers with 100 percent employment in wholesale and retail differ from pure "producer and consumer" trading firms along a number of dimensions: they are smaller in terms of employment, trade value and domestic sales, operate fewer U.S. establishments and are present in fewer U.S. states. "Mixed" firms, i.e., those with both production/consumption and wholesale retail within the boundaries of the firm, on the other hand, are substantially larger. They trade more products, trade with more countries, and are more likely to engage in related-party trade.

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Wholesalers and Retailers in U.S. Trade (Long Version)

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International trade models typically assume that producers in one country trade directly with final consumers in another. In the real world, of course, trade can involve long chains of potentially independent actors who move goods through wholesale and retail distribution networks. These networks likely affect the magnitude and nature of trade frictions and hence both the pattern of trade and its welfare gains. To promote further understanding of the means by which goods move across borders, this paper examines the extent to which U.S. exports and imports flow through wholesalers and retailers versus “producing and consuming” firms. We highlight a number of stylized facts about these intermediaries, and show that their attributes can deviate substantially from the portrait of trading firms that has emerged from microdata in recent years.

We combine data on individual trade transactions from U.S. customs records with comprehensive information on firms’ employment from the Census Bureau’s business register. We define “pure” wholesalers

and retailers to be importers or exporters with 100 percent of their U.S. employment in either of those two sectors. These firms account for large shares of exporters and importers but relatively little export and import value. We define “pure” producing and consuming firms to be those with zero employment in wholesaling and retailing. These firms – arguably the closest analog to the hypothetical “trading firm” in much of the heterogeneous-firm literature in international trade – account for relatively large shares of firms but moderate amounts of value. The remaining “mixed” firms are the rarest but by far the largest in terms of value. Distinguishing between “mixed” firms that have more and less than three quarters of their employment in wholesaling plus retailing, we find the latter dominate.

Pure wholesalers and retailers differ from pure producer and consumer firms along a number of dimensions: they are smaller in terms of employment, trade value and domestic sales, operate fewer U.S. establishments and are present in fewer U.S. states. “Mixed” firms, on the other hand, are substantially larger. They trade more products, trade with more countries, and are more likely to engage in related-party trade.

Intermediaries’ existence indicates that they overcome barriers to international trade at lower cost than at least some producer and consumer firms. As a result, we examine whether the scope and intensity of wholesale and retail trade varies with product and country characteristics related to these costs as well as foreign demand.¹ We find participation in product-country markets to be well below one hundred percent for all types of firms, and especially low for pure retailers and mixed-wholesaler-retailers. This variation

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¹For theoretical explanations of intermediation see James E. Rauch and Joel Watson (2004), Bernardo Blum, Sebastian Claro and Ig Horstmann (2008), Anders Akerman (2009), JaeBin Ahn, Amit Khandelwal and Shang-Jin Wei (2009), Pol Antràs and Arnaud Costinot (2009) and Dimitra Petropoulou (2007).

in participation appears related to product and country attributes. Wholesalers' trade is disproportionately concentrated in agriculture-related sectors and is relatively less sensitive to market size than other types of firms' trade, with the result that wholesalers have relatively greater penetration of small markets than the other types of firms. Retailers and mixed wholesaler-retailers' trade, on the other hand, is relatively insensitive to distance, likely due to their concentration in consumer goods such as clothing and footwear that are sourced disproportionately from far-away China.

II. Data

Our results focus on 2002 but we note that results for other years are similar. We use the U.S. Linked/Longitudinal Firm Trade Transaction Database (LFTTD), which matches individual U.S. trade transactions to U.S. firms in the Longitudinal Business Database (LBD).² For each export and import transaction, we observe the U.S.-based firm engaging in the transaction, the ten-digit Harmonized System (HS) classification of the product shipped, the (nominal) value shipped, the shipment date, the destination or source country, and whether the transaction takes place at "arm's length" or between "related parties".³ For importers, we also observe an identifier for the manufacturer or shipper from which the import was received, and we use this field to identify each importer's number of foreign "partner firms". Via the LBD, we observe firms' employment according to the major-industry of each of its establishments (i.e., plants). This information allows us to compute the share of firms' U.S. employment across nine broad sectors, including wholesale and retail (NAICS sectors 42 and 44 to 45, respectively). Firms with only a single establishment in the United States necessarily have 100 percent of their employment in a single sector.

Table 1 reports weighted average employment shares across sectors for several types of exporters and importers defined below, where firms' employment shares are weighted by their share of export and import value respectively. The first column of each panel reports results for all trading firms appearing in our data. We find that wholesale and retail employment generally is higher among importers than exporters.

²We link 80 percent of transactions by value; see Andrew B. Bernard, J. Bradford Jensen and Peter K. Schott (2009) for more details.

³Ownership thresholds for relatedness are 10 percent (exports) and 6 percent (imports).

On average importers have 27 percent of their employment in wholesale and 7 percent in retail, which compares with 18 percent and 2 percent respectively for exporters. Outside of wholesaling and retailing, manufacturing is the dominant employment category, more so for exporters than for importers. Service sector employment, on the other hand, is higher among importers, particularly PC firms (defined below).

Among trading firms, we consider two categories of "pure" intermediaries: pure wholesalers (W), who have 100 percent of their U.S. employment in wholesaling, and pure retailers (R) who have 100 percent of their U.S. employment in retailing.⁴ We compare W and R to two other types of firms: "pure" producers or consumers (PC), which have zero wholesale and retail employment, and "mixed" firms, which have wholesale plus retail employment between 0 and 100 percent. To explore the ramifications of using a sharp 100 percent cutoff in defining W and R firms, we further divide mixed firms into "mixed wholesale-retail" (MWR) and "mixed producer-consumer" (MPC) according to whether wholesaling *plus* retailing accounts for more or less than 75 percent of employment.⁵ As indicated in Table 1, MPC firms have their employment disproportionately concentrated in manufacturing. The non-wholesale-retail employment of MWR firms, in contrast, is tilted towards services.

Together, W, R, PC, MWR and MPC firms are mutually exclusive and exhaustive. Unfortunately, we cannot compare firms in the LFTTD to those which trade "indirectly" via wholesalers or retailers as we do not observe the latter's sales or purchases within the United States.

Table 2 reports the share of each type of firm among exporters and importers in 2002, as well as the share of total U.S. exports and imports for which they are responsible. Collectively, pure wholesalers and retailers account for large shares of trading firms but relatively little value, with wholesalers being four to five times more prevalent and responsible for considerably more trade. PC firms are most numerous on the export side and as numerous as Ws on the import side, and represent roughly one fifth each of export and import value. Mixed firms are rarest but account for the

⁴Most – but not all – of the "pure" firms are single-establishment firms. Firms with employment split between wholesale and retail are allocated to W or R according to whichever is higher.

⁵MWR firms typically have only wholesale (most common) or only retail employment.

majority of U.S. trade; this dominance is stronger for exports than imports, though MWR importers are relatively more important for imports than for exports. The country composition of trade also differs substantially across firm types and between exports and imports, with W, R and MWR importers having by far the largest shares of trade with China.⁶

III. Wholesaler and Retailer “Premia”

It is well known that trading firms differ from purely domestic firms along a number of dimensions (e.g., Bernard et al. 2007). Here, we demonstrate substantial heterogeneity *within* trading firms.

Table 3 reports non-PC firms’ “premia” relative to PC firms in 2002. Each cell reports the result of a different firm- (top panel) or firm-product-country- (bottom panel) level OLS regression of the noted characteristic on a dummy variable for the noted firm type. Each regression sample includes all firms of the noted type as well as PC firms. Regressions in the top panel include firm major six-digit HS category fixed effects as well as controls for firm employment deciles (except in the first row). Regressions summarized in the bottom panel include product-country fixed effects and also use employment-decile dummies to control for firm size.

Firm-level attributes considered in the top panel of Table 3 include domestic employment, total trade value and total domestic sales (from across all economic censuses in which the firm is present), the number of country partners, the number of products traded, the value-weighted mean per capita GDP of firms’ country destinations or sources, the number of foreign partner firms (imports only), the number of U.S. establishments and the number of U.S. states in which the firm has an establishment.⁷ Firm-product-country attributes considered in the bottom panel of the figure include: trade value; overall, arm’s-length and related-party unit values (i.e., value divided by quantity); and related-party share (i.e., value with related-parties divided by total value).

Relative to PC firms, W and R exporters and importers have lower employment and, within size deciles, have lower domestic sales, operate fewer establishments, operate in fewer states and trade more

products per country.⁸ MWR exporters and importers, in contrast, are substantially larger than PC firms: they trade more products, trade with more countries, trade more products per country and, on the import side, interact with more foreign partner firms, though only W importers trade with more foreign partners per product per country than PC firms. MPC firms are also relatively large; they trade significantly more value at the product-country level than PC firms and are substantially more likely to engage in trade with related parties. W, R and MWR importers all trade with countries with a lower average GDP per capita than PC firms.

Results with respect to unit values are less clear. Perhaps intuitively, W, R and MWR exporters have relatively low unit values within product-country cells and firm size deciles than either MPC or PC firms. On the other hand, while W and MWR importers have relatively low unit values, we find that R importers have relatively high unit values.

A final comparison of firm types, in Table 8, relates to the concentration of trade. We find W, R and MWR trade to be less concentrated among large firms than PC and MPC trade. While the top one (five) percent of W exporters and importers account for 0.47 (0.73) and 0.41 (0.67) of W exports and imports, respectively, the top one (five) percent of PC firms account for 0.60 (0.83) and 0.77 (0.90) of PC exports and imports, respectively. R and MWR firms are similarly less concentrated, while MPC firms are similarly concentrated. These results indicate that the extreme concentration of trade observed in microdata in recent years is driven by PC and MPC firms.

IV. Product-Country Determinants of Intermediation

The third column of each panel in Table 2 reveals that R and MWR firms participate in far lower shares of product-country markets than W, PC and MPC firms.⁹ Even among the latter, however, participation is well below 100 percent. In this section, we examine the product and country characteristics that influence the markets in which each type of trading firm participates.

The left and right panels of Table 4 report correlations across products of the share of trade value ac-

⁶See Emek Basker and Pham Hoang Van (2008a,b) for further evidence of the contribution of retailers to import growth from China.

⁷The coefficient in the first cell of the top panel, for example, indicates that exporting wholesalers have on average 60 percent ($1 - e^{-0.91}$) of the employment of PC firms.

⁸Manipulation of the coefficients in Table 3 allows comparison of products per country and, on the import side, foreign firms per product per country.

⁹The denominator of these shares is the total number of product-country cells in which the United States is present.

counted for by each type of exporter and importer in 2002, respectively. Two trends stand out. First, intermediaries' correlations with non-intermediaries are negative for both exporters and importers, indicating these firms' specialize in different sets of goods. Second, the shares of PC and MPC firms are also negatively correlated. This result suggests producer and consumer firms may develop in-house wholesaling or retailing capabilities depending on the products they produce, or *vice versa*.

Table 5 reports the distribution of export and import value across firm types for aggregations of two-digit HS categories. As indicated in the table, Ws tend to concentrate in agriculture-related sectors such as Animal and Vegetable products in both exports and imports. PC and MPCs, on the other hand, focus more on industries more likely to contain differentiated goods, such as Transportation. Among importers, we find that MWRs are disproportionately active in Textiles, Clothing and Footwear.

We also find a positive and statistically significant correlation across products between the trade value shares of exporters versus importers of each firm type. This correlation exists both across the two-digit HS categories reported in Table 5 and across six-digit HS categories (see the diagonal of Table 6), which are the most detailed level at which export and import HS codes can be compared. The fact that importers and exporters of a given firm type participate in similar products suggests the importance of product attributes in driving intermediation.

Evidence on the country characteristics influencing trade participation is reported in Table 7, which displays the distribution of U.S. trade by type of firm in 2002 according to destination- or source-country GDP quintile. As indicated in the table, the share of exports (imports) mediated by pure wholesalers declines with market size, from 0.20 (0.25) for the smallest quintile of destination (source) markets to 0.07 (0.14) for the largest. For MPC exporters and importers, we find the opposite trend, i.e., an increase in the share of trade from these firms as market size grows. Patterns for PC firms are less regular, but for both exports and imports, shares decline with market size after the first quintile. We explore these relationships further in the context of "gravity" in the next section.

V. Gravity

A long line of research in international trade highlights the importance of "gravity" in determining trade flows. Here, we examine the influence of gravity for different types of trading firms.

Table 9 reports the results of three, country-level OLS regressions. In the top panel, log aggregate trade value is regressed on partner countries' log GDP and log great-circle distance from the United States (in km).¹⁰ In the second and third panels, the extensive and intensive components of log value, i.e., the log number of firm-product observations with positive trade and the log average value per firm-product observation with positive trade, are regressed on these variables. As these components sum to log aggregate value, the coefficients reported in the second and third panels sum to their respective coefficients reported in the first panel.

Results for exports are straightforward: trade value falls with distance and rises with market size. Moreover, gravity's stronger effect on extensive versus intensive margins across the board is consistent with recent research on the margins of trade (Bernard et al. 2007, 2009). Comparing the coefficient on GDP across columns, we find W trade is less sensitive to market size than MPC trade, consistent with the former's declining market share across GDP quintiles noted above. This differential response is disproportionately due to the intensive margin. As indicated in the bottom panel, coefficients on log GDP are relatively larger for MWR and MPC versus other types of firms than in the middle panel.

Results for imports are less conventional. While we find the expected positive relationship between market size and import value across the three panels, distance has a negative and statistically significant relationship with import value only for PC and MPC firms. For intermediaries, the relationship is negative but statistically insignificant for Ws and positive but statistically insignificant for Rs and MWRs. One factor contributing to this result is the above-noted relatively heavy concentration of retailers and mixed wholesale-retailers in consumer goods such as textiles, clothing and footwear that are disproportionately imported from far-away China. As indicated in the final column of Table 2, a relatively large share of W, R and MWR firms' import value originates in China.¹¹ Indeed, R and MWR importers' value shares across the

¹⁰These data are from the World Bank and CEPII, respectively. The mean (standard deviation) of these variables are 25 (2) and 8 (0.7), respectively.

¹¹A similar trend is noted with respect low-wage countries more generally, e.g., those with less than 5 or 10 percent of U.S. per capita GDP as in Schott (2003). As noted in Table 3, W, R and MWR firms tend to import from countries with lower per-capita GDP than PC and MPC firms.

industries in Table 5 are strongly positively correlated with China's import market shares in those industries. Analogous correlations with respect to PC and MPC firms' shares are negative but statistically insignificant.¹²

VI. Conclusions

Trading firms exhibit substantial heterogeneity and can be quite different from the "stylized" trading firm emphasized in much of the recent literature in international trade. While pure wholesalers are relatively numerous, they are on average smaller than pure producers, and account for a relatively small share of trade value. While pure wholesalers are concentrated in agriculture-related sectors, pure producers and mixed firms are more prevalent in industries more likely to contain differentiated goods such as transportation. Pure wholesalers are relatively less sensitive to market size and import disproportionately from China and other low-wage countries. Together with differences in product specialization, this leads to departures on the import side from the standard gravity equation predictions for trade.

Ahn, J.B., Amit Khandelwal and Shang-Jin Wei. 2009. "The Role of Intermediaries in Facilitating Trade," Columbia University, mimeograph.

Akerman, Anders. 2009. "A Theory on the Role of Wholesalers in International Trade," Stockholm University, mimeograph.

Antras, Pol and Arnaud Costinot. 2009 "Intermediated Trade," Harvard University, mimeograph.

Basker, Emek and Pham Hoang Van. 2008a "Imports 'R' Us: Retail Chains as Platforms for Developing County Imports," University of Missouri, mimeograph.

Basker, Emek and Pham Hoang Van. 2008b "Walmart as Catalyst to U.S.-China Trade," University of Missouri, mimeograph.

Bernard, Andrew B., J. Bradford Jensen and Peter K. Schott. 2009. "Importers, Exporters and Multinationals: A Portrait of Firms in the U.S. that Trade Goods," in *Producer Dynamics: New Evidence from Micro Data*, ed. Timothy Dunne, J. Bradford Jensen and Mark J. Roberts, 133-63. Chicago: University of Chicago Press.

Bernard, Andrew B., J. Bradford Jensen, Stephen J. Redding and Peter K. Schott. 2007. "Firms in In-

ternational Trade," *Journal of Economic Perspectives* 21(3):105-130.

Bernard, Andrew B., J. Bradford Jensen, Stephen J. Redding and Peter K. Schott. 2009. "The Margins of U.S. Trade," *American Economic Review*, Papers and Proceedings, 99(2), 487-493.

Blum, Bernardo S., Ig Horstmann and Sebastian Claro. 2008 "Intermediation and the Nature of Trade Costs: Theory and Evidence," University of Toronto, mimeograph.

Petropoulou, Dimitra. 2007 "Information Costs, Networks and Intermediation in International Trade," University of Oxford, Department of Economics, Discussion Paper 370.

Rauch, James E. and Joel Watson. 2004. "Network Intermediaries in International Trade," *Journal of Economics and Management Strategy*, 13(1), 69-93.

Schott, Peter K. (2003) "Across-Product versus Within-Product Specialization in International Trade," *Quarterly Journal of Economics* 119(2):647-678.

¹²China's import market shares across the rows listed in Table 5 are 0.06, 0.02, 0.03, 0.01, 0.03, 0.15, 0.55, 0.07, 0.13, 0.66, 0.09, 0.12, 0.14, 0.01, 0.30, 0.03 and 0.11, respectively.

TABLE 1—DISTRIBUTION OF FIRM EMPLOYMENT BY TYPE OF FIRM, 2002

Employment	Exporting Firms				Importing Firms			
	All	PC	MWR	MPC	All	PC	MWR	MPC
Wholesale	0.18	na	0.74	0.12	0.27	na	0.40	0.16
Retail	0.02	na	0.13	0.02	0.07	na	0.48	0.04
Agriculture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mining	0.01	0.02	0.00	0.01	0.00	0.01	0.00	0.01
Construction	0.01	0.01	0.00	0.01	0.00	0.01	0.00	0.00
Manufacturing	0.55	0.66	0.04	0.60	0.35	0.37	0.03	0.50
TCU	0.05	0.14	0.02	0.03	0.08	0.25	0.02	0.05
FIRE	0.02	0.02	0.01	0.03	0.02	0.01	0.00	0.03
Other Services	0.16	0.14	0.07	0.19	0.19	0.36	0.06	0.20

Notes: Table reports weighted-average share of firm employment by sector across firms, by type of firm (see text), using firms' total exports or imports as weights. TCU is transportation, communication and utilities. FIRE is finance, insurance and real estate. Other services includes education and healthcare. Zeros are due to rounding. Data are for 2002.

TABLE 2—DISTRIBUTION OF FIRM TYPES AND THE TRADE VALUE FOR WHICH THEY ACCOUNT, 2002

Firm Type	Exporting Firms				Importing Firms			
	Share of Firms	Share of Export Value	Share of Product-Countries	China Value Share	Share of Importing Firms	Share of Import Value	Share of Product-Countries	China Value Share
W	0.34	0.08	0.45	0.05	0.42	0.15	0.53	0.21
R	0.09	0.01	0.08	0.00	0.13	0.01	0.18	0.35
PC	0.52	0.22	0.58	0.03	0.40	0.21	0.56	0.07
MWR	0.01	0.02	0.11	0.00	0.01	0.08	0.18	0.30
MPC	0.04	0.67	0.60	0.04	0.04	0.55	0.55	0.06

Notes: First two columns of each panel reports a breakdown of firms and the share of value for which they account; these columns sum to unity. Second two columns of each panel report the share of all U.S. product-country cells in which each type of firm is present and each type's share of trade value with China. Zeros are due to rounding. Data are for 2002.

TABLE 3—"PREMIA" RELATIVE TO PC FIRMS, 2002

	Exporting Firms				Importing Firms			
	W	R	MWR	MPC	W	R	MWR	MPC
Firm-Level OLS Regressions								
ln(Employment _f)	-0.91 *** 0.01	-0.80 *** 0.03	2.67 *** 0.06	2.76 *** 0.05	-1.16 *** 0.02	-0.96 *** 0.04	2.80 *** 0.08	2.77 *** 0.04
ln(Value _f)	-0.02 *** 0.00	-0.02 ** 0.01	0.11 *** 0.02	0.50 *** 0.02	0.00 0.00	-0.01 0.00	0.29 *** 0.03	0.35 *** 0.03
ln(Domestic Sales _f)	-0.09 *** 0.01	-0.19 *** 0.04	2.98 *** 0.06	2.44 *** 0.04	-0.60 *** 0.02	-0.53 *** 0.05	2.55 *** 0.06	2.40 *** 0.04
ln(Countries _f)	-0.01 0.01	-0.05 *** 0.01	0.14 *** 0.02	0.40 *** 0.03	-0.08 *** 0.01	0.00 0.01	0.28 *** 0.02	0.38 *** 0.02
ln(Products _f)	0.06 *** 0.01	-0.02 ** 0.01	0.31 *** 0.03	0.52 *** 0.03	0.00 0.01	0.13 *** 0.02	0.46 *** 0.03	0.39 *** 0.02
ln(Mean PCGDP _f)	-0.13 *** 0.01	0.02 ** 0.01	0.01 0.02	0.04 *** 0.02	-0.18 *** 0.01	-0.04 ** 0.02	-0.05 ** 0.03	0.11 *** 0.02
ln(Partners _f)					0.03 *** 0.01	0.09 *** 0.01	0.54 *** 0.03	0.49 *** 0.02
ln(Establishments _f)	-0.07 *** 0.00	0.02 ** 0.01	2.40 *** 0.08	1.83 *** 0.02	-0.16 *** 0.00	-0.05 *** 0.01	2.42 *** 0.05	1.84 *** 0.02
ln(States _f)	-0.04 *** 0.00	-0.04 *** 0.00	1.17 *** 0.06	1.11 *** 0.02	-0.10 *** 0.00	-0.06 *** 0.00	1.19 *** 0.03	1.16 *** 0.02
Product-Country-Level OLS Regressions								
ln(Value _{fpc})	-0.09 *** 0.00	0.00 0.01	-0.16 *** 0.01	0.19 *** 0.01	0.16 *** 0.01	-0.08 *** 0.01	0.62 *** 0.01	0.29 *** 0.01
ln(Unit Value _{fpc})	-0.14 *** 0.01	-0.08 *** 0.01	-0.17 *** 0.01	-0.06 *** 0.01	-0.20 *** 0.01	0.02 ** 0.01	-0.03 *** 0.01	0.03 *** 0.01
ln(RP Share _{fpc})	-0.83 *** 0.07	0.61 *** 0.15	4.08 *** 0.25	10.58 *** 0.11	3.44 *** 0.11	1.63 *** 0.14	0.14 0.16	7.06 *** 0.13

Notes: Each cell reports the results of a different firm OLS regression of noted characteristic on a dummy variable for noted firm type versus PC firms. Top- (bottom-) panel regressions include major six-digit HS category (product-country) fixed effects. All regressions except those in first row control for firm size (see text). Robust standard errors clustered according to the fixed effects are reported below coefficients. ***, ** and * denote statistical significance at the 1, 5 and 10 percent levels. Data are for 2002.

TABLE 4—CORRELATIONS ACROSS PRODUCTS OF THE SHARE OF TRADE VALUE ACCOUNTED FOR BY EACH TYPE OF FIRM, 2002

	Exports				Imports			
	PC	MPC	W	R	PC	MPC	W	R
MPC	-0.63				-0.36			
W	-0.25	-0.53			-0.38	-0.55		
R	-0.05	-0.18	0.04		-0.09	-0.17	-0.05	
MWR	-0.12	-0.19	0.03	0.03	-0.21	-0.23	-0.11	0.03

Notes: Table displays correlations across ten-digit HS export (left panel) and import (right panel) products of the share of trade value accounted for by each type of firm. All correlations are statistically significant at the 1 percent level. Data are for 2002.

TABLE 5—SHARE OF INDUSTRIES' TRADE DUE TO W, R, PC AND MPC FIRMS, 2002

HS Categories	Export Value					Import Value				
	W	R	PC	MWR	MPC	W	R	PC	MWR	MPC
01-05 Animal	0.23	0.01	0.23	0.02	0.51	0.54	0.01	0.18	0.05	0.21
06-15 Vegetable	0.21	0.00	0.10	0.08	0.60	0.47	0.02	0.10	0.13	0.27
16-24 Foodstuffs	0.11	0.01	0.19	0.02	0.68	0.44	0.01	0.11	0.11	0.33
25-27 Minerals	0.10	0.00	0.23	0.01	0.66	0.06	0.00	0.50	0.02	0.43
28-38 Chemicals	0.05	0.00	0.19	0.01	0.74	0.09	0.00	0.14	0.07	0.69
39-40 Plastics / Rubber	0.06	0.00	0.26	0.01	0.66	0.23	0.01	0.19	0.06	0.51
41-43 Hides, Skins	0.36	0.01	0.23	0.04	0.36	0.35	0.04	0.16	0.22	0.23
44-49 Wood	0.15	0.01	0.27	0.05	0.51	0.28	0.02	0.27	0.12	0.31
50-63 Textiles, Clothing	0.11	0.01	0.30	0.02	0.55	0.26	0.03	0.13	0.28	0.30
64-67 Footwear	0.18	0.16	0.22	0.05	0.39	0.26	0.10	0.06	0.24	0.34
68-71 Stone / Glass	0.24	0.02	0.36	0.01	0.37	0.21	0.03	0.52	0.06	0.18
72-83 Metals	0.11	0.01	0.29	0.02	0.57	0.27	0.01	0.17	0.07	0.48
84-85 Mach / Elec	0.06	0.00	0.23	0.03	0.68	0.15	0.01	0.18	0.07	0.60
86-89 Transportation	0.03	0.00	0.13	0.00	0.83	0.04	0.00	0.11	0.02	0.82
90-97 Miscellaneous	0.07	0.01	0.33	0.02	0.57	0.18	0.03	0.23	0.15	0.41
98-99 Special	0.07	0.01	0.43	0.01	0.48	0.11	0.02	0.36	0.01	0.50
01-99 All	0.08	0.01	0.22	0.02	0.67	0.15	0.01	0.21	0.08	0.55

Notes: Table reports share of each type of firm in noted industry's trade, i.e., rows sum to 1. Zeros are due to rounding. Data are for 2002.

TABLE 6—CORRELATIONS ACROSS PRODUCTS OF SHARE OF TRADE VALUE ACCOUNTED FOR BY EACH TYPE OF EXPORTING VERSUS IMPORTING FIRM, 2002

	PC	MPC	W	R	MWR
PC	0.18	-0.11	-0.04	-0.02	-0.05
MPC	-0.22	0.40	-0.26	-0.10	-0.08
W	0.07	-0.27	0.28	0.05	0.03
R	0.05	-0.14	0.08	0.16	0.06
MWR	-0.02	-0.10	0.07	0.08	0.20

Notes: Table displays correlations across six-digit HS products of the share of trade value accounted for by each type of exporter (row) versus importer (column). Correlations with absolute value above 0.02 are statistically significant at the 5 percent level. Data are for 2002.

TABLE 7—SHARE OF TRADE BY DESTINATION- OR SOURCE-COUNTRY GDP QUINTILE, 2002

GDP Quintile	Exporting Value					Importing Value				
	W	R	PC	MWR	MPC	W	R	PC	MWR	MPC
1	0.20	0.01	0.31	0.02	0.46	0.25	0.01	0.14	0.32	0.28
2	0.18	0.01	0.32	0.01	0.48	0.14	0.02	0.26	0.17	0.41
3	0.16	0.01	0.28	0.02	0.53	0.16	0.01	0.26	0.11	0.46
4	0.09	0.00	0.20	0.02	0.69	0.18	0.01	0.22	0.10	0.49
5	0.07	0.01	0.22	0.02	0.67	0.14	0.01	0.20	0.07	0.57
Total	0.08	0.01	0.22	0.02	0.67	0.15	0.01	0.20	0.08	0.56

Notes: Table reports share of each type of firm in trade with countries in the noted GDP quintile, i.e., rows sum to 1. Quintile 1 encompasses the smallest countries. Zeros are due to rounding. Data are for 2002.

TABLE 8—SHARE OF TRADE VALUE BY FIRM SIZE, 2002

Firm Rank	Exporting Firms					Importing Firms				
	W	R	PC	MWR	MPC	W	R	PC	MWR	MPC
Top 1%	0.47	0.52	0.60	0.52	0.57	0.41	0.54	0.77	0.45	0.56
Top 5%	0.73	0.76	0.83	0.85	0.84	0.67	0.76	0.90	0.77	0.83
Top 10%	0.84	0.85	0.91	0.92	0.92	0.79	0.85	0.95	0.87	0.91
Top 25%	0.95	0.94	0.97	0.98	0.98	0.93	0.95	0.99	0.97	0.98
Top 50%	0.99	0.98	0.99	1.00	1.00	0.99	0.99	1.00	1.00	1.00
Top 100%	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Notes: Table reports the distribution of export and import value across noted firm-size percentiles by firm type. Data are for 2002.

TABLE 9—COUNTRY-LEVEL GRAVITY, 2002

	Exports					Imports				
	W	R	PC	MWR	MPC	W	R	PC	MWR	MPC
	ln(Value)									
ln(Distance _c)	-1.55 ^{***}	-1.63 ^{***}	-1.33 ^{***}	-1.64 ^{***}	-1.42 ^{***}	-0.31 [*]	0.01 [✓]	-1.19 ^{***}	0.24 [✓]	-0.99 ^{***}
ln(GDP _c)	0.21 [✓]	0.18 [✓]	0.17 [✓]	0.24 [✓]	0.20 [✓]	0.23 [✓]	0.31 [✓]	0.26 [✓]	0.41 [✓]	0.26 [✓]
	0.93 ^{***}	0.86 ^{***}	0.92 ^{***}	1.03 ^{***}	1.13 ^{***}	1.15 ^{***}	1.15 ^{***}	1.27 ^{***}	1.28 ^{***}	1.28 ^{***}
Constant	0.04 [✓]	0.04 [✓]	0.04 [✓]	0.06 [✓]	0.04 [✓]	0.05 [✓]	0.07 [✓]	0.05 [✓]	0.10 [✓]	0.06 [✓]
	8.95 ^{***}	8.34 ^{***}	8.02 ^{***}	5.07 [*]	4.67 ^{**}	-6.7 ^{***}	-12.4 ^{***}	-1.6 [✓]	-16.1 ^{***}	-3.1 [✓]
	2.13	2.10	1.84	2.72	2.06	2.30	2.75	2.70	4.00	2.83
Observations	173	166	175	157	174	171	143	172	147	170
R ²	0.76	0.69	0.74	0.66	0.81	0.72	0.59	0.73	0.53	0.69
	ln(Extensive Margin)									
ln(Distance _c)	-1.66 ^{***}	-1.47 ^{***}	-1.28 ^{***}	-1.67 ^{***}	-1.28 ^{***}	-0.20 [✓]	0.00 [✓]	-0.73 ^{***}	0.37 [✓]	-0.72 ^{***}
ln(GDP _c)	0.19 [✓]	0.14 [✓]	0.14 [✓]	0.21 [✓]	0.17 [✓]	0.18 [✓]	0.18 [✓]	0.16 [✓]	0.24 [✓]	0.16 [✓]
	0.73 ^{***}	0.68 ^{***}	0.82 ^{***}	0.74 ^{***}	0.80 ^{***}	0.97 ^{***}	0.98 ^{***}	0.96 ^{***}	0.93 ^{***}	0.97 ^{***}
Constant	0.04 [✓]	0.03 [✓]	0.03 [✓]	0.04 [✓]	0.04 [✓]	0.04 [✓]	0.04 [✓]	0.04 [✓]	0.06 [✓]	0.04 [✓]
	3.62 [*]	0.95 [✓]	-1.36 [✓]	1.37 [✓]	-1.01 [✓]	-15.5 ^{***}	-18.9 ^{***}	-10.7 ^{***}	-21.1 ^{***}	-11.0 ^{***}
	2.01	1.68	1.70	2.24	1.88	1.80	1.81	1.77	2.25	1.73
Observations	173	166	175	157	174	171	143	172	147	170
R ²	0.75	0.73	0.79	0.68	0.73	0.74	0.74	0.79	0.60	0.79
	ln(Intensive Margin)									
ln(Distance _c)	0.11 [✓]	-0.16 [*]	-0.05 [✓]	0.02 [✓]	-0.14 [✓]	-0.11 [✓]	0.01 [✓]	-0.46 ^{**}	-0.13 [✓]	-0.26 [✓]
ln(GDP _c)	0.08 [✓]	0.09 [✓]	0.09 [✓]	0.10 [✓]	0.08 [✓]	0.12 [✓]	0.22 [✓]	0.20 [✓]	0.22 [✓]	0.20 [✓]
	0.20 ^{***}	0.18 ^{***}	0.11 ^{***}	0.30 ^{***}	0.33 ^{***}	0.18 ^{***}	0.17 ^{***}	0.31 ^{***}	0.36 ^{***}	0.31 ^{***}
Constant	0.02 [✓]	0.02 [✓]	0.03 [✓]	0.03 [✓]	0.02 [✓]	0.03 [✓]	0.05 [✓]	0.05 [✓]	0.06 [✓]	0.05 [✓]
	5.33 ^{***}	7.39 ^{***}	9.39 ^{***}	3.70 ^{***}	5.68 ^{***}	8.83 ^{***}	6.46 ^{***}	9.10 ^{***}	5.05 ^{**}	7.91 ^{***}
	0.74	0.98	0.84	1.11	0.83	1.36	2.00	2.10	2.51	2.20
Observations	173	166	175	157	174	171	143	172	147	170
R ²	0.32	0.25	0.10	0.33	0.48	0.16	0.08	0.17	0.20	0.17

Notes: Table reports country-level OLS regressions for three dependent variables: log aggregate value per country (top panel), the log number of firm-product observations with positive trade per country (extensive margin; middle panel) and log average value per firm-product observation with positive trade per country (intensive margin, bottom panel). Robust standard errors reported below coefficients. Data are for 2002.