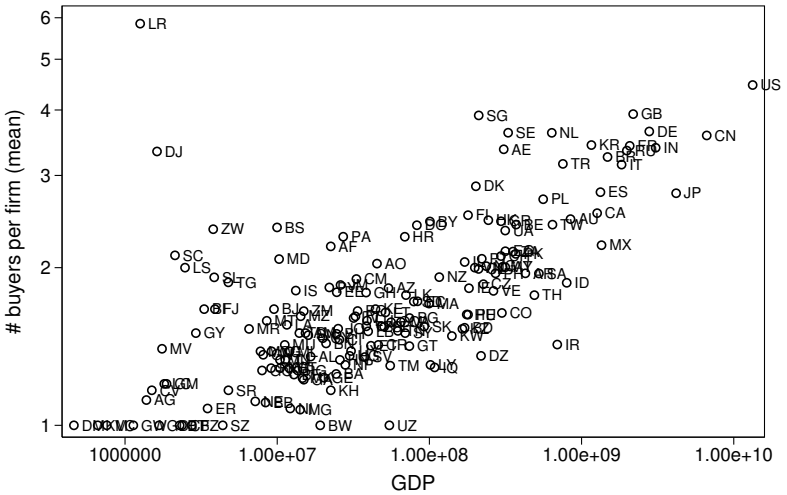
Online Appendix

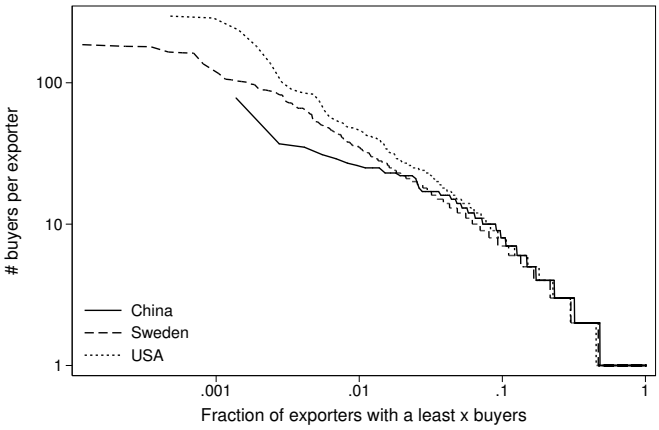
A Additional Figures and Tables

Figure 3: Average numbers of buyers per seller versus market size (2006)



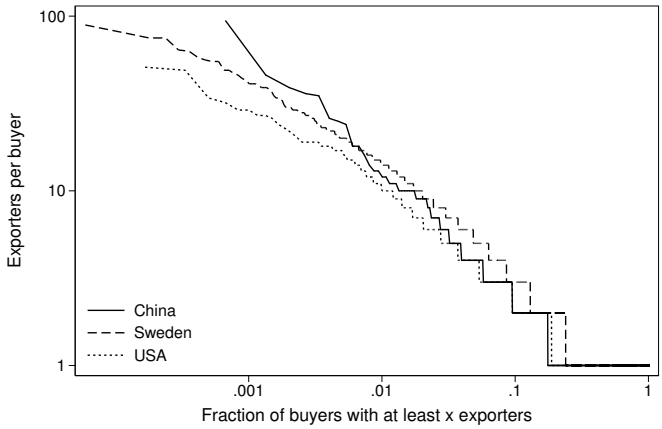
Note: The vertical axis denotes the mean number of customers per Norwegian exporter (unweighted average across all exporters to destination j) while the horizontal axis denotes destination market GDP (log scale). The larger the market size, the greater the number of buyers for a given Norwegian exporter.

Figure 4: Distribution of the number of buyers per exporter (2006).



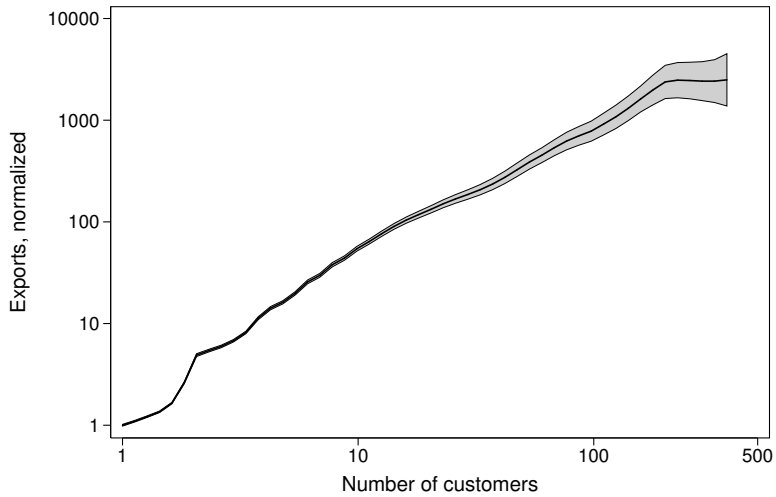
Note: The plot shows the number of buyers of each exporting firm in a particular market against the fraction of exporters selling in the market who sell to at least that many buyers, i.e. the empirical CDF. Let x_j^ρ be the ρth percentile of the number of buyers per exporter in market j. We can then write $\Pr\left[X \leq x_j^\rho\right] = \rho$. The distribution is Pareto if the slope is constant. If the distribution is Pareto with shape parameter a and location parameter x_0, we have $1 - \left(x_0/x_j^\rho\right)^a = \rho$. Taking logs gives us $\ln x_j^\rho = \ln x_0 - \frac{1}{a}\ln(1-\rho)$, i.e. the slope coefficient equals the negative of the inverse of the Pareto shape parameter $(-1/a)$. Axes use log scale. The estimated slope coefficients: -1.02 (s.e. 0.010) for China, -1.02 (s.e. 0.002), for Sweden, and -1.13 (s.e. 0.005) for the U.S.

Figure 5: Distribution of the number of exporters per buyer (2006).



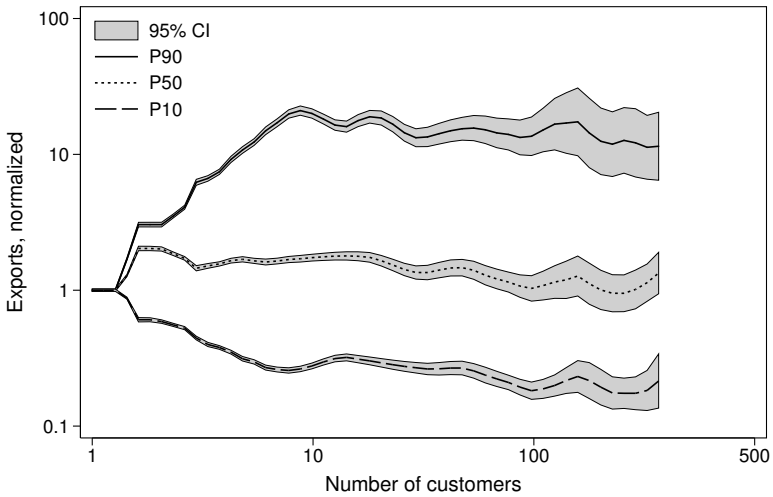
Note: The plot shows the number of exporters per buyer in a particular market against the fraction of buyers in this market who buy from at least that many exporters, i.e. the empirical CDF. Let x_j^ρ be the ρth percentile of the number of buyers per exporter in market j. We can then write $\Pr\left[X \leq x_j^\rho\right] = \rho$. The distribution is Pareto if the slope is constant. If the distribution is Pareto with shape parameter a and location parameter x_0, we have $1 - \left(x_0/x_j^\rho\right)^a = \rho$. Taking logs gives us $\ln x_j^\rho = \ln x_0 - \frac{1}{a}\ln(1-\rho)$, i.e. the slope coefficient equals the negative of the inverse of the Pareto shape parameter $(-1/a)$. Axes use log scale. The estimated slope coefficients: -0.92 (s.e. 0.002) for China, -0.88 (s.e. 0.001) for Sweden, and -0.80 (s.e. 0.001) for the U.S.

Figure 6: Number of Buyers & Firm-level Exports (2006).



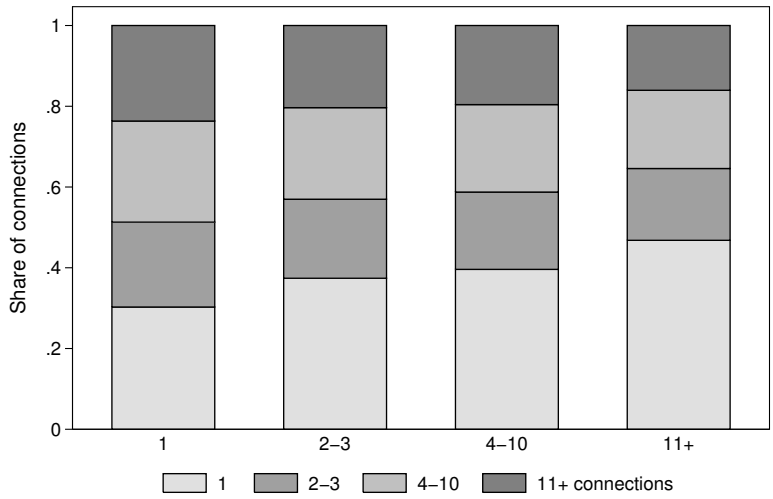
Note: Figure 6 plots the relationship between a firm's number of customers on the horizontal axis and its total exports on the vertical axis using log scales. The solid line is the fit from a kernel-weighted local polynomial regression, and the gray area is the 95 percent confidence interval. We pool all destination countries and normalize exports such that average exports for one-customer firms in each destination equal 1. The unit of observation is a firm-destination. Log exports are expressed relative to average log exports for one-customer firms, $\ln Exports_{mj} - \ln \overline{ExportsOCF_j}$, where $\ln Exports_{mj}$ is log exports from seller m to market j and $\ln \overline{ExportsOCF_j}$ is average log exports for one-customer firms in market j. This normalization is similar to removing country fixed effects from export flows. Furthermore it ensures that the values on the vertical axis are expressed relative to one-customer firms.The Figure shows the fitted line from a kernel-weighted local polynomial regression of log firm-destination exports on log firm-destination number of customers.

Figure 7: Number of Buyers & Within-firm Dispersion in Exports (2006).



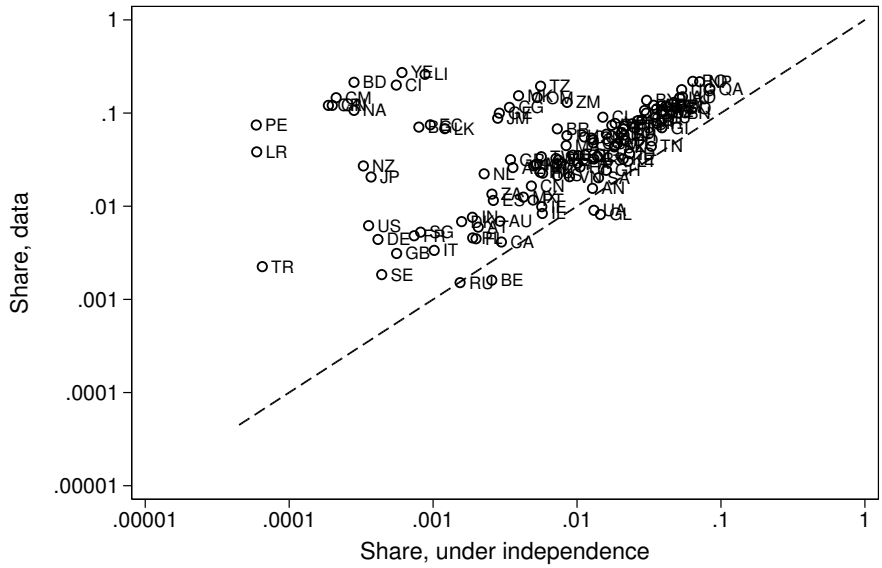
Note: The plot shows the fitted lines from kernel-weighted local polynomial regressions of the 10th, median and 90th percentile of within-firm-destination-level log exports (across buyers) on the log number of customers using log scales. We focus on firms with 10 or more customers because the 10th and 90th percentiles are not well defined for firms with fewer than 10 buyers. We pool all destinations and normalize exports such that average exports for one-customer firms are 1.

Figure 8: Matching Buyers and Sellers (2006).



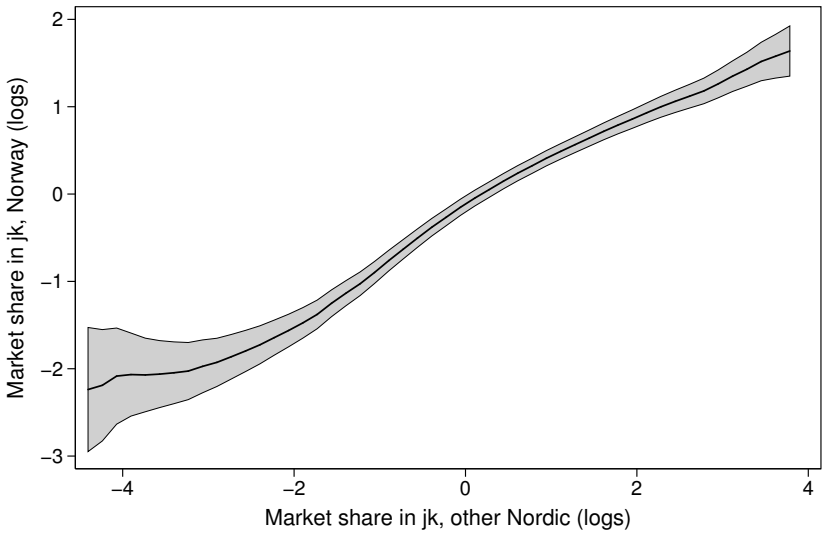
Note: Destination market is Sweden, the largest market for Norwegian exporters. Each bar represents a group of exporters: (i) Firms with 1 connection, (ii) 2-3, (iii) 4-10 and (iv) 11+ connections. For each group, we show the share of buyers that have 1, 2-3, 4-10, 11+ Norwegian connections. Among exporters with 1 Swedish connection, around 30 percent of the total number of matches are made with buyers with 1 Norwegian connection (the far left bar in the figure). Among exporters with 11+ Swedish connections, almost half of the number of matches made are with buyers with 1 Norwegian connection (the far right bar in the figure). Hence, better connected exporters are much more exposed to single-connection buyers.

Figure 9: Pecking Order Hierarchy across Buyers (2006).



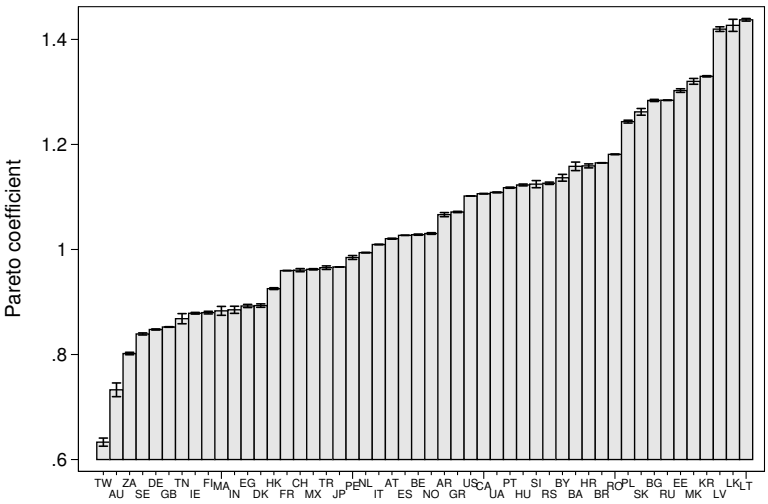
Note: shows the actual shares of firms following the hierarchy on the vertical axis and the simulated shares under the assumption of independence on the horizontal axis. All destination markets with more than 20 sellers and buyers are included (log scales). The shares on the vertical axis represent the number of exporters selling only to the top buyer, the top and second top buyer, and so on, relative to the number of exporters in that destination. The horizontal axis represents the simulated shares under the assumption that connection probabilities are independent ($\sum_{i=1}^{B} p_i$).

Figure 11: Market shares π_{jkt} and $\pi_{Nordic,jkt}$.



Note: 2004 data. The figure shows the kernel-weighted local polynomial regression of normalized log Norwegian market share π_{jkt} (vertical axis) on normalized log other Nordic market share $\pi_{Nordic,jkt}$ (horizontal axis). Gray area denotes the 95 percent confidence bands. The data is normalized by taking the deviation from country means, i.e. we show $\ln \pi_{jk2004} - \ln \bar{\pi}_{j2004}$. Sample is first trimmed by excluding the 1 percent lowest and highest observations.

Figure 10: Firm-level Heterogeneity across Countries.



Note: The figure shows estimated Pareto coefficients for each country using firm-level data from Orbis. The capped spikes denote the 95% confidence interval of the estimated Pareto coefficients.

Figure 12: Out-of-sample Validation: Predicted and Actual Change in the Number of Suppliers.

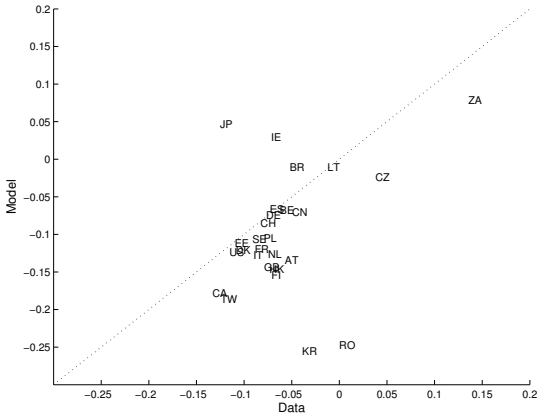


Table 5: Top Exported Products by Number of Exporters and Value.

Top HS8 Products - Number of Exporters		
HS code	Description	Share of exporters, %
84799090	Subgroup of: 847990 Parts of machines and mechanical appliances n.e.s.	9.1
84733000	Parts and accessories for automatic data-processing machines or for other machines of heading 8471, n.e.s.	7.6
73269000	Articles of iron or steel, n.e.s. (excl. cast articles or articles of iron or steel wire)	5.8
39269098	Subgroup of: 392690 Articles of plastics or other materials of headings 3901 to 3914, for civil aircraft, n.e.s	4.9
84099909	Subgroup of: 840999 Parts suitable for use solely or principally with compression-ignition internal combustion piston engine "diesel or semi-diesel engine", n.e.s	4.4

Top HS8 Products - Value		
HS code	Description	Share of value, %
76012001	Subgroup of: 760120 Unwrought aluminium alloys	9.9
03021201	Subgroup of: 030212 Fresh or chilled Pacific salmon	5.1
75021000	Nickel, not alloyed, unwrought	4.8
89069009	Subgroup of: 890690 Vessels, incl. lifeboats (excl. warships, rowing boats and other vessels of heading 8901 to 8905 and vessels for breaking up)	1.3
31052000	Mineral or chemical fertilisers containing the three fertilising elements nitrogen,	1.2

Note: 2006 data. HS8 codes refer to 2006 edition eight digit HS codes. Oil and gas exports excluded (HS 27x products).

Table 6: Within-Firm Gravity (2006).

	Exports (log)	# Buyers (log)	Exports/Buyer (log)
Distance	-0.48[a]	-0.31[a]	-0.17[a]
GDP	0.23[a]	0.13[a]	0.10[a]
Firm FE	Yes	Yes	Yes
N	53,269	53,269	53,269
R^2	0.06	0.15	0.01

Note: Robust standard errors clustered by firm. GDP data from Penn World Table 7.1 (cgdp x pop). [a] p< 0.01, [b] p< 0.05, [c] p< 0.1.

Table 7: Descriptive Statistics.

	Sweden	Germany	US	China	OECD	non-OECD	Overall
Number of exporters	8,614	4,067	2,088	725	1,588.2	98.2	301.7
Number of buyers	16,822	9,627	5,992	1,489	3,055.6	144.5	542.1
Buyers/exporter, mean	3.6	3.6	4.5	3.6	2.7	1.6	1.8
Buyers/exporter, median	1	1	1	1	1	1	1
Exporters/buyer, mean	1.9	1.5	1.6	1.7	1.5	1.2	1.3
Exporters/buyer, median	1	1	1	1	1	1	1
Share trade, top 10% sellers	.94	.97	.96	.86	.90	.75	.77
Share trade, top 10% buyers	.95	.95	.97	.89	.89	.73	.76
Log max/median exports	10.7	11.4	11.2	7.9	8.7	4.6	5.2
Log max/median imports	10.8	10.8	11.7	8.4	8.4	4.6	5.2
Share in total NO exports, %	11.3	9.6	8.8	2.1	81.6	18.4	100

Note: 2006 data. OECD, non-OECD and Overall are the unweighted means of outcomes for OECD, non-OECD and all countries. Log max/median exports (imports) is the log ratio of the largest exporter (importer), in terms of trade value, relative to the median exporter (importer).

Table 8: Types of Matches between Exporters and Importers.

	One-to-one	Many-to-one	One-to-many	Many-to-many
Share of total trade value, %	4.6	26.9	4.9	63.6
Share of total number of matches, %	9.5	40.1	11.0	39.4

Note: 2006 data. One-to-one: Matches where both exporter and importers have one connection in a market; Many-to-one: the E has many connections and the I has one; One-to-many: the E has one connection and the I has many; Many-to-many: both E and I have many connections. The unit of observation is firm-destination, e.g. an exporter with one customer in two destinations is counted as a single-customer exporter.

Table 9: Correlation Matrix.

	Pareto	GDP/capita	Population	GDP	Distance
Pareto	1.00				
GDP/capita	-.26	1.00			
Population	-.29[b]	-.05	1.00		
GDP	-.41[a]	.41[a]	.89[a]	1.00	
Distance	-.15	-.35[a]	.23	.04	1.00

Note: GDP and population data from Penn World Tables. [a] $p < 0.01$, [b] $p < 0.05$, [c] $p < 0.1$.

Table 10: Market Access and Heterogeneity. OLS and First Stage Estimates.

	(1) OLS		(2) OLS		(3) 1st stage		(4)1st stage	
	Exports		# Buyers		π_{jkt}		$\pi_{jkt} \times \Gamma_j^1$	
Y_{jkt}	.17^a	(.02)	.04^a	(.01)	.01	(.01)	-.05^a	(.00)
π_{jkt}	.27^a	(.02)	.06^a	(.01)				
$\pi_{jkt} \times \Gamma_j^1$ (Pareto)	.05^a	(.01)	.00	(.00)				
$\pi_{Nordic,jkt}$					.76^a	(.01)	.46^a	(.01)
$\pi_{Nordic,jkt} \times \Gamma_j^1$					.02^a	(.01)	.83^a	(.01)
Firm-country FE	Yes		Yes		Yes		Yes	
Country-year FE	Yes		Yes		Yes		Yes	
F-stat					4280.6		4260.8	
N	264,544		264,544		264,544		264,544	

Note: Robust standard errors in parentheses, clustered by firm. ^{a} p< 0.01, ^{b} p< 0.05, ^{c} p< 0.1. All variables in logs. F-statistics for the joint significance of the instruments in the first stage regressions.

Table 11: 2SLS estimates. Robustness II.

	(1) Exports		(2) # Buyers		(3) Exports		(4) # Buyers	
Y_{jt}	$.19^a$	(.01)	$.06^a$	(.00)	$.18^a$	(.01)	$.04^a$	(.00)
π_{jt}	$.51^a$	(.06)	$.13^a$	(.02)	1.16^a	(.15)	$.15^a$	(.05)
$\pi_{jkt} \times \Gamma_j^1$ (Pareto)	$.43^a$	(.06)	.02	(.02)				
$\pi_{jkt} \times \Gamma_j^3$ (CV)					$-.06^a$	(.01)	$-.01^b$	(.00)
Firm-country FE	Yes		Yes		Yes		Yes	
Country-year FE	Yes		Yes		Yes		Yes	
N	162,196		162,196		83,080		83,080	

Note: Robust standard errors in parentheses, clustered by firm. ^{a} p< 0.01, ^{b} p< 0.05, ^{c} p< 0.1. All variables in logs. Y_{jkt} and π_{jkt} are absorption and Norwegian market share in country-industry jk, respectively, Γ_j^1 is the Pareto shape parameter and Γ_j^3 is the coefficient of variation. π_{jkt} and $\pi_{jkt} \times \Gamma_j^1$ are instrumented with $\pi_{NOjkt}^{Imports}$ and $\pi_{NOjkt}^{Imports} \times \Gamma_j^1$ in columns (1)-(2) and $\pi_{Nordic,jkt}$ and $\pi_{Nordic,jkt} \times \Gamma_j^3$ in columns (3)-(4). $\pi_{NO,jkt}^{Imports}$ is imports from j relative to total imports in industry k. Only industry-country pairs with $\pi_{NOjkt}^{Imports} > .05$ is used in columns (1)-(2).

Table 12: Decomposition of Aggregate Imports.

	2005-06	2006-07	2007-08	2008-09	2009-10
Importer entry	0.04	0.02	0.08	0.13	0.07
Importer exit	-0.02	-0.10	-0.14	-0.10	-0.09
Net entry	**0.02**	**-0.08**	**-0.06**	**0.03**	**-0.02**
New supplier	0.27	0.30	0.19	0.14	0.17
Retired supplier	-0.18	-0.17	-0.17	-0.17	-0.17
Net supplier	**0.09**	**0.13**	**0.02**	**-0.03**	**0.00**
Intensive margin	**0.16**	**0.05**	**0.04**	**-0.16**	**0.08**
Aggregate imports	**0.27**	**0.10**	**0.00**	**-0.16**	**0.06**

Notes: The table shows annual changes $\Delta x_M/x$, where Δx_M is the change in margin M from $t-1$ to t and x is total manufacturing imports in $t-1$. The margins are described in Section 5.1.

B Theory

B.1 Equilibrium Sorting

The solution to the sorting function is:

$$\underline{z}_{ij}(Z) = \frac{\tau_{ij} w_i \Omega_j}{Z} \left(w_i f_{ij}\right)^{1/(\sigma-1)}$$

Proof. Equation (3) implicitly defines the $\underline{z}_{ij}(Z)$ function. We start with the guess $\underline{z}_{ij}(Z) = W_{ij} Z^s$ and the inverse $\underline{Z}_{ij}(z) = \left(z/W_{ij}\right)^{1/s}$, where W_{ij} and s are unknowns. Furthermore, the relationship between E and Z is not yet determined, but we start with a guess $E_j(Z) = \kappa_3 Z^{\gamma}$, where κ_3 is a constant term, and show in Section B.2 that this is consistent with the equilibrium.

Inserting these expressions, as well as the price index (equation (1)), into equation (3) yields

$$\begin{aligned}
\frac{1}{\sum_k n_k \left(\bar{m}\tau_{kj}w_k\right)^{1-\sigma}\left(W_{kj}\underline{Z}^s\right)^{-\gamma_2}} &= \frac{\sigma w_i f_{ij}}{E_j(\underline{Z})}\frac{\gamma z_L^\gamma}{\gamma_2}\left(\bar{m}\tau_{ij}w_i\right)^{\sigma-1} z^{1-\sigma} \\
\frac{\underline{Z}^{s\gamma_2+\gamma}}{\sum_k n_k \left(\bar{m}\tau_{kj}w_k\right)^{1-\sigma} W_{kj}^{-\gamma_2}} &= \frac{\sigma w_i f_{ij}}{\kappa_3}\frac{\gamma}{\gamma_2} z_L^\gamma \left(\bar{m}\tau_{ij}w_i\right)^{\sigma-1} z^{1-\sigma}.
\end{aligned}$$

Hence,

$$\frac{1}{s} = \frac{1-\sigma}{s\left(\gamma_2+\gamma/s\right)} \iff \frac{1}{s} = -1,$$

and

$$\begin{aligned}
\left(\frac{1}{W_{ij}}\right)^{1/s} &= \left[\frac{\sigma w_i f_{ij}}{\kappa_3}\frac{\gamma z_L^\gamma}{\gamma_2}\left(\bar{m}\tau_{ij}w_i\right)^{\sigma-1}\sum_k n_k\left(\bar{m}\tau_{kj}w_k\right)^{1-\sigma} W_{kj}^{-\gamma_2}\right]^{1/(s\gamma_2+\gamma)} \iff \\
W_{ij} &= \left[\frac{\sigma w_i f_{ij}}{\kappa_3}\frac{\gamma z_L^\gamma}{\gamma_2}\left(\tau_{ij}w_i\right)^{\sigma-1}\sum_k n_k\left(\tau_{kj}w_k\right)^{1-\sigma} W_{kj}^{-\gamma_2}\right]^{1/(\sigma-1)}. \qquad (17)
\end{aligned}$$

In sum, the cutoff is

$$\underline{z}_{ij}(Z) = \frac{W_{ij}}{Z}. \qquad (18)$$

We proceed by solving for W_{ij} and q_j. Inserting the expression for the cutoff (equation (18)) into the price index in equation (1) yields

$$q_j(Z)^{1-\sigma} = Z^{\gamma_2}\bar{m}^{1-\sigma}\frac{\gamma z_L^\gamma}{\gamma_2}\sum_k n_k\left(\tau_{kj}w_k\right)^{1-\sigma} W_{kj}^{-\gamma_2}.$$

Inserting the expression for W_{kj} from equation (17) then yields

$$q_j(Z)^{1-\sigma} = Z^{\gamma_2}\bar{m}^{1-\sigma}\frac{\kappa_3}{\sigma w_i f_{ij}}\left(\frac{W_{ij}}{\tau_{ij}w_i}\right)^{\sigma-1}.$$

This must hold for all i, so

$$\left(w_i f_{ij}\right)^{-1/(\sigma-1)}\frac{W_{ij}}{\tau_{ij}w_i} = \left(w_k f_{kj}\right)^{-1/(\sigma-1)}\frac{W_{kj}}{\tau_{kj}w_k}.$$

By exploiting this fact, we can transform the expression for W_{ij},

$$\begin{aligned}
W_{ij} &= \left(\tau_{ij}w_i\right)^{\sigma-1}\frac{\sigma w_i f_{ij}}{\kappa_3}\frac{\gamma z_L^{\gamma}}{\gamma_2}\sum_k n_k\left(\tau_{kj}w_k\right)^{1-\sigma}\left(\tau_{kj}w_k\right)^{-\gamma_2}\left(w_k f_{kj}\right)^{-\gamma_2/(\sigma-1)}\left(\left(w_k f_{kj}\right)^{-1/(\sigma-1)}\frac{W_{kj}}{\tau_{kj}w_k}\right)^{-\gamma_2} \\
&= \left(\tau_{ij}w_i\right)^{\sigma-1}\frac{\sigma w_i f_{ij}}{\kappa_3}\frac{\gamma z_L^{\gamma}}{\gamma_2}\left(\left(w_i f_{ij}\right)^{-1/(\sigma-1)}\frac{W_{ij}}{\tau_{ij}w_i}\right)^{-\gamma_2}\sum_k n_k\left(\tau_{kj}w_k\right)^{-\gamma}\left(w_k f_{kj}\right)^{-\gamma_2/(\sigma-1)} \quad \Longleftrightarrow \\
W_{ij} &= \left(\tau_{ij}w_i\right)^{\gamma}\frac{\sigma}{\kappa_3}\left(w_i f_{ij}\right)^{\gamma/(\sigma-1)}\frac{\gamma z_L^{\gamma}}{\gamma_2}\sum_k n_k\left(\tau_{kj}w_k\right)^{-\gamma}\left(w_k f_{kj}\right)^{-\gamma_2/(\sigma-1)} \quad \Longleftrightarrow \\
W_{ij} &= \tau_{ij}w_i\left(w_i f_{ij}\right)^{1/(\sigma-1)} z_L\left(\frac{\sigma}{\kappa_3}\frac{\gamma}{\gamma_2}\sum_k n_k\left(\tau_{kj}w_k\right)^{-\gamma}\left(w_k f_{kj}\right)^{-\gamma_2/(\sigma-1)}\right)^{1/\gamma}.
\end{aligned}$$

We define

$$\Omega_j \equiv \kappa_2\left(\sum_k n_k'\left(\tau_{kj}w_k\right)^{-\gamma}\left(w_k f_{kj}\right)^{-\gamma_2/(\sigma-1)}\right)^{1/\gamma},$$

where $\kappa_2 = \left(\frac{\sigma}{\kappa_3}\frac{\gamma}{\gamma_2}\right)^{1/\gamma}$ and given the normalization $n_i = z_L^{-\gamma}n_i'$, we get the closed form solution for the sorting function,

$$\underline{z}_{ij}(Z) = \frac{\tau_{ij}w_i\Omega_j}{Z}\left(w_i f_{ij}\right)^{1/(\sigma-1)}.$$

□

We can now write the price index as

$$\begin{aligned}
q_j(Z)^{1-\sigma} &= Z^{\gamma_2}\bar{m}^{1-\sigma}\frac{\kappa_3}{\sigma w_i f_{ij}}\left(\frac{W_{ij}}{\tau_{ij}w_i}\right)^{\sigma-1} \\
&= Z^{\gamma_2}\bar{m}^{1-\sigma}\frac{\kappa_3}{\sigma w_i f_{ij}}\left(\frac{\tau_{ij}w_i\left(w_i f_{ij}\right)^{1/(\sigma-1)}\Omega_j}{\tau_{ij}w_i}\right)^{\sigma-1} \\
&= Z^{\gamma_2}\frac{\bar{m}^{1-\sigma}\kappa_3}{\sigma}\Omega_j^{\sigma-1}. \qquad (19)
\end{aligned}$$

B.2 Final Goods Producers Expenditure on Intermediates and Productivity

In this section, we derive the equilibrium relationship between final goods expenditure E and productivity Z. Revenue for a final goods producer is

$$R_i = \left(\frac{P_i}{Q_i}\right)^{1-\sigma}\mu Y_i = \left(\frac{\bar{m}q_i(Z)}{ZQ_i}\right)^{1-\sigma}\mu Y_i,$$

where $P_i = \bar{m}q_i(Z)/Z$ is the price charged and Q_i is the CES price index for final goods. The price index for final goods is

$$\begin{aligned} Q_i^{1-\sigma} &= N_i \int_1^\infty P_i(Z)^{1-\sigma} dG(Z) \\ &= N_i \int_1^\infty (\bar{m}q_i(Z)/Z)^{1-\sigma} dG(Z) \\ &= Y_i \frac{\bar{m}^{2(1-\sigma)}\kappa_3}{\sigma} \frac{\Gamma}{\Gamma-\gamma} \Omega_i^{\sigma-1}. \end{aligned} \tag{20}$$

Rewriting revenue as a function of E and inserting the equilibrium expressions for $q_i(Z)$ and Q_i yields

$$\begin{aligned} \bar{m}E_i &= \left(\frac{\bar{m}q_i(Z)}{ZQ_i}\right)^{1-\sigma} \mu Y_i \\ &= \bar{m}^{1-\sigma} Z^{\sigma-1} \frac{Z^{\gamma_2} \frac{\bar{m}^{1-\sigma}\kappa_3}{\sigma} \Omega_i^{\sigma-1}}{\frac{\bar{m}^{2(1-\sigma)}\kappa_3}{\sigma} \frac{\Gamma}{\Gamma-\gamma} Y_i \Omega_i^{\sigma-1}} \mu Y_i \quad \Longleftrightarrow \\ E_i(Z) &= \kappa_3 Z^\gamma, \end{aligned} \tag{21}$$

where $\kappa_3 = \mu(\Gamma-\gamma)/\Gamma$. Hence, total spending on intermediates is increasing in productivity with an elasticity γ. he expression for $E_i(Z)$ is the same as the one we started with in Section B.8.

B.3 Firm-level Trade

Using equations (1) and (2), as well as the sorting function $\underline{Z}_{ij}(z)$, sales for a (z,Z) match are

$$r_{ij}(z,Z) = \left(\frac{p_{ij}(z)}{q_j(Z)}\right)^{1-\sigma} E_j(Z) = \sigma \left(\frac{zZ}{\tau_{ij} w_i \Omega_j}\right)^{\sigma-1}. \tag{22}$$

Note that revenue is supermodular in (z,Z): $\partial^2 r/\partial z \partial Z > 0$. Buyer productivity is distributed Pareto, $G(Z) = 1 - Z^{-\Gamma}$. For firms with $z < \underline{z}_{ij}(Z_L) \equiv z_H$, total firm-level exports to country j

are

$$
\begin{aligned}
r_{ij}^{TOT}(z) &= N_j \int_{\underline{Z}_{ij}(z)} r_{ij}(z,Z)\, dG(Z) \\
&= \kappa_1 Y_j \left(w_i f_{ij}\right)^{1-\Gamma/(\sigma-1)} \left(\frac{z}{\tau_{ij} w_i \Omega_j}\right)^{\Gamma}, \qquad (23)
\end{aligned}
$$

where we defined $\kappa_1 \equiv \sigma\Gamma/[\Gamma-(\sigma-1)]$. We can alternatively express revenue as a function of the hurdle $\underline{Z}_{ij}(z)$, which yields

$$
r_{ij}^{TOT}(z) = \kappa_1 Y_j w_i f_{ij} \underline{Z}_{ij}(z)^{-\Gamma}.
$$

For firms with $z \geq z_H$, total firm-level exports are

$$
\begin{aligned}
\tilde{r}_{ij}^{TOT}(z) &= N_j \int_{Z_L} r_{ij}(z,Z)\, dG(Z) \\
&= \kappa_1 Y_j \left(\frac{z}{\tau_{ij} w_i \Omega_j}\right)^{\sigma-1}.
\end{aligned}
$$

Using the sorting function, we can also derive the measure of buyers in country j for a firm in country i with productivity $z < z_H$,

$$
\begin{aligned}
b_{ij}(z) &= N_j \int_{\underline{Z}_{ij}(z)} dG(Z) \\
&= Y_j \left(w_i f_{ij}\right)^{-\Gamma/(\sigma-1)} \left(\frac{z}{\tau_{ij} w_i \Omega_j}\right)^{\Gamma}. \qquad (24)
\end{aligned}
$$

Given that z is distributed Pareto, the distribution of customers per firm (out-degree distribution) is also Pareto. For firms with $z \geq z_H$, the measure of buyers per seller is by definition N_j.

Knowing firm-level exports from equation (23) as well as the number of buyers from equation (24), the firm's average exports is given by

$$
\frac{r_{ij}^{TOT}(z)}{b_{ij}(z)} = \kappa_1 w_i f_{ij}. \qquad (25)
$$

Inversely, we calculate purchases from i of a final goods firm Z located in j. This is

$$\begin{aligned} R_{ij}^{TOT}(Z) &= n_i \int_{\underline{z}_{ij}(Z)} r_{ij}(z,Z)\, dF(z) \\ &= \kappa_4 Y_i \left(w_i f_{ij}\right)^{1-\gamma/(\sigma-1)} \left(\frac{Z}{\tau_{ij} w_i \Omega_j}\right)^{\gamma}, \end{aligned}$$

where $\kappa_4 = \sigma\gamma/[\gamma-(\sigma-1)]$. The firm-level measure of sellers for a buyer located in j with productivity Z is

$$S_{ij}(Z) \;=\; n_i \int_{\underline{z}_{ij}(Z)} dF(z) = Y_i \left(w_i f_{ij}\right)^{-\gamma/(\sigma-1)} \left(\frac{Z}{\tau_{ij} w_i \Omega_j}\right)^{\gamma}. \tag{26}$$

Hence, given that Z is distributed Pareto, both the distribution of purchases R_{ij}^{TOT} and the distribution of number of sellers per buyer $S_{ij}(Z)$ (in-degree distribution) are Pareto. These results are symmetric to the findings on the seller side.

Finally, equilibrium firm-level profits for intermediate producers with productivity $z < z_H$ is given by

$$\begin{aligned} \Pi_{ij}(z) &= \frac{r_{ij}^{TOT}(z)}{\sigma} - w_i f_{ij} b_{ij}(z) \\ &= \left(\frac{\kappa_1}{\sigma} - 1\right) Y_j \left(w_i f_{ij}\right)^{1-\Gamma/(\sigma-1)} \left(\frac{z}{\tau_{ij} w_i \Omega_j}\right)^{\Gamma}. \end{aligned}$$

For firms with $z \geq z_H$, firm-level profits are

$$\begin{aligned} \tilde{\pi}_{ij}(z) &= \frac{\tilde{r}_{ij}^{TOT}(z)}{\sigma} - w_i f_{ij} N_j \\ &= \frac{\kappa_1}{\sigma} Y_j \left(\frac{z}{\tau_{ij} w_i \Omega_j}\right)^{\sigma-1} - w_i f_{ij} Y_j. \end{aligned}$$

B.4 Aggregate Trade

Aggregate trade is given by

$$X_{ij} = n_i \int_{z_L}^{z_H} r_{ij}^{TOT}(z)\, dF(z) + n_i \int_{z_H}^{\infty} \tilde{r}_{ij}^{TOT}(z)\, dF(z),$$

where $\tilde{r}_{ij}^{TOT}(z)$ is exports for $z > z_H$ firms. Inserting the expressions for r_{ij}^{TOT} and $\tilde{r}_{ij}^{TOT}(z)$ above and solving the integrals yields

$$X_{ij} = n_i' \kappa_1 Y_j \left[\zeta \left(\tau_{ij} w_i \Omega_j \right)^{-\Gamma} + \tilde{\zeta} \left(\tau_{ij} w_i \Omega_j \right)^{-(\sigma-1)} \right]$$

where $\zeta = \left(w_i f_{ij}\right)^{1-\Gamma/(\sigma-1)} z_H^{\Gamma-\gamma} / (\Gamma - \gamma)$ and $\tilde{\zeta} = z_H^{-(\gamma-(\sigma-1))} / [\gamma - (\sigma - 1)]$ and $z_H = \underline{z}_{ij}(1) = \tau_{ij} w_i \Omega_j \left(w_i f_{ij}\right)^{1/(\sigma-1)}$.

Inserting the expressions for the weights ζ and $\tilde{\zeta}$, as well as z_H, then yields

$$X_{ij} = \kappa_5 n_i' Y_j \left(w_i f_{ij}\right)^{1-\gamma/(\sigma-1)} \left(\tau_{ij} w_i \Omega_j\right)^{-\gamma}$$

where $\kappa_5 = \Gamma \sigma \gamma / [\gamma_2 (\Gamma - \gamma)]$.

The trade share, $X_{ij} / \sum_k X_{kj}$, can thus be expressed as

$$\pi_{ij} \equiv \frac{X_{ij}}{\sum_k X_{kj}} = \frac{Y_i \left(w_i f_{ij}\right)^{1-\gamma/(\sigma-1)} \left(\tau_{ij} w_i\right)^{-\gamma}}{\sum_k Y_i \left(w_k f_{kj}\right)^{1-\gamma/(\sigma-1)} \left(\tau_{kj} w_k\right)^{-\gamma}}. \tag{27}$$

We emphasize two implications for aggregate trade. First, higher relation-specific cost f_{ij} reduces the number of matches between exporters and importers and therefore dampens aggregate trade with a partial elasticity $1 - \gamma / (\sigma - 1) < 0$. Second, the partial aggregate trade elasticity with respect to variable trade barriers, $\partial \ln X_{ij} / \partial \ln \tau_{ij}$, is $-\gamma$, the Pareto coefficient for seller productivity. This result mirrors the finding in models with one-sided heterogeneity, see e.g. Eaton et al. (2011).

It may seem surprising that the aggregate trade elasticity is γ, given that the firm-level elasticity is Γ. This occurs because the aggregate elasticity is the weighted average of firm-level elasticities for $z < z_H$ firms and $z \geq z_H$ firms. These elasticities are Γ and $\sigma - 1$ respectively (see the expression for X_{ij} above and this Online Appendix Section B.3). In equilibrium, the weighted average of the two becomes γ.

B.5 Other distributional assumptions

Proposition 1 was derived under the assumption that both buyer and seller productivities are distributed Pareto. In this section, we investigate the robustness of Proposition 1 under other distributional assumptions for buyer productivity.

Consider the elasticity of firm-level exports with respect to variable trade barriers. From the expression $r_{ij}^{TOT}(z) = N_j \int_{\underline{Z}_{ij}(z)} r_{ij}(z,Z)\, dG(Z)$, and by using Leibnitz' rule, we get

$$\frac{\partial \ln r_{ij}^{TOT}(z)}{\partial \ln \tau_{ij}} = \frac{\tau_{ij}}{r_{ij}^{TOT}} N_j \int_{\underline{Z}_{ij}(z)} \frac{\partial r_{ij}(z,Z)}{\partial \tau_{ij}} dG(Z) - \frac{\tau_{ij}}{r_{ij}^{TOT}} N_j \frac{\partial \underline{Z}_{ij}(z)}{\partial \tau_{ij}} r_{ij}\left(z,\underline{Z}_{ij}\right) G'\left(\underline{Z}_{ij}\right).$$

The first and second parts of this expression are the intensive and extensive margin elasticities, respectively. From equation (22) we get that $\partial r_{ij}(z,Z)/\partial \tau_{ij} = -(\sigma-1)\, r_{ij}(z,Z)/\tau_{ij}$. Hence the intensive margin is

$$\begin{aligned}
\varepsilon_{intensive} &= \frac{\tau_{ij}}{r_{ij}^{TOT}} N_j \int_{\underline{Z}_{ij}(z)} \frac{\partial r_{ij}(z,Z)}{\partial \tau_{ij}} dG(Z) \\
&= -\frac{\tau_{ij}}{r_{ij}^{TOT}} N_j \int_{\underline{Z}_{ij}(z)} (\sigma-1) \frac{r_{ij}(z,Z)}{\tau_{ij}} dG(Z) \\
&= -(\sigma-1).
\end{aligned}$$

From equation (4) we get that $\partial \underline{Z}_{ij}(z)/\partial \tau_{ij} = \underline{Z}_{ij}(z)/\tau_{ij}$. Hence the extensive margin is

$$\begin{aligned}
\varepsilon_{extensive} &= -\frac{\tau_{ij}}{r_{ij}^{TOT}} N_j \frac{\partial \underline{Z}_{ij}(z)}{\partial \tau_{ij}} r_{ij}\left(z,\underline{Z}_{ij}\right) G'\left(\underline{Z}_{ij}\right) \\
&= -N_j \frac{r_{ij}\left(z,\underline{Z}_{ij}\right)}{r_{ij}^{TOT}(z)} \underline{Z}_{ij} G'\left(\underline{Z}_{ij}\right).
\end{aligned}$$

Inserting the expression for r_{ij}^{TOT} above, and using equations (7) and (22), we get

$$\varepsilon_{extensive} = -\frac{\underline{Z}_{ij}^{\sigma} G'\left(\underline{Z}_{ij}\right)}{\int_{\underline{Z}_{ij}} Z^{\sigma-1} dG(Z)}.$$

First, consider the case of a Pareto distribution for $G(Z)$. Then $\varepsilon_{extensive} = -(\Gamma-(\sigma-1))$,

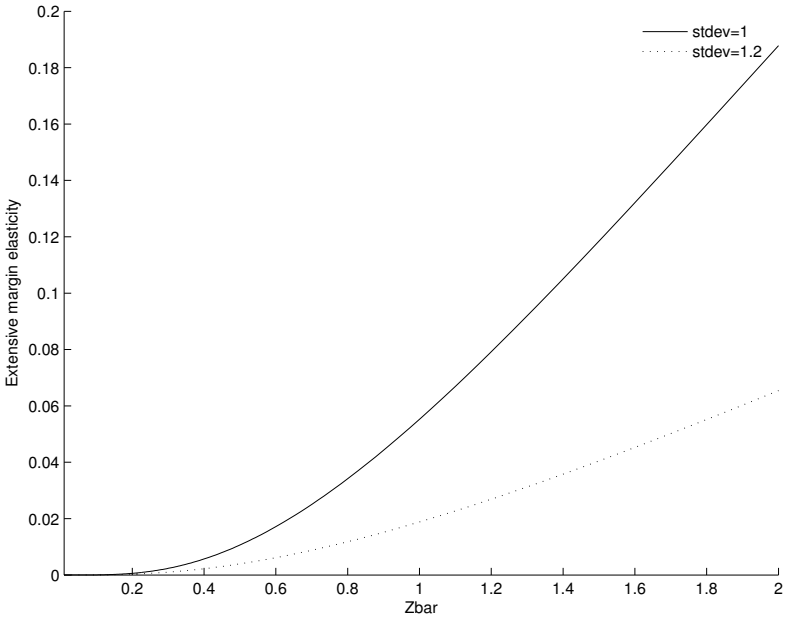


Figure 13: Extensive margin elasticity under the lognormal distribution.

so that the overall elasticity is simply Γ, as in the main text. Second, consider the case of a lognormal distribution with $E[\ln Z] = 0$ and with either $\sigma_Z = stdev[\ln Z] = 1$ or $stdev[\ln Z] = 1.2$. Figure 13 plots $\varepsilon_{extensive}$ for different values of $\underline{Z}_{ij}^{\sigma}$, and for the two values of dispersion. As is clear from the figure, $\varepsilon_{extensive}$ is greater (in absolute value) when σ_Z is low compared to when σ_Z is high, for all values of $\underline{Z}_{ij}$.

We also test two other distributions. Consider the case of an exponential distribution for $G(Z)$ with rate parameters $\lambda = 1$ and $\lambda = 1.2$ and corresponding variance λ^2. This also generates a greater $\varepsilon_{extensive}$ when dispersion is low compared to when dispersion is high.[38] Finally, consider the case of a Frechet distribution with shape parameters $\theta = 1$ and $\theta = 1.2$. Again, $\varepsilon_{extensive}$ is higher when dispersion is low (θ high).

In sum, the finding that the trade elasticity is higher when dispersion is low holds under various other commonly used distributions.

[38]The numerical results are available upon request.

B.6 Welfare

As shown in equation (20), the price index on final goods is

$$Q_i^{1-\sigma} \quad = \bar{m}^{2(1-\sigma)} \tfrac{\mu}{\sigma} N_i \Omega_i^{\sigma-1}.$$

Using the expression for the trade share in equation (27), we can rewrite Ω_i as

$$\Omega_j = \left(\frac{\sigma}{\kappa_3} \frac{\gamma}{\gamma_2} n_j^{'} \left(w_j f_{jj} \right)^{1-\gamma/(\sigma-1)} \right)^{1/\gamma} \pi_{jj}^{-1/\gamma} \frac{1}{\tau_{jj} w_j}.$$

Inserting this back into the price index Q_j for final goods in j and rearranging yields the real wage

$$\frac{w_j}{Q_j} \quad = \quad \kappa_6 \left(n_j^{'} N_j \right)^{1/\gamma} \left(\frac{f_{jj}}{L_j} \right)^{1/\gamma - 1/(\sigma-1)} \frac{\pi_{jj}^{-1/\gamma}}{\tau_{jj}},$$

where κ_6 is a constant.[39] Higher spending on home goods (higher π_{jj}) lowers real wages with an elasticity $1/\gamma$, mirroring the finding in Arkolakis et al. (2012).

B.7 The Within-Firm Export Distribution

Using the expression for sales for a given (z, Z) match in equation (22) as well as the sorting function $\underline{Z}_{ij}(z)$, the distribution of exports across buyers for a seller with productivity z is

$$\Pr\left[r_{ij} < r_0 \mid z \right] = 1 - \left(\frac{\sigma w_i f_{ij}}{r_0} \right)^{\Gamma/(\sigma-1)}.$$

Hence, within-firm sales is distributed Pareto with shape coefficient $\Gamma/(\sigma-1)$. Note that the distribution is identical for every exporter in i selling to j.

B.8 Sorting

Extensive margin: Figure 1 shows the empirical relationship between a firm's number of customers in destination j and average number of connections to Norwegian exporters among its

[39] $\kappa_6 = \left(\frac{\sigma}{\kappa_3} \frac{\gamma}{\gamma_2} \right)^{1/\gamma} \left(\bar{m}^{2(1-\sigma)} \frac{\mu}{\sigma} \right)^{1/(\sigma-1)} (1+\psi)^{-1/\gamma + 1/(\sigma-1)}$.

customers, i.e. the correlation between the degree of a node and the average degree of its neighbors. In this section, we derive the corresponding relationship in the model.

Using equations (26) and (4), the number of connections for the marginal customer of a firm with productivity z is $S_{ij}\left(\underline{Z}_{ij}(z)\right) = Y_i z^{-\gamma}$. Using equation (24), we can rewrite this as

$$\underline{S}_{ij}\left(b_{ij}\right) = Y_i Y_j \left(w_i f_{ij}\right)^{-\gamma/(\sigma-1)} \left(\tau_{ij} w_i \Omega_j\right)^{-\gamma} b_{ij}^{-\gamma/\Gamma},$$

which relates a firm's number of customers b_{ij} to the number of connections for the firm's marginal customer, $\underline{S}_{ij}$.

In the data, we explore the average number of connections among all the firm's customers, not just the marginal one. The average number of connections among the customers of a firm with productivity z is

$$\begin{aligned} \tilde{S}_{ij}(z) &= \frac{1}{1-G\left(\underline{Z}_{ij}(z)\right)} \int_{\underline{Z}_{ij}(z)} S_{ij}(Z)\, dG(Z) \\ &= \frac{\Gamma}{\Gamma-\gamma} Y_i z^{-\gamma}. \end{aligned}$$

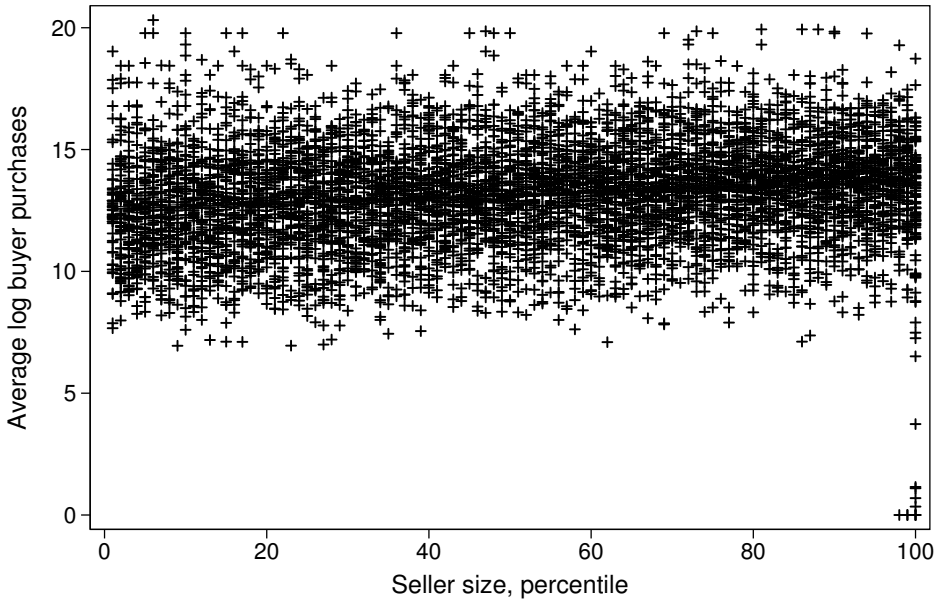
The average number of connections among the customers of a firm with b_{ij} customers is then

$$\tilde{S}_{ij}\left(b_{ij}\right) = \frac{\Gamma}{\Gamma-\gamma} Y_i \left(\frac{b_{ij}}{b_{ij}(1)}\right)^{-\gamma/\Gamma}.$$

Hence, the elasticity of $\tilde{S}_{ij}(z)$ with respect to b_{ij} is $-\gamma/\Gamma$.

Intensive margin: Using the same approach as above, it can be shown that the average purchases among the customers of a firm with sales r_{ij}^{TOT} is decreasing with the same elasticity $-\gamma/\Gamma$ (i.e., the average of R_{ij}^{TOT} across the customers of an upstream firm with sales r_{ij}^{TOT}). Figure 14 shows this relationship in the data. First, we sort Norwegian exporters according to their percentile rank of sales r_{ij}^{TOT} in market j. Denote the percentile rank ρ_j. Second, we take the average of R_{ij}^{TOT} across all the customers of Norwegian exporters belonging to percentile rank ρ_j. A complication is that R_{ij}^{TOT} and r_{ij}^{TOT} are both a function of the transaction size r_{ij}. We solve this by taking the leave-out sum, i.e. R_{ij}^{TOT} is calculated by summing across all

Figure 14: Intensive Margin Sorting.



Note: 2006 data. The Figure shows all percentile ranks ρ_j of exports to destination j on the x-axis, and the average log purchases from Norway among these buyers on the y-axis. The fitted regression line and 95% confidence intervals are denoted by the solid line and gray area. The slope coefficient is 0.01 (s.e. 0.001).

purchases except the purchase from the Norwegian supplier in question.[40] Figure 14 shows the percentile rank for all destinations j on the x-axis and the average log R_{ij}^{TOT} on the y-axis. The fitted regression line is slightly positive with a slope coefficient of 0.01 (s.e. 0.001).

B.9 Free entry

This section develops a simple extension of the model where the number of buyers in a market, N_j, is endogenous and determined by free entry. Assume that downstream firms incur a fixed cost f_e, paid in terms of labor, in order to observe a productivity draw Z. Prior to entry, expected firm profits are therefore $\int_1 \tilde{\Pi}_j(Z)\, dG(Z) - w_j f_e$, where $\tilde{\Pi}_j(Z)$ is profits of a downstream firm

[40] As a consequence, buyers with only one Norwegian supplier drop out.

with productivity Z. From equation (21), we know that a downstream firm's revenue is

$$R_j(Z) = \bar{m}\mu \frac{\Gamma - \gamma}{\Gamma} \frac{Y_j}{N_j} Z^{\gamma}.$$

Because gross profits are proportional to revenue, $\tilde{\Pi}_j(Z) = R_j(Z)/\sigma$, we can rewrite the free entry condition as

$$\begin{aligned}
\int_1 \tilde{\Pi}_j(Z)\, dG(Z) &= w_j f_e \\
\bar{m}\frac{\mu}{\sigma}\frac{\Gamma - \gamma}{\Gamma}\frac{Y_j}{N_j}\int_1 Z^{\gamma} dG(Z) &= w_j f_e \\
\bar{m}\frac{\mu}{\sigma}\frac{Y_j}{N_j} &= w_j f_e \\
N_j &= \bar{m}\frac{\mu}{\sigma}\frac{Y_j}{w_j f_e}.
\end{aligned}$$

Hence, the number of buyers in a market is proportional to income Y_j.

C A Random Matching Model

In this section, we ask to what extent a random matching model can replicate the basic facts presented in the main text. The main finding is that a random model fails to explain key empirical facts.

We model the matching process as a balls-and-bins model, similar to Armenter and Koren (2013). There are B buyers, S sellers and n balls. The number of bins is SB, the total number of possible buyer-seller combinations, and we index each bin by sb. The probability that a given ball lands in bin sb is given by the bin size s_{sb}, with $0 < s_{sb} \leq 1$ and $\sum_s^S \sum_b^B s_{sb} = 1$. We assume that $s_{sb} = s_s s_b$, so that the buyer match probability (s_b) and seller match probability (s_s) are independent. Trade from seller s to buyer b is the total number of balls landing in bin sb, which we denote by r_{sb}. A buyer-seller match is denoted by $m_{sb} = 1[r_{sb} > 0]$.

Parameters and simulation. We simulate the random model as follows. Focusing on Norway's largest export destination, Sweden, we set B and S equal to the number of buyers in Sweden and exporters to Sweden (see Table 7). The number of balls, n, equals the total number of connections made (24,400). The match probabilities s_s correspond to each seller's number

of customers relative to the total number of connections made; s_b correspond to each buyer's number of suppliers relative to the total number of connections made.

Results. We focus on the key relationships described in the main text; (i) degree distributions,[41] (ii) number of connections versus total sales and within-firm sales dispersion and (iii) assortivity in in-degree and average out-degree of the nodes in:

(i) We plot the simulated degree distributions in Figure 15, in the same way as in the main text. Given that the match probabilities s_b and s_s are taken from the actual data, it is not surprising that the simulated degree distributions resemble the actual distributions in Figures 4 and 5.

(ii) The relationship between the number of customers and total exports per seller is plotted in the left panel of Figure 16. The relationship is positive and log linear. The right panel plots the number of customers on the horizontal axis and the value of 10th, 50th and 90th percentile of buyer-seller transactions (within firm) on the vertical axis. In contrast to the actual data and our main model (see Figure 7), the large majority of firms sell the same amount to each buyer; hence both the 10th and the 90th percentile cluster at $r_{sb} = 1$. For the firms with dispersion in sales, the magnitude of dispersion is small, with the 90th percentile not exceeding $r_{sb} = 2$.

(iii) Figure 17 plots the relationship between out-degree and mean in-degree (and the opposite), as illustrated in the main text in Figure 1. The relationship is essentially flat, so that the contacts of more popular sellers are on average similar to the contacts of less popular sellers. This is also at odds with the data and our main model.

In sum, the random matching model is not able to reproduce all the basic facts from the data.

[41]The degree of a node in a network is the number of connections it has to other nodes, while the degree distribution is the probability distribution of these degrees over the whole network.

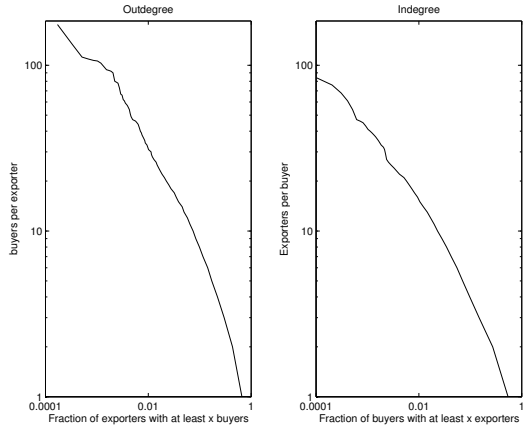


Figure 15: Distribution of out-degree and in-degree.

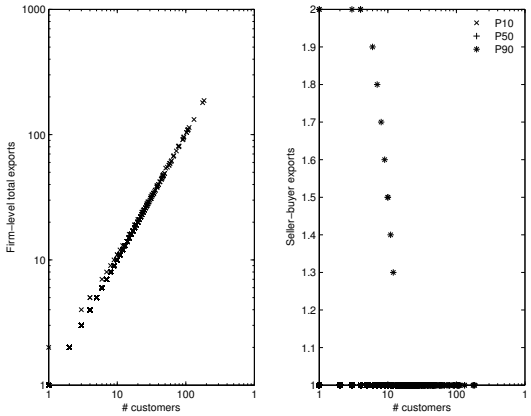


Figure 16: Firm-level total exports and within-firm dispersion in exports.

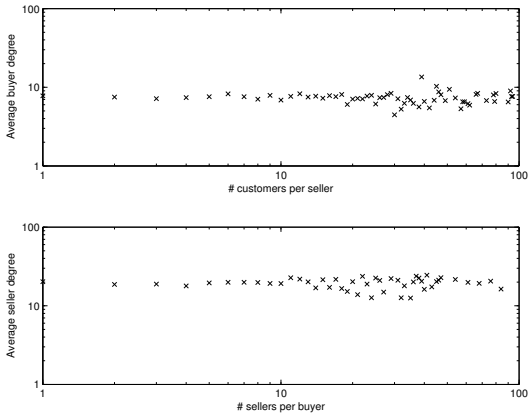


Figure 17: Degree and average degree of customers/suppliers.

D Basic Facts Revisited

D.1 Robustness Checks

The basic facts presented in Secion 2 show empirical regularities between buyers and sellers irrespective of the product dimension. However, firms with many customers are typically firms selling many products. To control for the product dimension, we recalculate the facts using the firm-product as the unit of analysis.[42] The qualitative evidence from the facts reported above remains robust to this change. These findings suggest that the basic facts cannot be explained by variation in the product dimension alone.

Products in the data are a mix of homogeneous and differentiated goods. We therefore recalculate the facts above for differentiated products only. Specifically, we drop all products that are classified as "reference priced" or "goods traded on an organized exchange" according the the Rauch classification.[43] The qualitative evidence from the facts section remains robust to this change. A different concern is that the data includes both arm's length trade and intra-firm trade. We drop all Norwegian multinationals from the dataset and recalculate the facts.[44] Again, the evidence is robust to this change.

The data used in this paper is the universe of non-oil merchandise exports and a subset of the exporters are outside manufacturing. We match the customs data to the manufacturing census, which allows us to remove exporters outside manufacturing. The qualitative evidence from the facts reported above remains robust to this change.[45]

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[42] A product is defined as a HS1996 6 digit code. Results available upon request.

[43] The Rauch classification is concorded from SITC rev. 2 to 6 digit HS 1996 using conversion tables from the UN (http://unstats.un.org/unsd/trade).

[44] The trade transactions themselves are not identified as intra-firm or arm's length. Norwegian multinationals account for 38 percent of the total value of Norwegian exports.

[45] The export value for non-manufacturing firms is 9 percent relative to total exports in 2006. Detailed results available upon request.

D.2 Data from Colombia

This section presents descriptive evidence on buyer-seller relationships using trade data from a different country, Colombia. We show that the basic facts from Section 2 also hold in the Colombian data.

The data set includes all Colombian import transactions in 2011 as assembled by ImportGenius.[46] As in the Norwegian data, we can identify every domestic buyer (importer) and foreign sellers (exporters) in all source countries. However unlike the Norwegian data, transactions must be matched to firms (either exporters or importers) using raw names and thus are potentially subject to more error than the comparable Norwegian data. However, there is no reason to believe the noise in the data is systematic and thus we are comfortable using the data as a robustness check. Since we only have import data from Colombia, the roles of buyers and sellers are reversed compared to the Norwegian data, i.e. in the descriptive evidence that follows, an exporter represents a foreign firm exporting to Colombia, and an importer denotes a Colombian firm purchasing from abroad.

We reproduce the same facts as in the Norwegian data. Table 13 in this Online Appendix reports exporter and importer concentration for all imports and imports from Colombia's largest sourcing markets in 2011, U.S., China and Mexico. Both sellers and buyers of Colombian imports are characterized by extreme concentration, mirroring the finding in Table 7 (basic fact 2) in this Online Appendix. Figure 18 confirms that the degree distributions in Colombia are close to Pareto, mirroring the finding in Figures 4 and 5 in the main text. Moreover, Table 14 shows that one-to-one matches are relatively unimportant in total imports (basic fact 3). Figures 19 and 20 show that while more connected exporters typically sell more, the within-firm distribution of sales is relatively constant, mirroring the finding in Figures 6 and 7 (basic fact 4). Figure 21 illustrates that more popular exporters on average match to less connected importers, mirroring the finding in Figure 1 (basic fact 5).

[46] The data are available at http://importgenius.com. See Bernard and Dhingra (2014) for details on the data construction.

Table 13: Descriptive statistics: Colombian Imports.

	Overall	U.S.	China	Mexico
Number of exporters	95,185	28,926	32,677	5,349
Number of buyers	34,166	15,047	15,445	5,050
Share trade, top 10% sellers	.90	.93	.84	.96
Share trade, top 10% buyers	.93	.93	.87	.93
Share in total CO imports, %	100	26.2	15.5	11.4

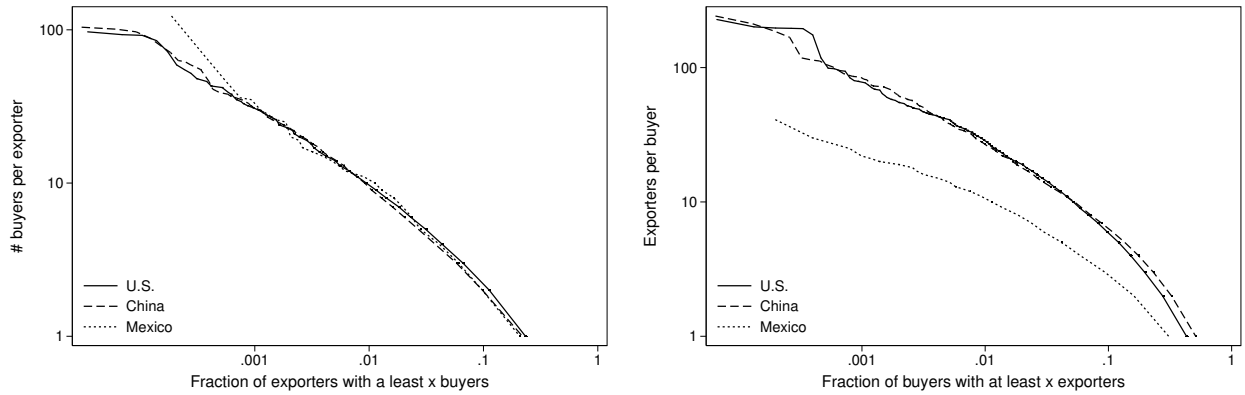
Note: 2011 data. The overall column refers to outcomes unconditional on importer country.

Table 14: Types of matches, % : Colombia.

	(1) One-to-one	(2) Many-to-one	(3) One-to-many	(4) Many-to-many
Share of value, %	4.9	36.4	7.6	51.1
Share of counts, %	15.8	36.5	12.8	34.9

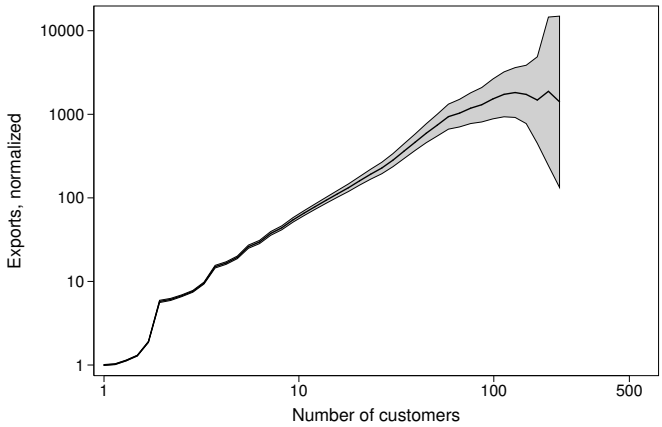
Note: 2011 data. See Table 8 footnote.

Figure 18: Distribution of # buyers per exporter (left) and exporters per buyer (right): Colombia.



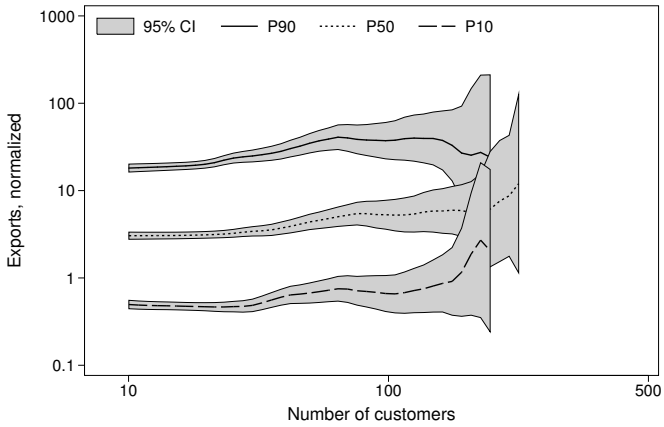
Note: 2011 data. Buyers per exporter: The estimated slope coefficients are -0.74 (s.e. 0.0004) for U.S., -0.78 (s.e. 0.001) for China and -0.78 (s.e. 0.001) for Mexico. Exporters per buyer: The estimated slope coefficients are -0.99 (s.e. 0.002) for U.S., -0.74 (s.e. 0.002) for China and -0.74 (s.e. 0.002) for Mexico.

Figure 19: Number of buyers & firm-level exports: Colombia.



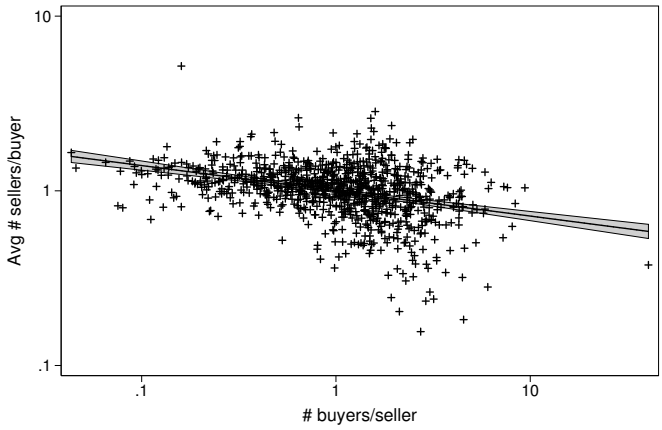
Note: 2011 data. See Figure 6 footnote.

Figure 20: Number of buyers & within-firm dispersion in exports: Colombia.



Note: 2011 data. See Figure 7 footnote.

Figure 21: Matching buyers and sellers across markets: Colombia.



Note: 2011 data. The linear regression slope is -0.14 (s.e. 0.01). See Figure 1 footnote.