



Financial Development and the Choice of Trade Partners

Journal of Development Economics 116 (2015), p.122-145.

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Motivation

- ❑ International trade significantly contributes to economic growth in developing countries
 - Exporting provides access to bigger consumer market, increasing domestic employment and profits
 - Productivity gains through scale economies in production and innovation, as well as through technological spillovers across borders

- ❑ Not only total trade value, but also number and characteristics of export destinations can matter for aggregate welfare
 - Spillovers from exposure to bigger range of products, technologies and know-how
 - Reduced demand volatility by diversifying across consumer markets

Trade Partners and Exports

- Countries with more export destinations in 1985 exported more in 1985-1995

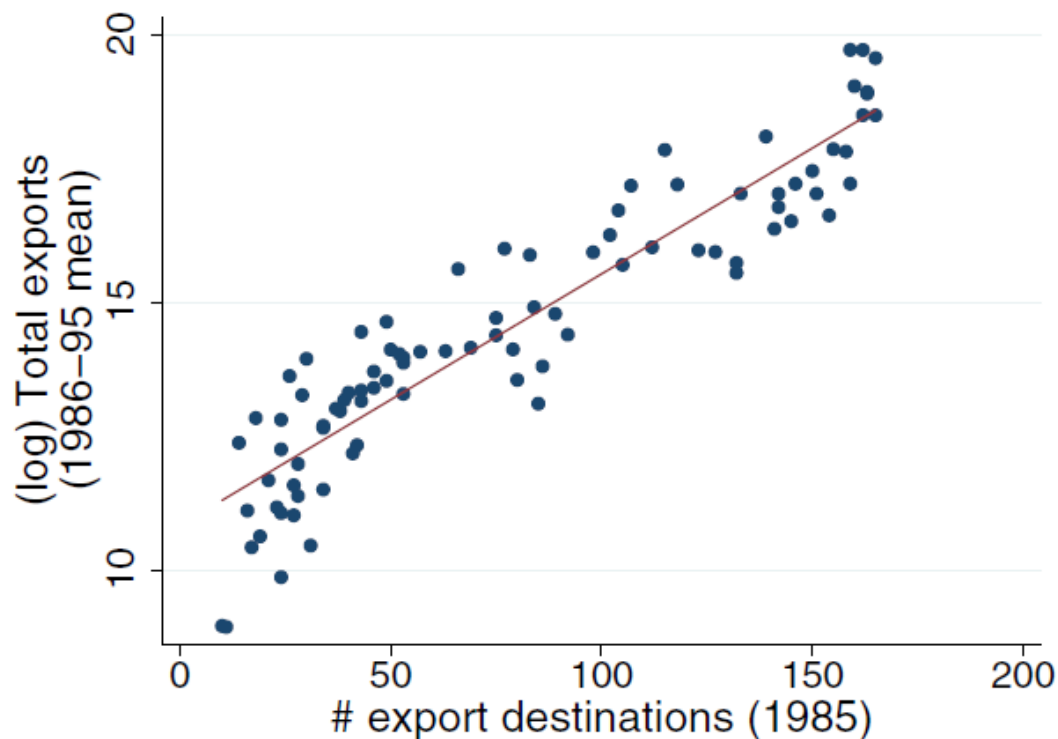
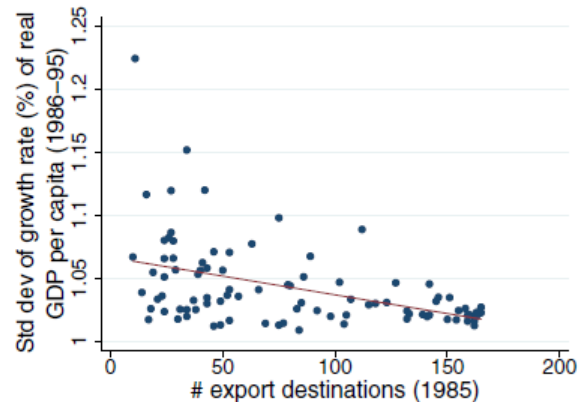
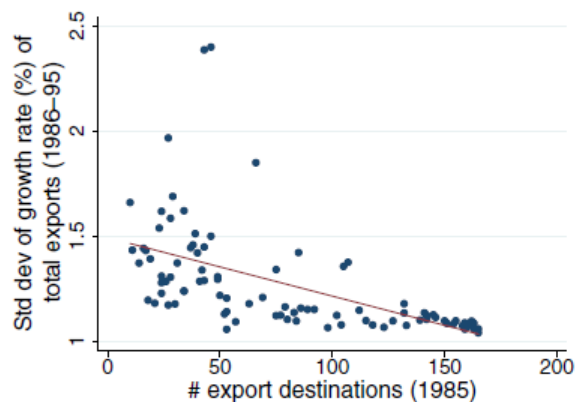
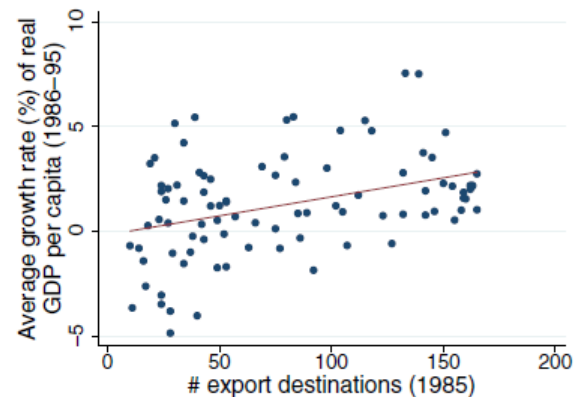
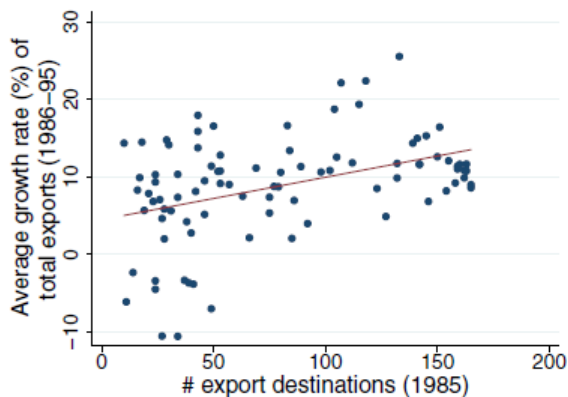


Fig. 1. Export partners and total exports. Slope (t-stat) of the fitted line: 0.047 (23.1). $N = 90$.

Trade Partners and Growth

- Countries with more export destinations in 1985 experienced faster growth and less growth volatility in their exports and GDP per capita in 1985-1995



Financial Development and Trade Partners

- Countries with higher financial development have more trade partners

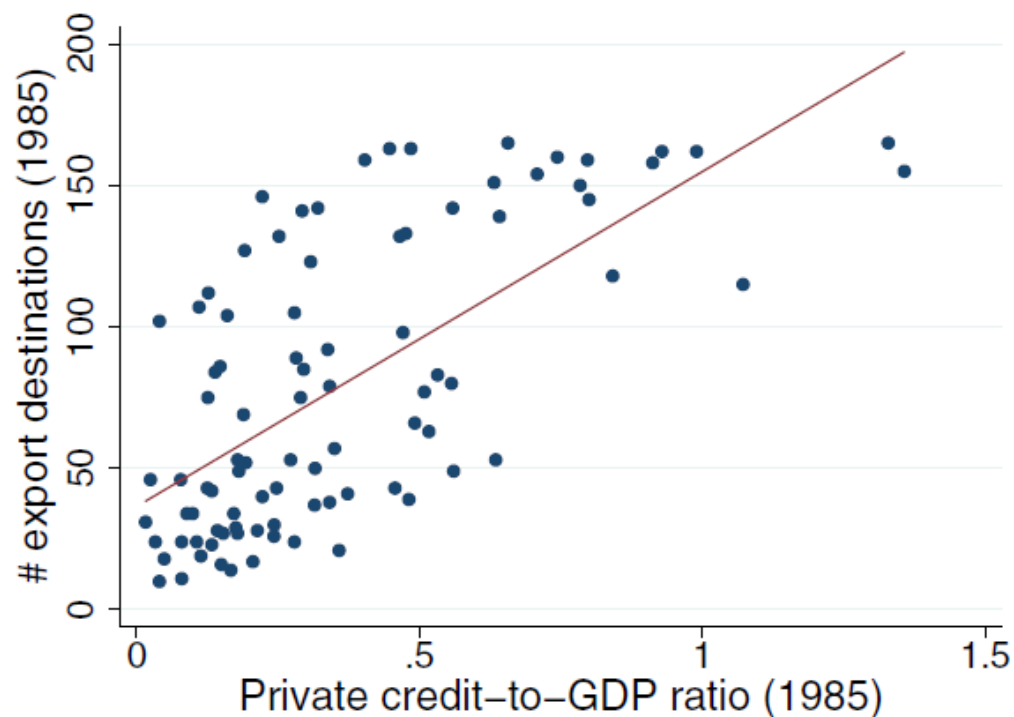


Fig. 5. Private credit and export partners. Slope (t-stat) of the fitted line: 118.4 (8.5). $N = 90$.

This Paper

- ❑ Examine the effect of financial market imperfections on the number and characteristics of exporters' trade partners

- ❑ Theoretical framework based on Manova (2013)
 - Larger economies with lower trade costs are relatively more profitable
 - This generates a pecking order of export destinations based on market potential
 - Firms export to all destinations above a cut-off level of market potential
 - Financial market frictions raise this cut-off, such that financially developed countries have more trade partners and go further down the pecking order

- ❑ Robust empirical support using bilateral trade data
 - 78 export countries, 27 industries, 1985-1995

Key Implications

- ❑ Financial institutions importantly affect the number and identity of countries' trade partners

- ❑ There exists a hierarchy of destinations stable across exporting countries
 - Develop model-consistent summary measures of market potential and ranking of destinations by market potential
 - Empirically establish that hierarchy of destinations is governed by market size and trade costs

- ❑ Credit constraints interact with the pecking order, affecting the choice of countries' trade partners
 - Exploit the variation in financial development across exporters and in financial vulnerability across sectors to establish causal effect of financial frictions

Contribution to the Literature

- ❑ Variation of incidence and magnitude of cross-border transactions
 - Eaton et al 2011, Helpman et al 2008, Bernard et al 2007, Bernard et al 2011, Dhingra 2013, Mayer et al 2014

- ❑ International trade and corporate finance
 - Foley and Manova 2015, Feentra et al 2015, Manova 2013, Amiti and Weinstein 2011, Berman and Héricourt 2010, Bricogne et al 2012, Chor and Manova 2012, Minetti and Zhu 2011

- ❑ International trade and economic growth
 - Rodrik 2005, Goldberg et al 2010, Manova and Zhang 2012, Verhoogen 2008, de Loecker 2007, Baxter and Kouparitsas 2005, Clark and van Wincoop 2001, Frankel and Rose 1998, Burstein et al 2008, Eaton et al 2011

Outline

1. Introduction and motivation
2. Theoretical framework
3. Empirical specification and data
4. Results
5. Conclusion

Model Overview

- ❑ Heterogeneous exporters require external finance and pledge collateral to raise capital, but financial contracts are not perfectly enforced
 - More productive firms are less credit constrained because they can offer investors higher repayment when contract is enforced
 - Fixed and variable trade costs give rise to productivity cut-off for exporting

- ❑ Key implications
 - Financial frictions reinforce the selection of only the most productive firms into exporting and preclude potentially profitable firms from exporting
 - Productivity cut-off for exporting increases with trade costs and falls with destination market size and home-country financial development
 - Bigger distortions due to financial frictions in financially more dependent sectors that require more external finance and feature less collateralizable assets

Model Set-Up

- A continuum of heterogeneous firms produce differentiated goods in each of I countries and S sectors
 - CES utility with elasticity $\varepsilon > 1$ summarizes consumers' love of variety

- Production
 - Firms draw productivity $1/a$ from $G(a)$ with support $[a_L, a_H]$, $a_H > a_L > 0$
 - $c_{js}a$: cost of producing 1 unit in country j in sector s
 - Sunk entry cost $c_{js}e_j$

- Exporting
 - $c_{js}f_{ij}$: fixed cost of exporting from j to i
 - τ_{ij} : iceberg cost of exporting from j to i

Financing Constraints

- ❑ Firms require external finance for a fraction d_s of the fixed trade cost, which they can raise by pledging a fraction t_s of the entry cost as collateral
 - d_s and t_s are technologically determined sector characteristics

- ❑ Financial contracting is imperfect and depends on countries' institutions
 - With probability λ_j the financial contract is enforced and investors are repaid a pre-specified amount $F_{js}(a)$
 - With probability $(1 - \lambda_j)$ the firm defaults, investors claim collateral $t_s c_{js} e_j$, and firms keep all revenues but need to replace collateral to continue operations

Firm Problem

- Credit constrained exporter in country j and sector s with productivity a chooses its set of trade partners $TP(a)$ and determines optimal export price and quantity in each market i to maximize total profits

$$\max_{TP, p, q, F} \pi_{js}(a) = \sum_{i \in TP} \{pq - q\tau_{ij}c_{js}a - (1 - d_s)c_{js}f_{ij}\} - \lambda_j F - (1 - \lambda_j)t_s c_{js}e_j$$

subject to

$$(1) \quad q = \frac{p^{-\varepsilon} \theta_s Y_i}{P_{is}^{1-\varepsilon}}$$

$$(2) \quad A_{ijs}(a) \equiv pq - q\tau_{ij}c_{js}a - (1 - d_s)c_{js}f_{ij} \geq F$$

$$(3) \quad B_{ijs}(a) \equiv -\sum_{i \in TP} d_s c_{js} f_{ij} + \lambda_j F + (1 - \lambda_j)t_s c_{js} e_j \geq 0$$

Market Potential and Pecking Order

- ❑ Firms in a given country-sector unanimously rank all destinations by their relative profitability
- ❑ Importing countries with a larger market size Y_i and lower trade costs τ_{ij} and f_{ij} are more attractive and have higher market potential

$$MP_{ijs} = \frac{Y_i}{\tau_{ij}f_{ij}}$$

- ❑ All firms in a given country observe the same pecking order (decreasing order of MP) regardless of the sector, but firms in different export countries may follow different pecking orders

Theoretical Predictions

- ❑ **Proposition 1 (Trade partners)** The number of export destinations increases with the exporter's level of financial development. This effect is stronger in financially more vulnerable sectors.
- ❑ **Proposition 2 (Pecking order)** Exporters follow a pecking order of destinations, determined by market potential. All exporters sell to the destination with the greatest market potential. Financially developed countries go further down the pecking order and also export to destinations with lower market potential. This latter effect is stronger in financially more vulnerable sectors.

Empirical Specification

- Reduced from test of Proposition 1 as in Manova (2013)

$$\ln Exports_{jst} = \delta + \delta_0 FinDev_{jt} + \delta_1 FinDev_{jt} \times ExtFin_s + \delta_2 FinDev_{jt} \times Tang_s \\ + \Delta_X X_{jst} + \varphi_j + \varphi_s + \varphi_t + \varepsilon_{jst}$$

$$\#TP_{jst} = \rho + \rho_0 FinDev_{jt} + \rho_1 FinDev_{jt} \times ExtFin_s + \rho_2 FinDev_{jt} \times Tang_s \\ + P_X X_{jst} + \phi_j + \phi_s + \phi_t + v_{jst}$$

Empirical Specification

□ Reduced from test of Proposition 2

$$\begin{aligned} \max_{i \in TP_{jst}} MP_{ijst} &= \alpha + \alpha_0 FinDev_{jt} + \alpha_1 FinDev_{jt} \times ExtFin_s + \alpha_2 FinDev_{jt} \times Tang_s \\ &\quad + \Lambda_X X_{jst} + \varphi_j + \varphi_s + \varphi_t + \varepsilon_{jst} \end{aligned}$$

$$\begin{aligned} \min_{i \in TP_{jst}} MP_{ijst} &= \beta + \beta_0 FinDev_{jt} + \beta_1 FinDev_{jt} \times ExtFin_s + \beta_2 FinDev_{jt} \times Tang_s \\ &\quad + B_X X_{jst} + \phi_j + \phi_s + \phi_t + v_{jst} \end{aligned}$$

$$\begin{aligned} \min_{i \in TP_{jst}} MP_{ijst} &= \gamma + \gamma_0 FinDev_{jt} + \gamma_1 FinDev_{jt} \times ExtFin_s + \gamma_2 FinDev_{jt} \times Tang_s \\ &\quad + \gamma_3 \#TP_{jst} + \Gamma_X X_{jst} + \psi_j + \psi_s + \psi_t + \eta_{jst} \end{aligned}$$

Empirical Specification

□ Assuming stable pecking order across exporting countries:

- Financially developed countries have higher exports and more trade partners

$$\delta_1 > 0, \delta_2 < 0, \rho_1 > 0, \rho_2 < 0$$

- All exporters can enter the most profitable market in the world

$$\alpha_1 = \alpha_2 = 0$$

- Financially developed economies can go further down the pecking order

$$\beta_1 < 0, \quad \beta_2 > 0$$

- Number of trade partners pins down the least appealing destination's MP

$$\gamma_1 = \gamma_2 = 0, \quad \gamma_3 < 0$$

□ To allow varying pecking order across exporters:

- Use panel data on bilateral trade by sector with exporter, sector, year fixed effects
- Consider different dimensions of market potential that are invariant across exporting countries (eg. destination market size, bureaucratic import costs)

Data

- ❑ Core sample: 78 exporters, 175 destinations, 27 sectors, 1985-1995
- ❑ Bilateral trade flows (Feenstra 2000)
 - 164 exporters, 175 importers
- ❑ Financial development (Beck et al 2000)
 - Amount of credit extended by deposit-money banks and other financial institutions to the private sector, as a share of GDP
 - 150 countries, avg 0.414, st dev 0.364
- ❑ Importer characteristics
 - GDP (PWT)
 - Aggregate demand, measured as net imports + domestic output (UNIDO)

Data

❑ Trade costs

- Bilateral distance (CEPII)
- Regulation costs of trade (Doing Business Report)
- Logistics Performance Index (World Bank)
- ESCAP-World Bank trade cost index

❑ Control variables

- GDP per capita (PWT)
- Physical and human capital per capita (Caselli 2005)
- Natural resource endowments (World Bank)
- Sectoral factor intensities (Braun 2003)

Sectors' Financial Vulnerability

- ❑ Two commonly used indicators of sectors' technologically determined level of financial vulnerability
 - Liquidity needs: external finance dependence
 - Availability of collateral: asset tangibility

- ❑ Measures constructed from data on all publicly traded US-based companies from Compustat
 - Standard practice in the literature
 - Median firm's value of 1980-1999 average across firms in a sector
 - Measures and sector ordering stable over time

Sectors' Financial Vulnerability

- ❑ Three advantages to constructing measures from US firm-level data
 1. Sophisticated financial systems, so that the measures reflect firms' optimal choice over external financing and asset structure
 2. Sector measures are not endogenous to countries' level of financial development (possible downward bias)
 3. Identification requires that ranking of sectors, not levels, remain stable across countries

- ❑ External finance dependence: avg 0.242, st dev 0.330

- ❑ Asset tangibility: avg 0.298, st dev 0.139

First Glance: Importers

- Top importers are larger and richer economies with lower trade costs than bottom importers

Table 1
Top and bottom importers.

Country	Total imports (in billions)	Average number of partners	GDP (in billions)	GDP per capita (in thousands)	DB trade cost index
1. USA	459	94.6	6530	26.1	9.2
2. Germany	268	81.9	1540	19.4	7.4
3. France	177	80.9	1110	19.1	11.5
4. Great Britain	171	89.3	1030	17.9	8.9
5. Japan	136	65.0	2620	21.2	9.9
...					
103. Sierra Leone	0.156	15.7	4.57	1.14	23.3
104. Burundi	0.137	11.9	4.34	0.80	60.9
105. Central African Republic	0.122	10.8	3.91	1.34	74.1
106. Chad	0.114	7.8	5.73	0.99	79.7
107. Equatorial Guinea	0.063	6.6	0.50	1.43	28.3

Notes: Total imports, GDP, and GDP per capita are measured in 1996 international dollars. Average number of partners refers to the mean number of partners across sectors where imports are positive. Mean values over the period 1985–1995 given for the first four columns, values in 2007 for the last.

First Glance: Exporters

- Top exporters are financially more developed and penetrate into more and much smaller markets than bottom exporters

Table 2
Top and bottom exporters.

Country	Total exports (in billions)	Average number of partners	Private credit	Maximum destination GDP (in billions)	10th percentile destination GDP (in billions)
1. USA	351	130.0	0.91	2690	4.93
2. Germany	349	141.3	0.93	6534	4.68
3. Japan	302	121.0	1.63	6534	7.50
4. France	178	139.5	0.86	6534	4.22
5. Great Britain	160	146.1	0.95	6534	4.23
...					
103. Guinea-Bissau	0.025	4.3	0.03	2544	657
104. Central Africa Republic	0.020	3.4	0.07	2044	477
105. Equatorial Guinea	0.015	2.4	0.18	1362	682
106. Rwanda	0.008	3.3	0.09	3027	719
107. Burundi	0.007	3.0	0.09	1641	524

Notes: Total exports and GDP are measured in 1996 international dollars. Average number of partners refers to the mean number of partners across sectors where exports are positive. Private credit is the ratio of the amount of private credit by deposit money banks and other financial institutions to GDP. Mean values over the period 1985–1995 given.

Exports & Number of Trading Partners

- Financially advanced countries export relatively more and to more destinations in financially more vulnerable sectors

	Panel A	
	At least 1 partner	
Dependent variable:	(log) Exports	# TP
	(1)	(2)
$FinDev_{jt}$	0.150 (0.57)	-2.227 (-0.46)
$FinDev_{jt} \times ExtFin_s$	1.564 ^{***} (8.31)	41.942 ^{***} (13.44)
$FinDev_{jt} \times Tang_s$	-1.171 [*] (-1.89)	-17.045 ^{**} (-2.12)
Controls	log(GDP_{jt}) and j, s, t fixed effects	
R ²	0.82	0.90

Pecking Order of Market Sizes

Table 3
Market size.

Dependent variable:	Panel A		
	(log) GDP		
	Maximum	10th percentile	
	(1)	(2)	(3)
$FinDev_{jt}$	0.250* (1.81)	-0.150 (-0.70)	-0.206 (-1.16)
$FinDev_{jt} \times ExtFin_s$	0.044 (0.56)	-0.498*** (-3.71)	-0.047 (-0.37)
$FinDev_{jt} \times Tang_s$	-0.210 (-0.93)	0.809** (2.01)	0.536* (1.77)
# $Partners_{jst}$			-0.015*** (-11.93)
R ²	0.28	0.52	0.56
F-test on interaction terms (<i>p</i>)	0.64	<0.01	0.21

Pecking Order of Market Sizes

- Additional evidence on the pecking order stability using ranking of GDP
- Results robust to using aggregate consumption measures instead of GDP

Table 3
Market size.

Dependent variable:	Panel B		
	Ranking of GDP		
	Minimum	90th percentile	
	(1)	(2)	(3)
$FinDev_{jt}$	-1.534* (-1.88)	0.235 (0.06)	1.474 (0.47)
$FinDev_{jt} \times ExtFin_s$	-0.287 (-0.70)	10.740*** (4.27)	0.802 (0.41)
$FinDev_{jt} \times Tang_s$	1.602 (1.18)	-15.985** (-2.13)	-9.973* (-1.93)
# $Partners_{jst}$			0.333*** (15.68)
R ²	0.12	0.54	0.61
F-test on interaction terms (p)	0.50	<0.01	0.15

Economic Magnitudes

- Consider one standard deviation increase in private credit availability
 - The industry at the 90th percentile of external finance dependence (electrical machinery) sees the size of its smallest destination fall by 16.6 percentage points more than the industry at the 10th percentile (leather)
 - The industry at the 10th percentile of asset tangibility (footwear) sees the size of its smallest destination fall by 10.1 percentage points more than the industry at the 90th percentile (iron and steel)
 - The industry that experiences the biggest expansion into new export markets sees the size of its smallest destination fall by 32.0 percentage points more than the industry that benefits the least

Pecking Order of Trade Costs

Dependent variable:	Panel A			Panel B		
	(log) Bilateral distance			DB trade cost index		
	Minimum	90th percentile		Minimum	90th percentile	
	(1)	(2)	(3)	(1)	(2)	(3)
$FinDev_{jt}$	-0.055 (-0.60)	-0.089* (-1.84)	-0.079 (-1.59)	0.379 (1.29)	1.371 (0.71)	1.882 (1.11)
$FinDev_{jt} \times ExtFin_s$	-0.011 (-0.33)	0.082* (1.85)	-0.003 (-0.07)	0.149 (0.47)	3.514** (2.54)	-0.583 (-0.46)
$FinDev_{jt} \times Tang_s$	-0.119 (-1.50)	0.059 (0.63)	0.111 (1.18)	-0.294 (-0.50)	-1.115 (-0.48)	1.363 (0.75)
# Partners _{jst}			0.003*** (5.92)			0.137*** (13.04)
R ²	0.79	0.48	0.50	0.46	0.52	0.56
F-test on interaction terms (p)	0.32	0.15	0.50	0.76	0.04	0.74
Dependent variable:	Panel C			Panel D		
	Logistics Performance Index			ESCAP-WB trade costs		
	Maximum	10th percentile		Minimum	90th percentile	
	(1)	(2)	(3)	(1)	(2)	(3)
$FinDev_{jt}$	-0.009 (-0.43)	-0.044 (-0.85)	-0.056 (-1.20)	-1.784 (-0.55)	-8.325 (-0.87)	-3.640 (-0.43)
$FinDev_{jt} \times ExtFin_s$	0.001 (0.04)	-0.047 (-1.23)	0.052 (1.44)	0.645 (1.08)	30.099** (2.44)	-10.902 (-1.33)
$FinDev_{jt} \times Tang_s$	0.023 (0.55)	0.138* (1.71)	0.079 (1.12)	-2.562 (-1.30)	-24.775 (-1.22)	0.410 (0.03)
# Partners _{jst}			-0.003*** (-8.34)			1.382*** (18.13)
R ²	0.27	0.46	0.48	0.80	0.49	0.59
F-test on interaction terms (p)	0.86	0.15	0.15	0.26	0.03	0.40

Economic Magnitudes

- ❑ Financial conditions matter less for the set of export partners with respect to trade costs than with respect to market size
 - One standard deviation increase in private credit would raise the longest distance at which countries export by 1-3 percentage points more in the sector at the 90th percentile by financial vulnerability than in the sector at the 10th percentile
- ❑ No single measure of trade barriers uniquely characterizes the pecking order of exporting
- ❑ But collectively, evidence of financial frictions and trade costs jointly affecting the location of foreign sales

Pecking Order of Market Potential

- Summary measure of market potential: log ratio of GDP to distance
 - Larger and closer destinations are more attractive
 - Results robust to other trade cost measures and alternative formulations
 - Greater economic significance than with market size and trade costs on their own

Dependent variable:	Panel A		
	(log) GDP / bilateral distance		
	Maximum	10th percentile	
	(1)	(2)	(3)
<i>FinDev_{jt}</i>	0.282* (1.71)	-0.072 (-0.36)	-0.150 (-1.10)
<i>FinDev_{jt} × ExtFin_s</i>	0.013 (0.33)	-0.540*** (-3.01)	0.091 (0.66)
<i>FinDev_{jt} × Tang_s</i>	-0.060 (-0.49)	0.815* (1.89)	0.433 (1.47)
<i># Partners_{jst}</i>			-0.021*** (-16.14)
R ²	0.83	0.60	0.68
F-test on interaction terms(<i>p</i>)	0.89	<0.01	0.18

Pecking Order of Market Potential

- Summary measure of market potential: log number of exporters by sector
 - Revealed preference: more popular destination must be more profitable
 - Similar results with log number of exporters averaged across sectors

	Panel D		
Dependent variable:	(log) Number of exporters by sector		
	Maximum	10th percentile	
	(1)	(2)	(3)
$FinDev_{jt}$	0.032 (1.49)	0.008 (0.09)	-0.012 (-0.15)
$FinDev_{jt} \times ExtFin_s$	0.008 (0.54)	-0.150** (-2.46)	0.003 (0.06)
$FinDev_{jt} \times Tang_s$	-0.051 (-1.61)	0.128 (0.93)	0.035 (0.29)
$\# Partners_{jst}$			-0.005*** (-10.49)
R^2	0.87	0.71	0.73
F-test on interaction terms(p)	0.28	0.05	0.96

Pecking Order of Market Potential

- Preferred agnostic summary measure of market potential: importer-time fixed effect coefficient δ_{it} from auxiliary probit regression
 - $\Pr[j \text{ exports to } i \text{ in sector } s \text{ in year } t] = \Phi(\delta_{jt} + \delta_{it} + \delta_{st})$
 - Use δ_{it} as market potential measure in subsequent analysis

Dependent variable:	Panel F		
	Fixed effect coefficient from auxiliary probit regression		
	Maximum	10th percentile	
	(1)	(2)	(3)
$FinDev_{jt}$	0.059 (1.48)	-0.038 (-0.49)	-0.059 (-0.85)
$FinDev_{jt} \times ExtFin_s$	0.011 (0.48)	-0.201*** (-3.84)	-0.033 (-0.69)
$FinDev_{jt} \times Tang_s$	-0.050 (-0.79)	0.241** (2.34)	0.140 (1.85)
$\# Partners_{jst}$			-0.006*** (-12.69)
R ²	0.88	0.82	0.84
F-test on interaction terms(p)	0.73	<0.01	0.17

Robustness

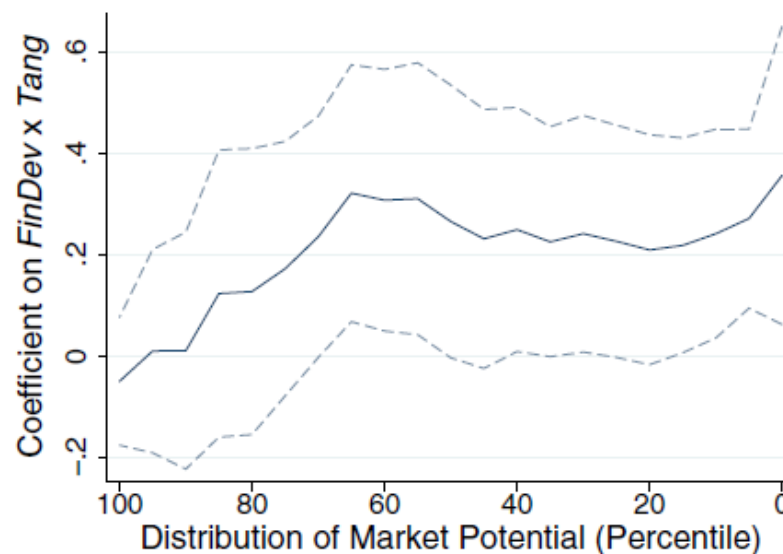
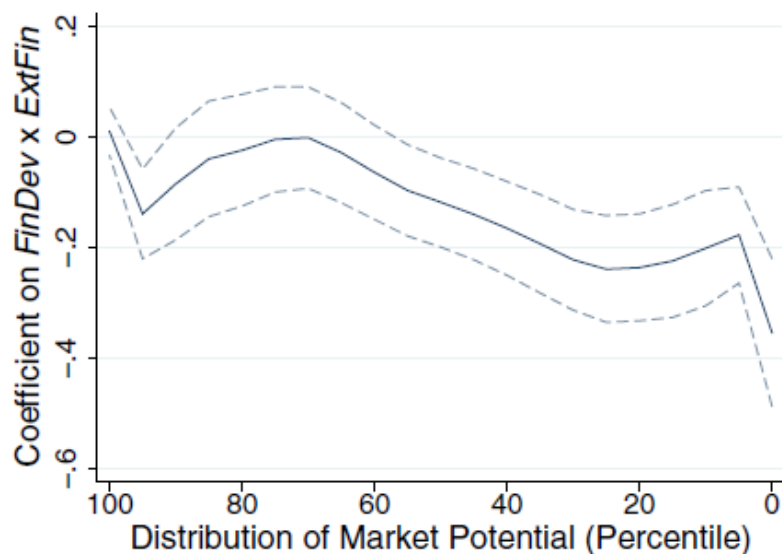
- ❑ Alternative financial development measures
 - Stock market value traded or stock market turnover: value of total shares traded divided by stock market capitalization or by GDP
 - Institutional quality: risk of contract repudiation, risk of expropriation, or accounting standards

- ❑ Control for broader institutional environment
 - Adding interactions of rule of law and corruption with financial vulnerability does not alter the results

- ❑ Functional form assumptions
 - One interaction term at a time
 - Rank (rather than level) of probit estimated coefficients
 - Logit and linear probability instead of probit

Nestedness

- Estimates for each destination MP percentile as the dependent variable
 - With perfect nestedness, financial development should not affect maximum (100th percentile) MP among destinations differentially across sectors, but should gradually reduce MP of other destinations as we move from 99th to 1st percentile
 - Estimates confirm that financially more developed countries smoothly go further down the pecking order of destinations in financially more vulnerable sectors



Conclusion

□ Theoretical framework

- Firms add trade partners in decreasing order of profitability, determined by market size and trade costs
- Financial frictions distort export decisions in countries with weak capital markets: financially advanced countries export to more destinations and go further down the pecking order of market potential, especially in financially vulnerable sectors

□ Empirical evidence

- Confirm results in Manova (2013) for variation in total exports and # destinations with exporters' financial development and sectors' financial vulnerability
- New: Analyze how max/min values of market potential among destinations vary with exporters' financial development and sectors' financial vulnerability
- New: Develop methodology for obtaining agnostic, comprehensive measure of market potential from observable data
- New: Demonstrate how market size and trade costs shape market potential