Firm Exports and MNC Activity Under Credit Constraints

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Motivation

- Growing evidence that credit constraints severely hamper trade activity
  - The strength of countries' financial institutions is an important determinant of the volume and sectoral composition of their export flows
  - Corroborative findings at the level of the firm
  - Credit tightening contributed to the collapse in trade during the recent crisis

- The role of financial frictions in trade has important policy implications
  - Many financially underdeveloped countries rely on trade for economic growth
  - Presumption that foreign direct and portfolio investment can offset the detrimental consequences of financial underdevelopment

- But limited direct evidence on the effect of credit constraints on firm exports and the potential mitigating role of cross-border capital flows
  - Little interaction between literatures on finance and trade and on MNCs' production and organizational decisions

This Paper

- An integrated analysis of the role that financial frictions play in:
  - Constraining firms' export participation
  - Shaping the spatial and sectoral composition of MNC activity

- Identification strategy: exploit the variation in export performance across sectors at different levels of financial vulnerability and across firms of different ownership types
  - Use rich customs data on the universe of Chinese exporting firms
  - Isolate a causal effect of credit constraints on firms' extensive and intensive margin of trade
  - Identify how financial considerations impinge on MNC decisions

Main Findings

- Foreign affiliates and joint ventures outperform private domestic firms, especially in sectors at higher levels of financial vulnerability
  - Advantage particularly strong when firms face high export costs
  - Evidence that credit constraints restrict firms' export activity and affect the organizational decisions of multinational enterprises
  - MNC affiliates have a comparative advantage in financially dependent sectors because they can tap internal capital markets

- Financial frictions hamper firms' extensive and intensive margin of trade
  - Firms face binding constraints in the financing of both fixed and variable costs
  - Limited access to capital distorts trade flows more than domestic activities
  - This has implications for the role of credit constraints in the adjustment to trade reforms, exchange rate movements and other cost or demand shocks

Contribution to the Literature

- Country- and firm-level evidence on the detrimental effects of financial frictions on trade (Beck 2002,2003, Becker-Greenberg 2007, Manova 2007, Greenaway et al. 2007, Muûls 2008, Berman-Héricourt 2008, Amiti-Weinstein 2009, Minetti-Zhu 2010, Bricongne et al. 2010)
- Recent work on MNC activity under financial frictions (Desai-Foley-Forbes 2008, Antràs-Desai-Foley 2009, Chor-Foley-Manova 2007, Buch et al. 2009)
- Evidence on the role of foreign equity flows in alleviating the impact of credit constraints on trade (Harrison-McMillan-Love 2004, Manova 2008)
- Literature on the importance of financial integration in promoting growth, investment and entrepreneurship in host countries (Alfaro-Charlton 2007, Alfaro et al. 2009)

Outline

1. Theoretical background
2. Data
3. Empirical results
4. Next steps

Why Exporters Require External Finance

- Firms routinely rely on external capital to cover upfront costs that cannot be financed out of retained earnings or cash flows from operations

- Exporting even more dependent on external finance than manufacturing for the home country
  - Additional up-front costs specific to export activities
  - Cross-border shipments take 30-90 days longer to process
  - International transactions are riskier

- Very active market for the financing and insurance of international transactions, worth $10-$12 trillion in 2008
  - 90% of world trade relies on some form of trade finance

Financial Vulnerability Across Sectors

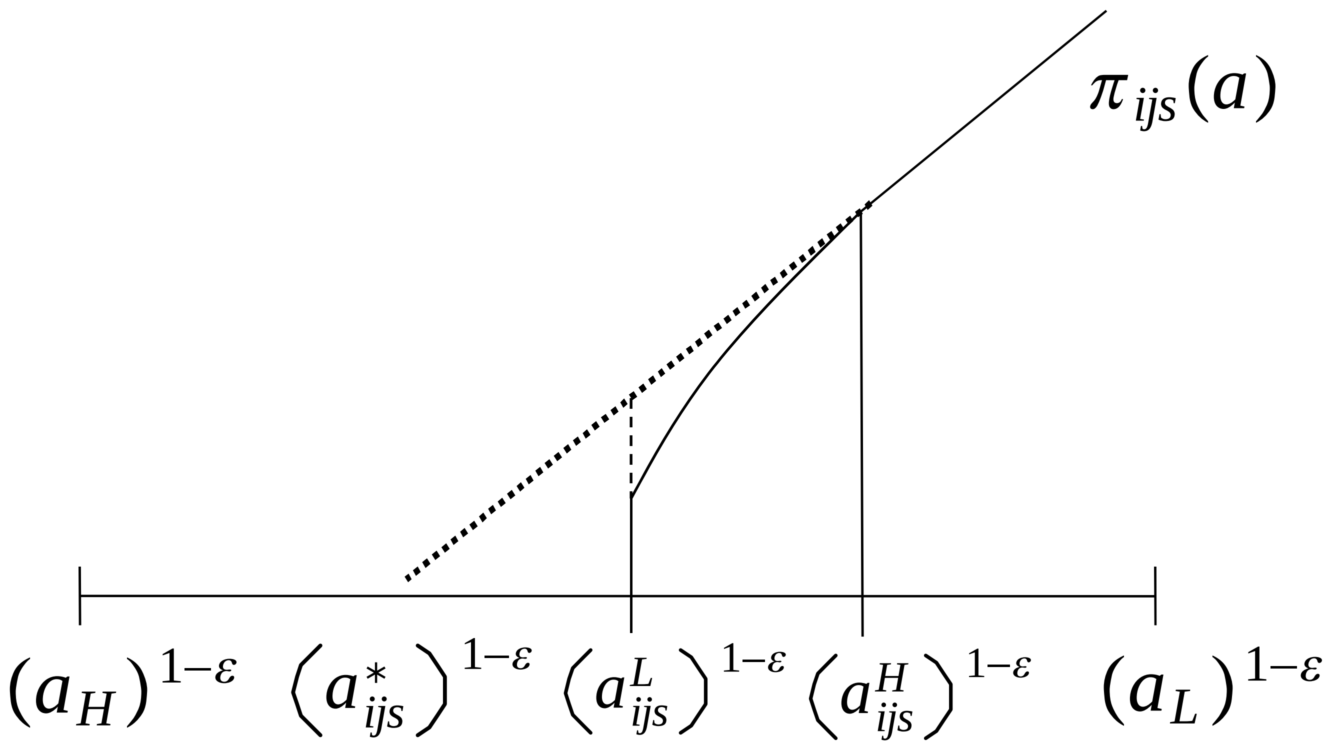
- Industries differ substantially in their reliance on the financial system for technological reasons that are innate to the nature of the manufacturing process and beyond the control of individual firms

- Two measurable dimensions of sectors' financial vulnerability:
  - Liquidity needs: requirements for external finance (Rajan-Zingales 1998)
  - Availability of collateral: asset tangibility (Braun 2003, Claessens-Laeven 2003)

Theoretical Background

- Setup: exporters require external capital which they can raise by pledging collateral (Manova 2008)
  - More productive firms less credit constrained because they can offer investors higher repayment when contract is enforced
- Key implications:
  - Financial frictions reinforce the selection of only the most productive firms into exporting and preclude potentially profitable firms from exporting
  - If firms require external finance for variable costs, credit constraints also restrict the volume of firms' exports
  - With repeated fixed costs of exporting at the destination-product level, credit constraints limit firms' export product scope and trade partner intensity
  - Bigger distortions in financially dependent sectors

Credit Constraints and Firms' Export Activity



MNCs and Internal Capital Markets

- Relative to domestic firms, the affiliates of foreign multinationals have access to additional financing via internal capital markets
  - Headquarters can fund affiliate operations when they cannot raise sufficient capital in local financial markets
  - Conditional on foreign ownership, expect MNC affiliates to enjoy a comparative advantage in financially vulnerable sectors

- MNCs' integration decisions are endogenous (Antràs-Desai-Foley 2009)
  - In the presence of financial frictions, headquarters more likely to integrate affiliates in financially vulnerable sectors
  - Foreign ownership alleviates credit constraints either directly through parent financing or indirectly by providing monitoring to incentivize local financiers

Multi-Sector Firms

- Credit constraints can also affect the activities of multi-sector firms
  - Firms with limited access to external finance will direct resources towards sectors with lower requirements for outside capital and sectors with greater endowments of collateralizable assets
  - This adjustment is not only optimal for given total availability of external credit, but can also improve firms' ability to raise outside finance

- Testable implications
  - Relative to domestic firms, MNCs will earn higher export revenues from more products and destination markets in more financially vulnerable sectors, even controlling for firm fixed effects

Other Effects of Credit Constraints

- Limited access to external finance can constrain a firm's export activity at any level of firm export potential

- But credit constraints can also directly affect firms' export potential by …
  - … curtailing productivity upgrading via investment in superior production technologies
  - … precluding improvements in product quality via the use of better intermediate inputs and more skilled workers

- Our empirical analysis captures the total effect of credit constraints on firm export performance, via all three channels
  - Data limitations make it difficult to separately evaluate each mechanism
  - Evidence from quantity and price data suggest capacity constraints important

Chinese Trade Data

- Detailed customs records on the universe of Chinese trading firms (Manova-Zhang 2008)
  - Firm-level data on exports by product and trade partner
  - Firm ownership types: private domestic, SOE, joint venture, MNC affiliate
  - 96,522 exporters, 6,908 HS-8 products, 231 destinations
  - Annual data for 2005

Note: We exclude wholesalers that serve as intermediaries between foreign and domestic firms but do not manufacture

Note: We exclude SOEs as the Chinese government exerts considerable pressure over their activities and sectoral orientation

Sectors' Financial Vulnerability

- Four commonly used indicators of sectors' technologically-determined level of financial vulnerability
  - Liquidity needs: external finance dependence, R&D intensity, inventories-to-sales ratio
  - Availability of collateral: asset tangibility

- Measures constructed from data on all publicly-traded US-based companies from Compustat (Kroszner-Laeven-Klingebiel 2007)
  - 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 system ➔ firms' optimal asset structure and use of external finance
  2. Sector measures not endogenous to China's level of financial development (possible downward bias)
  3. Identification requires that ranking of sectors, not levels, remain stable across countries

Sectors' Financial Vulnerability

- Measures capture firms' overall financing decisions and asset composition, and are not specific to international trade activities
- However, these measures reflect technological characteristics that shape both domestic and cross-border production and sales
  1. Manufacturing costs same for home and foreign market, and large part of total export costs
  2. Products that entail a lot of R&D, marketing research and distribution costs at home plausibly also require similarly large fixed costs for product customization, marketing and distribution networks in foreign markets
  3. Compustat firms are typically large exporters
- Identification requires only that ranking of sectors similar for domestic production and exporting

A First Glance at the Data

- Foreign affiliates and joint ventures mediate a bigger share of Chinese exports in financially vulnerable sectors relative to private domestic firms

Firm Type	All Firms	State Owned	Private Domestic	Joint Ventures	Foreign Owned
Total Exports	531.36	9.8%	12.9%	26.3%	51.0%
Panel A. Classifying sectors by external finance dependence					
Low	58.88	10.7%	21.1%	27.6%	40.6%
Medium	234.09	11.8%	12.0%	24.1%	52.1%
High	238.38	7.6%	11.6%	28.2%	52.6%
Panel B. Classifying sectors by R&D intensity					
Low	156.18	18.1%	23.1%	28.4%	30.4%
High	375.18	6.3%	8.6%	25.4%	59.6%

A First Glance at the Data

- Foreign affiliates and joint ventures mediate a bigger share of Chinese exports in financially vulnerable sectors relative to private domestic firms

Firm Type	All Firms	State Owned	Private Domestic	Joint Ventures	Foreign Owned
Total Exports	531.36	9.8%	12.9%	26.3%	51.0%
Panel C. Classifying sectors by inventories-to-sales ratio					
Low	52.55	22.4%	21.2%	28.7%	27.6%
Medium	95.89	19.2%	25.2%	27.7%	27.9%
High	382.91	5.7%	8.6%	25.6%	60.0%
Panel D. Classifying sectors by asset tangibility					
Low	384.20	5.7%	8.6%	25.6%	60.1%
Medium	91.07	15.6%	25.8%	28.5%	30.1%
High	56.09	28.4%	20.8%	27.6%	23.2%

Estimation Strategy

- Exploit the variation in exports across firms with different organizational structure and across sectors at different levels of financial vulnerability

$$\log Exports_{fi} = \alpha_0 + \alpha_1 \cdot D_{JV} + \alpha_2 \cdot D_{MNC} +$$
$$+\beta \cdot FinVuln_i \cdot D_{JV} + \gamma \cdot FinVuln_i \cdot D_{MNC} + \varphi_i + \varepsilon_{fi}$$

  - Industry FE control for sectors' factor costs, trade costs, demand shocks, ...
  - Ownership dummies control for differences in average productivity, product quality, managerial talent, worker skill, tax treatment, total external finance ...

Credit Constraints and Firm Exports

Dep variable: log firm exports by 3-digit ISIC sector
209,329 observations, 88,005 firms, 29 sectors

Financial vulnerability measure:	Ext Fin Dependence	R&D Intensity	Inventories Ratio	Asset Tangibility
Joint venture	0.525	0.343	-0.297	1.022
	(28.65)***	(14.09)***	(-3.62)***	(19.71)***
MNC affiliate	0.320	-0.025	-0.904	1.328
	(20.88)***	(-1.21)	(-12.75)***	(29.90)***
JV x Fin vuln	**0.336**	**7.317**	**4.739**	**-1.866**
	(5.72)* **	**(8.69)*** **	**(9.85)*** **	**(-10.70)*** **
MNC x Fin vuln	**0.511**	**13.979**	**7.053**	**-3.773**
	(10.54)* **	**(20.37)*** **	**(17.03)*** **	**(-25.11)*** **
Sector FE	Y	Y	Y	Y
R-squared	0.151	0.152	0.151	0.153

Firm Selection into Exporting

- Credit constraints are predicted to both reduce firms' export capacity and deter the least productive firms from exporting altogether

$$\log Exports_{fi} = \alpha_0 + \alpha_1 \cdot D_{JV} + \alpha_2 \cdot D_{MNC} +$$
$$+\beta \cdot FinVuln_i \cdot D_{JV} + \gamma \cdot FinVuln_i \cdot D_{MNC} + \varphi_i + \varepsilon_{fi}$$

- The estimates so far captured both effects, and thus under-estimated the effect of credit constraints at the firm level:
  - *ß* and *γ* reflect systematic differences across sectors between the exports of the *average* firm in a given sector and ownership type and the *average* private domestic firm in that sector
  - Since credit constraints reinforce the selection of only the most productive firms into exporting, the selection effect biases *ß* and *γ* down

Variation Across Sectors Within Firms

- Firm FE isolate the effect of credit constraints on exports at the firm level
  - Identification from variation across sectors within multi-sector firms reflects how firms allocate limited resources across exporting in different industries

Dep variable: log firm exports by 3-digit ISIC sector

Financial vulnerability measure:	Ext Fin Dependence	R&D Intensity	Inventories Ratio	Asset Tangibility
JV x Fin vuln	0.787	13.360	8.511	-3.110
	(10.56)***	(11.26)***	(13.02)***	(-13.13)***
MNC x Fin vuln	0.757	17.009	8.417	-3.988
	(12.64)***	(18.55)***	(15.82)***	(-20.63)***
Sector FE	Y	Y	Y	Y
Firm FE	Y	Y	Y	Y
R-squared	0.525	0.526	0.526	0.526
# observations	209,317	209,317	209,317	209,317

The Advantages of Foreign Ownership

- Foreign affiliates and joint ventures export more than domestic firms, and this advantage is systematically bigger in financially vulnerable sectors
  - MNC affiliates (joint ventures) outperform private Chinese firms by 20% (13%) more in sectors highly dependent on external capital relative to sectors with low dependence on outside finance
  - Corresponding numbers are 72% (35%) for sectors intensive in soft assets relative to sectors with high asset tangibility
- Sectoral composition of firms' exports tends to vary monotonically with the share of foreign ownership
  - Consistent with parent companies providing more internal financing at higher levels of foreign ownership because of greater monitoring rights or managerial control

Endogeneity of Foreign Ownership

- Concern 1: MNCs may have greater incentives to pursue greenfield FDI or integrate supplier in financially vulnerable sectors
  - Ensure constrained suppliers can make relationship-specific investments
  - Less competition in local market for specialized inputs and in output markets
  - Both consistent with financial frictions affecting firm exports and MNC activity

- Concern 2: MNCs may outperform domestic firms on average if they intentionally integrate firms with bigger export potential
  - But this cannot rationalize systematic variation across sectors
  - If MNC headquarters specifically target better Chinese firms in financially vulnerable sectors, they plausibly do so precisely because they have a comparative advantage in such sectors due to binding credit constraints

➔ Endogeneity not a concern for the interpretation of the results

Other Determinants of MNC Activity

- Concern: sector measures of financial vulnerability are correlated with other sector characteristics that affect MNC activity
  - Vertical integration more likely than arms-length outsourcing in capital, R&D and contract intensive sectors because of relationship-specific investments or risk of expropriation of intellectual property
  - MNCs may have a comparative advantage in technologically sophisticated products (although this may reflect easier access to external financing)

- Our results appear to reflect a credit constraints channel
  - 4 different, imperfectly correlated measures of sectors’ financial vulnerability
  - Results robust to controlling for sectors’ physical and human capital intensity
  - Results robust to controlling for sectors’ contract intensity
  - Results for external finance dependence, asset tangibility and inventories-to-sales ratio robust to controlling for sectors’ R&D intensity

Robustness I: Factor Intensities

Dep variable: (log) firm exports by 3-digit ISIC sector
203,989 observations, 87,291 firms, 28 sectors

Financial vulnerability measure:	Ext Finance Dependence	R&D Intensity	Inventories Ratio	Asset Tangibility
JV x Fin vuln	**0.751**	**8.934**	**3.485**	**-0.065**
	(9.76)* **	**(6.77)*** **	**(4.40)*** **	**(-0.15)**
MNC x Fin vuln	**0.680**	**13.220**	**2.992**	**-2.776**
	(10.89)* **	**(12.86)*** **	**(4.57)*** **	**(-7.75)*** **
JV x K/L	-17.57	-15.93	-14.77	-17.40
	(-17.42)***	(-15.39)***	(-12.31)***	(-9.79)***
MNC x K/L	-17.97	-15.68	-15.63	-8.94
	(-21.74)***	(-18.48)***	(-15.66)***	(-6.16)***
JV x H/L	1.69	1.51	1.84	2.01
	(11.01)***	(9.11)***	(11.84)***	(12.41)***
MNC x H/L	1.75	1.32	1.92	1.69
	(14.33)***	(9.97)***	(15.59)***	(13.21)***
Sector FE, Firm FE	Y	Y	Y	Y
R-squared	0.528	0.528	0.528	0.528

Robustness II: R&D Intensity

Dep variable: (log) firm exports by 3-digit ISIC sector
209,317 observations, 88,004 firms, 29 sectors

Sector measure of financial vulnerability:	Ext Finance Dependence	Inventories Ratio	Asset Tangibility
JV x Fin vuln	**0.412** **(4.28)*** **	**7.237** **(10.81)*** **	**-2.614** **(-10.68)*** **
MNC x Fin vuln	**0.050** **(0.63)**	**6.497** **(11.89)*** **	**-3.270** **(-16.30)*** **
JV x R&D intensity	9.205 (6.00)***	10.466 (8.61)***	10.128 (8.27)***
MNC x R&D intensity	16.475 (13.52)***	14.445 (15.34)***	12.879 (13.54)***
Sector FE, Firm FE	Y	Y	Y
R-squared	0.526	0.527	0.527

Robustness III: Contract Intensity

Dep variable: (log) firm exports by 3-digit ISIC sector
209,317 observations, 88,004 firms, 29 sectors

Sector measure of financial vulnerability:	Ext Finance Dependence	R&D Intensity	Inventories Ratio	Asset Tangibility
JV x Fin vuln	**0.788**	**14.236**	**8.558**	**-3.247**
	(9.00)***	**(9.38)*****	**(11.01)*****	**(-11.40)*****
MNC x Fin vuln	**0.747**	**16.845**	**8.389**	**-3.949**
	(10.95)***	**(15.50)*****	**(13.63)*****	**(-17.70)*****
JV x Contract intensity	-0.483	-1.009	-0.720	-0.962
	(-1.75)*	(-3.60)***	(-2.61)***	(-3.46)***
MNC x Contract intensity	0.879	0.231	0.749	0.396
	(3.96)***	(1.02)	(3.37)***	(1.78)*
Sector FE, Firm FE	Y	Y	Y	Y
R-squared	0.525	0.526	0.526	0.526

Firm Size vs. Ownership Structure

- Concern: MNCs are larger than domestic firms and bigger firms are known to be less credit constrained
  - Explanation still consistent with credit constraints restricting firms' export activity, but foreign affiliates less constrained because their size facilitates access to external capital and not because of MNC internal capital markets
- Our results suggest that MNCs' advantage is large even controlling for firm size
  - Proxy size with firms' total export revenues, across all markets and sectors
  - Results robust to controlling for interaction of firm size with sectors' financial vulnerability

Robustness IV: Firm Size

Dep variable: (log) firm exports by 3-digit ISIC sector
209,317 observations, 88,004 firms, 29 sectors

Sector measure of financial vulnerability:	Ext Finance Dependence	R&D Intensity	Inventories Ratio	Asset Tangibility
JV x Fin vuln	**0.690**	**10.604**	**6.670**	**-2.569**
	(9.23)* **	**(8.89)*** **	**(10.18)*** **	**(-10.84)*** **
MNC x Fin vuln	**0.692**	**14.903**	**7.259**	**-3.687**
	(11.51)* **	**(16.18)*** **	**(13.63)*** **	**(-19.10)*** **
Firm size x Fin vuln	0.188	4.136	3.316	-1.289
	(12.98)***	(20.11)***	(26.40)***	(-28.19)***
Sector FE, Firm FE	Y	Y	Y	Y
R-squared	0.526	0.527	0.528	0.529

Credit Constraints, Exports and MNCs

- Implications:
  1. Credit constraints restrict firms' export activity and lead to large inefficiencies
  2. Financial frictions distort both the selection of firms into export markets and firm-level trade flows
  3. MNC affiliates less constrained because they can tap internal capital markets
  4. Credit conditions shape the sectoral and spatial composition of MNC activity

Intensive vs. Extensive Margin of Firm Exports

- Two dimensions of firms' intensive margin of exports:
  - export revenues by sector and destination
  - export revenues by product and destination
- Four dimensions of firms' extensive margin of exports:
  - # products, # destinations, # destination-product markets by sector
  - # products by sector and destination
- Result:
  - Foreign affiliates and joint ventures have higher bilateral exports than domestic firms, especially in financially vulnerable sectors
  - Foreign affiliates and joint ventures enter more destination-product markets than domestic firms, especially in financially vulnerable sectors

Intensive vs. Extensive Margin of Firm Exports

- Implications:
  1. Exporters face binding credit constraints in the financing of both fixed and variable trade costs
  2. Foreign ownership alleviates these constraints via internal capital markets
  3. Credit constraints have an effect on export participation above and beyond that on domestic production

The Intensive Margin of Firm Exports

- Two dimensions of firms' intensive margin of exports:
  - export revenues by sector and destination
  - export revenues by product and destination

- Exploit the variation in exports across firms with different organizational structure, across sectors at different levels of financial vulnerability, and across different destination countries

$$\log Exports_{fdi} = \alpha_0 + \beta \cdot FinVuln_i \cdot D_{JV} + \gamma \cdot FinVuln_i \cdot D_{MNC} + \varphi_f + \varphi_d + \varphi_i + \varepsilon_{fdi}$$

  - Industry FE control for sectors' trade costs, demand shocks, etc.
  - Country FE control for trade partner's market size, trade costs, consumer income, bilateral exchange rate, etc.
  - Firm FE control for firms' productivity, managerial talent, total external finance, etc.

Firms' Bilateral Exports by Sector

Dep variable: log firm exports by sector and destination

Financial vulnerability measure:	Ext Fin Dependence	R&D Intensity	Inventories Ratio	Asset Tangibility
JV x Fin vuln	0.783 (27.62)***	12.796 (28.56)***	10.022 (37.81)***	-3.150 (-32.87)***
MNC x Fin vuln	0.708 (30.81)***	12.769 (35.87)***	11.412 (53.00)***	-4.207 (-53.21)***
Sector FE	Y	Y	Y	Y
Destination FE	Y	Y	Y	Y
Firm FE	Y	Y	Y	Y
R-squared	0.370	0.370	0.371	0.371
# observations	953,475	953,475	953,475	953,475

The Extensive Margin of Firm Exports

- Four dimensions of firms' extensive margin of exports:
  - # products, # destinations, # destination-product markets by sector
  - # products, by sector and destination

- Exploit the variation across firms with different organizational structure and across sectors at different levels of financial vulnerability (& across countries)

$$\log \#ProdDest_{fi} \; (or \; \log \#Products_{fi} \; or \; \log \#Dest_{fi}) =$$

$$= \alpha_0 + \beta \cdot FinVuln_i \cdot D_{JV} + \gamma \cdot FinVuln_i \cdot D_{MNC} + \varphi_f + \varphi_i + \varepsilon_{fi}$$

$$\log \#Products_{fdi} = \alpha_0 + \beta \cdot FinVuln_i \cdot D_{JV} + \gamma \cdot FinVuln_i \cdot D_{MNC} + \varphi_f + \varphi_d + \varphi_i + \varepsilon_{fdi}$$

Firms' # Destination-Product Markets

Dep variable: log exporters' # destination-product markets by sector

Financial vulnerability measure:	Ext Fin Dependence	R&D Intensity	Inventories Ratio	Asset Tangibility
JV x Fin vuln	0.161***	3.750***	0.966***	-0.473***
MNC x Fin vuln	0.050**	3.960***	0.285	-0.523***
Sector FE	Y	Y	Y	Y
Firm FE	Y	Y	Y	Y
R-squared	0.538	0.538	0.538	0.538
# observations	209,317	209,317	209,317	209,317

Firms' # Products by Sector and Destination

Dep variable: log exporters' # products by sector and destination

Financial vulnerability measure:	Ext Fin Dependence	R&D Intensity	Inventories Ratio	Asset Tangibility
JV x Fin vuln	-0.001	1.200***	0.585***	-0.299***
MNC x Fin vuln	-0.046***	1.632***	0.690***	-0.459***
Sector FE	Y	Y	Y	Y
Destination FE	Y	Y	Y	Y
Firm FE	Y	Y	Y	Y
R-squared	0.352	0.353	0.352	0.353
# observations	953,475	953,475	953,475	953,475

Interpreting the Results

- Credit constraints restrict firms' ability to expand export scale, to enter more markets and to broaden product scope
  - Foreign affiliates and joint ventures have higher bilateral exports and enter more destination-product markets than domestic firms, especially in financially vulnerable sectors

- Implications:
  1. Exporters face binding credit constraints in the financing of both fixed and variable trade costs
  2. Foreign ownership alleviates these constraints via internal capital markets
  3. Credit constraints have an effect on export participation above and beyond that on domestic production

Export Quantities vs. Export Prices

- Limited access to external finance can constrain firms' export activity through different channels
- Mechanism 1: restricted capacity to export at full potential
  - Foreign affiliates and joint ventures indeed export greater quantities than domestic firms, especially in financially vulnerable sectors
- Mechanism 2: lower export potential
  - Product quality: joint ventures have higher export prices than domestic firms in financially vulnerable sectors
  - Production efficiency: foreign affiliates have lower export prices than domestic firms in financially vulnerable sectors

Trade Costs Across Destinations

- Credit constraints presumably restrict trade flows because firms are unable to finance the costs associated with exporting

- Trade costs vary widely across export destinations
  - Bilateral distance
  - Fixed costs of market entry
    (cost, procedures or days to set up a new business, *Doing Business*)

- Result: foreign affiliates and joint ventures export relatively more than domestic firms in financially vulnerable sectors, particularly when they face high export costs
  - Confirms mechanism and corroborates interpretation above

Trade Costs Across Destinations

Dep variable: (log) firm exports by 3-digit ISIC sector and destination

Sector measure of financial vulnerability:	Ext Finance Dependence	R&D Intensity	Inventories Ratio	Asset Tangibility
Panel A. Bilateral distance to China. 952,463 observations				
JV x Distance	0.063***	0.028***	-0.145***	0.148***
MNC x Distance	0.028***	-0.003	-0.209***	0.137***
Distance x Fin vuln	-0.071***	-2.616***	-1.176***	0.274***
JV x Distance x Fin vuln	**0.088*****	**1.441*****	**1.144*****	**-0.359*****
MNC x Distance x Fin vuln	**0.078*****	**1.382*****	**1.287*****	**-0.476*****
R-squared	0.370	0.370	0.371	0.371
Panel B. Dummy for high cost of doing business. 885,938 observations				
JV x High cost	-0.070***	-0.139***	-0.523***	0.104***
MNC x High cost	-0.138***	-0.210***	-0.629***	0.096***
High cost x Fin vuln	-0.107***	-2.066***	-2.328***	0.861***
JV x High cost x Fin vuln	**0.195*****	**2.524*****	**2.564*****	**-0.682*****
MNC x High cost x Fin vuln	**0.174*****	**2.726*****	**2.787*****	**-0.899*****
R-squared	0.372	0.372	0.373	0.373
Firm, Destination, Sector F.E.	Y	Y	Y	Y

Future Steps I

1. The identity of firms' trade partners
   - Pecking order of export destinations by size and financial development
   - Do foreign affiliates go further down this pecking order than domestic firms, especially in financially vulnerable sectors?

Future Steps II

2. Arms-length vs. intra-firm trade
   - Headquarters that engage in arms-length outsourcing may offer trade credit to Chinese producers
   - With asymmetric information, such trade credit is likely to be more limited than under integration but more generous than that offered by an importer that engages in "ordinary" trade
   - Do Chinese processing-and-assembly exporters outperform ordinary-trade exporters, especially in financially vulnerable sectors?
   - Do more constrained firms opt for pure assembly vs. processing-with-assembly, and how does that affect firm profits?

Conclusions

- Understanding the role of financial frictions for firms' export performance has important policy implications, particularly for financially underdeveloped countries that depend on trade for economic growth

- New firm-level evidence of the causal effect of credit constraints on:
  - firms' export activity (export sales, product scope, number of trade partners)
  - the spatial and sectoral composition of MNC activity

- FDI may mitigate the detrimental effects of credit market frictions on growth, trade and private sector development …
  - … at the expense of greater volatility and exposure to global crises?