

Credit Constraints, Equity Market Liberalizations and International Trade

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Links: Kalina Manova's [webpage](#) and [research portfolio](#), [this paper](#), and [these slides](#)

Motivation

- ❑ International trade models traditionally assume that resources are perfectly and instantaneously allocated in an economy
 - Comparative advantage based on cross-country differences in factor endowments and productivity leaves many trade patterns unexplained

- ❑ An important recent advance in the trade literature is the study of different market and institutional frictions
 - Rule of law, labor market rigidities, financial market imperfections
 - Motivated by results in the development, growth and finance literatures on the disruptive effects of financial constraints

- ❑ Growing evidence that credit conditions have a first-order effect on international trade and investment activity

This Paper

- ❑ Empirical evidence that credit constraints are an important determinant of international trade flows
 - Equity market liberalizations increase exports disproportionately more in financially vulnerable sectors
 - Consistent results for long-term effects based on panel of countries and for short-term changes based on event study of countries that removed capital controls

- ❑ Reforms that liberalize foreign investors' access to domestic stock market constitute a shock to the availability of external finance and allow causal inference
 - Previous cross-sectional approaches subject to endogeneity concerns: foreign demand shocks can increase both exports in financially vulnerable sector and observed economy-wide borrowing in absence of financial frictions

- ❑ Equity market reforms provide a policy-relevant exercise

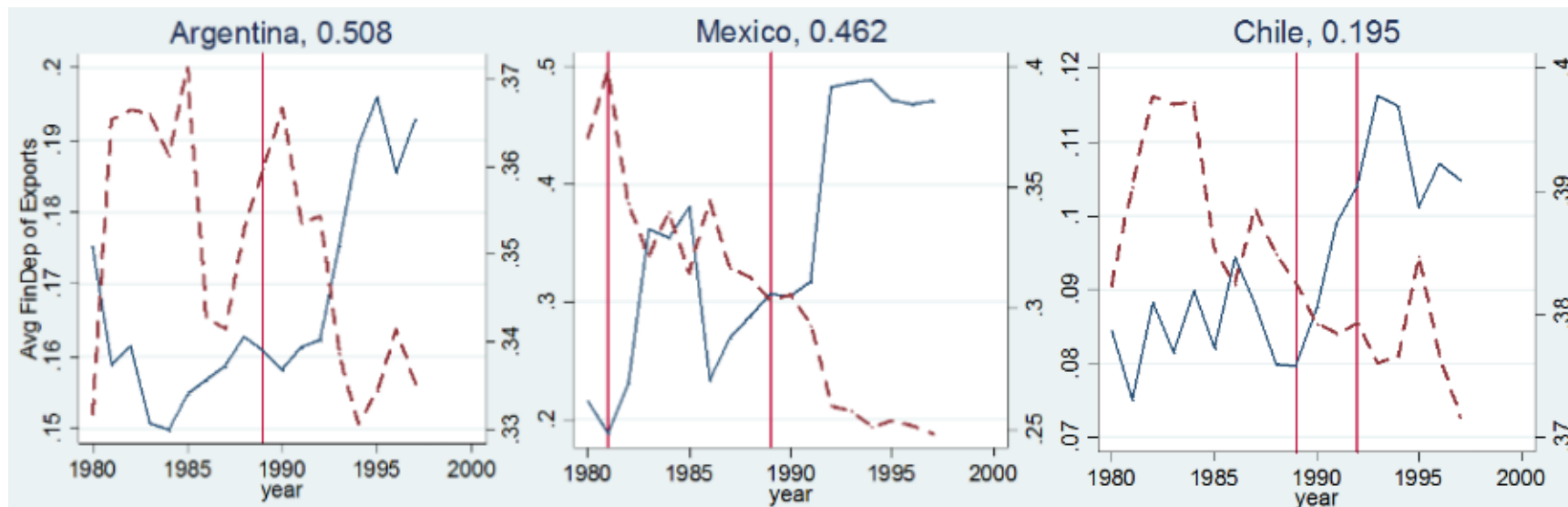
This Paper

- ❑ Within three years after an equity market liberalization...
 - Exports of sectors with high external finance dependence (textiles, 75th percentile) increase by 13 percentage points more than exports of less financially dependent sectors (mineral products, 25th percentile)
 - Exports of low tangibility sectors (other chemicals, 25th percentile) grow by 17 percentage points more than exports of high tangibility sectors (wood products, 75th percentile)

- ❑ Effects of liberalizations more pronounced in economies with initially less active stock markets
 - Foreign equity flows may substitute for weak domestic financial system

Financial Vulnerability of Exports

- Pronounced jump in the average financial vulnerability of country exports following stock market reform
 - Blue solid lines: average external finance dependence of exports
 - Red dashed lines: average asset tangibility of exports
 - Vertical lines: reform dates, first sign and official
 - Graph heading: country and reform intensity (% stock market foreigners allowed to invest in)



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 upfront 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

Outline

1. Introduction and motivation
- 2. Data and descriptive statistics**
3. Results
 1. Panel analysis
 2. Event study
 3. Domestic stock market activity and trade openness
4. Conclusion

Data Sources

- ❑ 91 countries, 27 ISIC sectors, 1980-1997
- ❑ Sectoral export flows (Feentra 2000)
- ❑ Equity market liberalization measures (Bekaert et al 2005)
- ❑ Sectoral external capital dependence and asset tangibility (Braun 2003)

Equity Market Liberalization

- ❑ Available for 91 countries, 1980-1997
 - 39 countries opened to foreign equity flows
 - 16 liberalized prior to 1980
 - 36 maintained stock market restrictions

- ❑ Two reform dates: official and first sign
 - First sign: earliest of official liberalization, first American Depository Receipt announcement, or first country fund launch
 - Pre- and post-reform dummy

- ❑ Intensity of stock market reform
 - Reflects the fraction of the equity market foreigners are allowed to invest in
 - Varies between 0 and 1, average 46% (across the 55 countries that liberalized)

Sector 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

Sector Financial Vulnerability

- Three advantages to constructing measures from US firm-level data
 1. Sophisticated financial systems, so that the measure 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

First Glance

- ❑ 29 countries with open and 62 countries with closed stock markets in 1990
- ❑ Exports greater in financially liberalized countries, more so in financially vulnerable sectors

A. Cross-section, by external finance dependence

	Liberalized equity markets	Closed equity markets	Difference
High FinDep	15.24 (377)	11.73 (806)	3.51
Low FinDep	14.35 (406)	11.79 (868)	2.56
Difference	0.89	-0.06	0.95

B. Cross-section, by asset tangibility

	Liberalized equity markets	Closed equity markets	Difference
High Tang	14.47 (377)	11.95 (806)	2.53
Low Tang	15.14 (406)	11.55 (868)	3.59
Difference	-0.67	0.40	-1.07

First Glance

- ❑ 39 countries that removed capital flow restrictions
- ❑ Exports greater after the liberalization, more so in financially vulnerable sectors

C. Liberalization episodes, by external finance dependence

	After liberalization	Before liberalization	Difference
High FinDep	13.38 (507)	13.09 (507)	0.29
Low FinDep	12.77 (546)	12.59 (546)	0.18
Difference	0.61	0.50	0.11

D. Liberalization episodes, by asset tangibility

	After liberalization	Before liberalization	Difference
High Tang	12.97 (507)	12.79 (507)	0.19
Low Tang	13.22 (546)	12.92 (546)	0.30
Difference	-0.25	-0.14	-0.12

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Panel Analysis: Specification

$$T_{cit} = \beta_0 \text{Liberal}_{ct} + \beta_1 \text{Liberal}_{ct} \times \text{FinDep}_i + \beta_2 \text{Liberal}_{ct} \times \text{Tang}_i + \alpha_0 + \alpha_1 \text{GDP}_{ct} + \eta_c + \eta_i + \eta_t + \varepsilon_{cit}$$

- ❑ T_{cit} : log value of country c 's exports in industry i in year t
- ❑ Liberal_{ct} : dummy equal to 1 or continuous measure of liberalization intensity post equity market reform (inclusive)
- ❑ $\text{FinDep}_i, \text{Tang}_i$: external capital dependence and asset tangibility in sector i
- ❑ GDP_{ct} : log of country c 's real GDP in year t
- ❑ Cluster by export country

Panel Analysis: Results

Dependent variable: industry-level log exports to the world

Liberalization measure	Official Liberalization Dummy	First Sign Liberalization Dummy	Official Liberalization Intensity	First Sign Liberalization Intensity
Liberalization	0.444 (2.79) ^{***}	0.458 (2.88) ^{***}	0.691 (2.63) ^{***}	0.799 (2.93) ^{***}
Liberalization × external finance dependence	0.924 (7.08) ^{***}	0.996 (7.19) ^{***}	1.177 (7.10) ^{***}	1.213 (6.87) ^{***}
Liberalization × asset Tangibility	-1.133 (-2.65) ^{***}	-1.282 (-3.01) ^{***}	-0.808 (-1.40)	-0.854 (-1.46)
GDP	0.872 (3.25) ^{***}	0.893 (3.31) ^{***}	1.009 (3.83) ^{***}	1.004 (3.82) ^{***}
Controls			Exporter, year and sector FE	
<i>R</i> -squared (<i>R</i> _{min} ² , <i>R</i> _{max} ²)	0.795 (0.003, 0.35)	0.795 (0.003, 0.38)	0.795 (0.003, 0.37)	0.795 (0.003, 0.39)
# Observations	39,568	39,568	39,568	39,568
# Exporters	91	91	91	91

Economic Magnitudes

- ❑ Liberalizing equity markets...
 - increases exports in the 75th percentile industry by external capital dependence by 43 percentage points more than in the 25th percentile industry
 - increases exports in the 25th percentile industry by asset tangibility by 29 percentage points more than in the 75th percentile industry

- ❑ Contribution of credit constraints to trade flows
 - R_{\max}^2 : R -squared from the regression with only the liberalization and financial vulnerability measures and no other controls (~39%)
 - R_{\min}^2 : difference between the R -squared from the specification and from a regression of exports on controls alone (~0.3%)

- ❑ Result robust to
 - controlling for traditional sources of comparative advantage
 - looking at the subsample of switchers only (39 countries)

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Event Study: Specification

$$\Delta T_{cit} = \beta_0 \Delta \text{Liberal}_{ct} + \beta_1 \Delta \text{Liberal}_{ct} \times \text{FinDep}_i + \beta_2 \Delta \text{Liberal}_{ct} \times \text{Tang}_i + \Delta \varepsilon_{cit}$$

- ❑ Exploit the within-country variation in trade activity over time, in subset of reforming countries
- ❑ Address concerns with unobserved systematic differences across countries at the time of an equity market intervention

Event Study: Results

Dependent variable: $\ln(T_{t+1,t+2,t+3}) - \ln(T_{t-1,t-2,t-3})$

Liberalization date	Official	First Sign	Official	First Sign
A. Liberalization measure: liberalization dummy				
Constant	0.636 (5.65) ^{***}	0.698 (6.87) ^{***}	0.319 (3.16) ^{***}	0.884 (9.23) ^{***}
FinDep	0.235 (2.76) ^{***}	0.195 (2.33) ^{**}	0.237 (2.76) ^{***}	0.198 (2.36) ^{**}
Tang	-0.553 (-1.72) [*]	-0.680 (-2.23) ^{**}	-0.552 (-1.70) [*]	-0.678 (-2.20) ^{**}
Liberalization year FE	No	No	Yes	Yes
R-squared	0.016	0.017	0.055	0.064
# Observations	860	833	860	833
# Exporters	32	31	32	31
B. Liberalization measure: liberalization intensity				
Lib intensity	1.157 (3.66) ^{***}	1.454 (4.46) ^{***}	0.109 (0.32)	0.029 (0.07)
Lib intensity × FinDep	0.205 (1.06)	0.188 (1.08)	0.204 (1.03)	0.193 (1.10)
Lib intensity × Tang	-0.523 (-0.76)	-0.964 (-1.27)	-0.523 (-0.76)	-0.960 (-1.25)
Liberalization year FE	No	No	Yes	Yes
R-squared	0.149	0.157	0.298	0.317
# Observations	860	833	860	833
# Exporters	32	31	32	31

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Domestic Stock Market Activity

- ❑ Do domestic stock markets and foreign equity flows act as substitutes or complements?
 - Strong domestic financial infrastructure may enlarge the benefits of foreign flows by efficiently allocating new resources
 - Countries with weak stock markets may gain more from liberalization

- ❑ Interactions of financial liberalization with domestic stock market activity

$$\begin{aligned} T_{cit} = & \beta_0 \text{Liberal}_{ct} + \beta_1 \text{Liberal}_{ct} \times \text{FinDep}_i + \beta_2 \text{Liberal}_{ct} \times \text{Tang}_i \\ & + \delta_0 \text{MktAct}_{ct} + \delta_1 \text{MktAct}_{ct} \times \text{FinDep}_i + \delta_2 \text{MktAct}_{ct} \times \text{Tang}_i \\ & + \gamma_0 \text{Liberal}_{ct} \times \text{MktAct}_{ct} + \gamma_1 \text{Liberal}_{ct} \times \text{MktAct}_{ct} \times \text{FinDep}_i \\ & + \gamma_2 \text{Liberal}_{ct} \times \text{MktAct}_{ct} \times \text{Tang}_i + \alpha_0 + \alpha_1 \text{GDP}_{ct} + \eta_c + \eta_i + \eta_t + \varepsilon_{cit} \end{aligned}$$

- ❑ If substitute, expect $\gamma_0 < 0$, $\gamma_1 < 0$, $\gamma_2 > 0$

Domestic Stock Market Activity

Dependent variable: industry-level exports to the world

Market activity measure	Stock Market Value Traded	Stock Market Turnover	
Lib	0.273 (1.40)	0.393 (1.66)	0.414 (1.81)*
Lib x FinDep	0.988 (6.86)***	0.975 (4.97)***	1.039 (4.64)***
Lib x Tang	-1.002 (-1.96)*	-1.275 (-2.07)**	-1.364 (-2.24)**
MktAct x FinDep	18.000 (13.99)***	2.612 (2.11)**	2.610 (2.29)**
MktAct x Tang	-23.108 (-3.85)***	-5.837 (-3.43)***	-5.836 (-3.43)***
MktAct x Lib	-3.817 (-1.39)	-1.233 (-1.88)*	-1.196 (-1.80)*
MktAct x Lib x FinDep	-16.586 (-12.72)***	-2.004 (-1.67)	-2.049 (-1.86)*
MktAct x Lib x Tang	19.742 (3.37)***	4.223 (2.60)**	4.170 (2.56)**
MktSize x FinDep			1.161 (1.41)
MktSize x Tang			0.067 (0.03)
MktSize x Lib			-0.084 (-0.09)
MktSize x Lib x FinDep			-0.696 (-0.91)
MktSize x Lib x Tang			0.465 (0.24)
Controls		GDP, exporter, year and sector FE	
R-squared	0.776	0.774	0.775
# Observations	22,206	22,206	22,206
# Exporters	46	46	46

Trade Openness

□ Findings not driven by simultaneous changes in trade policy

1. Panel analysis results remain unchanged when controlling for initial or concurrent trade openness
2. Event study results remain unchanged when looking only at countries that liberalized stock markets but not trade flows

A. Panel analysis			B. Event study		
Dependent variable: industry-level exports to the world			Dependent variable: $\ln(T_{t+1,t+2,t+3}) - \ln(T_{t-1,t-2,t-3})$		
Trade openness	Initial	Concurrent			
Lib	0.458 (2.99)***	0.252 (1.19)	Constant	0.836 (5.78)***	0.525 (3.89)***
Lib × FinDep	0.436 (3.01)***	0.568 (3.44)***	FinDep	0.229 (1.62)	0.228 (1.59)
Lib × Tang	-1.594 (-3.42)***	-0.473 (-0.76)	Tang	-1.221 (-2.75)**	-1.221 (-2.71)**
Trade Open		0.054 (0.24)			
Trade Open × FinDep		0.618 (3.31)***			
Trade Open × Tang		-0.734 (-1.01)			
Controls	GDP, exporter, year and sector FE		Lib year FE	No	Yes
R-squared	0.693	0.805	R-squared	0.037	0.122
# Observations	16,286	32,418	# Observations	404	404
# Exporters	34	70	# Exporters	15	15

Endogeneity

- ❑ Equity market liberalization might be pursued in expectation of growth and export opportunities

- ❑ Some evidence endogeneity cannot completely explain the results
 - Exact timing of equity market liberalization depends on political process and is plausibly exogenous to individual producers and exporters
 - Prior evidence that equity market liberalizations do not follow surges in investment
 - Reverse causality could explain the results with external finance dependence, but not with asset tangibility

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Conclusion

- ❑ Credit constraints are an important determinant of international trade flows
- ❑ Equity market liberalizations increase trade more in sectors intensive in external finance and softer assets
 - Causal link from financial frictions to international trade
- ❑ Liberalizations have a stronger effect under higher trade costs
 - Access to external finance has greater impact when funding needs more acute
- ❑ Capital account reforms can alleviate local credit market imperfections
 - Important policy implications for financially underdeveloped countries