Lesson 2: Export and Financial Constraints

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Firms' export decision and credit constraints

Financial factors and export decision: main questions

- How do credit constraints affect firms' decision to export?
- Is financial health a determinant of export market participation?
- Or Is it an outcome?

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- **Financial health as a determinant of firms' export participation**
- Financial constraints affect firm investment, employment, and R&D decisions
- The better the financial health of firms they can ask for credits to pay fixed export costs and enter the export market.

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- Does export participation help to improve ex-post firms financial health?

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Export markets and firms' financial health

- **Financial health as an outcome of firms' export participation**
- Participation in export markets improves firms' ex-post financial health, and could be due to:
- (1) Firms that export have access to both internal and international financial markets, which allows them to diversify sources of financing and the associated risks.
- (2) Given that sunk costs need to be met when entering foreign markets for the first time, being an exporter also provides a signal that the firm is sufficiently productive to generate enough profits in foreign markets to recover these.
- (3) This increases the likelihood that the firm will be able to service its external debt, and further relaxes liquidity constraints.

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Financial factors and export decision

- Financial factors and exporting decisions: David Greenaway, Alessandra Guariglia, Richard Kneller (2007)
- Using a panel of 9292 UK manufacturing firms over the period 1993-2003, they explore the links between firms' financial health and their export market participation decisions.
- Financial constraints affect firm investment, employment, and R&D decisions
- The better the financial health of firms they can ask for credits to pay fixed export costs and enter the export market

Firms' export decision and credit constraints

UK firms' dataset

- Why the UK?
- Focusing on UK firms can be motivated by two considerations.
- (1) The UK is the fifth largest exporter of manufactures globally, and within our sample, almost 70% of all firms exported in at least one year.
- (2) This dataset contains profit and loss and balance sheet information on a very large number of firms, including firms not quoted on the stock market, which are particularly likely to face financial constraints

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Results I:

- Exporters exhibit better financial health than non-exporters companies.
- Yet, when we differentiate between **continuous exporters**(the companies that export during the whole period) and **starters** (new exporters), we see that this result is driven by continuous exporters.
- Starters generally display low liquidity and high leverage, possibly due to the sunk costs which need to be met to enter export markets

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Results II

- Does good ex-ante financial health lead to export market participation?
- No evidence that UK firms enjoying better ex-ante financial health are more likely to start exporting, Does participation in foreign markets improve firms' ex-post financial health?
- Strong evidence that participation in export markets improves firms' financial health.

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Export markets and firms' financial health

- They study how financial variables affect the probability of exporting and also the ex-post effect of financial advantage of continuous exporters
- Two main financial variables
- (1) The liquidity ratio: the ratio of current assets over total liabilities of the firm
- (2) The leverage ratio: ratio of borrowings over total assets
- Why the liquidity and the leverage ratios are good proxies of firms' financial health?

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Export markets and firms' financial health

- Why the liquidity and the leverage ratios are good proxies of firms' financial health?
- The liquidity ratio indicates a firm's ability to pay off its short-terms debts obligations,
- The leverage ratio is a measure of firm's demand for borrowings relative to their capacity to borrow
- An increase in the liquidity ratio of the firm and a reduction in its leverage ratio, increases the access to external finance.

Export participation and financial institutions

Table 6
Differential effects of financial variables on the probabilities of being a continuous exporter or a starter

	Continuous exporters	Continuous exporters	Starters	Starters
	(1)	(2)	(3)	(4)
Very small$_i$	−0.810*** (0.08)	−0.812*** (0.08)	0.132 (0.14)	0.127 (0.14)
Small$_i$	−0.406*** (0.08)	−0.419*** (0.08)	0.147 (0.13)	0.152 (0.13)
Medium$_i$	−0.268*** (0.08)	−0.276*** (0.08)	0.248** (0.12)	0.254** (0.12)
Large$_i$	−0.093 (0.08)	−0.091 (0.08)	0.024 (0.12)	0.017 (0.12)
Wage$_i$	−0.008*** (0.003)	−0.008** (0.002)	−0.005 (0.005)	−0.005 (0.005)
TFP$_i$	0.0004 (0.01)	−0.001 (0.01)	0.003 (0.02)	0.002 (0.02)
Subsidiaries$_i$	0.051 (0.043)	0.052 (0.04)	−0.051 (0.07)	−0.049 (0.07)
Foreign$_i$	0.171*** (0.04)	0.197*** (0.04)	0.164*** (0.06)	0.142** (0.06)
Liquidity$_i$	0.521*** (0.08)		−0.519*** (0.11)	
Leverage$_i$		−0.341*** (0.05)		0.266*** (0.06)
Observations	5477	5430	5272	5226

Note: All estimates in this Table are obtained from Probit models conducted on the cross-sectional data containing the means of all relevant variable for each firm. Firms that changed export status more than once over the sample period are excluded. Robust *z*-statistics are reported in parentheses. Industry dummies were included in all specifications. Sample period: 1993–2003. * indicates significance at the 10% level. ** indicates significance at the 5% level. *** indicates significance at the 1% level. Also see Notes to Tables 1 and 3.

Export participation and financial institutions

Table 8
Ex-post financial advantage of continuous exporters over various time horizons

	No control	Industry controls	Industry and size controls	Observations
	(1)	(2)	(3)	(4)
1993–1997				
Liquidity_{it}	0.064*** (0.02)	0.053*** (0.01)	0.056*** (0.01)	3599
Leverage_{it}	−0.068*** (0.02)	−0.063*** (0.02)	−0.069*** (0.02)	3526
1998–2003				
Liquidity_{it}	0.085*** (0.02)	0.074*** (0.02)	0.082*** (0.02)	3923
Leverage_{it}	−0.074** (0.03)	−0.074** (0.03)	−0.092*** (0.03)	3855
1993–2003				
Liquidity_{it}	0.074** (0.01)	0.066*** (0.01)	0.071*** (0.01)	4825
Leverage_{it}	−0.073*** (0.02)	−0.071*** (0.02)	−0.082*** (0.02)	4766

Note: Firms are included in the sample if they exported in the final year (1997, 2003, 2003). Firms may or may not have exported in the years preceding the last. Firms that changed export status more than once over the sample period are excluded, so that those firms that exported in the first year are in fact continuous exporters. The numbers in this Table represent the average financial advantage for initial exporters over the years following the first (1994–97; 1999–2003; 1994–2003). Specifically, they represent the coefficients on EXPDUM_{i1}, where i indexes the firm and 1, the first year available for firm i, in a cross-sectional regression of the average value of $\text{Liquidity}_{it}/\text{Leverage}_{it}$ calculated in all years following the first one. Industry dummies are included in column (2). Industry dummies and a control for the firm's initial size, measured in terms of the logarithm of its real assets are included in column (3). Standard errors are reported in

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Credit Constraints and Heterogeneous Firms

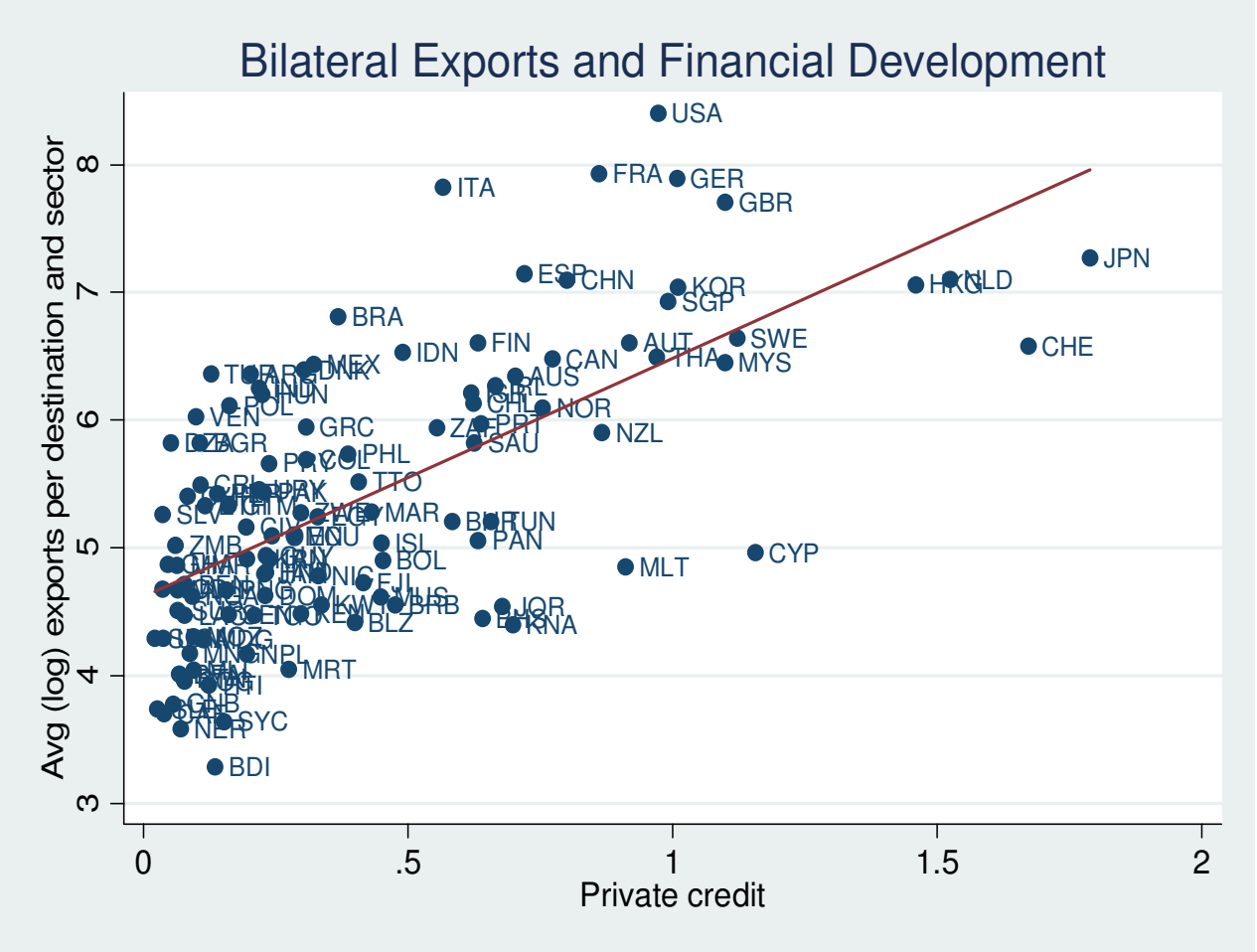
- "Credit Constraints, Heterogeneous Firms, and International Trade" Manova (2008)
- Financially developed countries are more likely to export larger volumes.
- This effect depends on the financial access of the sector.

Firms' export decision and credit constraints

Credit Constraints and Heterogeneous Firms

- Firm selection into export markets accounts for 1/3 of the effect of credit constraints on export volumes,
- whereas 2/3 are due to the impact on firm-level exports.
- In financially vulnerable sectors, financially developed countries export a wider variety of products and experience less product turnover in their exports over time.
- While all countries export to large destinations, financially advanced countries have more trading partners and also export to smaller import markets, especially in financially vulnerable sectors.

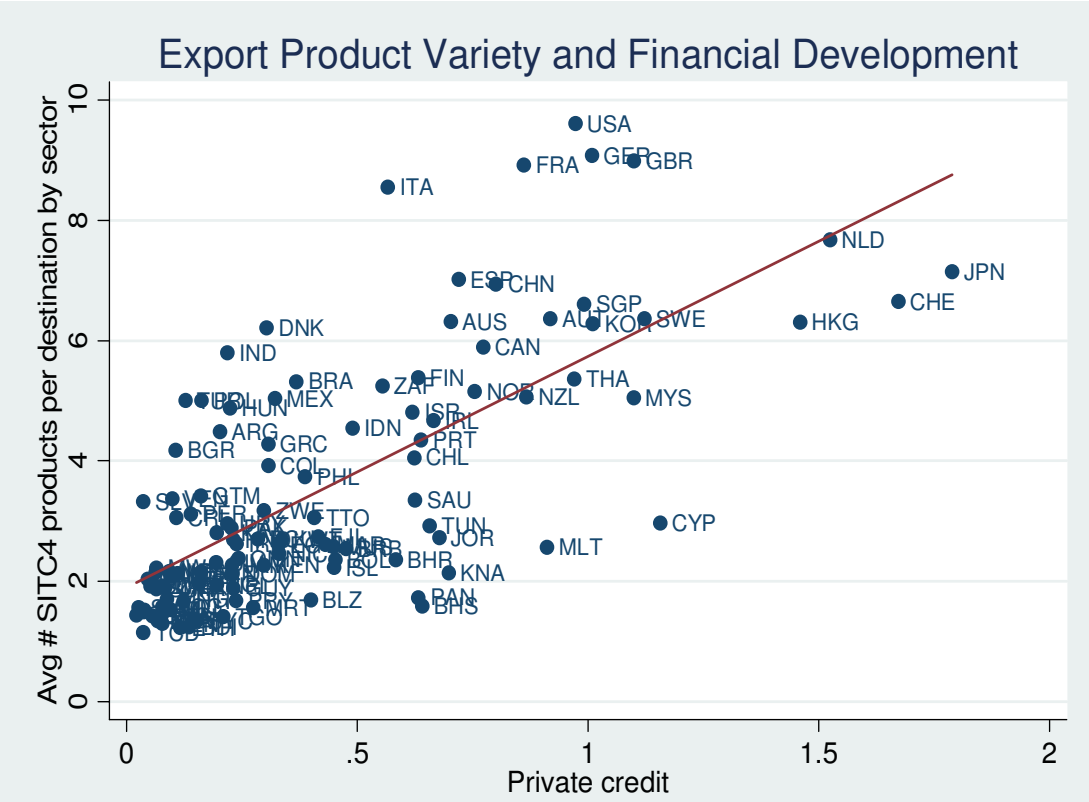
Export participation and financial institutions



Export participation and financial institutions

Figure 3. Export Product Variety and Financial Development

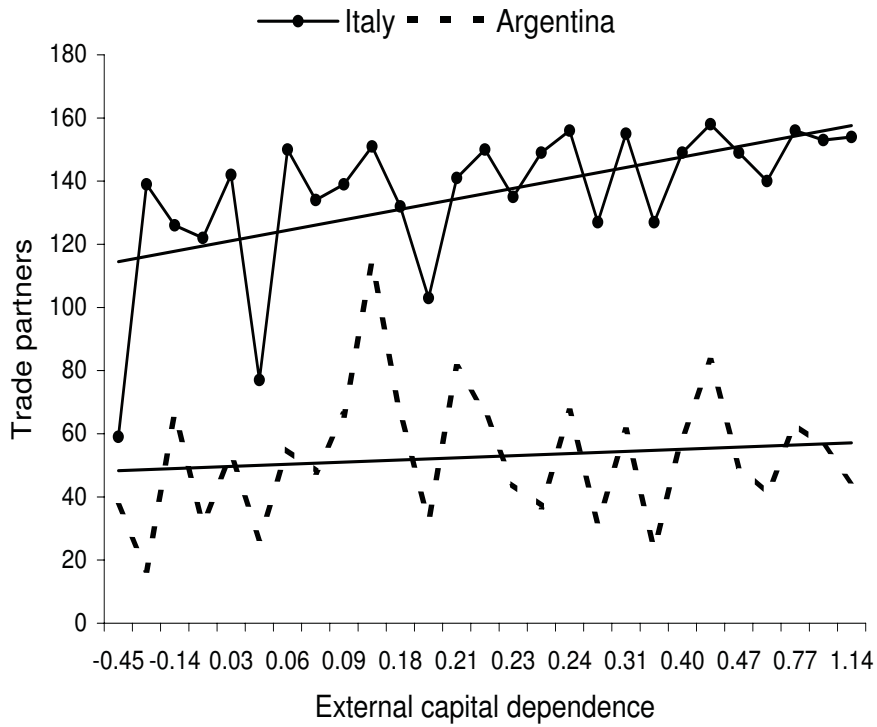
This graph shows the relationship between the variety of products countries export and the exporter's financial development. Financial development is measured by private credit as in Figure 1. The y-axis gives the average number of 4-digit products exported by each exporting country across all destinations and sectors, in the SITC industry classification. All data is for 1995 and reflects exporter-importer-sector triplets with positive trade. Coeff=3.83***, R-squared=0.5075.



Export participation and financial institutions

Figure 5. Italy vs. Argentina: Trade Partners

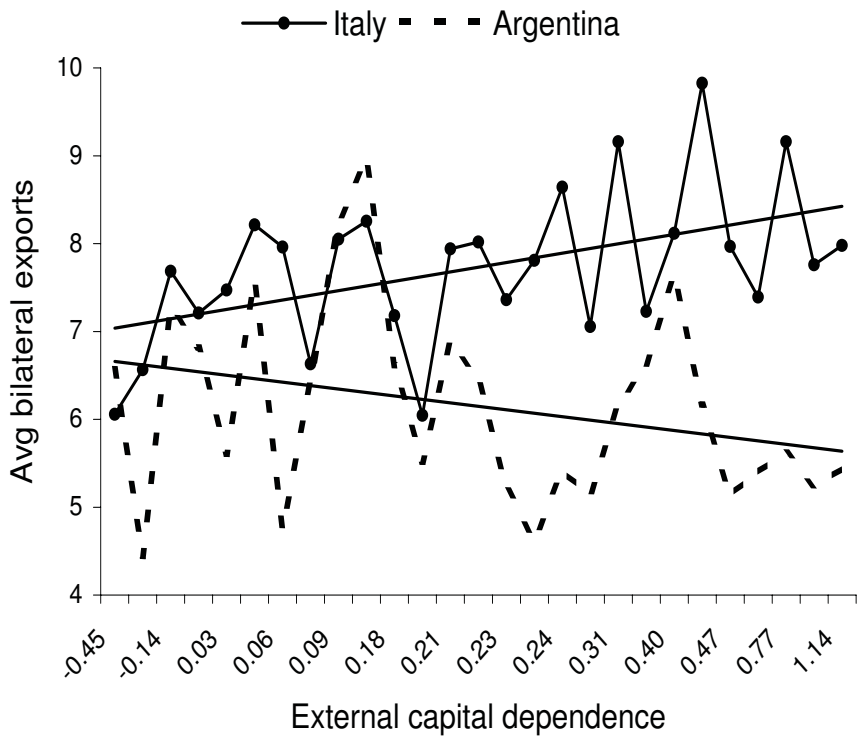
This graph compares trade partner intensity for two countries: Italy (log GDP 20.87, log per capita GDP 9.92) and Argentina (log GDP 19.69, log per capita GDP 9.24). Italy (70^{th} percentile by private credit) is much more financially developed than Argentina (40^{th} percentile by private credit). The graph plots the number of export destinations in each sector against the external finance dependence of the sector. All data for 1995.



Export participation and financial institutions

Figure 6. Italy vs. Argentina: Export Volumes

This graph compares export volumes for two countries: Italy (log GDP 20.87, log per capita GDP 9.92) and Argentina (log GDP 19.69, log per capita GDP 9.24). Italy (70th percentile by private credit) is much more financially developed than Argentina (40th percentile by private credit). The graph plots the average volume of bilateral exports by sector against the external finance dependence of the sector. All data for 1995.



Firms' export decision and credit constraints

Financial development and export decision

- "Financial Factors and the Margins of Trade : Evidence from Cross-Country Firm-Level Data", Berman and Hericourt (2008)
- Using a large cross-country, firm level database containing 5,000 firms in 9 developing economies, they study how financial factors affect
- (1) frms' export decisions and
- (2) the amount exported by firm.

Firms' export decision and credit constraints

Results I

- A significant impact of firms' access to finance on their entry decision into the export market.
- However, a better financial health neither increases the probability of remaining an exporter once the firm has entered, nor the size of exports.

Firms' export decision and credit constraints

Results II

- Financial constraints create a disconnection between firms' productivity and their export status:
- Firms productivity is a significant determinant of exporting decision only if the firm has a sufficient access to external finance.
- An increase in a country's financial development dampens this disconnection, acting positively both on the number of exporters and on the exporters' selection process.

Firms' export decision and credit constraints

Results II

- They investigate how financial constraints affect the probability of selling products into the export market:
- $Prob(X) = \beta_1 FinancialAccess_{it} + \beta_2 Z_{it} + \epsilon$
- X is an indicator variable equal to one if the firm exports in the year t
- Financial access is measured by different proxies:
- (1) Total assets over total debt,
- (2) Cash flow over total assets,
- (3) Tangible assets over total assets.
- We expect a positive and significant effect of financial access on the probability of entering the export market

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Table 4: Financial constraints and entry probability (1/3)

Dep. Var	$P(X>0)$ $X_{t-1}=0$				$P(X>0)$ $X_{t-1}>0$			
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)
Size	0.005^{a}	0.006^{a}			0.001	0.001		
	(0.001)	(0.001)			(0.001)	(0.001)		
Productivity	0.003^{b}	0.002^{c}			0.003^{b}	0.003^{b}		
	(0.001)	(0.001)			(0.001)	(0.001)		
Foreign	0.019^{c}	0.017^{c}	0.017	0.016	0.008^{a}	0.008^{a}	0.005^{b}	0.005^{b}
	(0.010)	(0.009)	(0.012)	(0.012)	(0.003)	(0.003)	(0.002)	(0.002)
Size (t-1)			0.006^{a}	0.006^{a}			0.001^{c}	0.001^{c}
			(0.001)	(0.001)			(0.001)	(0.001)
Productivity(t-1)			-0.000	-0.001			0.001	0.001
			(0.002)	(0.002)			(0.001)	(0.001)
Total Assets /TD		0.003^{c}				0.001		
		(0.002)				(0.001)		
(Total Assets / TD)(t-1)				0.005^{b}				0.001
				(0.002)				(0.001)
No. Obs.	5079	5079	3553	3553	3335	3335	2486	2486
Estimation	Probit				Probit			
Fisher statistic	4.09	8.12			0.75	3.27		
p-value	0.13	0.043			0.68	0.35		
R-Squared	0.23	0.24	0.22	0.22	0.15	0.15	0.19	0.19

Note: TD: Total Debt. Marginal effects computed at means. All estimations include year, country and sector dummies. Robust standard errors into parentheses. Significance levels: ^{c}10%, ^{b}5%, ^{a}1%. Intercept not reported. Froot (1989) correction for firm-level cluster correlation.

Imports and credit constraints

- In order to increase their efficiency, firms in developing countries might upgrade their technology
- How firms in developing countries can adopt modern technologies?
- How financial health of firms' could affect foreign technology upgrading?

Imports and credit constraints

- How financial health of firms' could affect foreign technology upgrading?
- The existence of fixed costs of importing capital goods from abroad
- Only a subset of most profitable firms will be able to upgrade foreign technology
- Firms financial access will determine the capacity of firms to source their goods from foreign countries and pay the fixed importing costs
- How the liquidity and the leverage ratio affect firms import choice of capital goods?

Imports and credit constraints

- (1) The liquidity ratio= the ratio of current assets over total liabilities of the firm
- (2) The leverage ratio= ratio of borrowings over total assets
- An increase in the liquidity ratio of the firm and a reduction in its leverage ratio, increases the access to external finance.
- The higher the liquidity of the firm or the lower its leverage, the higher the probability of sourcing technological goods from more developed countries.

Imports and credit constraints

- We test this relationship using a panel of Indian firms (1996-2006) importing capital goods from foreign countries:

- $Prob(M) = \beta_1 Liquidity_{it} + \beta_2 Leverage_{it} + \beta_3 Z_{it} + \epsilon$

Imports and credit constraints

Table 1: Descriptive statistics of firms importing capital goods

	Always importers		New importers		Switchers		Quitters		Never importers	
Variable	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
Number of firms	378	45	304	80	1703	132	381	50	2342	449
Sales	1680	9504	165	622	161	496	130	839	33	154
Capital	370	995	58	183	64	194	60	168	13	88
Wages	40	141	5	9	6	16	4.3	11	1.4	8
Age	29	21	19	17	24	19	22	20	22	20
Foreign	0.18	0.38	0.06	0.24	0.07	0.25	0.04	0.18	0.03	0.16
State firms	0.04	0.19	0.02	0.13	0.03	0.16	0.03	0.17	0.03	0.17
Private	0.71	0.45	0.84	0.36	0.81	0.38	0.86	0.34	0.87	0.33
Financial variables										
Assets	1534	6949	198	904	189	625	158	514	40	390
Liquidity ratio	0.49	0.18	0.51	0.21	0.49	0.21	0.43	0.23	0.49	0.26
Leverage ratio	0.31	0.19	0.36	0.26	0.42	0.39	0.57	0.63	0.48	0.66

Imports and credit constraints

Table 2: Access to external finance and import of capital goods decision (1996-2006)

Dependent variable	Dummy equal one if firm(i) imports capital goods in t							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Leverage ratio(i)(t-1)	-0.217***	-0.457***	-0.529***					-0.470***
	(0.057)	(0.030)	(0.053)					(0.079)
Leverage ratio(i)(t-2)				-0.453***				
				(0.079)				
Liquidity ratio (i)(t-1)					0.490***	0.283***		0.283***
					(0.067)	(0.070)		(0.066)
Liquidity ratio(i)(t-2)							0.231***	
							(0.062)	
Log wage-bill(i)(t-1)		0.114***	0.155***	0.155***		0.106***	0.097***	0.145***
		(0.014)	(0.018)	(0.019)		(0.027)	(0.027)	(0.021)
Capital intensity(i)(t-1)		0.017**	0.025**	0.003		0.032***	0.017*	0.039***
		(0.008)	(0.011)	(0.012)		(0.011)	(0.009)	(0.012)
Output tariff(s)(t-1)			-0.124	-0.187		-0.112	-0.130	-0.117
			(0.185)	(0.199)		(0.147)	(0.142)	(0.185)
Herfindhal index(s)(t-1)			0.009	0.011		0.006	0.007	0.008
			(0.008)	(0.008)		(0.005)	(0.005)	(0.007)
Import propensity(s)			0.112***	0.117***		0.082***	0.078***	0.106***
			(0.035)	(0.029)		(0.019)	(0.018)	(0.026)
Firm fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	21109	17521	15042	13474	21114	15046	13482	15042
pseudo R^2	0.0712	0.0673	0.0575	0.0535	0.0560	0.0472	0.0464	0.0596
Log likelihood	-7766	-6528	-5650	-5085	-7895	-5715	-5127	-5637