Credit access in Latin American enterprises

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Motivations

- **Access to bank credit** is often indicated as one of the main constraints impairing firms' growth, innovation, and export capacity, especially for SMEs.

- The extent to which firms may be financially constrained varies across countries and results for advanced economies are not always applicable to EM and DC.

- We provide a comprehensive picture of firms' access to credit in the **LAC region**, focusing on:
  - firms specific characteristics;
  - **credit market structures**.

Theory

- **Information asymmetries** between borrowers and lenders, **imperfect screening and monitoring** technologies, and paucity of **pledgeable collateral** make credit rationing an equilibrium phenomenon (Stiglits & Weiss 1981).
- Banks rely as much as possible on *hard*, codified information to overcome informational asymmetries.
  - More informational opaque borrowers are more likely to be financially constrained.
  - Relationship lending mitigate informational asymmetries through *soft*, non-codified information.

The pervasiveness of firms financing constraints would depend not only on firms characteristics, but also on the structure of the local credit markets and on the types of local banks.

Theory - market power and distance

Market power could have opposite effects on credit availability:

- it may lead to inefficiencies, resulting in lower credit availability, as banks with more market power can charge higher interest rates and adopt tighter lending standards.
- it could increase credit availability as banks may need a certain degree of market power to find the investment in bank-firm relationship profitable (Petersen & Rajan 1995)

Similarly, distance in credit markets could have opposite effects:

- a closer proximity between lenders and borrowers would ease the collection and transmission of *soft* information (Petersen & Rajan 1994);
- proximity may give market power to lenders, because of information rents and/or transportation costs (Hauswald & Marquez 2006) and it can induce winners curve behaviors.

Theory - the role of large and foreign-owned banks

- **Standard view**: large and foreign banks have a comparative advantage in lending to large and informational transparent corporations, while small local banks are more prone to small business lending (Berger & Udell 2002; Berger et al. 2005).

- **New paradigm**: also large and foreign banks can be effective in SME lending (Berger & Udell 2006).

- **Foreign bank penetration** has attracted a lot of attention (Claessens & Van Horen 2014):
  - the size of the bank and its functional distance could reduce the capacity and willingness of foreign banks to engage in SME lending and induce "cherry picking" (Mian 2006; Detragiache et al. 2008).
  - foreign multi-service banks could be more efficient, especially in developing and emerging markets (de la Torre et al. 2012).
  - foreign banks penetration could exerts competitive pressures on domestic banks to re-orient their lending activity to informational opaque borrowers (Dell'Ariccia & Marquez 2004).

Empirics (on LACs)

- There is a consistent evidence showing that older, larger, more productive and foreign-owned firms are less financially constrained (Beck et al. 2006; Galindo & Schiantarelli 2002; Makler et al. 2013; Kuntchev et al. 2013).

- **Market concentration** is positively associated with financing obstacles, especially in developing countries.
  - This effect is mitigated by foreign banks and credit registries.
- **Foreign bank** penetration has a positive effect on credit availability in the region, especially when they have a significant local presence (Clarke et al. 2005; 2006).
- **Private and public registries** are associated with better access to private credit, especially in poor countries (Djankov et al. 2007).
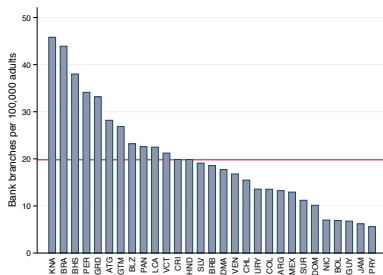
Credit markets in LAC

- After the financial crises in the 1990s, deregulation and the opening of financial markets to foreign competition have increased competitive pressures and led to an intense process of bank restructuring, privatization and consolidation.

- **High heterogeneity in financial development and competition**:
    - development of the banking systems in LAC-7, with the exception of Chile, is lagging behind other regions;
    - offshore centers in the Caribbean have more developed credit markets.

- Financial depth ranges from very low values in Argentina, Mexico and Peru, to high ratios in Chile and in the Caribbean.

- LAC-7 banking systems have become more concentrated and they have a high penetration of foreign banks.

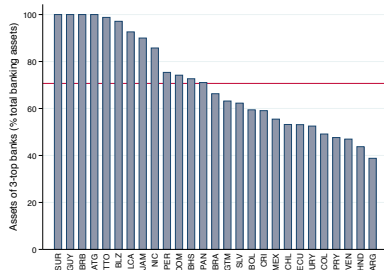# Credit market structure in LAC (1)
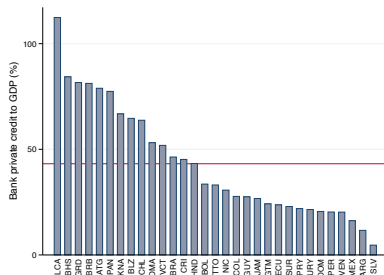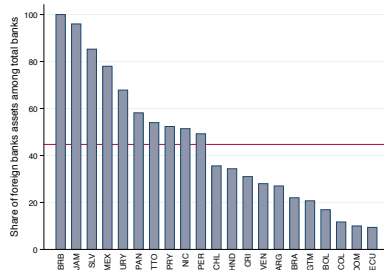

(a) Bank credit to the private sector

(b) Bank branches diffusion

Notes: Global Financial Development Database. Values are averages over the period 2006-2010.

Credit market structure in LAC (2)

(c) Credit market concentration

(d) Foreign banks presence

Notes: Global Financial Development Database. Values are averages over the period 2006-2010.

Firms' financing in LAC – a few stylized facts

❶ Firms finance their working capital mainly through internal sources, followed by trade credit (21% of working capital) and bank credit comes only as the third source (17%).

❷ Bank credit shows a significant degree of variability across firm characteristics.

❸ 90% of LAC firms have a bank account (but only 60% in Mexico).

❹ Less than two firms out of three have an overdraft facility and only 54% of LAC firms have a line of credit or a loan.

❺ The diffusion of these instruments is again significantly different across firm size, age and export status, and across countries.

This evidence is consistent with the existing findings about the limited use and access to bank credit among SMEs in the region (Didier and Schmukler 2013).

The financing structure

	Internal funds	Banks	Other financial institutions	Trade credit	Other (i.e. money lenders, friends)
Size					
Micro	62.04	12.63	1.71	19.95	3.67
Small	57.44	16.35	1.71	21.88	2.62
Medium	55.84	19.40	1.57	21.54	1.64
Large	51.66	23.80	1.55	21.96	1.03
Age					
New	60.34	13.63	1.58	19.28	5.18
Young	59.31	15.92	1.89	19.66	3.22
Mature	56.99	17.40	1.61	21.84	2.17
Ownership					
Domestic	57.22	17.06	1.64	21.55	2.53
Foreign	62.24	14.46	1.33	19.96	2.00
Gender					
No female ownership	58.06	16.65	1.60	21.25	2.44
At least one female owner	57.12	16.99	1.60	21.71	2.58
Internationalization					
Exporter	52.30	20.54	1.41	23.36	2.40
Non-Exporter	58.44	16.37	1.71	21.02	2.46
Sector					
Manufacturing	61.26	16.17	1.45	18.91	2.21
Service	55.12	17.56	1.79	22.92	2.61

Access to finance

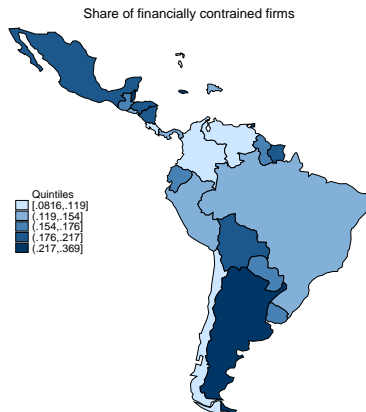|	Checking/savings account	Overdraft	Line of credit/loan
Size			
Micro	82.34	46.19	37.75
Small	91.69	64.78	53.9
Medium	92.62	73.91	65.11
Large	94.34	81.78	76.26
Age			
New	85.93	51.56	40.02
Young	88.47	58.15	49.08
Mature	90.23	65.74	56.41
Ownership			
Domestic	88.64	61.96	54.97
Foreign	94.18	71.59	51.47
Gender			
No female ownership	88.47	62.39	53.56
At least one female owner	90.71	64.12	56.58
Internationalization			
Exporter	94.75	74.1	65.63
Non-Exporter	88.76	61.76	52.19
Sector			
Manufacturing	92.21	65.94	51.25
Service	88.14	62.3	55.94

Defining financing constraints

The WBES collect information about firms that applied for a loan/line of credit in the last FY and, among the ones that have not, the reason for not having applied. Thus, we define a set of dummy variables identifying:

- firms that have applied for a bank loan/line of credit (*DEMAND*);

- borrowers that not applied (*DISCOURAGED*);

- firms that have not obtained a loan or a line of credit among firms having applied (*RATIONED*);

- rationed borrowers and those which did not apply because interest rates and collateral requirements are too high, the size of loan and the maturity are insufficient, or they believe that the loan would not be approved, excluding who did not apply because of the complexity of the procedures (*CONSTRAINED*).
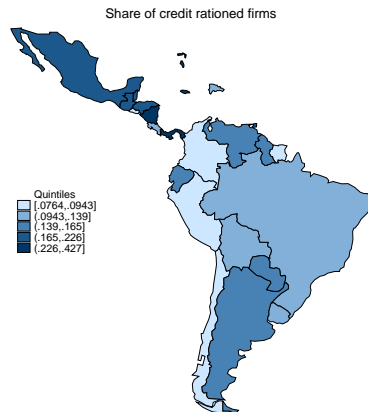
Firms' access to finance

	CONSTRAINED	DEMAND	DISCOURAGED	RATIONED
Size				
Micro	23.47	29.97	27.36	24.56
Small	18.31	41.58	20.88	15.79
Medium	11.47	50.89	13.54	8.95
Large	6.37	62.73	7.8	4.65
Age				
New	20.55	35.24	23.3	23.81
Young	19.73	38.99	22.13	16.9
Mature	16.07	43.96	18.84	12.96
Ownership				
Domestic	17.47	42.76	20.36	13.93
Foreign	13.25	39.24	15.89	14.5
Gender				
No female ownership	17.05	41.62	20.07	14.23
At least one female owner	17.4	44.06	19.78	13.75
Internationalization				
Exporter	13.2	51.74	15.64	8.9
Non-Exporter	17.72	40.99	20.43	15.23
Sector				
Manufacturing	17.24	43.99	19.85	13.25
Service	16.59	40.12	19.43	15.58

Firms' financing constraints across the LAC region

Share of financially contrained firms

Quintiles
[.0816,.119]
(.119,.154]
(.154,.176]
(.176,.217]
(.217,.369]

Share of credit rationed firms

Quintiles
[.0764,.0943]
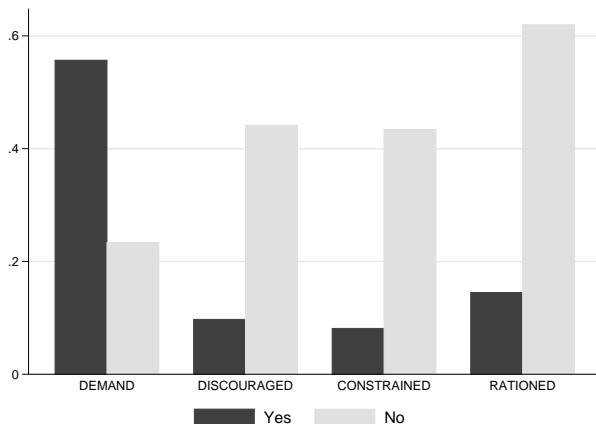(.0943,.139]
(.139,.165]
(.165,.226]
(.226,.427]

(e) Financially constrained firms

(f) Credit rationed firms

Source: WBES.

Firms' financing constraints and labor productivity

Notes: elaboration on WBES. For each category of firms we report the logarithm of labor productivity (minus 10, to improve the readability of the picture). The differences between firms with and without access to finance are statistically significant at 95% level of confidence.

Firms' financing constraints and labor productivity
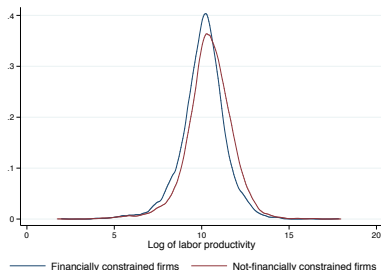
(g) Financing constraints
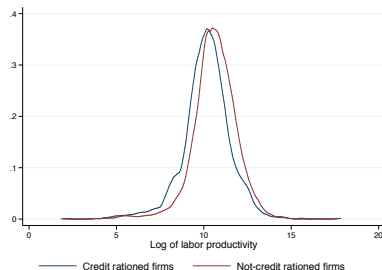
(h) Credit rationing

Notes: elaboration on WBES. The figures report the kernel density of the logarithm of labor productivity for different categories of firms.

Firms' financing constraints and credit market structure (1)
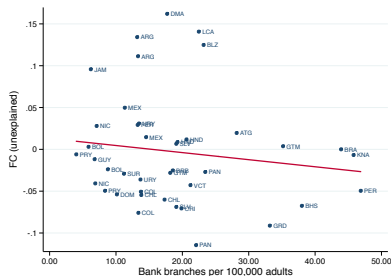
(i) Bank branches per capita
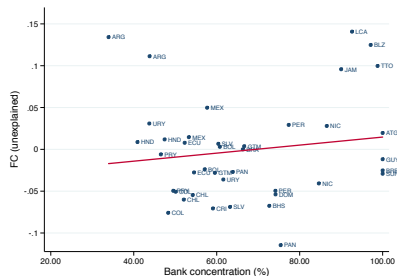
(j) Credit market concentration

Notes: Each panel plots on the vertical axis the OLS residuals from a firm-level regression in which the variable CONSTRAINED (dummy identifying the discouraged and the rationed borrowers) is a linear function of a set of firm-level characteristics (as the ones reported in Table 1 and a set of year and industry dummies.

Firms' financing constraints and credit market structure (2)

(k) Foreign banks penetration

(l) GDP per capita

Notes: Each panel plots on the vertical axis the OLS residuals from a firm-level regression in which the variable CONSTRAINED (dummy identifying the discouraged and the rationed borrowers) is a linear function of a set of firm-level characteristics (as the ones reported in Table 1 and a set of year and industry dummies.

The empirical specification – financing constraints

We estimate two different probit models:

$$Prob(Y_{ij} = 1) = \Phi(FIRM_i; MARKET\ STRUCTURE_j) \qquad (1)$$

where

- Y is, alternatively, *DISCOURAGED* or *CONSTRAINED*.
- *FIRM* is a vector of firm-specific characteristics including labor productivity, size, age, location, legal status, the tenure of the top manager, and a set of dummies about foreign ownership, exporting capacity, gender of the firm, and the possession of a quality certification.
- *MARKET STRUCTURE* includes credit market structure variables (and other macro controls).

The empirical specification – credit rationing

- The identification of the drivers of the likelihood of credit rationing has to address the **selection bias** (not all firms in the sample had a positive demand for credit and that these firms might not be randomly drawn from the population).

- To address the left truncation of the sample, our **identification strategy** is based on a sample selection model, in which the selection mechanism results from sampled firms not responding to the survey questions about access to bank credit (Popov & Udell 2012; Presbitero et al. 2014).

We estimate a bivariate model for credit demand and supply:

$$Prob(RATIONED_{ij} = 1) = \Phi(FIRM_i; MARKET\ STRUCTURE_j)\ (2)$$
$$Prob(DEMAND_{ij} = 1) = \Phi(FIRM_i; MARKET\ STRUCTURE_j)\ (3)$$

Dealing with unobserved heterogeneity

- Unobserved firm-level heterogeneity may affect the credit market outcomes.
- In the baseline specification we allow for **industry-year-country specific shocks**, interacting country FE with year FE and with a dummy identifying manufacturing from service sectors.
- When adding $MARKET\ STRUCTURE_j$ we just have year $\times$ sector-specific fixed effects
- We **cluster standard errors** at the country-year level deal with possible serial correlation across firms interviewed in each survey.

Dep. Var.:	CONSTRAINED			DISCOURAGED		
Sample	ALL	LAC-7	OTHERS	ALL	LAC-7	OTHERS
Labor productivity	-0.107***	-0.096***	-0.123***	-0.115***	-0.134***	-0.094***
	(0.021)	(0.029)	(0.024)	(0.013)	(0.025)	(0.014)
Firm size (ref: micro)						
Small	-0.131***	-0.149**	-0.116***	-0.144***	-0.140*	-0.149***
	(0.038)	(0.074)	(0.038)	(0.037)	(0.072)	(0.035)
Medium	-0.387***	-0.434***	-0.339***	-0.373***	-0.391***	-0.352***
	(0.055)	(0.091)	(0.069)	(0.048)	(0.086)	(0.059)
Large	-0.689***	-0.681***	-0.765***	-0.763***	-0.731***	-0.802***
	(0.071)	(0.101)	(0.117)	(0.085)	(0.122)	(0.109)
Large establishment	-0.157***	-0.144**	-0.181***	-0.069	-0.094	-0.041
	(0.036)	(0.056)	(0.050)	(0.044)	(0.066)	(0.054)
Exporter	0.060	0.079	0.049	0.076**	0.101	0.054
	(0.037)	(0.053)	(0.053)	(0.037)	(0.069)	(0.037)
Firm age (ref: new)						
Young	0.028	-0.019	0.076	0.030	-0.041	0.096
	(0.070)	(0.111)	(0.087)	(0.069)	(0.078)	(0.110)
Mature	-0.078	-0.124	-0.026	-0.057	-0.147	0.030
	(0.071)	(0.106)	(0.093)	(0.078)	(0.091)	(0.120)
Foreign ownership	0.071	0.172*	0.013	0.081**	0.112	0.064*
	(0.056)	(0.092)	(0.067)	(0.033)	(0.072)	(0.038)
Female ownership	-0.005	0.004	-0.014	-0.043*	0.003	-0.088**
	(0.029)	(0.027)	(0.050)	(0.024)	(0.023)	(0.037)
Top manager tenure	0.016	0.091**	-0.051	-0.001	0.043	-0.042
	(0.031)	(0.043)	(0.038)	(0.030)	(0.046)	(0.035)
Quality certification	-0.057	-0.072	-0.043	-0.117***	-0.131***	-0.097
	(0.044)	(0.052)	(0.063)	(0.040)	(0.046)	(0.062)
Observations	16,200	8,243	7,957	16,200	8,243	7,957

Sample:	ALL		LAC-7		OTHERS	
Dep. Var.:	RAT	DEMAND	RAT	DEMAND	RAT	DEMAND
Labor productivity	-0.117***	0.086***	-0.074**	0.084***	-0.169**	0.082***
	(0.039)	(0.015)	(0.030)	(0.022)	(0.074)	(0.021)
Firm size (ref: micro)						
Small	-0.230**	0.255***	-0.187*	0.249***	-0.261	0.260***
	(0.111)	(0.036)	(0.097)	(0.053)	(0.266)	(0.051)
Medium	-0.583***	0.511***	-0.466**	0.551***	-0.688*	0.472***
	(0.188)	(0.046)	(0.183)	(0.051)	(0.418)	(0.081)
Large	-0.780***	0.855***	-0.492***	0.899***	-1.266**	0.779***
	(0.241)	(0.059)	(0.162)	(0.083)	(0.639)	(0.079)
Large establishment	-0.110**	-0.018	-0.088	0.003	-0.142	-0.056
	(0.054)	(0.041)	(0.064)	(0.061)	(0.103)	(0.051)
Exporter	0.003	-0.144***	0.009	-0.172***	-0.001	-0.116**
	(0.069)	(0.034)	(0.064)	(0.045)	(0.146)	(0.055)
Firm age (ref: new)						
Young	0.035	-0.015	-0.190	0.066	0.259	-0.079
	(0.245)	(0.105)	(0.311)	(0.160)	(0.316)	(0.137)
Mature	-0.038	-0.034	-0.216	0.068	0.148	-0.119
	(0.232)	(0.109)	(0.297)	(0.165)	(0.316)	(0.139)
Foreign ownership	0.210	-0.277***	0.249	-0.333***	0.179	-0.238***
	(0.135)	(0.051)	(0.189)	(0.070)	(0.267)	(0.073)
Female ownership	-0.054	0.052*	-0.077	0.008	-0.047	0.099***
	(0.063)	(0.028)	(0.076)	(0.043)	(0.131)	(0.033)
Top manager tenure	-0.017	0.015	0.024	0.010	-0.067	0.021
	(0.046)	(0.025)	(0.072)	(0.037)	(0.060)	(0.035)
Quality certification	0.018	0.058	-0.019	0.048	0.070	0.055
	(0.065)	(0.044)	(0.060)	(0.068)	(0.133)	(0.050)
Observations	13,835	13,835	7,195	7,195	6,640	6,640

Firm- and country-specific factors

- A lot of the variability of firms financing constraints is due to unobservable heterogeneity at the firm level.

- Country-specific factors are potentially able to explain about 40% of the *explained part* of the variability of firms' financing constraints

Dep. Var.:	CONSTRAINED		DISCOURAGED		RATIONED	
	(1)	(2)	(3)	(4)	(5)	(6)
Observations	16,200	16,200	16,200	16,200	6,958	6,958
R-squared	0.034	0.061	0.041	0.069	0.064	0.099
Industry × year FE	Yes	Yes	Yes	Yes	Yes	Yes
Country FE	No	Yes	No	Yes	No	Yes
F-test (p-value)		0.000		0.000		0.000

Notes: For each dependent variable, two linear probability models have been estimated including the standard set of firm-level control variables and industry × year dummies, with and without the country fixed effects.

The role of credit market structure

| Dep. Var.:	CONSTRAINED (1)	DISCOURAGED (2)	RATIONED (3)	DEMAND (4)
GDP	-0.018	0.000	0.032	-0.115
	(0.057)	(0.064)	(0.070)	(0.089)
GDP GROWTH	0.013	-0.010	-0.005	0.017
	(0.018)	(0.016)	(0.018)	(0.023)
Manufacturing share	0.032**	0.029**	0.012	-0.030*
	(0.014)	(0.013)	(0.019)	(0.018)
Bank branches	-0.011***	-0.007**	-0.008*	0.012*
	(0.004)	(0.003)	(0.005)	(0.006)
Bank concentration	-0.004	-0.007**	-0.001	-0.001
	(0.003)	(0.003)	(0.003)	(0.004)
Foreign banks	0.003**	0.004**	0.004	-0.007***
	(0.002)	(0.002)	(0.003)	(0.003)
Observations	14,047	14,047	11,899	
Censored			6,526	

Notes: Each regression includes the whole set of firm-specific controls, year, sector and legal status dummies and a constant. Standard errors (in parentheses) are clustered at the country-year level.

A focus on foreign banks

- We have interacted the share of foreign banks with:
  1. a dummy that signals the existence of a public credit register,
  2. the number of bank branches per capita, and
  3. the measure of market concentration.

- We find that foreign banks:
  - are associated with more binding financing constraints only in countries that do not have a credit registry.
  - seems to have a detrimental effect on access to credit in less developed and more concentrated markets, but they are indeed beneficial in more competitive and financially developed markets.

# Financing constraints, foreign banks & information sharing
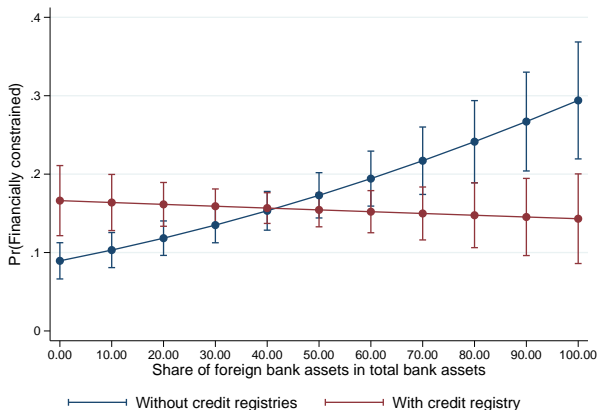
Notes: the figure plots the estimated probability that a firm is financially constrained for different shares of foreign bank assets in total bank assets, disaggregating between countries with and without a credit registry. The vertical lines represent the 95 percent confidence intervals.

Financing constraints, foreign banks & market structure
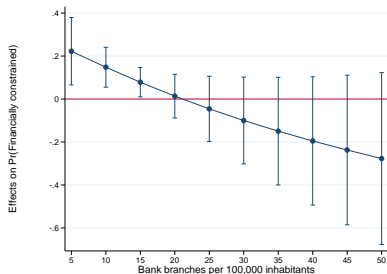
(m) Bank branches per capita
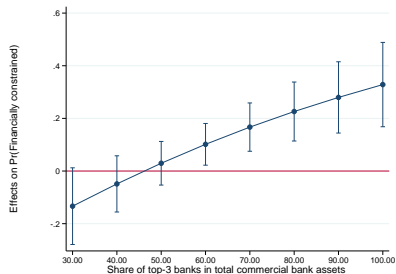
(n) Credit market concentration

Notes: The figures plot the effects of the share of foreign bank assets in total bank assets on the probability that a firm is financially constrained, for different values of the number of bank branches per 100,000 adults, and the share of top-3 banks in total commercial bank assets. The vertical lines represent the 95 percent confidence intervals.

Preliminary conclusions

- The access to bank credit among LAC firms is very heterogeneous and shows a differentiated picture across the region.

- Larger, older, more productive and more export-oriented firms are more likely to demand for bank credit and less likely to be discouraged and financially constrained.

- The structure of domestic credit markets is also important for explaining the heterogeneity in credit access.

- This preliminary results underline the importance of improving the functioning of domestic market structures.

Research agenda

❶ Does credit market structure (bank penetration) affect firms' financing structure?

❷ To what extent does credit market structure affect the correlation between firms' characteristics and financing constraints?