Sandra M. Leitner and Robert Stehrer

Access to Finance and Composition of Funding during the Crisis: A firm-level analysis for Latin American countries

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Summary

In 2009, Latin America was sucked into the financial crisis which, following the bankruptcy of Lehman Brothers, echoed around the globe and shook and shocked the entire global financial system. As a consequence, Latin America experienced a slump in real GDP growth, a drop in exports and a collapse in inward FDI flows. Against that backdrop, the paper sheds light on the effects the global financial crisis had on firms' access to financing as well as on their funding strategies of investment projects. The analysis uses data collected as part of the World Bank Enterprise Survey (WBES) component of the Latin American and Caribbean (LAC) Enterprise Surveys 2006 and 2010 and demonstrates that during the crisis, the availability of internal capital markets played a pivotal role for larger and foreign firms or firms that were part of a larger firm; in contrast, no evidence is found that state-owned firms enjoyed preferential treatment or special budgetary support. In addition, it shows that in the face of the crisis, entrepreneurs adapted their funding strategies: firms whose access to financing deteriorated, more intensely relied on bank and supply-chain-financing, foreign firms or firms that were part of a group more strongly availed of internal funds, while firms that both export and import more intensely drew on bank credits to fund their investment projects.

Sandra M. Leitner and Robert Stehrer

Access to finance and composition of funding during the crisis: a firm-level analysis for Latin American countries

1. Introduction

The global financial crisis, which began in the summer of 2007, initially had a limited impact on Latin America: in Central and South America, real GDP growth rates declined from 3.8% in 2007 to 1.8% in 2008 and from 6.7% in 2007 to 5.5% in 2008, respectively (Figure 1). However, in the aftermath of the bankruptcy of Lehman Brothers in September 2008, Latin America was drawn into the undertow of the crisis which quickly spread globally. In 2009, real GDP growth plummeted and Central and South America contracted economically by -5.9% and -0.3%, respectively. However, the crisis spread unevenly across countries. Mexico, with its strong economic ties with the US, was hit the hardest as real GDP growth dropped from 1.5% in 2008 to -6.5% in 2009, followed by Paraguay, El Salvador and Venezuela with growth rates between -5% and -3%. In contrast, with real GDP growth of almost 3.5% in 2009, both Bolivia and Guyana weathered the crisis pretty well (see Table A1 in Appendix A). Nevertheless, the crisis was limited and rather short-lived as recovery quickly set in.

Figure 1

Annual real GDP growth rates in Central and South America, 2000-2010
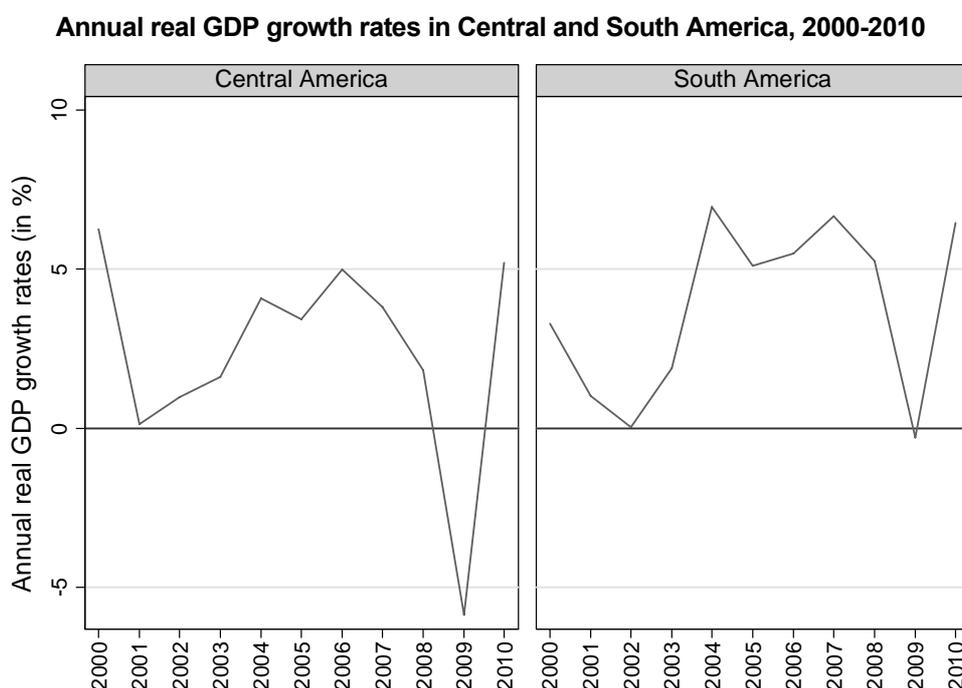
Source: UNCTAD

In its global course of expansion, the crisis found several transmission mechanisms and channels and gained a foothold in Latin America through three major channels: (i) trade, (ii) financial markets and (iii) remittances. Firstly, given the region's growing economic inte-

gration, trade channels have been particularly strong and have affected local producers in terms of a drop in global, and particularly US, demand and have harmed local primary commodity exporters through the collapse of commodity prices (Ocampo 2009). Specifically, in Central and South America, exports dropped by between 20% and 25% in the wake of the crisis (from USD 356 billion in 2008 to USD 286 billion in 2009 in Central America and from USD 609 billion in 2008 to USD 471 billion in 2009 in South America) (Figure 2). Furthermore, from a country-perspective, exports collapsed the most in Venezuela (with -39%) and Bolivia (with -28%) but the least in Guyana (with -0.2%), Nicaragua (with -3%), Guatemala (with -5%) and Panama (with -8%) (see Table A2 in Appendix A).

Figure 2

Annual exports in Central and South America, 2000-2010

Source: UNCTAD
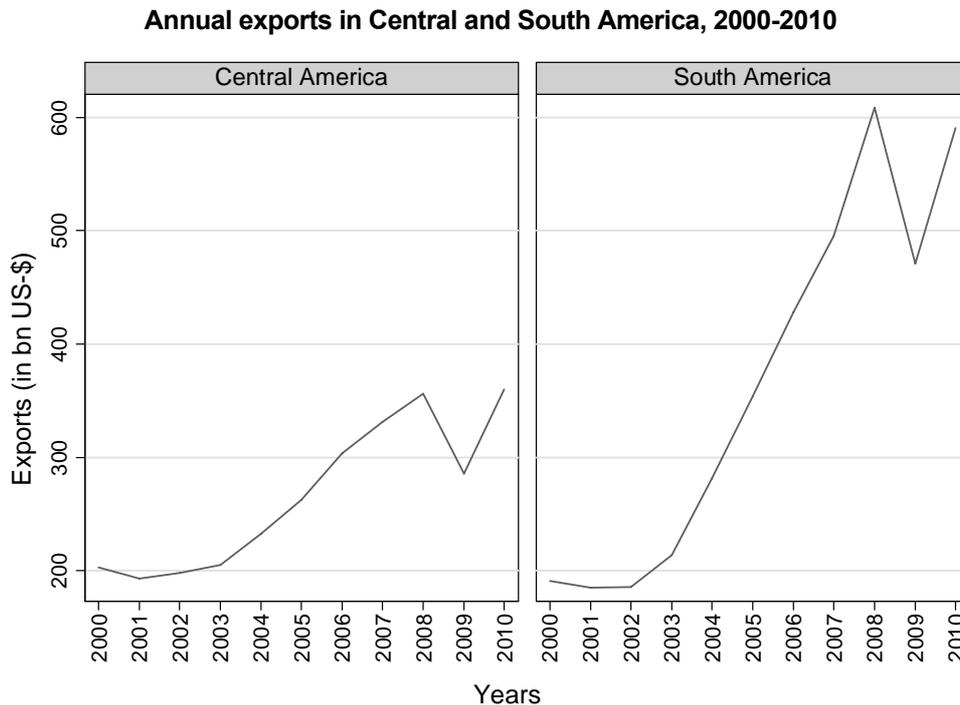
Secondly, following the crisis, gross capital inflows, particularly inward foreign direct investments (FDI), to Latin America dropped (Jara et al. 2009). In particular, between 2008 and 2009, inward FDI flows almost halved in Central and South America (from USD 34 billion in 2008 to USD 20 billion in 2009 in Central America and from USD 92 billion in 2008 to USD 55 billion in 2009 in South America) (Figure 3). But the scale of the fall in inward FDI flows differed across countries with Venezuela, Ecuador, El Salvador and Argentina experiencing the sharpest drops of more than -60% while, with between -15% to -20%, the decline in inward FDI flows was most moderate in Chile, Bolivia, Guyana, Panama and Peru (see Table A3 in Appendix A).

Finally, economic sectors outside Latin America with a high proportion of migrant workers (like construction in the United States) were most affected by the crisis. Hence, unemploy-

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ment among migrant workers increased disproportionately, depriving them of the financial means to send back to their families (Orozco 2009).

Generally, firms have to adapt and adequately respond to the changing economic environment of continuously recurring crises. In particular, in the course of a crisis, access to financing may become significantly more difficult. Due to waning local or global demand, firm turnover, cash flow and profits decline so that internal funds quickly melt away. Simultaneously, as loss-making firms drop out of their markets, credit default rates rise and bank credits become scarcer, access to external funds is limited also. Moreover, in view of deteriorating access to financing during crises, entrepreneurs may have to resort to alternative funding strategies to finance their investments. And with waning internal funds and constrained access to bank loans, other external funding sources like family or friends, contributions of owners or supplier credits may become more dominant sources.

Figure 3

Annual inward FDI flows in Central and South America, 2000-2012
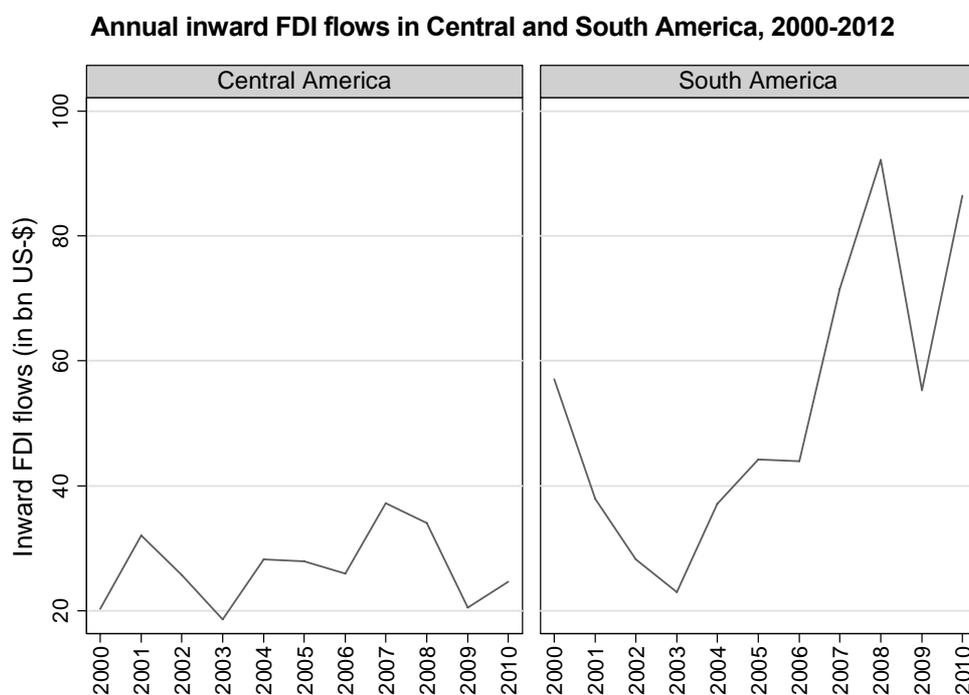
Source: UNCTAD

Against that backdrop, the ensuing analysis uses firm panel data for a sample of Latin American countries collected as part of the World Bank Enterprise Survey component of the Latin American and Caribbean Enterprise Surveys 2006 and 2010 and seeks to shed light on the effects the crisis of 2009 had on i) access to financing of firms and on ii) their funding strategies of fixed capital investments. Specifically, the goal of the paper is twofold. First, it identifies important firm and country level determinants of access to financing and explores their roles in accessing funds, both before and during the crisis. Second, it throws light on firms' funding strategies of fixed capital investments and demonstrates how spe-

cific firm characteristics shape and determine firms' funding strategies to accommodate the negative effects of the global financial crisis. And while there is a growing body of literature on determinants of access to and patterns of financing[1], analyses on the effects of recurring (financial) crises is surprisingly scarce (see e.g. ECB 2009, OECD 2009a, World Bank 2011 or Ariff et al. 2008), a shortcoming the ensuing analysis attempts to tackle.

The analysis shows that very specific firm characteristics are key determinants of access to financing. In particular, before and during the crisis, access to financing was consistently more difficult for firms that already used a line of credit or loan from a financial institution or whose regulatory environment was considered to be risky, burdensome or overly expensive due to extensive red tape or widespread corruption. Furthermore, it points at the pivotal role internal capital markets played during the financial crisis as access to financing was easier for firms that could resort to internal funds like larger and majority foreign-owned firms or firms which were part of a larger firm. In addition, the crisis also exerted an equalizing effect on access to financing. Given the global nature of the crisis that materialized in a global slump of demand, access to financing became equally difficult for internationally trading firms as well as for firms which cater to domestic markets only. Similarly, before the crisis, access to financing was easier for state-owned firms but with the crisis, both private and state-owned firms faced similar obstacles to financing, a finding that rejects the 'preferential treatment hypothesis' of state-owned firms.

In addition, the analysis also demonstrates that firms adapted to the crisis and modified their funding strategies of fixed capital investments accordingly to accommodate the slump in demand and the tightening of financial markets. Specifically, firms whose access to financing became more difficult, more intensely relied on bank and supply-chain-financing but slashed internal funds instead. Moreover, conclusive evidence is found that funding strategies crucially depend on specific firm characteristics. In particular, during the crisis, ownership and trading status emerged as key determinants of firms' funding strategies. Foreign-owned firms as well as firms that were part of a larger firm profited from the existence of internal capital markets and more strongly availed of internal funds to finance their investment projects. In addition, compared to their purely domestically oriented counterparts, firms that import only used non-bank financial institutions to a significantly lesser degree while firms that both export and import more intensely drew on credits from private and state-owned banks but simultaneously left owner's contribution an underutilized funding source. Finally, funding strategies and patterns also dependent on the state of the economy in general or of the banking sector in particular. With the advent of the financial crisis, firms located in faster growing Latin American economies more strongly drew on owner's contribution while credits from suppliers and advances from customers became more dominant funding sources for firms located in economies with healthier and better capitalized banking sectors.

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[1]   See e.g. Beck et al. (2005), Beck et al. (2006), Hubbard (1998), Rajan and Zingales (1998), Schiantarelli (1996) on the former or Rajan and Zingales (1995), Beck et al. (2008) or Gurcharan (2010) on the latter.

The remainder of the paper is organized as follows. Section 2 briefly discusses initial economic conditions in Latin America prior to the crisis and different monetary and fiscal policy responses to the global financial crisis while section 3 provides an overview of the data used in the analysis. Section 4 discusses important determinants of access to financing before and during the crisis while section 5 analyses changing funding patterns as response to the crisis. Finally, section 6 concludes.

2. Initial conditions and policy responses to weather the crisis

Latin America looks back at a turbulent history of recurring financial crises. However, while the region was ill-equipped to effectively combat previous crises, profound central bank and financial market reforms of the 1990s enabled the region to better cope with such shocks as the recent global financial crisis (Schmidt-Hebbel 2011). In effect, Latin America's financial systems withstood pretty well the fierce storms that befell global banking sectors and the severe recessions that quickly spread like wildfire throughout the industrial world. As a consequence, no Latin American economy experienced a financial crisis. Moreover, since Latin America was in relatively good fiscal shape when it entered the financial crisis, enough fiscal policy space was available to contain the effects of the crisis and successfully fight against pronounced and persistent economic slumps.

In the eve of the crisis, financial fundamentals were pretty solid throughout Latin America (Table 1). In particular, due to stricter and more transparent credit approval processes, banks' exposure to non-performing loans was limited. In 2008, the share of non-performing loans in total gross loans ranged between 1% and 4.3% only. With between 1% and 2%, it was lowest in Chile and Uruguay followed by Paraguay, Costa Rica, Panama and Venezuela and with 4.3% it was highest in Bolivia. Additionally, as indicated by bank capital-asset-ratios of between 8% and 13%, banks had accumulated relatively strong capital bases. In 2008, bank capital-asset-ratios were highest in Panama and Costa Rica and lowest in Peru. Finally, partly substantial reserves were accumulated as financial buffers. In 2008, the share of total reserves in real GDP varied between 16% (in El Salvador, Costa Rica and Colombia) and almost 70% (in Bolivia).

And even as the crisis struck in 2009, financial fundamentals remained solid and sound. In 2009, even though the share of non-performing loans rose in the majority of countries, it did not explode but stayed in the narrow range between 1% and 4.2%. In comparison, except for Bolivia, Mexico, Panama and Uruguay, it increased in all Latin American countries but most dramatically rose in Chile and Venezuela, whose shares of non-performing loans tripled (from 1% to 3%) and almost doubled (from 1.9% to 3%), respectively. In addition, in contrast to experiences in Europe or the US, bank capital-asset-ratios remained stable, or even increased in the majority of Latin American countries. The only exceptions are Bolivia, Ecuador, Panama and Paraguay, where banks experienced slight losses in

their capital bases. Finally, no depletion of reserves occurred in the course of the crisis. On the contrary, the majority of countries (except for Ecuador and Venezuela) even managed to increase their reserves.

Table 1

Financial fundamentals prior to and during the financial crisis

Country	Bank non-performing loans to total gross loans (%)		Bank capital-asset ratio		Total reserves to real GDP (%)		Total reserves (in USD million)	
	2008	2009	2008	2009	2008	2009	2008	2009
Central America								
Costa Rica	1.5	2.0	13.3	13.9	16.2	17.6	3800	4070
Guatemala	2.4	2.7	10.3	10.5	18.0	20.0	4650	5200
Mexico	3.2	3.1	9.2	9.7	13.6	15.2	95300	99900
Panama	1.6	1.4	13.4	11.7	12.6	15.3	2420	3030
El Salvador	2.5	3.6	12.6	13.2	16.2	19.8	2650	3120
South America								
Argentina	2.7	3.0	12.9	13.3	11.8	12.1	46400	48000
Bolivia	4.3	3.5	9.3	8.7	67.7	72.6	7720	8570
Brazil	3.1	4.2	9.3	9.5	22.6	28.1	194000	239000
Chile	1.0	3.0	6.9	7.4	22.0	24.6	23100	25300
Colombia	4.0	4.1	12.2	13.6	16.7	17.4	23700	25000
Ecuador	2.5	2.9	8.8	7.7	18.6	15.7	4470	3790
Peru	2.2	2.7	8.3	9.9	37.0	39.1	31200	33200
Paraguay	1.2	1.6	8.9	8.7	30.2	42.5	2860	3860
Uruguay	1.0	1.0	8.9	8.9	22.7	28.0	6360	8040
Venezuela	1.9	3.0	9.4	9.4	26.1	21.4	43100	34300

Source: World Development Indicators

Table 2

Fiscal situation prior to the financial crisis

	Gross public debt (% of 2008 GDP)	Budget balance (% of 2008 GDP)
Central America		
Belize	--	-3.9
Costa Rica	38.3	0.2
Guatemala	23.8	-1.5
Honduras	22.0	-3.9
Mexico	20.3	-0.1
Nicaragua	54.7	-4.8
Panama	45.5	0.4
El Salvador	37.4	-1.0
South America		
Argentina	44.2	1.3
Bolivia	43.5	5.8
Brazil	35.8	-1.4
Chile	4.8	5.3
Colombia	42.6	-0.8
Ecuador	30.5	2.2
Guyana	--	-5.8
Paraguay	23.9	0.2
Peru	24.4	2.2
Uruguay	70.3	-1.2
Venezuela	20.6	-1.1

Source: M. Cárdenas (2009)

Figure 4

Money market rate responses during the financial crisis
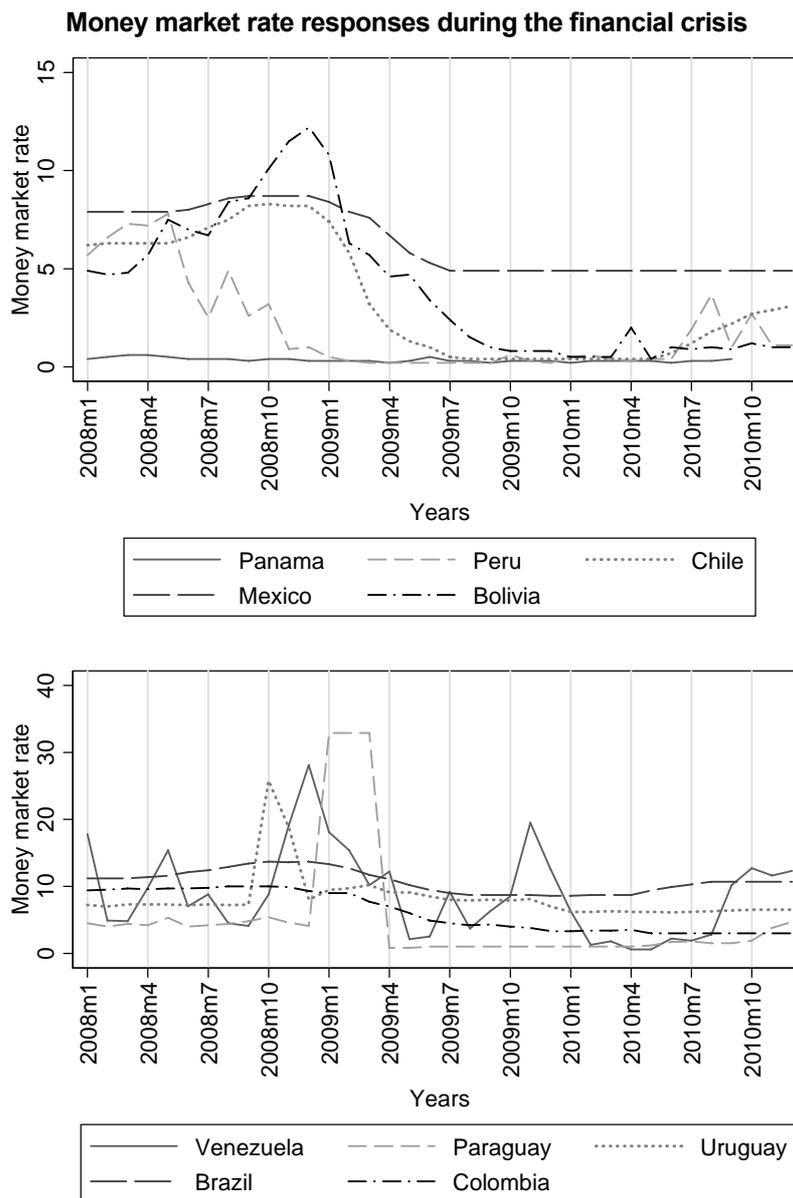
Source: International Financial Statistics

Similarly, Latin America also faced the global financial crisis in relatively good fiscal shape. And with reasonably low debt-to-GDP levels in the majority of countries and budget surpluses or relatively low budget deficits there was ample room for manoeuvre. In 2008, the gross debt-to-GDP ratio lay below 60% in all countries but Uruguay (with 70%) and was even below 25% in Guatemala, Honduras, Mexico, Paraguay, Peru and Venezuela and, with 5% only, by far lowest in Chile. Moreover, several countries reported budget surpluses for 2008, which were highest in Bolivia with almost 6% of GDP and in Chile with around 5%. But the larger part of Latin American economies had budget deficits in the range of - 6% and only -0.1%. In comparison, budget deficits were highest in Guyana (with -5.8%), followed by Nicaragua (with -4.8%) and Belize (with -3.9%). On the contrary, with only -

0.1%, Mexico reported the lowest budget deficit in 2008. All in all, in the eve of the financial crisis, Chile and Peru had the by far most advantageous fiscal set-ups to successfully resist and fight the crisis.

In response to the crisis, most Latin American central banks implemented monetary easing policies and partly drastically reduced their interest rates to spur investments and pave the way for an early recovery. The Central Banks of Bolivia and Chile both pursued the most aggressive policies, slashing their interest rates from 12.2% in December 2008, to 1% in September 2009 and 0.5% in January 2010 in the case of Bolivia and from 8.2% in December 2008, to 0.4% in August 2009 in the case of Chile (Figure 4). Other central banks pursued a more moderate approach, only slightly cutting their interest rates (The Bank of Mexico, The Central Bank of Brazil or The Central Bank of Colombia). In contrast, the Central Banks of Uruguay, Paraguay and Venezuela all reversed their pre-crisis tightening monetary policies and significantly reduced their interest rates to lower pre-crisis levels.

Table 3

Domestic credit provided prior to and during the crisis

	Net domestic credit (billion national currency)			Domestic credit provided by banking sector (% of GDP)		
Country	2008	2009	*Growth rate (%)*	2008	2009	*Change (pp)*
Central America						
Belize	1.92	1.97	*2.6*	70.6	72.7	*2.1*
Costa Rica	8420	9090	*8.0*	53.9	54.3	*0.4*
Guatemala	115	121	*5.2*	36.7	37.7	*1.0*
Honduras	136	152	*11.8*	51.1	54.1	*3.0*
Mexico	3890	4280	*10.0*	37.4	44.1	*6.7*
Nicaragua	84.8	84.6	*-0.2*	74.3	67.5	*-6.8*
Panama	19.8	20.2	*2.0*	85.4	81.6	*-3.8*
El Salvador	10.4	9.87	*-5.1*	44.9	44.5	*-0.4*
South America						
Argentina	247	315	*27.5*	24.4	28	*3.6*
Bolivia	38.1	40.3	*5.8*	48.4	49.5	*1.1*
Brazil	2920	3080	*5.5*	96.9	97.5	*0.6*
Chile	73200	73300	*0.1*	97.5	98.8	*1.3*
Colombia	171000	188000	*9.9*	35.9	37.2	*1.3*
Ecuador	10.1	12.3	*21.8*	17.3	18.9	*1.6*
Guyana	170	168	*-1.2*	49.6	49.1	*-0.5*
Peru	69	70.4	*2.0*	18.5	18.1	*-0.4*
Paraguay	15300	18000	*17.6*	20.8	25.5	*4.7*
Suriname	2.32	2.8	*20.7*	27.9	--	*--*
Uruguay	221	201	*-9.0*	33.6	27.9	*-5.7*
Venezuela	134	--	*--*	20.5	--	*--*

Note: Net domestic credit is the sum of net credit to the non-financial public sector, credit to the private sector, and other accounts. *Domestic credit provided by the banking sector* includes all credit to various sectors on a gross basis, with the exception of credit to the central government, which is net. The banking sector includes monetary authorities and deposit money banks, as well as other banking institutions where data are available (including institutions that do not accept transferable deposits but do incur such liabilities as time and savings deposits). Examples of other banking institutions are savings and mortgage loan institutions and building and loan associations.

Source: World Development Indicators

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Moreover, additional expansionary monetary and credit policies were implemented to ease the growing tension on domestic financial markets which, in the face of the sudden drop in external credit lines due to the global credit crunch, risked drying up. For example, to avoid any disruptions on foreign exchange markets and to make external financing available, several central banks provided foreign currency liquidity to the private sector in the form of foreign exchange spot, repo and swap transactions (Winograd and Brei 2009).

Furthermore, Brazil and Peru (beginning in September 2008) and Colombia all significantly reduced their (marginal) reserve requirements to mobilize additional capital for banks to make loans and to bolster growth. Between end-September and mid-October 2008, the exemption threshold for compulsory reserve requirements was successively raised in Brazil from initially 100 million to 2 billion *reais* (OECD 2009b). Moreover, marginal reserve requirements were lowered in Peru from 25% in September 2008 to 7.5% in December 2008 and removed altogether in Colombia (Jara et al. 2009).

All in all, measures and policies aimed at stabilizing and supporting domestic financial and credit markets appear to have been quite effective. Guo and Stepanyan (2011) stress that, relative to emerging market economies in Europe, the decline in bank credits in Central and South American emerging market economies was moderate. In view of that, Table 3 presents information on the scale of domestic credit prior to but also during the financial crisis. It highlights that with a few exceptions only, the provision of net credits (as the sum of net credit to the non-financial public sector, credit to the private sector, and other accounts) increased during the crisis. In Central America, the volume of net domestic credits (in national currency) expanded most strikingly in Honduras (with +12%) and Mexico (with +10%) but contracted most dramatically in El Salvador (with -5%) and Nicaragua (with modest -0.2%). In South America, the hike in net domestic credit volumes was most dramatic in Argentina with +28%, Ecuador with +22% and Suriname with +21%. In contrast, Uruguay and Guyana both experienced declines in net credit volumes of -9% and around -1%, respectively.

Moreover, Table 3 also captures the role of the banking sector in providing domestic credits before and during the crisis. It emphasizes that prior to the financial crisis the volumes of domestic credits provided by the banking sector were sizeable in a number of countries and amounted to more than 70% of GDP in Belize, Nicaragua, Panama and even more than 90% of GDP in Brazil and Chile. In the face of the crisis, domestic credits of the banking sector (as % of GDP) expanded in the majority of Latin American economies which demonstrates that monetary easing policies which brought interest rates down effectively stimulated investments. The only exceptions are Nicaragua, Panama and El Salvador in Central America and Guyana, Peru and Uruguay in South America, economies which all (but El Salvador) successfully weathered the crisis without any losses in GDP.

In an attempt to cushion the slump in aggregate demand and to mitigate associated drastic declines in economic growth and wealth, partly substantial fiscal stimulus packages were tied and implemented in the wake of the crisis. However, the toolbox of measures taken differed widely across countries in terms of both scale and type. The total amount of economic stimulus amounted to USD 3.9 billion (or 1.2% of GDP) in Argentina, to USD 3.6 billion (or 0.2% of GDP) in Brazil, to USD 4 billion (or 2.2% of GDP) in Chile or to USD 11.4 billion (or 1% of GDP) in Mexico (Ortiz 2009). With regard to the type of measure taken, Mexico and Peru both boosted public spending on infrastructure investment, Brazil, Chile, Mexico and Peru all resorted to sizeable transfers to vulnerable social strata, Brazil also granted tax breaks to the automobile, construction and home appliance sectors while Mexico froze government-controlled prices (Oganes 2010).

3. Data

The analysis uses data for a sub-sample of Latin American countries comprising Argentina, Bolivia, Chile, Colombia, Ecuador, Guatemala, Panama, Peru, Paraguay, El Salvador, Uruguay and Venezuela, collected as part of the World Bank Enterprise Survey (WBES) component of the Latin American and Caribbean (LAC) Enterprise Surveys 2006 and 2010. Generally, the Enterprise Survey collects information about individual firms' business environment, how it is perceived by them, how it changes over time, identifies various constraints or obstacles to firm performance and growth, and captures the effects a country's business environment has on its international competitiveness.

The surveys were conducted during the calendar years 2006 and 2007 as well as 2010 and 2011, respectively, but refer to the last complete fiscal years: 2005 and 2009. The establishment-level panel that emerges from the two waves allows for the analysis of establishment-level responses to changes in the business environment. Each country-sample was selected using random sampling, stratified by size, region and industry classification. The primary sampling unit of each survey was the establishment with five or more full-time employees, located in major urban centres, which engages in non-agricultural activities. Generally, the sampling strategy and the survey instruments used in collecting the data guarantees that survey data from different countries are comparable.

The analysis uses a balanced sample of 2784 firms that were covered in both waves. As for sample characteristics (see Table B1 in Appendix B), around 40% of all firms in the samples are either micro and small firms (with not more than 19 employees) or medium-sized firms (with between 20 and 99 employees) while the remaining 20% are large firms with more than 99 employees. Around 10% are foreign-owned, only around 5% are state-owned, while around 17% are part of a larger firm. In terms of trading status, around 10% of all firms in the sample are exporters only or importers only, 12% are both, exporters and importers while the remaining 60% are domestic firms that cater to domestic markets only.

Finally, around 8% of all firms use technology licensed from a foreign-owned company while around 60% of all firms have a line of credit or loan from a financial institution at the time of the interview.

For the ensuing analyses, the establishment-level panel from the Enterprise Surveys was complimented by additional data stemming from the World Bank World Development Indicators (WDI) to account for country-level characteristics like real GDP growth, real interest rates or capital market related characteristics like the share of non-performing loans in total gross loans, the share of domestic credit to private sector in GDP or bank capital-to-asset ratio. Both sets of data were matched for the years 2005 and 2009 since World Bank Enterprise Survey (WBES) data, which were collected in 2006 and 2010, referred to the last complete fiscal year, i.e. 2005 and 2009.

In what follows, the analysis first sheds light on crucial determinants of access to financing and explores whether and how the global financial crisis contributed to the buildup or teardown of perceived obstacles to financing.

In a second step, it looks at firms' funding strategies of fixed capital investments and analyses how, in the face of the crisis, firms adjust their financing patterns to accommodate adverse effects of the crisis, like plunging income and demand, tumbling exports, dropping turnover and cash flow, mounting credit default rates or soaring real interest rates.

4. Access to funding

To assess the impact the global financial crisis of 2009 had on firms' access to financing in Latin America, the ensuing analysis focuses on a Likert-scale variable, representing firms' assessment of the difficulty they face in accessing financing. Specifically, firms were asked to assess the following: *'Is access to financing, which includes availability and cost No Obstacle (0), a Minor Obstacle (1), a Moderate Obstacle (2), a Major Obstacle (3), or a Very Severe Obstacle (4) to the current operations of this establishment?'*

Figure 5 presents histograms of the Likert-scale variable 'access to finance' for the two waves of 2006 and 2010. It suggests that for the overall sample considered, between 2006 and 2010, a net shift has occurred: predominantly away from No Obstacle (0) and towards Minor Obstacle (1) and Moderate Obstacle (2). All in all, relative to Moderate Obstacle (2), the category Minor Obstacle (1) experienced the highest net increases.

However, Figure 5 hides more complex and diverse movements across categories. Therefore, Table 4 presents the transition matrix concerning any obstacle to access to finance and demonstrates that between 2006 and 2010, the majority (or 66 percent of all establishments) reported a change concerning any obstacles to access to finance while only the

remaining 34 percent considered access to finance to have remained unaltered. It also highlights that the majority of changes occurred among 'neighbouring' categories while more dramatic changes from very low to very high obstacle (or vice versa) were relatively rare. All in all, most changes occurred in the categories Very Severe Obstacle (4) and Major Obstacle (3) for which only around 18% and 23% of all firms reported no change in access to finance at all. In both categories, around 30% of all entrepreneurs reported slight improvements in access to finance. In addition, it shows that the category No Obstacle (0), which experienced the most pronounced net reduction, predominantly lost to Minor Obstacle (1) and Moderate Obstacle (2) with around 23% each. Finally, it reveals that the net increase in Minor Obstacle (1) predominantly stems from No Obstacle (0) and Moderate Obstacle (2).

Figure 5

Histograms for access to finance for 2006 (left panel) and 2010 (right panel)
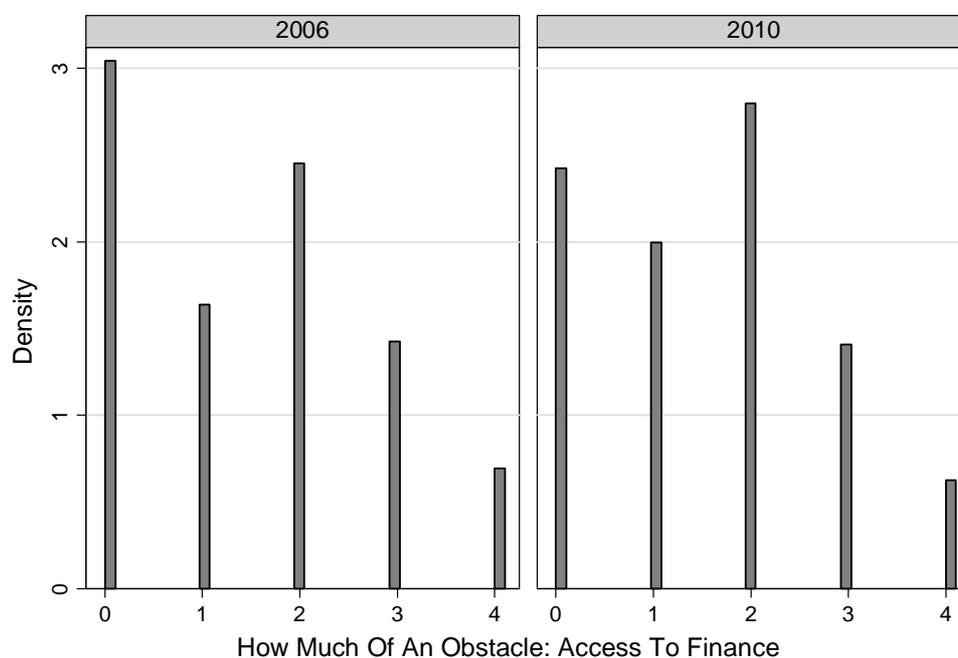
Graphs by Year of survey

Source: World Bank Enterprise Survey, LAC 2006 and 2010

Table 4

Transition matrix - obstacle to access to finance (between 2006 and 2010)

... To From ...	No Obstacle	Minor Obstacle	Moderate Obsta- cle	Major Obstacle	Very Severe Obstacle
No Obstacle	**42.69%**	22.93%	23.36%	7.10%	3.93%
Minor Obstacle	23.12%	**26.98%**	33.27%	13.18%	3.45%
Moderate Obstacle	17.38%	21.68%	**37.40%**	17.89%	5.83%
Major Obstacle	15.38%	17.72%	31.00%	**23.31%**	12.59%
Very Severe Obstacle	4.90%	10.58%	26.44%	29.81%	**18.27%**

Source: own calculations

After the thorough discussion of shifts in access to financing, the analysis next turns to identifying the effect of the crisis on access to financing. Methodologically, given the ordered nature of the dependent variable, an ordered logit approach is pursued which is specified as follows:

$$y_i^* = \mathbf{x}_i\boldsymbol{\beta}' + e_i \qquad\qquad\qquad (1)$$

where y_i^* is an unobservable latent variable, $\mathbf{x}_i$ is a set of control variables and e_i represents the error term.

Then the following holds:

$$y_i = 0 \quad \text{if} \quad y_i^* \leq \lambda_0$$
$$y_i = 1 \quad \text{if} \quad \lambda_0 < y_i^* \leq \lambda_1$$
$$y_i = 2 \quad \text{if} \quad \lambda_1 < y_i^* \leq \lambda_2$$
$$y_i = 3 \quad \text{if} \quad \lambda_2 < y_i^* \leq \lambda_3$$
$$y_i = 4 \quad \text{if} \quad y_i^* > \lambda_3,$$

with 'No Obstacle', 'Minor Obstacle', 'Moderate Obstacle', 'Major Obstacle' and 'Very Severe Obstacle' coded as 0, 1, 2, 3 and 4, respectively and the $\lambda_i's$ as unknown parameters (cut points) that will be estimated together with $\boldsymbol{\beta}$.

$\mathbf{x}_i$ contains a set of firm-level characteristics, a set of industry dummies as well as some country–level characteristics. Specifically, following Beck et al. (2006), firm size is included to account for the role size plays in determining the ease of accessing funding. They analyse a unique firm-level survey database covering 54 countries and find that, on average, smaller firms report significantly higher obstacles to finance than larger firms. These size-related obstacles to funding may also translate into economically difficult times of recessions, when demand, turnover and cash flow drop and access to funding becomes more difficult. The ensuing analysis includes size-related dummy variables, where small firms refer to firms with 5-19 employees, medium-sized firms to firms with 20-99 employees and large firms to firms with more than 99 employees.

Moreover, the existence of internal funds or capital markets renders access to financing easier for firms that are part of a group, state-owned firms or foreign-owned firms. Specifically, as emphasized by Shin and Park (1999) in their analysis of Korean chaebols and confirmed by Beck et al. (2006), business-group affiliation is associated with lower funding obstacles as firms that belong to business groups may avail of internal capital markets and internal group cash flows and funds. In the same vein, foreign-owned firms may also avail of internal funds and resources should external sources become too expensive, scarce or difficult to access due to extensive or growing information asymmetries and credit ration-

ing. This is corroborated by findings by Schiantarelli and Sembenelli (2000) for a panel of Italian firms and Beck et al. (2006) which demonstrate that foreign-owned firms indeed enjoy easier access to funds. Finally, as potential recipients of budgetary support from the government or due to preferential treatment by state-owned financial institutions, access to funding may also be easier for state-owned firms. This is supported by the analysis of Héricourt and Poncet (2007) on Chinese firm-level data which finds that state-owned firms are less credit-constrained than their private counterparts. The existence of internal or alternative funds is particularly relevant during economic downturns or recessions when access to financing becomes more difficult or expensive. In that case, firms that are part of a group, state-owned firms or foreign-owned firms can all resort to internal funds or access internal capital markets to satisfy their capital needs. Hence, to capture the role business-group affiliation or ownership plays for the ease of accessing financing, dummy variables are included in the ensuing analysis for business-group affiliation and foreign as well as public ownership.

Relative to their purely domestically oriented counterparts, internationally trading firms (i.e. exporters, importers as well as exporters and importers) not only differ in terms of productivity, size, wages or capital intensity (see Bernard and Jensen (1995 and 1999), Roberts and Tybout (1997) and Bernard et al. (2005)) but also with respect to access to financing. Specifically, internationally trading firms that are exposed to stronger uncertainty and risk of failure and higher working capital needs (Amiti and Weinstein 2009) may be credit-constrained and may therefore experience stronger obstacles to funding. However, the advent of an external shock may alter the difficulties exporters experience when accessing funds. Particularly, in the face of a domestic recession, domestic demand collapses, leaving firms that cater to domestic markets only with significantly lower turnover, profits and cash flow and more difficult access to financing. In contrast, exporters also serve international – still flourishing – markets and therefore earn sufficient turnover and cash flow to finance their capital needs. However, in a global recession when global demand for exports collapses, exporters' turnover and cash flow plunge and access to financing becomes equally difficult for both, exporters as well as purely domestically oriented firms. In view of that, several dummy variables capturing firms' trading status are included to account for the difficulties internationally trading firms may face in accessing financing: firms that both, export and import, are labelled 'exporters and importers', firms that export only (but do not import) are labelled 'exporters only' while firms that import only (without re-exporting) are labelled 'importers only'. Their purely domestically oriented counterparts constitute the reference group.

The continuous development of novel products and productivity-enhancing processes is considered a crucial determinant of firm performance (Crépon et al. 1998) and a prerequisite for firm survival and growth (Schumpeter 1942). Specifically, innovations provide the innovator with a temporary monopoly position and the opportunity to cream off above-

normal monopoly rents, profits that can be used to fund operational businesses of firms. But, such technological novelties may also be licensed out, giving the licensee a competitive edge over its competitors and the opportunity to boost turnover, expand market shares and increase profits. Therefore, relative to non-licensees, access to finance may be easier for firms that license technologies from other companies since more internal funds are available on the one hand and solid performance records eases access to credits from banks or other financial institutions on the other. Furthermore, despite an economic crisis, technology licensees may succeed in maintaining their competitive edge as well as income and cash flow records and therefore may still enjoy easier access to financing. In that respect, a dummy variable equal to one is included if a firm uses a technology licensed from a foreign-owned company.

In contrast, access to funds may be more difficult for firms that already have a line of credit or loan from a financial institution. On the one hand, this is indicative of insufficient internal resources, on the other hand, banks and other financial institutions may be reluctant to grant additional credits or loans to already indebted firms. In addition, in a crisis-stricken environment in which access to financing becomes increasingly more difficult, already indebted firms face even stronger obstacles to financing. Hence, to account for the difficulties firms with credits face in accessing additional funds, a dummy variable equal to one is included.

Perceived risks and burden of firms' regulatory environment also impact on the perception concerning the ease of accessing funds. Specifically, if business operations are burdened by extensive red tape or if corruption is widespread and rampant, more time and financial resources need to be spent on firms' daily business operations in general, but also on getting access to external funds in particular, rendering access to financing more difficult also, irrespective of the state of the economy. The perceived burden of both, the administrative tape or corruption is captured by two Likert-scale variables on business licensing and permits on the one hand and corruption on the other. Specifically, to assess the importance of the administrative red tape or corruption, firms were asked to rate, on a scale from 0 (No Obstacle) to 4 (Very Severe Obstacle), how problematic business licensing and permits or corruption were to their current business operations.

At the country level, three control variables are included that may affect the ease of accessing funds. As a business-cycle indicator, the annual GDP growth rate captures the state of the economy and implicitly accounts for the demand for and availability of funds. During an economic upturn, demand is high which translates into higher firm turnover and cash flow, higher internal funds and consequently, on average, lower demand for external funds. At the same time, the availability of external funds improves as savings increase. Hence, during an economic upturn, both internal and external funds are abundant and access to financing is relatively easy. In contrast, during an economic downturn, demand,

turnover and cash flow collapse, which squeeze internal funds but increase the need to resort to alternative funds to satisfy capital needs. Simultaneously, with increasing credit default rates, external funds become scarcer. Hence, during economic recessions access to financing becomes increasingly more difficult.

Moreover, the overall state of the financial market in general or the banking sector in particular is pivotal to firms' access to external funds. A healthy banking sector, whose credit approval processes are guided by thorough risk assessment procedures, should show a high willingness to finance private sector investments, irrespective of the state of the economy. However, if the share of bank non-performing loans is high already, banks' reluctance to granting even more credits increases. Hence, in a recession, with a credit crunch looming, access to external funds is hampered or rendered impossible altogether. The state of the banking sector is captured by the share of domestic credit to private sector in total GDP on the one hand, and the share of bank non-performing loans to total gross loans, on the other.

Furthermore, regional location may also matter. Hence, a dummy variable is included for countries located in South America. Finally, a set of industry dummies is included to capture systematic industry-specific differences.

Results of the analysis are presented in Table 5. It demonstrates that larger and majority foreign-owned firms reported significantly lower obstacles to access to financing, both before and during the crisis. Hence, results suggest that these firms enjoyed easier access to substantial internal funds, rendering financing an unproblematic issue, even during the crisis.

In contrast, while business-group affiliation was irrelevant for access to financing before the crisis, it became a crucial factor during the crisis as firms which were part of a larger firm faced lower funding obstacles and therefore gained easier access to internal group cash flows and funds to finance daily regular and special business operations.

Moreover, as expected, irrespective of the state of the economy considered, access to financing was consistently more difficult for firms which already used a credit line or loan from a financial institution or which considered their regulatory environment burdensome, risky and expensive, due to extensive red tape or rampant corruption.

On the contrary, the crisis appeared to have an equalizing effect on access to financing for internationally trading firms. Specifically, before the crisis, exporters only as well as firms that export and import considered access to financing significantly more difficult than their purely domestically oriented counterparts. However, once the crisis struck, this difference vanished and accessing funds became equally difficult for firms that export only or both,

export and import as well as for firms that cater to domestic markets only. A similar equalizing effect is observable for majority state-owned firms. Before the crisis, access to financing was easier for state-owned firms but once the crisis set in, any differences disappeared, which rejects the 'preferential treatment' hypothesis of state-owned firms.

Table 5

Regression results for difficulty of access to financing, 2006 and 2010

Dep.Var.: Access to financing, Likert scale	(1)	(2)
Variables	2006	2010
Firm level		
Medium-sized firms	-0.179**	-0.166*
	(2.13)	(1.95)
Large firms	-0.603***	-0.572***
	(5.43)	(5.11)
Part of a larger firm, yes=1	-0.090	-0.228**
	(0.87)	(2.24)
Majority state-owned, yes=1	-0.506**	0.960
	(2.04)	(1.37)
Majority foreign-owned, yes=1	-0.547***	-0.379***
	(3.75)	(2.73)
Exporter only, yes=1	0.364***	-0.073
	(3.07)	(0.58)
Importer only, yes=1	-0.081	-0.172
	(0.58)	(1.32)
Exporter and importer, yes=1	0.242*	-0.036
	(1.80)	(0.28)
Technology licensed from foreign-owned company, yes=1	-0.183	0.006
	(1.22)	(0.04)
Credit or loan from financial institution, yes=1	0.135*	0.271***
	(1.70)	(3.30)
Business licensing and permit (Likert scale)	0.318***	0.277***
	(9.57)	(7.94)
Corruption (Likert scale)	0.200***	0.224***
	(7.20)	(7.84)
Country level		
Annual GDP growth rate	0.058***	0.006
	(2.64)	(0.31)
Bank non-performing loans to total gross loans (%)	-0.020	0.243***
	(1.13)	(5.55)
Domestic credit to private sector (% of GDP)	-0.006***	-0.004**
	(3.10)	(2.40)
South America, yes=1	0.120	0.025
	(0.88)	(0.20)
Industry dummies	YES	YES
Cut 1	0.201	0.073
	(0.78)	(0.35)
Cut 2	1.046***	1.155***
	(4.05)	(5.54)
Cut 3	2.367***	2.648***
	(9.05)	(12.40)
Cut 4	3.730***	4.112***
	(13.81)	(18.32)
No of observations	2,570	2,562
Pseudo R²	0.0507	0.0515
Log likelihood	-3661.8921	-3677.4691

Note: z-statistics in parentheses, *** p<0.01, ** p<0.05, * p<0.1

The dependent variable is the response to the following question*: 'Is access to financing, which includes availability and cost No Obstacle (0), a Minor Obstacle (1), a Moderate Obstacle (2), a Major Obstacle (3), or a Very Severe Obstacle (4) to the current operations of this establishment?'.* Methodologically, an ordered logit approach is taken.

Furthermore, the analysis also sheds light on the effect of country level characteristics on the perceived difficulty of accessing financing of firms. In that respect, it points at the crucial role of a healthy and well-functioning banking sector during a crisis. Specifically, the exposure of the banking sector to non-performing loans mattered and became pivotal during the crisis only, as access to financing became significantly more difficult if the banking sector had accumulated a high share of non-performing loans. In contrast, however, access to financing was perceived to be easier if the banking sector provided plenty of domestic credits to the private sector.

The crisis also exerted an equalizing effect on the role of economic growth. Before the crisis, a high annual GDP growth rate was associated with stronger difficulties of accessing financing. With the onset of the crisis, however, any growth-related differences became irrelevant. This could be the result of the effectiveness of monetary easing policies that were widely implemented in response to the global crisis which helped cut interest rates, ease access to external funding and stimulate borrowing.

Finally, no significant effects are found for importers only, firms with technology licensed from a foreign-owned company or a firm's geographic location.

5. Composition of funding sources

In their strategic investment decisions, entrepreneurs need to adapt their behaviour to accommodate the consequences of any external macroeconomic shocks. And while, in the face of a crisis, some firms decide to postpone any investments until demand recovers, others proceed with their fixed asset purchases but adjust both, the scale of total fixed capital expenditure as well as the composition of funding sources to accommodate the drop in demand. In what follows, the analysis focuses on the latter aspect and seeks to shed light on how the pattern of funding changed in response to the financial crisis of 2009. For that purpose, and for the sake of comparison, it analyses firms that purchased fixed assets both before the crisis as well as during the crisis and identifies changes in funding patterns, particularly of firms that reported a deterioration of access to financing.[2]

To identify the composition of funding sources before and during the crisis, entrepreneurs were asked to provide information on the following: *'Over fiscal year …, please estimate the proportion of this establishment's purchase of fixed assets that was financed from each of the following sources?' (in %) a) Internal funds/Retained earnings, b) Owner's contribution or issued new equity shares, c) Issued new debt (including commercial paper and debentures), d) Borrowed from banks (private or state-owned), e) Borrowed from non-bank*

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[2]   To account for the associated selection bias, the inverse Mill's ratio is included in the analysis.

financial institutions, f) Purchases on credit from suppliers and advances from customers, and g) Other (moneylenders, friends, relatives, etc)'.

Figure 6

Proportion of sources in fixed asset investments for 2006 and 2010

Proportion of sources in fixed asset investments
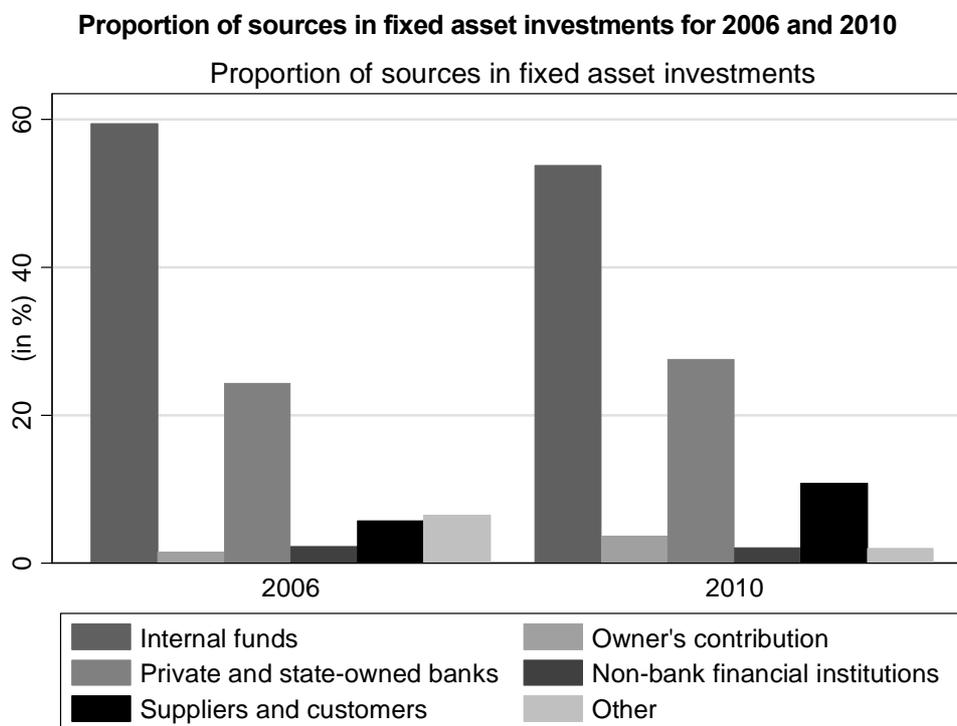
Source: World Bank Enterprise Survey, LAC 2006 and 2010

Figure 6 gives an overview of the average proportion of potential sources for the waves of 2006 and 2010 and therefore captures how the composition of funding sources changed with the onset of the crisis. It highlights that, in 2006, almost 60 percent of all investments stemmed from internal funds while another 25 percent came from private and state-owned banks. In contrast, remaining external sources were of limited importance and only accounted for between 10 percent (for credit from suppliers and advances from customers and other sources) and 2 to 4 percent (in the case of owner's contribution and non-bank financial institutions, respectively). In comparison with 2006, the proportion of internal funds decreased somehow in 2010 but, with almost 55 percent, still remained the dominant funding source. In contrast, despite the crisis, credits from private and state-owned banks became more important (almost 30 percent). The most remarkable changes occurred with respect to the proportions of credits from suppliers and advances from customers as well as of owner's contributions which both doubled between 2006 and 2010. And while the proportion stemming from non-bank financial institutions decreased slightly, the proportion of other sources plummeted, from almost 7 percent in 2006 to only 2 percent in 2010.

Generally, the analysis seeks to shed light on how entrepreneurs who reported a deterioration of access to financing responded to the crisis in terms of financing patterns. For that

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purpose, firms are grouped according to the change in their perception such that 'non-shifters' refer to firms whose perception concerning the access of financing has remained unchanged between 2006 and 2010, 'negative shifters' refer to firms whose access to financing has become increasingly more difficult while 'positive shifters' denote firms whose access to financing has become easier, despite the crisis. An overview of the three groups is presented in Table 6, both in absolute terms and as shares in the total number of shifting firms per country. It highlights that, in absolute terms, the total number of shifters was highest in larger countries like Argentina, Chile and Peru. Moreover, it shows that for the overall sample, with around one third each, the shares of positive, negative and non-shifters were pretty balanced. However, at the country level, emerging patterns are more heterogeneous. Specifically, with around 40%, the share of non-shifters was highest in Guatemala, Bolivia, Colombia, Chile, Peru and Uruguay. With the exception of Chile whose real GDP contracted by -1.53% during the crisis, these countries weathered the crisis well and even grew by between 0.5% and around 3%. In addition, with around 50%, the share of negative shifters was highest in El Salvador, Ecuador and Panama and even almost touched upon the 60% threshold in Venezuela. These responses hardly come as a surprise for El Salvador and Venezuela whose real GDP plummeted by -3.5% and -3.3%, respectively. In contrast, the economies of both Ecuador and Panama continued to expand, despite the crisis, which renders the high share of negative shifters an unexpected outcome. Finally, the share of positive shifters was generally rather small but highest in Paraguay and Argentina. Given that Paraguay was the second-hardest hit economy in Latin America (after Mexico), the high share of positive shifters is pretty surprising.

Table 6

Reported shifts concerning the difficulty of accessing financing between 2006 and 2010, by country

Country	Real GDP growth rate in 2009	No. of non-shifters	No. of nega-tive shifters	No. of posi-tive shifters	Share of non-shifters	Share of negative shifters	Share of positive shifters
Argentina	0.85%	164	146	186	33.06	29.44	37.50
Bolivia	3.36%	58	42	38	42.03	30.43	27.54
Chile	-1.53%	168	142	122	38.89	32.87	28.24
Colombia	0.36%	88	80	48	40.74	37.04	22.22
Ecuador	0.36%	50	80	40	29.41	47.06	23.53
El Salvador	-3.54%	30	40	14	35.71	47.62	16.67
Guatemala	0.57%	40	36	18	42.55	38.30	19.15
Panama	2.40%	8	14	8	26.67	46.67	26.67
Paraguay	-4.55%	46	34	72	30.26	22.37	47.37
Peru	0.93%	124	94	100	38.99	29.56	31.45
Uruguay	2.86%	78	64	72	36.45	29.91	33.64
Venezuela	-3.29%	14	32	10	25.00	57.14	17.86
TOTAL		868	804	728	36.17	33.50	30.33

Note: 'Non-shifters' are firms whose access to financing has remained the same; 'Negative shifters' refer to firms whose access to financing has become increasingly more difficult; 'positive shifters' denote firms whose access to financing has become easier. All firms are included which invested both, in 2006 and 2010.

Source: own calculations

Next, the analysis seeks to throw light on the effects the crisis of 2009 had on the composition of funding sources of fixed capital investments. Methodologically, given the dependent variables' censoring both at 0 and 100, a tobit approach with heteroskedasticity-robust estimates is applied. Specifically, the following model is estimated:

$$y_{ikt} = \alpha_0 + \beta_A X_{Aikt} + \gamma_B Y_{Bikt} + \delta_C Z_{Cikt} + u_{ikt},$$ (2)

where y_{ikt} is the proportion of fixed asset investment financed by firm i in country k at time t (with $t = 2006$ *or* 2010) through i) private and state-owned banks, ii) internal funds and/or retained earnings, iii) purchases on credit from suppliers and advances from customers, iv) owner's contribution or the issuance of new equity shares, v) non-bank financial institutions, or vi) others like moneylenders, friends, relatives etc. X_{Aikt} is a matrix of A firm characteristics, Y_{Bikt} is a matrix of B country level characteristics while Z_{Cikt} is a matrix of C industry level dummies. Finally, u_{ikt} represents the error term.

At the firm level, dummy variables for a firm's negative shifter status and non-shifter status are included, which capture firms' funding strategies and are therefore the major variables of interest. Specifically, they show how negative and non-shifters shifters (relative to positive shifters) responded to the crisis in terms of the composition of funding sources of their investments in fixed assets.

Moreover, firm size is considered pivotal to firms' funding strategies. Specifically, a growing body of empirical literature on small business lending highlights that a non-negligible proportion of small firms faces systematic credit constraints (see e.g. Berger and Udell 1992 and 1998). This is corroborated by Beck et al. (2008) who use firm-level data from the World Business Environment Survey conducted in 1999 on 48 developed and developing countries and show that, on average, smaller firms use less external funds, specifically, less bank finance but, to a great deal, resort to informal sources to finance themselves. This may be even more so during a crisis, when access to external bank funds becomes more difficult and internal funds fade. To account for the crucial role of firm size, dummy variables are included for small and medium-sized firms, respectively.

In a similar vein, firm age is also decisive for firms' funding strategies, as, in the absence of extensive and reliable credit histories that offer vital information about potential borrowers' future repayment probabilities, younger firms may experience stronger credit constraints and may therefore turn to other funding sources to satisfy their capital needs. This is supported by findings by Canton et al. (2011) who analyse a sample of firms located in the EU and show that young firms (aged below 10 years) perceive access to loans to be significantly more difficult while it is significantly easier for older firms (older than 20 years). Furthermore, as suggested by Vickery (2005), these disadvantages in accessing credits also hold during episodes of economic crisis. He analyses the financial crisis of 1997/98 and

shows that weak banking relationships reduce the availability of credits from domestic banks.

Furthermore, it goes beyond speculation that business-group affiliation and ownership status are crucial determinants of firms' funding strategies: both may predominantly avail of internal funds to finance their investment projects, particularly once external funds become scarce or expensive. Supportive evidence is provided by Chang and Hong (2000) who stress that Korean chaebols share substantial internal group resources. Moreover, foreign-owned firms are found to be less credit constrained (see e.g. Harrison and McMillan, 2003, or Manova et al., 2011) and, in terms of composition, rely more on equity than on leasing or supplier finance to finance their investment projects (Beck et al., 2008). In addition, empirical evidence also suggests that foreign-owned firms respond to cost and availability conditions of external funds by increasingly resorting to internal funds should external funds become less accessible or more expensive and risky (Desai et al., 2004). Hence, in the face of a crisis, when access to external funds deteriorates, firms that are part of a larger firm as well as foreign-owned firms are expected to more strongly resort to internal funds to satisfy their capital needs.

In addition, funding strategies also hinge on firms' trading status. In that respect, Amiti and Weinstein (2009) argue that exporters experience stronger credit constraints since they face higher default risk due to the difficulties of enforcing payments across country boundaries but also since they have higher working-capital financing needs due to the longer time lags between production and receipt of payments. As a consequence, internal or non-bank sources should dominate exporters' funds. Supportive empirical evidence comes from Feenstra et al. (2011) who show for a set of Chinese firms that exporters indeed face more severe credit constraints. However, any prevailing funding differences may vanish during a global economic crisis, when exporters, just like their domestically oriented counterparts, face a plunge in demand for their products as well as in turnover and cash flow. In such a scenario, bank credits may be equally inaccessible to both, domestic and foreign owned firms, forcing them to look for alternative sources.

Moreover, a set of country level variables is included comprising the annual GDP growth rate, the bank capital to asset ratio as well as the real interest rate (all taken from the World Development Indicators). Specifically, during a recession, when the demand for firm products falls, firm cash flow, turnover and profits decline and the value of firm collateral drops, the probability of default rises significantly. As a consequence, with insufficient internal funds and collateral but in need of financing, firms face considerable credit constraints from the banking sector and therefore need to look for and resort to other external sources that help them tie things over until the economy recovers and demand resumes. In contrast, internal funds and bank credits should be the dominant funding source during economic recoveries or upturns, when demand, cash flow and turnover increase and the value of

collateral recovers, while alternative sources like purchases on credit from suppliers and advances from customers, owner's contribution or the issuance of new equity shares, non-bank financial institutions, or other sources should remain underutilized.

In addition, availability and attractiveness of credit or loans crucially depend on the state of the banking sector and its willingness to offer affordable loans. If endowed with adequate and sufficient capital – relative to all accumulated assets – banks are protected against losses and should therefore be willing to grant additional credits. Hence, a high capital-to-asset-ratio (as the ratio of bank capital and reserves to total assets) is expected to facilitate access to bank credits. In contrast, during economic crisis when credit default rates increase, the availability of bank credits is expected to drop which forces firms to look for alternative financing sources.

Finally, the real interest rate is included as an indicator for the cost of external bank-related funds. As such, bank credits become more attractive with a fall in the real interest rate and vice versa.

Table 7 presents estimation results and demonstrates that in the face of the crisis, firms which experienced a deterioration of access to financing drastically adapted their financing behaviour. Specifically, in response to the crisis, negative shifters significantly reduced the proportion of internal funds but more intensively relied on credits from private and state-owned banks on the one hand and on purchases on credits from suppliers and advances from customers on the other to finance their investments in fixed assets. Hence, during the financial crisis, supply-chain-financing has become a more dominant funding source as, probably due to their vested interest in maintaining long-standing business relationships, suppliers extended extra credit concessions to their customers (see Evans 1998 or Wilner 2000). In terms of marginal effects, negative shifters financed on average 7 percentage points more of their investment with credits from private and state-owned banks, 4 percentage points more with credits from suppliers and advances from customers but almost 10 percentage points less with internal funds. On the contrary, funding strategies were similar or comparable for firms whose access to financing remained unaltered during the crisis as well as for firms whose access to financing improved, despite the crisis.

In contrast, firm size is found to hardly matter for the composition of financing sources. Before the crisis, smaller firms strongly relied on purchases on credits from suppliers and advances from customers to finance their investments. However, with the onset of the crisis, any size-related differences disappeared and funding became an activity independent of firm size.

Similar dynamics are observable for firm age. Before the crisis, older firms more heavily relied on internal funds but, compared to their younger counterparts, abstained from other

sources like moneylenders, friends or relatives to finance their investments. However, the crisis eliminated any age-related differences and any funding activities became age-independent.

In addition, empirical evidence points at the pivotal role of internal funds for firms with business-group affiliation. Before the crisis, owner's contribution or new equity constituted a significantly smaller part in capital spending of firms that belonged to a business group. But, in the face of the crisis, internal funds became a crucial funding source for investments of firms that were part of a larger firm while owner's contribution or new equity remained an underrepresented funding source. The marginal effects indicate that firms that are part of a firm financed on average around 6 percentage points more of their investment with internal funds but almost 2 percentage points less with owner's contribution or new equity.

In a similar vein, ownership emerges as a key determinant of firms' funding behaviour. Before the crisis, majority foreign-owned firms predominantly funded their fixed-capital investments from owner's contribution or new equity and internal funds but, compared to their domestically-owned counterparts, to a lesser degree availed of both, credits from private and state-owned banks or other sources. But the crisis partly offset prevailing differences in funding strategies as foreign-owned and domestic firms started to use both owner's contribution or new equity and other sources to similar degrees. In contrast, foreign-owned firms continued to more intensely draw from internal sources (8 percentage points more) while leaving credits from private and state-owned firms an almost untapped source of funds (almost 11 percentage points less).

Moreover, evidence is found that trading status affects firms' funding strategies. Similarities emerge such that all internationally trading firms, irrespective of their exact trading status, generally draw significantly less from owner's contribution or new equity to finance their investments. But, differences prevail too as firms that import only rely more significantly on internal funds. But once the effects of the crisis unfolded, financing patterns altered also. Specifically, any pre-crisis differences in funding strategies between domestic firms and firms that export only disappeared. In contrast, firms that import only used non-bank financial institutions to a significantly lesser extent. Finally, firms that export and import maintained the substantially lower proportion of owner's contribution or new equity but, at the same time, drew more heavily from private and state-owned banks. Specifically, marginal effects suggest that compared to their purely domestically oriented counterparts, importers only financed on average around 0.8 percentage points less of their investment with funds from non-bank financial institutions, while firms that both, export and import finance on average around 8 percentage points more of their investment with credits from private and state-owned banks but around 2 percentage points less with owner's contribution or new equity.

Table 7

Results on the composition of financing of investments

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	Internal funds/retained earnings		Owner or new equity		Private and state-owned banks		Non-bank financial institutions		Suppliers & customers		Other	
Variables	2006	2010	2006	2010	2006	2010	2006	2010	2006	2010	2006	2010
Constant	-79.382*	135.449***	-548.307***	-4.554	145.267***	-57.054	-332.866**	-930.284***	39.999	-275.740***	-331.825***	-218.547
	(1.79)	(2.94)	(4.55)	(0.06)	(2.73)	(1.12)	(2.12)	(4.42)	(0.52)	(4.11)	(3.00)	(0.82)
Firm level												
Negative shifters	6.609	-26.955***	-32.694	-11.299	18.340	23.194**	3.259	-23.879	-64.255***	25.861**	7.045	67.127
	(0.67)	(3.02)	(1.24)	(0.70)	(1.52)	(2.33)	(0.11)	(0.78)	(3.65)	(2.06)	(0.39)	(1.14)
Non-shifters	5.610	-1.764	-33.740	-16.707	18.789	9.714	5.808	-20.333	-38.073**	6.289	-34.946*	87.313
	(0.59)	(0.20)	(1.43)	(1.02)	(1.61)	(1.01)	(0.19)	(0.68)	(2.38)	(0.53)	(1.95)	(1.61)
Medium-sized	6.446	-19.274	6.750	-26.097	13.808	9.111	-33.103	15.297	-45.510**	10.553	-6.044	-57.860
	(0.55)	(1.63)	(0.24)	(1.47)	(0.97)	(0.69)	(0.91)	(0.44)	(2.23)	(0.65)	(0.28)	(1.01)
Large	26.428	-19.331	-9.506	-29.501	1.808	-6.014	-74.912	10.989	-54.103*	13.614	-9.858	0.942
	(1.59)	(1.17)	(0.26)	(1.21)	(0.09)	(0.34)	(1.43)	(0.20)	(1.91)	(0.61)	(0.33)	(0.01)
Log age	9.033*	4.161	11.753	-4.403	-5.817	1.120	9.205	-24.994	-0.987	11.431	-17.743*	-40.088
	(1.91)	(0.75)	(1.00)	(0.41)	(1.02)	(0.18)	(0.64)	(1.29)	(0.13)	(1.47)	(1.87)	(1.11)
Part of a larger firm	7.239	15.625*	-86.116**	-41.578**	-4.546	5.697	-15.639	-0.108	1.274	-14.248	9.661	-61.445
	(0.70)	(1.71)	(2.40)	(2.35)	(0.36)	(0.57)	(0.46)	(0.00)	(0.07)	(1.12)	(0.51)	(-0.880)
Majority foreign-owned	30.620**	22.355*	49.677*	-11.316	-56.532***	-41.434***	-82.582	-23.307	35.728*	12.095	-49.024*	31.169
	(2.37)	(1.89)	(1.90)	(0.53)	(3.32)	(3.06)	(1.56)	(0.53)	(1.70)	(0.79)	(1.75)	(0.50)
Exporter only	9.900	-1.203	-64.112*	0.898	18.544	-8.924	-27.930	19.585	-16.005	1.637	-38.412	-88.138
	(0.79)	(0.10)	(1.78)	(0.04)	(1.23)	(0.66)	(0.64)	(0.46)	(0.74)	(0.09)	(1.44)	(1.03)
Importer only	28.705*	0.896	-64.829*	-12.989	-13.775	1.970	-93.961	-105.515*	-3.958	-10.238	-17.581	-21.600
	(1.87)	(0.07)	(1.80)	(0.62)	(0.74)	(0.14)	(1.63)	(1.75)	(0.17)	(0.58)	(0.61)	(0.33)
Exporter and importer	13.208	-12.551	-182.660***	-50.110**	-2.481	27.198*	-20.166	57.220	-17.384	-8.837	7.465	-107.782
	(0.91)	(1.00)	(2.90)	(2.34)	(0.14)	(1.93)	(0.48)	(1.37)	(0.67)	(0.51)	(0.29)	(1.54)
Country level												
Annual GDP growth rate	2.021	2.202	-13.807*	7.578*	-4.783	0.193	-12.891	-16.874*	-11.641***	-5.932*	8.119	27.257**
	(0.77)	(1.04)	(1.86)	(1.92)	(1.53)	(0.08)	(1.41)	(1.82)	(2.71)	(1.86)	(1.58)	(1.98)
Capital-asset-ratio	4.633**	-2.696	5.792	-3.879	-13.978***	0.202	21.180***	8.084	-7.707**	9.713***	20.585***	-6.821
	(2.53)	(1.55)	(1.15)	(1.19)	(6.06)	(0.11)	(3.11)	(1.33)	(2.38)	(3.88)	(5.61)	(0.65)
Real interest rate	-0.215	-1.313**	-4.966***	0.443	2.191***	1.423**	-0.679	-0.519	-0.778	-0.609	-2.681**	3.132
	(-0.416)	(2.17)	(2.77)	(0.42)	(3.60)	(2.17)	(0.35)	(0.29)	(0.88)	(0.74)	(2.23)	(0.82)
South America	-15.181	-36.784**	520.841***	15.677	-12.676	32.149	33.945	633.885***	21.244	32.423	47.475	-46.925
	(0.72)	(2.00)	(6.07)	(0.59)	(0.51)	(1.41)	(0.46)	(5.62)	(0.64)	(1.39)	(0.85)	(0.53)
Industry dummies	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Inverse Mill's ratio	68.556***	-5.573	-133.803***	-91.668**	-44.629	-25.419	-65.984	48.401	-37.567	10.602	-49.964	-13.708
	(2.96)	(0.24)	(2.69)	(2.51)	(1.58)	(0.99)	(0.95)	(0.61)	(0.95)	(0.33)	(1.07)	(0.12)
No of observations	1103	1057	1103	1057	1103	1057	1103	1057	1103	1057	1103	1057

Note: Robust z-statistics in parentheses, *** p<0.01, ** p<0.05, * p<0.1

In addition, the state of the economy also substantially affects and shapes firms' funding strategies. Before the crisis, firms located in faster growing economies less intensely relied on credits from suppliers and advances from customers as well as owner's contribution or new equity to finance their fixed capital investments. With the crisis, however, a shift in the composition of funding sources occurred as firms in faster growing economies more strongly availed of owner's contribution or new equity and other sources but less intensely drew from credits from suppliers and advances from customers or from non-bank financial institutions.

Surprisingly, before the crisis, firms located in economies with healthier banking sectors sourced significantly less from private and state-owned banks but instead more heavily drew from internal funds, funds from non-bank financial institutions and other funds (like e.g. friends or family). However, firms' funding strategies became almost independent of the state of the banking sector once the crisis struck as only credits from suppliers and advances from customers became more dominant in firms located in economies with healthier and better capitalized banking sectors. All remaining sources were used irrespective of banks' capital bases.

In addition, the composition of funding sources also hinges on the real cost of external capital. And while before the crisis, firms located in high real interest rate countries more intensely used funds from private and state-owned banks but left owners' contributions or other funds underutilized, the onset of the crisis prompted entrepreneurs to partly revise their funding strategies and more heavily draw from private and state-owned banks. Hence, during the crisis, the proportion of funds stemming from private and state-owned banks remained higher, despite the relatively higher costs.

Finally, funding patterns are also found to differ across regions. In pre-crisis years, firms in South American countries more strongly relied on owners' contributions to fund their fixed capital investments. But with the onset of the crisis, funding patterns shifted more strongly towards non-bank financial institutions.

6. Summary and conclusion

Following the bankruptcy of Lehman Brothers in September 2008, Latin America was drawn into the undertow of the global financial crisis: in 2009, real GDP growth took a nosedive, exports plunged and inward FDI flows collapsed. However, thanks to the implementation of sizeable fiscal stimuli packages paired with effective monetary easing policies, the crisis was limited and rather short-lived.

Against that background, the analysis focuses on firm responses to the global financial crisis in Latin America and seeks to provide evidence on whether access to financing dete-

riorated during the crisis and how entrepreneurs responded to the crisis and adapted their funding strategies of fixed capital investments accordingly.

The analysis uses firm data for a sub-sample of Latin American countries collected as part of the World Bank Enterprise Survey component of the Latin American and Caribbean (LAC) Enterprise Surveys in 2006 and in 2010. It demonstrates that very specific firm characteristics determine the ease with which financing can be accessed. Before as well as during the crisis, access to financing was consistently more difficult for firms which already used a credit line or loan from a financial institution and were therefore constrained to access additional bank loans or for firms which considered their regulatory environment burdensome, risky and expensive, due to extensive red tape or rampant corruption. Furthermore, it found evidence for the pivotal role of internal funds or capital markets. Specifically, during the crisis, access to financing was found to be significantly easier for firms that could tap into internal funds like larger or majority foreign-owned firms as well as for firms which were part of a group. In addition, the analysis revealed the equalizing effects of the crisis. Before the crisis, relative to their purely domestically oriented counterparts, access to financing was considerably more difficult for firms that export only as well as for firms that export and import. With the onset of the crisis, however, access to financing became equally difficult for all firms, irrespective of trading status, as, given the global nature of the crisis and the global slump in demand, firms were equally effected. In the same vein, before the crisis struck, access to financing was easier for state-owned firms but once the crisis set in, both private and state-owned firms faced similar obstacles to financing. This finding undermines the hypothesis that, during the crisis, state-owned firms enjoyed preferential treatment and therefore had easier access to financing.

Finally, evidence is found that a healthy and well-functioning banking sector is pivotal as access to financing became significantly more difficult if the banking sector was burdened with a high proportion of non-performing loans while it was considered to be easier if the banking sector provided plenty of domestic credits to the private sector.

Moreover, the analysis reveals that entrepreneurs modified their funding strategies of fixed capital investments to accommodate the negative effects of the global financial crisis. In particular, firms which experienced a deterioration of access to financing more intensely availed of bank and of supply-chain-financing to finance their investments while they significantly cut back on internal funds. In terms of marginal effects, negative shifters financed on average 7 percentage points more with credits from private and state-owned banks, 4 percentage points more with credits from suppliers and advances from customers but almost 10 percentage points less with internal funds.

Furthermore, the analysis highlights that funding strategies and patterns crucially depend on specific firm characteristics. As such, supportive evidence of the pivotal role of owner-

ship is found: with the onset of the financial crisis, when external funds appeared to dry up, foreign-owned firms as well as firms that were part of a larger firm profited from the existence of internal capital markets and more strongly drew from internal funds to satisfy their capital needs and finance their investment projects. In a similar vein, trading status emerges as a key determinant of firms' funding strategies. In the face of the crisis, firms that import only used non-bank financial institutions to a significantly lesser degree while firms that both export and import more intensely turned to and relied on credits from private and state-owned banks but simultaneously left owner's contribution an underutilized funding source.

The analysis also demonstrates that the state of both, the economy and the banking sector affects and shapes firms' funding patterns. Once the crisis reached Latin America, firms located in faster growing economies more strongly availed of owner's contribution and other sources like family or friends but less intensely drew from credits from suppliers and advances from customers or from non-bank financial institutions. Moreover, credits from suppliers and advances from customers became more dominant funding sources for firms located in economies with healthier and better capitalized banking sectors, while the proportion of credits from private and state-owned banks was significantly higher among firms located in countries with higher credit costs.

Finally, the financial crisis resulted in a regionally differentiated funding pattern as non-bank financial institutions became a more dominant source among firms located in South America.

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Appendix A

Table A1

Annual real GDP growth rates by country, 2000-2010

Country	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
					Central America						
Belize	12.92	4.94	5.09	9.34	4.63	3.08	5.62	0.28	3.77	-0.03	2.00
Costa Rica	1.80	1.08	2.90	6.40	4.26	5.89	8.78	7.95	2.82	-1.06	4.17
Guatemala	3.61	2.33	3.87	2.53	3.15	3.26	5.38	6.30	3.30	0.57	2.61
Honduras	5.75	2.72	3.75	4.55	6.23	6.05	6.57	6.31	4.16	-2.07	2.77
Mexico	6.59	-0.03	0.77	1.39	4.07	3.28	4.83	3.44	1.52	-6.54	5.40
Nicaragua	5.52	3.52	1.84	1.64	3.93	4.78	4.09	3.52	3.19	2.58	4.48
Panama	2.72	0.57	2.23	4.21	7.52	7.19	8.53	12.11	10.73	2.40	7.50
El Salvador	2.15	1.71	2.34	2.30	1.85	3.33	4.22	4.33	2.43	-3.54	0.75
					South America						
Argentina	-0.79	-4.41	-10.89	8.84	9.03	9.18	8.47	8.65	6.76	0.85	9.16
Bolivia	2.51	1.68	2.49	2.71	4.17	4.42	4.80	4.56	6.15	3.36	4.19
Brazil	4.31	1.31	2.66	1.15	5.71	3.16	3.96	6.09	5.14	-0.19	7.49
Chile	4.49	3.38	2.18	3.92	6.04	5.56	4.59	4.60	3.69	-1.53	5.20
Colombia	2.92	2.18	2.46	4.61	4.66	5.72	6.94	7.55	2.43	0.36	4.31
Ecuador	2.80	5.34	4.25	3.58	8.00	6.00	3.89	2.49	6.52	0.36	3.60
Guyana	-1.38	2.25	1.05	-1.01	3.29	-1.96	5.13	7.00	2.00	3.30	3.63
Peru	2.95	0.21	5.02	4.03	4.98	6.83	7.74	8.87	9.76	0.93	8.79
Paraguay	-3.33	2.06	-0.05	3.84	4.14	2.86	4.35	6.76	5.83	-4.55	15.27
Suriname	2.06	4.19	2.78	6.28	8.00	3.92	4.51	5.39	6.00	2.50	4.42
Uruguay	-1.93	-3.84	-7.73	0.81	5.00	7.46	4.33	7.46	8.54	2.86	8.47
Venezuela	3.69	3.39	-8.86	-7.76	18.29	10.32	9.87	8.15	4.78	-3.29	-1.40

Source: UNCTAD

Table A2

Exports (annual growth rates) by country, 2000-2010

Country	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
					Central America						
Belize	10.71	-9.54	2.85	20.96	7.47	13.71	23.41	3.64	3.76	-15.99	11.48
Costa Rica	-6.51	-10.78	2.66	13.90	5.17	12.93	15.95	15.56	5.65	-9.92	9.91
Guatemala	9.24	0.58	51.28	3.97	11.21	8.99	12.61	14.57	11.37	-4.91	16.89
Honduras	18.45	2.00	9.15	1.36	19.18	10.99	4.77	9.01	7.92	-18.43	17.06
Mexico	21.60	-4.93	1.27	2.65	14.11	13.24	16.00	8.56	7.13	-21.01	27.93
Nicaragua	13.65	-5.97	-3.20	9.62	20.79	12.01	17.70	14.17	24.35	-3.09	22.65
Panama	6.90	1.73	7.61	8.95	9.80	13.70	19.86	20.19	14.92	-8.07	7.08
El Salvador	14.65	-1.99	5.91	7.89	7.80	-0.69	8.17	8.42	9.56	-16.89	17.49
					South America						
Argentina	11.59	-0.34	-6.50	16.88	17.02	17.87	16.19	21.16	25.10	-18.88	21.74
Bolivia	10.90	4.63	2.28	26.13	30.62	28.00	32.66	13.94	52.44	-28.11	23.85
Brazil	17.06	4.63	3.52	19.52	30.62	23.17	16.86	17.38	23.72	-20.87	29.33
Chile	10.76	-3.79	0.69	18.47	44.21	25.54	37.42	15.21	0.85	-21.59	31.68
Colombia	11.66	-4.06	-4.84	8.87	23.20	28.85	16.59	20.37	26.87	-12.77	19.38
Ecuador	11.49	-4.07	6.95	19.89	23.41	26.75	23.87	9.36	33.74	-25.04	24.46
Guyana	0.22	-1.35	0.90	0.35	12.51	-7.04	4.95	15.75	18.20	-0.19	14.50
Peru	11.30	-1.40	8.34	17.86	36.98	32.79	34.76	17.15	13.35	-13.21	29.45
Paraguay	11.27	5.51	-1.71	23.74	16.04	5.96	14.29	43.08	48.53	-18.53	32.08
Suriname	13.30	-6.57	9.57	33.32	42.72	26.62	17.20	13.89	26.45	-17.18	34.98
Uruguay	2.05	-10.86	-17.30	13.11	35.77	16.66	13.25	18.31	37.65	-13.24	21.94
Venezuela	55.55	-19.21	-0.89	1.13	45.09	39.91	17.64	5.45	37.47	-38.75	13.27

Source: UNCTAD

Table A3

Inward FDI flows (annual growth rates) by country, 2000-2010

Country	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Central America											
Belize	-57.3	162.0	-58.4	-142.9	-1120.6	13.8	-14.2	31.5	18.5	-35.9	-10.4
Costa Rica	-34.0	12.7	43.2	-12.8	38.0	8.5	70.6	29.1	9.6	-35.2	4.9
Guatemala	48.5	117.1	-58.8	28.3	12.4	71.7	16.4	26.0	1.2	-20.4	14.5
Honduras	60.8	-20.3	-9.6	46.4	35.7	9.7	11.6	38.6	8.5	-48.0	52.4
Mexico	30.5	64.9	-20.3	-31.7	52.7	-2.7	-16.9	48.3	-11.6	-41.7	21.8
Nicaragua	-11.2	-43.6	35.8	-1.3	24.2	-3.6	19.0	33.1	64.0	-30.7	17.0
Panama	-19.0	-42.2	-80.7	889.5	30.2	-4.2	159.6	-28.9	23.6	-19.3	33.3
El Salvador	-19.6	60.9	68.5	-69.9	156.3	40.7	-52.8	543.1	-41.8	-59.5	-78.7
South America											
Argentina	-56.6	-79.2	-0.8	-23.1	149.7	27.7	5.2	16.9	50.2	-58.7	57.8
Bolivia	-27.1	-4.2	-4.1	-70.8	-56.7	-436.5	-197.6	30.4	39.9	-17.5	47.1
Brazil	14.7	-31.5	-26.1	-38.9	78.9	-17.0	24.9	83.7	30.3	-42.4	86.7
Chile	-44.5	-13.6	-39.3	68.9	66.5	-2.6	4.5	71.7	20.9	-15.0	17.3
Colombia	61.6	4.3	-16.1	-19.4	75.3	240.0	-35.1	35.9	17.1	-32.6	-5.3
Ecuador	-103.6	-2397.7	45.4	11.3	-4.0	-41.0	-45.0	-28.5	418.1	-68.3	-48.6
Guyana	45.9	-16.5	-22.1	-40.1	14.9	156.0	33.3	48.8	16.8	-19.0	30.0
Peru	-58.3	41.3	88.4	-38.1	19.8	61.3	34.4	58.4	26.1	-19.5	31.4
Paraguay	10.2	-19.1	-88.1	174.0	37.5	42.0	223.9	7.0	72.4	-34.7	100.6
Suriname	140.7	-81.9	-642.9	37.9	42.1	22.0	-7.2	-44.7	17.2	-27.8	19.0
Uruguay	16.2	8.5	-34.7	114.9	-20.2	155.0	76.2	-11.0	58.4	-24.4	47.8
Venezuela	62.7	-21.7	-78.8	160.9	-27.3	74.6	-119.6	-298.4	-65.4	-989.7	-54.8

Source: UNCTAD

Appendix B

Table B1

Basic sample characteristics, 2006 and 2010

Characteristics	2006	2010	2006 (in %)	2010 (in %)
Small and micro firms	1228	1111	44.11	39.91
medium-sized firms	1036	1072	37.21	38.51
Large firms	520	601	18.68	21.59
Foreign owned firms	359	245	12.90	8.80
State-owned firms	138	8	4.96	0.29
Part of a group	467	479	16.77	17.21
Exporter only	340	276	12.21	9.91
Importer only	265	306	9.52	10.99
Exporter and importer	316	366	11.35	13.15
Domestic firms	1863	1836	66.92	65.95
Technology licensed	202	227	7.26	8.15
Credit line used	1640	1723	58.91	61.89
TOTAL NO. OF FIRMS	**2784**	**2784**		

Table B2

Descriptive statistics – access to financing, 2006

Variable	Obs	Mean	Std. Dev.	Min	Max
Access to financing	2570	1.444	1.285	0	4
Medium-sized firms	2570	0.371	0.483	0	1
Large firms	2570	0.192	0.394	0	1
Part of a larger firm	2570	0.169	0.375	0	1
Majority state-owned	2570	0.053	0.223	0	1
Foreign owned	2570	0.131	0.338	0	1
Exporter only	2570	0.118	0.323	0	1
Importer only	2570	0.095	0.294	0	1
Exporter and importer	2570	0.112	0.316	0	1
Technology licensed	2570	0.072	0.258	0	1
Credit line	2570	0.591	0.492	0	1
Business licensing and permit	2570	1.154	1.191	0	4
Corruption	2570	2.217	1.493	0	4
Annual GDP growth rate	2570	6.258	2.120	2.88	10.3
Bank non-performing loans to total gross loans	2570	4.170	2.657	0.9	11.3
Domestic credit to private sector (% of GDP)	2570	33.663	25.310	11.7	87.1
South America	2570	0.861	0.346	0	1

Table B3

Descriptive statistics – access to financing, 2010

Variable	Obs	Mean	Std. Dev.	Min	Max
Access to financing	2562	1.550	1.215	0	4
Medium-sized firms	2562	0.390	0.488	0	1
Large firms	2562	0.221	0.415	0	1
Part of a larger firm	2562	0.165	0.371	0	1
Majority state-owned	2562	0.003	0.052	0	1
Foreign owned	2562	0.085	0.280	0	1
Exporter only	2562	0.103	0.305	0	1
Importer only	2562	0.112	0.315	0	1
Exporter and importer	2562	0.137	0.344	0	1
Technology licensed	2562	0.084	0.278	0	1
Credit line	2562	0.633	0.482	0	1
Business licensing and permit	2562	1.282	1.165	0	4
Corruption	2562	1.928	1.458	0	4
Annual GDP growth rate	2562	0.453	2.002	-3.85	3.36
Bank non-performing loans to total gross loans	2562	2.767	0.877	1	4.1
Domestic credit to private sector (% of GDP)	2562	39.339	29.472	13.5	97.5
South America	2562	0.861	0.346	0	1

Table B4

Correlation matrix – access to financing, 2006

	MEDIUM	LARGE	PART	STATE	FOREIGN	EXP	IMP	EXPIMP	TECH	CREDIT	LICENSE	CORRUP	GR GDP	NP LOANS	DCRED	SA
MEDIUM	1															
LARGE	-0.375	1														
PART	-0.015	0.176	1													
STATE	-0.047	-0.035	0.099	1												
FOREIGN	-0.031	0.106	0.225	0.596	1											
EXP	0.028	0.075	0.025	-0.059	0.015	1										
IMP	0.074	0.000	-0.023	-0.076	-0.028	-0.119	1									
EXPIMP	0.017	0.201	0.083	-0.084	0.037	-0.130	-0.116	1								
TECH	-0.026	0.114	0.068	-0.065	0.080	-0.036	0.177	0.217	1							
CREDIT	0.100	0.145	-0.014	-0.152	-0.113	0.020	0.038	0.156	0.062	1						
LICENSE	0.025	0.026	-0.003	0.065	0.033	-0.006	0.020	0.039	0.001	0.059	1					
CORRUP	-0.032	-0.047	-0.059	-0.066	-0.073	0.007	-0.014	-0.020	-0.001	0.001	0.323	1				
GR GDP	-0.043	-0.086	0.136	0.432	0.270	0.059	-0.010	0.089	0.014	-0.129	0.043	-0.019	1			
NP LOANS	-0.039	-0.025	0.021	-0.253	-0.128	0.006	0.036	0.011	0.015	-0.066	0.054	0.271	-0.098	1		
DCRED	0.094	0.067	-0.005	-0.190	-0.129	-0.057	0.059	0.003	0.016	0.144	-0.127	-0.247	-0.283	-0.428	1	
SA	-0.019	0.005	0.004	0.095	0.003	-0.013	0.058	0.061	0.042	0.052	0.044	0.030	0.331	0.219	-0.275	1

Table B5

Correlation matrix – access to financing, 2010

	MEDIUM	LARGE	PART	STATE	FOREIGN	EXP	IMP	EXPIMP	TECH	CREDIT	LICENSE	CORRUP	GR GDP	NP LOANS	DCRED	SA
MEDIUM	1															
LARGE	-0.426	1														
PART	-0.018	0.247	1													
STATE	-0.011	0.026	0.017	1												
FOREIGN	-0.067	0.231	0.180	0.145	1											
EXP	0.060	0.041	0.012	-0.018	0.047	1										
IMP	0.069	0.043	0.033	0.005	0.033	-0.121	1									
EXPIMP	-0.043	0.325	0.069	0.001	0.163	-0.135	-0.141	1								
TECH	-0.024	0.167	0.093	0.038	0.184	-0.002	0.151	0.207	1							
CREDIT	0.086	0.170	0.066	-0.007	0.007	0.051	0.099	0.148	0.053	1						
LICENSE	0.050	0.038	0.077	0.000	0.076	0.014	0.019	0.046	0.042	0.059	1					
CORRUP	0.037	-0.058	0.013	-0.008	0.004	-0.018	0.001	-0.012	0.011	-0.005	0.368	1				
GR GDP	0.009	-0.021	-0.078	0.055	-0.017	-0.010	-0.020	-0.011	0.029	-0.121	0.014	0.037	1			
NP LOANS	0.041	0.024	0.034	-0.046	-0.048	0.060	-0.045	-0.004	-0.007	0.135	0.093	0.124	-0.100	1		
DCRED	0.042	-0.017	-0.006	-0.027	-0.040	-0.065	0.003	-0.043	0.010	0.016	-0.140	-0.267	-0.340	0.032	1	
SA	0.013	0.042	-0.005	0.021	-0.039	-0.009	0.114	0.097	0.040	0.201	0.033	-0.042	0.048	0.107	-0.150	1

Table B6

Descriptive Statistics – composition of funding sources, 2006

Variable	Obs	Mean	Std. Dev.	Min	Max
Internal funds	1155	59.36	42.64	0	100
Owner's contribution	1155	1.54	10.23	0	100
Private and state-owned banks	1155	24.24	37.62	0	100
Non-bank financial institutions	1155	2.24	12.98	0	100
Supplies and customers	1155	5.84	20.14	0	100
Other	1155	6.66	21.96	0	100
Negative shifter	1155	0.33	0.47	0	1
Non-shifter	1155	0.36	0.48	0	1
Medium-sized	1155	0.40	0.49	0	1
Large	1155	0.29	0.45	0	1
Log Age	1155	2.93	0.90	0	5.11
Part of a larger firm	1155	0.21	0.41	0	1
Foreign	1155	0.13	0.34	0	1
Exporter only	1155	0.15	0.36	0	1
Importer only	1155	0.12	0.32	0	1
Exporter and importer	1155	0.17	0.38	0	1
GDP growth rate	1155	6.44	2.00	2.88	10.30
Capital-to-asset ratio	1155	9.85	2.36	6.90	12.90
Real interest rate	1155	6.83	9.42	-9.87	21.90
South America	1155	0.95	0.22	0	1

Table B7

Descriptive Statistics – composition of funding sources, 2010

Variable	Obs	Mean	Std. Dev.	Min	Max
Internal funds	1070	54.43	42.26	0	100
Owner's contribution	1070	3.14	14.01	0	100
Private and state-owned banks	1070	27.92	38.20	0	100
Non-bank financial institutions	1070	1.89	11.78	0	100
Supplies and customers	1070	10.88	26.07	0	100
Other	1070	1.73	12.03	0	100
Negative shifter	1070	0.32	0.47	0	1
Non-shifter	1070	0.37	0.48	0	1
Medium-sized	1070	0.41	0.49	0	1
Large	1070	0.34	0.48	0	1
Log Age	1070	3.17	0.72	0	5.14
Part of a larger firm	1070	0.21	0.41	0	1
Foreign	1070	0.12	0.33	0	1
Exporter only	1070	0.13	0.34	0	1
Importer only	1070	0.15	0.36	0	1
Exporter and importer	1070	0.22	0.42	0	1
GDP growth rate	1070	0.32	1.96	-3.85	3.36
Capital-to-asset ratio	1070	10.34	2.34	7.40	13.60
Real interest rate	1070	9.85	7.13	2.93	28.40
South America	1070	0.94	0.23	0	1

Table B8

Correlation matrix – composition of funding sources, 2006

	NEGSH	NONSH	MEDIUM	LARGE	AGE	PART	FOREIGN	EXP	IMP	EXPIMP	GR GDP	CTAR	RIR	SA
NEGSH	1													
NONSH	-0.530	1												
MEDIUM	0.010	-0.052	1											
LARGE	-0.013	0.069	-0.516	1										
AGE	-0.054	0.039	-0.041	0.231	1									
PART	0.000	-0.008	-0.063	0.197	0.099	1								
FOREIGN	0.073	0.003	-0.053	0.166	-0.020	0.210	1							
EXP	-0.035	-0.028	-0.029	0.086	0.043	0.041	0.070	1						
IMP	0.029	0.021	0.092	-0.041	0.053	-0.041	-0.016	-0.154	1					
EXPIMP	-0.056	0.057	-0.020	0.175	0.184	0.121	0.090	-0.194	-0.168	1				
GR GDP	0.008	-0.042	-0.041	-0.096	0.090	0.139	0.179	0.071	-0.047	0.130	1			
CTAR	-0.011	-0.033	-0.009	-0.103	-0.054	0.089	0.070	0.097	-0.064	0.016	0.342	1		
RIR	-0.059	0.031	0.067	-0.090	-0.089	-0.133	-0.134	-0.059	0.081	-0.046	-0.460	-0.229	1	
SA	-0.040	-0.015	-0.021	0.004	0.012	-0.023	-0.022	-0.051	0.038	0.017	0.269	0.036	-0.003	1

Table B9

Correlation matrix – composition of funding sources, 2010

	NEGSH	NONSH	MEDIUM	LARGE	AGE	PART	FOREIGN	EXP	IMP	EXPIMP	GR GDP	CTAR	RIR	SA
NEGSH	1													
NONSH	-0.522	1												
MEDIUM	-0.033	-0.035	1											
LARGE	0.009	0.071	-0.604	1										
AGE	-0.047	0.053	-0.090	0.290	1									
PART	-0.033	-0.006	-0.073	0.240	0.115	1								
FOREIGN	0.035	0.044	-0.116	0.236	0.024	0.198	1							
EXP	-0.013	-0.021	0.048	-0.009	-0.046	0.008	0.051	1						
IMP	-0.008	0.043	0.070	-0.008	0.044	0.021	-0.007	-0.162	1					
EXPIMP	-0.021	0.043	-0.127	0.319	0.215	0.077	0.195	-0.206	-0.226	1				
GR GDP	0.000	0.032	0.029	0.004	-0.027	-0.038	-0.010	0.007	-0.056	0.008	1			
CTAR	0.006	-0.019	-0.038	-0.017	-0.071	0.003	0.007	0.107	-0.114	0.068	0.407	1		
RIR	-0.048	-0.008	0.057	-0.068	-0.121	-0.081	-0.009	-0.066	0.101	-0.072	-0.172	-0.182	1	
SA	-0.045	-0.010	0.003	0.037	0.024	0.079	-0.065	-0.024	0.071	0.047	-0.110	-0.048	0.014	1

Table B10

List of variables used in the analyses

Variable name	Abbreviation	Definition	Source
Negative shifter	NEGSH	Firm whose access to finance deteriorated during the crisis	LAC - WBES
Non-shifter	NONSH	Firm whose access to finance remained unchanged during the crisis	LAC - WBES
Log Age	AGE	Age of the firm	LAC - WBES
Medium-sized firms	MEDIUM	Firms with between 20 and 99 employees	LAC - WBES
Large firms	LARGE	Firms with more than 99 employees	LAC - WBES
Part of a larger firm	PART	Firm that is part of a larger firm	LAC - WBES
Majority state-owned	STATE	More than 50% of the firm owned by the government/state	LAC - WBES
Foreign owned	FOREIGN	More than 50% of the firm owned by foreign company	LAC - WBES
Exporter only	EXP	Firm that exports only	LAC - WBES
Importer only	IMP	Firm that imports only	LAC - WBES
Exporter and importer	EXPIMP	Firm that exports and imports	LAC - WBES
Technology licensed	TECH	Firm that uses technology licensed from a foreign-owned company	LAC - WBES
Credit line	CREDIT	Firm that has a line of credit or loan from a financial institution	LAC - WBES
Business licensing and permit	LICENSE	Likert-scale variable: business licensing and permits (0-4)	LAC - WBES
Corruption	CORRUP	Likert-scale variable: corruption (0-4)	LAC - WBES
South America	SA	Dummy for Southern American countries	LAC - WBES
Annual GDP growth rate	GR GDP	Annual real GDP growth rate	WDI
Bank non-performing loans	NP LOANS	Bank non-performing loans to total gross loans (in %)	WDI
Domestic credit to private sector	DCRED	Domestic credit to private sector (as % of GDP)	WDI
Capital-to-asset ratio	CTAR	Bank capital to asset ratio (in %)	WDI
Real interest rate	RIR	Real interest rate (%)	WDI

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