

ACCESS TO FINANCE AND FUNDING COMPOSITION DURING THE CRISIS: A FIRM-LEVEL ANALYSIS OF LATIN AMERICAN COUNTRIES

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This paper describes the effects of the 2009 global financial crisis on firms' access to financing for investment projects. The analysis uses data from the Latin American and Caribbean Enterprise Surveys 2006 and 2010, demonstrating that during the crisis, the availability of internal sources was crucial for larger and foreign-owned firms or firms that were part of a group, while state-owned firms did not enjoy any financial privileges. Firms sought greater bank and supply-chain financing, larger firms used less internal funds, foreign firms relied more on internal funds, while firms that export and import used bank credits more intensively.

JEL classification: G01, G11, D22, L16

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1. INTRODUCTION

It is evident that investments are necessary for firm survival and growth. However, an ever-growing body of empirical literature has provided robust evidence that firms encounter financing constraints that can significantly affect their investment decisions and, as a consequence, hurt their survival and growth prospects. In that respect, given their pivotal role, a systematic identification of financing constraints helps policymakers spot key areas for policy intervention and support.

Methodologically, following the seminal paper by Fazzari *et al.* (1988), an indirect though controversial approach to identifying financing constraints took root that is based on a comparison of investment cash flow sensitivities across pre-specified firm sub-samples. Lately, more direct measures of the presence of financing constraints have been developed and are exploitable empirically. Empirical evidence suggests that financing constraints are widespread and unevenly

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distributed across firms such that smaller, younger, or single-unit firms face significantly higher obstacles to financing.

In addition to firm-specific characteristics, the macroeconomic context is also found to strongly influence the presence and build-up of financing obstacles (Beck *et al.*, 2006). Likewise, a change in the macroeconomic context is expected to manifest itself in changing perceptions of financing obstacles. In 2009, the global financial crisis, which had begun in the summer of 2007 and spread globally after the Lehman Brothers bankruptcy in September 2008, led to a global recession as credits froze and global demand collapsed. Latin America was initially unscathed by the crisis but was drawn into its undertow in the aftermath of the Lehman Brothers bankruptcy: In 2009, real GDP growth plummeted in the region and economic activity in Central and South America contracted by 5.9% and 0.3%, respectively. However, the effect of the crisis was uneven across countries. Mexico, with its strong economic ties to the U.S., 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 fairly well (see Appendix A, Table A1). In its global course of expansion, the crisis found several transmission mechanisms, gaining a foothold in Latin America through three major channels: i) trade, ii) financial markets and iii) remittances. Firstly, given the region's growing economic integration and expanded trade channels, local producers were affected by a drop in global, and particularly U.S., demand, while local primary commodity exporters felt the impact of the collapse of commodity prices (Ocampo, 2009). Specifically, in the wake of the crisis, exports from the region dropped by between 20 and 25%. On the national level, exports collapsed most dramatically for Venezuela (-39%) and Bolivia (-28%) but fell only slightly in Guyana (by 0.2%), Nicaragua (by 3%), Guatemala (by 5%) and Panama (by 8%) (see Appendix A, Table A2). Secondly, following the crisis, gross capital inflows, particularly inward foreign direct investment (FDI), to Latin America was almost halved (Jara *et al.*, 2009). Finally, certain economic sectors in countries outside Latin America with a high proportion of migrant workers (such as construction in the United States) were most affected by the crisis. Hence, unemployment among migrant workers increased disproportionately, reducing their ability to send remittances to their families (Orozco, 2009).

Given this context, the ensuing analysis seeks to shed light on the effects of the financial crisis on i) access to financing and ii) funding strategies for fixed-capital investments among firms located in Latin America. 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 when domestic financial markets risked drying up as a result of the global credit crunch. Second, it analyzes firms' funding strategies for fixed-capital investments and demonstrates how specific firm characteristics shape and determine their strategies to deal with the negative effects of the global financial crisis. The analysis applies unique firm panel data for a large 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. As such, the analysis contributes greatly to the discussion of crisis-related consequences affecting entrepreneurs and their responses to them. The importance of this is that while there is a growing body of literature on determinants of financing access and patterns, analyses of the effects of recurring (financial) crises is surprisingly scarce (see, for example, European Central Bank, 2009; OECD, 2009a; World Bank, 2011; or Ariff *et al.*, 2008). This paper is an attempt to address this situation.

The analysis shows that 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 loans 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. In contrast, firms which could resort to overdraft facilities enjoyed easier access to funds. Furthermore, it underscores the pivotal role that internal sources or capital markets played during the financial crisis, as access to financing was easier for firms that were able to obtain internal sources, such as majority foreign-owned firms, or resort to internal capital markets, such as firms which are part of a group. In addition, the crisis also exerted an equalizing effect on access to financing. Given the global nature of the crisis that materialized into a global slump of demand, access to financing became equally difficult for firms trading internationally as well as for firms that cater solely to domestic markets. However, there is no evidence of any preferential treatment of majority state-owned firms.

In addition, the analysis demonstrates that firms adapted to the crisis and modified their funding strategies for 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 in the course of the crisis relied more intensely on bank and supply-chain financing. 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 profited from the existence of internal capital markets and drew more strongly on internal funds to finance their investment projects. In addition, compared to firms with a purely domestic orientation, firms that only import used non-bank financial institutions to a significantly lesser degree while firms that both export and import more intensely drew on credit from private and state-owned banks.

The remainder of the paper is organized as follows. Section 2 provides an overview of prior literature and evidence on financing constraints and stresses the unequal distribution of funding obstacles across firms, underscoring the pivotal role of economic, financial and legal system development in alleviating funding obstacles. Section 3 provides an overview of the data used in the analysis. Section 4 discusses results on determinants of access to financing before and during the crisis, while Section 5 analyzes crisis-related changes in funding patterns for fixed-capital investments. Finally, Section 6 concludes.

2. ACCESS TO FUNDING LITERATURE

Following the seminal paper by Fazzari *et al.* (1988), prevailing financing constraints were typically identified by dividing samples of firms according to a priori measures of financing constraints and by analyzing and comparing emerging investment cash flow sensitivities across sub-samples. Greater investment cash flow sensitivities across sub-samples were then interpreted as proof of tighter financing constraints. However, Kaplan and Zingales (1997, 2000) cast serious doubt on the underlying assumption that investment cash flow sensitivities increase monotonically with the degree of financing constraints and stressed that investment cash flow sensitivities are poor indicators of financing constraints.

More recently, however, the availability of new and better data—particularly survey data—allows for more direct measurement of the presence and determinants of financing constraints. Generally, the related literature finds strong evidence that financing constraints

are not independent of specific firm characteristics. Specifically, firm size, age, business-group affiliation, or ownership all emerge as non-negligible determinants of financing constraints. For example, Beck *et al.* (2006) analyzed a unique firm-level survey database covering 80 developed and developing countries and found that, on average, smaller firms reported significantly higher obstacles to financing than larger firms. This size-constraint nexus was however more important for middle- and low-income countries. Moreover, they emphasized that older firms faced lower financing constraints but again pointed to differences among low-, middle- and high-income countries, as age was more important in high-income countries. Probably due to the presence of and easy access to internal capital markets, financing obstacles were found to be lower for firms that are part of a business group (see, e.g., Shin and Park, 1999 or Beck *et al.*, 2006) and foreign-owned firms (see, e.g., Schiantarelli and Sembenelli, 2000 and Beck *et al.*, 2006), while state-owned firms appeared less financially constrained because of the potential for preferential treatment from state-owned financial institutions or because they were potential recipients of budgetary support from the government (Héricourt and Poncet, 2007). Furthermore, empirical evidence seems to support the notion that exporters experience lower financing constraints, since—once the initial sunk cost of foreign market entry is covered—firms that enter export markets experience significant improvements in their financial health (see, e.g., Greenaway *et al.*, 2007; Silva, 2012). However, Español (2006) demonstrated for a set of large Argentine firms during the currency board regime years (1992 to 2001) that exporting firms indeed faced greater financial constraints. This puzzling result was ascribed to the extensive exchange rate appreciation that occurred over the course of the 1990s, which inflicted a non-negligible profit squeeze on exporters, weakening their balance sheets and undermining their creditworthiness.

In addition, previous empirical evidence also indicates the decisive role of economic, financial and legal system development in alleviating funding obstacles. In that respect, Beck *et al.* (2006) emphasized that financing obstacles were lower among firms located in countries with higher levels of financial intermediary development, better stock market development, more efficient legal systems, higher GDP per capita and superior institutional development. Likewise, funding obstacles were not independent of the exact market structure of the banking sector. For example, Laeven (2002) studied the effects of liberalization of the banking market on financing constraints of firms located in developing countries and showed that financial liberalization tended to ease prevailing

financing constraints, particularly for smaller firms. In a similar vein, O’Toole (2012) showed for a large sample of developing and transitional economies that financial liberalization reduced the probability of being credit-constrained. The effect was greatest among young, private, domestic small—and medium—sized enterprises. However, regionally differentiated effects emerge, as firms located in Sub-Saharan Africa actually faced more formidable constraints, and credit constraints increased with financial liberalization. The potentially distortive effect of the fast-growing presence of foreign banks on access to credit was addressed by Clarke *et al.* (2001). Using survey data for 38 developing and transitional economies, they showed that firms benefit from foreign bank penetration due to easier access to credit. These benefits accrued to all firms, irrespective of size, although there was some indication that larger firms tended to benefit more than smaller ones. In contrast, bank concentration was found to increase financing obstacles and decrease the probability of receiving bank financing (Beck *et al.*, 2003). However, a country’s level of institutional, economic and financial development helped reduce the unfavorable effect of bank concentration.

3. DATA

The analysis uses data for a sub-sample of Latin American countries comprising Argentina, Bolivia, Chile, Colombia, Ecuador, El Salvador, Guatemala, Honduras, Mexico, Nicaragua, Panama, Peru, Paraguay, 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 2010.¹ The Enterprise Surveys have been conducted regularly since 2002 by means of face-to-face interviews with managers, owners or directors of establishments on a three- to four-year rotation in order to collect information about the business environment for individual firms, how the respondents perceived the business environment and its changes over time, identifying constraints or obstacles to firm performance and growth and capturing the effects a country’s business environment has on its international competitiveness. Because its focus is on private business activities, fully state-owned enterprises are excluded from the survey.

1. Except for Honduras, Mexico and Nicaragua, for which data on individual survey waves were matched by means of constant panel identifiers, officially available panel data are used. Belize, Brazil, Suriname and Guyana were excluded from the analysis since data are available for 2010 only (but not the pre-crisis period), while Costa Rica was excluded due to incompatibility of data across survey waves.

Country samples are selected using random sampling, stratified by firm size (small: 5-19 employees; medium-sized: 20-99 employees; and large: more than 99 employees), region (of major economic activity) and industry classification. As for the latter, all manufacturing sectors (group D) as well as construction (group F), services (groups G and H), transport, storage, and communications (group I) and IT (from group K) are covered (based on the ISIC classification, revision 3.1).² The primary sampling unit of each survey is a formally registered establishment with five or more full-time employees, located in a major urban centers, which engages in non-agricultural activities. Generally, the sampling strategy and the survey instruments used in collecting the data guarantee that survey data from different countries are comparable.

Table 1. Cross-section and panel data characteristics of WBES-2006 and WBES-2010

Country	2010 only	2006 only	2006 & 2010
Argentina	556	565	498
Bolivia	182	433	180
Chile	603	587	430
Colombia	636	694	306
Ecuador	189	481	177
El Salvador	244	577	116
Guatemala	450	382	140
Honduras	162	238	198
Mexico	1,270	1,270	210
Nicaragua	192	334	144
Panama	241	480	124
Peru	686	318	314
Paraguay	208	460	153
Uruguay	320	334	287
Venezuela	171	351	149
Total	6,110	7,504	3,426
Note: Number of firms			

2. Given the low number of observations per industry, some industries were grouped together to form homogenous groups. See Table B1 in Appendix B.

The Enterprise Surveys are designed to provide panel data sets as maximum effort is made to re-interview firms covered in previous waves. Specifically, data used in the ensuing analysis stem from two consecutive survey waves that were conducted during 2006 and 2007 (WBES-2006) as well as 2010 and 2011 (WBES-2010), respectively, but refer to the last complete fiscal years—that is, 2005 and 2009—respectively. All in all, for the sample of countries analyzed, the WBES-2006 covers 10,930 firms and the WBES-2010 includes 9,536 firms. From both cross sections, a panel data set of 3,426 firms was constructed, comprising firms covered in both waves³ (Table 1) which allows for the analysis of establishment-level responses to changes in the business environment over time.

The WBES is particularly suited for the ensuing analysis as it offers a direct measure of financing obstacles and therefore avoids the shortcomings of previous analyses that indirectly infer the presence and scale of financing obstacles from, e.g., highly-criticized investment cash flow sensitivities. Moreover, because the WBES includes a large number of small and medium-sized firms, it allows for more accurate study of size-related funding obstacles highlighted in related empirical studies. However, it is also subject to some limitations, particularly with respect to the design and explanatory power of the analysis. In the course of generating firm-level panels, attrition becomes a major issue, compounding the potential for non-response bias present in many firm-level surveys, which may seriously affect the random nature of samples. Both issues manifest in non-response to the survey, but while the former reflects a potentially endogenous decision to refuse to participate, the latter is the result of structural shifts in the economy due to firm exit. This issue is of particular concern because over the course of the financial crisis, firm exit may have greatly increased due to collapsing demand and rapidly dwindling profits. Overall, the firm attrition rate of about 70% between WBES-2006 and WBES-2010 is considered a high level of attrition. In contrast, with a 6% exit rate from the sample, non-response due to firm exit was only of minor importance. However, as will be shown later,

3. Only eligible establishments that did not refuse to answer the screener question were re-interviewed in the 2010 wave. The exception to this are firms that were no longer in businesses or could not be reached, as well as education or government establishments, establishments with fewer than five employees, establishments that did not reply to repeated attempts at making contact, firms with disconnected phone lines, answering machines or fax line, and those for whom it was not possible to obtain current address information. Sampling weights were adjusted accordingly to account for ineligibility.

although the panel sample suffers from an attrition bias, the scale of this bias is quite small.

The analysis is based on a panel of 3,426 firms that were covered in both waves. As for sample characteristics (see Table B1, Appendix B), around 40% of all firms in the sample are micro or small firms (less than 19 employees), another 40% are medium-sized firms (between 20 and 99 employees) while the remaining 20% are large firms with more than 99 employees. Around 10% are foreign-owned, only between 1% and 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 68% are firms that cater to the domestic market only. Finally, around 8% of all firms use technology licensed from a foreign-owned company while between 50% and 60% of all firms had a line of credit or loan from a financial institution at the time of the interview.

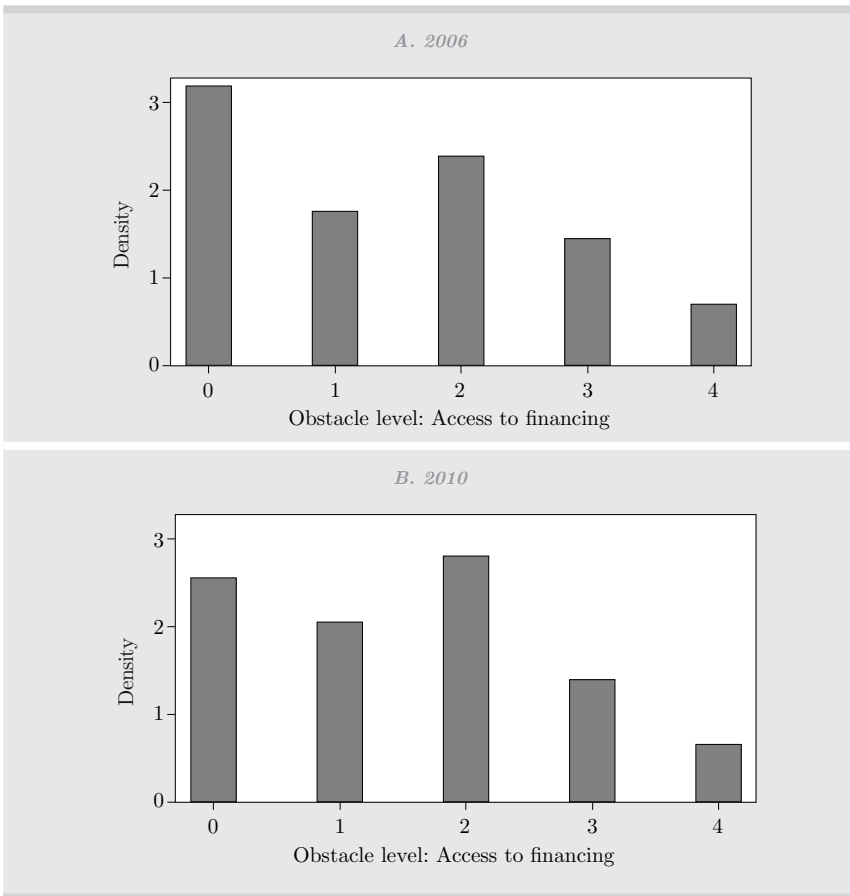
For these analyses, the establishment-level panel from the Enterprise Surveys was complemented by additional data from the World Bank World Development Indicators (WDI) to account for country-level characteristics such as real interest rates or capital market-related characteristics. The latter include non-performing loans as a share of total gross loans, domestic credit extended to the private sector as a share of GDP, the bank capital-to-asset ratio and trade statistics (DATAINTAL) provided by the Inter-American Development Bank (IDB) and developed by the Institute for the Integration of Latin America (INTAL) and data on the presence of foreign banks in Latin America extracted from Claessens and Van Horen (2012). All data sets were matched for the years 2005 and 2009 since World Bank Enterprise Survey (WBES) data collected in 2006 and 2010 refer to the last complete fiscal year, i.e., 2005 and 2009.

In what follows, the analysis first examines crucial determinants of access to financing and explores whether and how the global financial crisis contributed to the build-up or teardown of perceived obstacles to financing (Section 4). In the second stage of analysis (Section 5), we look at firms' funding strategies for fixed-capital investments and analyze how, in the face of the crisis, firms adjust their financing patterns to accommodate adverse effects such as falling income and demand, lower exports, reduced turnover and cash flow, mounting credit default rates or soaring real interest rates.

4. ACCESS TO FUNDING

To assess the impact of the 2009 global financial crisis on firms' access to financing in Latin America, this analysis focuses on a Likert-scale variable that represents firms' assessment of the difficulty they face in accessing financing. Specifically, firms were asked to answer 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?"

Figure 1. Histograms representing access to financing for 2006 and 2010



Source: World Bank Enterprise Survey, LAC, 2006 and 2010.

Figure 1 suggests that for the overall sample considered, between 2006 and 2010 a net shift occurred predominantly away from No Obstacle (0) and towards Minor Obstacle (1) and Moderate Obstacle (2). Overall, the category Moderate Obstacle (2) experienced the highest net increases.

However, there are more complex and diverse movements across categories than what is shown by Figure 1. Therefore, Table 2 presents the transition matrix concerning any obstacle to access to financing and demonstrates that between 2006 and 2010, the majority (68% of all establishments) reported a change in obstacles to financing access while the remaining 32% responded that access to financing was unaltered. It also highlights that the majority of changes occurred among neighboring categories, while more dramatic changes from very low to very high obstacle (or vice versa) were relatively rare. Overall, most changes occurred in the categories Very Severe Obstacle (4) and Major Obstacle (3) for which only around 18% and 22% of all firms reported no change in access to financing at all. In both categories, around 30% of all entrepreneurs reported slight improvements in access to financing. In addition, it shows that the category No Obstacle (0) experienced the most pronounced net reduction, predominantly losing ground to Minor Obstacle (1) and Moderate Obstacle (2) with around 23 to 24%, respectively. Finally, it reveals that the net increase in Minor Obstacle (1) highlighted above predominantly stems from reductions in No Obstacle (0) and Moderate Obstacle (2). In contrast, the more pronounced net increase in Moderate Obstacle (2) stems from reductions in all other categories, to almost equal degrees.

Table 2. Transition matrix – Level of obstacle to access to finance between 2006 and 2010 (%)

From ... \ To ...	No obstacle	Minor obstacle	Moderate obstacle	Major obstacle	Very severe obstacle
No obstacle	40.85	22.85	24.39	7.36	4.55
Minor obstacle	24.96	25.30	31.70	13.49	4.55
Moderate obstacle	18.00	21.82	35.88	17.63	6.66
Major obstacle	17.46	17.88	30.15	22.45	12.06
Very severe obstacle	15.81	11.97	27.78	26.50	17.95

Source: Authors' calculations.

After discussion of significant shifts in access to financing between 2006 and 2010, the analysis now turns to identifying the effect the crisis had on access to financing. Methodologically, given the ordered nature of the dependent variable, an ordered logit approach is pursued, as follows:

$$y_{it}^* = \mathbf{x}'_{it}\beta + e_{it} \quad (1)$$

where y_{it}^* is an unobservable, latent variable, \mathbf{x}_{it} is a set of control variables and e_{it} represents the error term.

Then, the following holds:

$$\begin{aligned} y_{it} = 0 & \quad \text{if } y_{it}^* \leq \lambda_{0t} \\ y_{it} = 1 & \quad \text{if } \lambda_{0t} < y_{it}^* \leq \lambda_{1t} \\ y_{it} = 2 & \quad \text{if } \lambda_{1t} < y_{it}^* \leq \lambda_{2t} \\ y_{it} = 3 & \quad \text{if } \lambda_{2t} < y_{it}^* \leq \lambda_{3t} \\ y_{it} = 4 & \quad \text{if } y_{it}^* > \lambda_{3t}, \end{aligned}$$

with No Obstacle, Minor Obstacle, Moderate Obstacle, Major Obstacle and Very Severe Obstacle coded as 0, 1, 2, 3 and 4, respectively, and the λ_{it} 's as unknown parameters (cut-off points) that will be estimated together with β for $t = 2006, 2010$ separately.

\mathbf{x}_{it} contains a set of firm-level characteristics, a set of industry dummies and some country-level characteristics. Specifically, following Beck *et al.* (2006), who demonstrate that smaller firms face higher financing obstacles, firm size is included to account for the role of size in determining the ease of accessing funding. Size is captured by means of size-related dummy variables, where small firms refer to firms with 5-19 employees, medium-sized firms have 20-99 employees and large firms have more than 99 employees.

Moreover, dummy variables are included for business-group affiliation and foreign ownership to test the hypothesis that the existence of internal capital markets or funds renders access to financing easier for firms that are either part of a group or foreign-owned. Similarly, a dummy variable for majority state-owned firms is included to test the preferential treatment hypothesis corroborated in the literature. The availability of internal or alternative funds may be particularly relevant during economic downturns or recessions when access to financing becomes more difficult or expensive, in which case firms that are part of a group, foreign-owned firms or state-owned firms can

all resort to internal capital markets or exploit preferential financial and budgetary treatment to satisfy their capital needs.

Relative to their purely domestic-oriented counterparts, firms engaged in international trade not only differ in terms of productivity, size, wages and 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, exporters may enjoy superior funding prospects since foreign exchange revenues represent better collateral for securing credits (Tornell and Westermann, 2003), trading internationally may be viewed as a sign of efficiency and competitiveness (Ganesh-Kumar *et al.*, 2001), or economies of scale can more easily be exploited in international markets. In contrast, internationally trading firms that are exposed to greater uncertainty, risk of failure and working capital needs (Amiti and Weinstein, 2009) may be credit-constrained and may therefore face more significant obstacles to funding. However, the advent of an external shock may alter the situation faced by exporters when accessing funds. This is particularly true in the event of a purely domestic recession, where domestic demand collapses, leaving firms that cater only to domestic markets 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 generate sufficient turnover and cash flow to finance their capital needs. However, in a global recession when demand for exports collapses, exporters' turnover and cash flow fall and access to financing becomes equally difficult for both exporters as well as domestic-oriented firms. In view of that, several dummy variables that capture firms' trading status are included to account for the difficulties that internationally trading firms may face in accessing financing: Firms that both export and import are called "exporters and importers," firms that export only are called "exporters only" while firms that import only (without re-exporting) are called "importers only". Their purely domestic-oriented counterparts constitute the reference group.

Continuous development of innovative 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 earn above-normal monopoly rents, profits that can be used to fund firm operations. But such technological innovations may also be licensed from other firms, giving the licensee an advantage over its

competitors and the opportunity to boost turnover, expand market share and increase profits. Therefore, relative to non-licensees, access to finance may be easier for firms that license technologies from other companies since they may have more internal funds available on the one hand and also may have a solid performance record that eases access to credit from banks or other financial institutions. Furthermore, regardless of the economic crisis technology licensees may succeed in maintaining their competitive edge as well as income and cash flow 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.

Whether firms that already have a line of credit or loan from a financial institution face higher or lower obstacles to funding is unclear a priori. Obstacles may be higher if prior credit is viewed as an indication of insufficient internal resources and collateral, and banks and other financial institutions may be reluctant to grant additional credits or loans to already indebted firms. In contrast, funding obstacles may be lower as longer-standing debtor-creditor relationships help build trust and a sound reputation with outside creditors who are willing to lend additional resources. This may also carry over to recession periods, when firms' internal resources can be quickly used up and in this environment of greater uncertainty banks resort to more conservative lending strategies. To test both hypotheses, a dummy variable equal to one is included for firms that already use a line of credit.

In contrast, the availability of overdraft facilities may significantly facilitate access to funding by making it easier to ride out funding bottlenecks with pre-specified and readily available overdrafts, irrespective of the state of the economy. A dummy variable that is equal to one is included if an establishment reports that an overdraft facility was available.

Perceived risks and the burden of firms' regulatory environment also affect perceptions concerning the ease of accessing funds. Specifically, if business operations are hampered by extensive red tape or if corruption is widespread, more time and financial resources have to be spent on firms' daily business operations in general, but also on obtaining access to external funds in particular. This also renders access to financing more difficult, irrespective of the state of the economy. The perceived burden of both administrative requirements 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 administrative red tape or corruption, firms

were asked to rate how problematic business licensing and permits or corruption were to their current business operations, using a scale from 0 (No Obstacle) to 4 (Very Severe Obstacle).

At the country level, four control variables are included that may affect the ease of accessing funds. To capture the role of external demand as a source of income and internal funds, annual export growth rates are included. Therefore, high export growth rates are expected to facilitate access to financing. In addition, 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 (NPL) is already high, banks' reluctance to grant more credit 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 domestic credit provided to the private sector as a share of total GDP on the one hand, and the ratio of bank non-performing loans to total gross loans, on the other. Furthermore, the past two decades have witnessed an unprecedented rise in the degree of globalization and integration in financial services as banks have dramatically increased their presence abroad, becoming crucial players in domestic financial intermediation. Claessens and van Horen (2012) highlight that prior to the Argentine and other financial crises in the region, many banks established a presence in Latin America. And while many foreign-owned banks exited after the crises and entry remained relatively sluggish thereafter, the region saw a renewed surge in bank investment starting in 2006.⁴ Hence, to account for the growing importance in and impact of foreign-owned banks on domestic financial sector development and lending stability during economic crises, the share of total banks that are foreign-owned is included.

Furthermore, regional location may also matter. As mentioned above, the crisis was most pronounced in Central America and exports and inward FDI flows collapsed most dramatically in South America. Hence, a dummy variable is included which is equal to one for countries located in South America and zero otherwise. Finally, a set of industry dummies is included to capture systematic, industry-specific differences.

4. In 2009, the share of total banks that were foreign-owned was above 50% in El Salvador (90%), Honduras (56%), Nicaragua (83%), Panama (65%), Paraguay (62%), Peru (63%) and Uruguay (81%). In contrast the presence of foreign-owned banks was lowest in Costa Rica (below 20%).

Table 3. Regression results for difficulty of access to financing, 2006 and 2010

Dep. Var.: Access to financing, Likert scale

Variables	(1) 2006	(2) 2010	(3) Total	(4) Panel only	(5) (4)-(3)
Firm level					
Medium-sized firms	-0.123 (1.49)	-0.153* (1.87)	-0.062 (1.39)	-0.123 (1.49)	-0.061 (0.86)
Large firms	-0.602*** (5.66)	-0.472*** (4.39)	-0.364*** (5.91)	-0.602*** (5.66)	-0.238*** (2.82)
Part of a larger firm (yes = 1)	-0.102 (1.00)	-0.165* (1.71)	-0.171*** (2.91)	-0.102 (1.00)	0.069 (0.85)
Majority state-owned (yes = 1)	0.397 (0.43)	0.812 (1.41)	-0.116 (0.20)	0.397 (0.43)	0.513 (0.67)
Majority foreign-owned (yes = 1)	-0.472*** (3.29)	-0.449*** (3.34)	-0.438*** (5.49)	-0.472*** (3.29)	-0.034 (0.28)
Exporter only (yes = 1)	0.407*** (3.54)	0.024 (0.20)	0.064 (0.97)	0.407*** (3.54)	0.343*** (3.70)
Importer only (yes = 1)	-0.085 (0.62)	-0.158 (1.27)	-0.126* (1.75)	-0.085 (0.62)	0.041 (0.35)
Exporter and importer (yes = 1)	0.304** (2.35)	0.086 (0.70)	0.144* (1.93)	0.304** (2.35)	0.160 (1.57)
Technology licensed from FO company (yes = 1)	-0.165 (1.15)	0.046 (0.36)	0.043 (0.56)	-0.165 (1.15)	-0.208* (1.76)
Credit or loan from financial institution (yes = 1)	0.342*** (4.13)	0.464*** (5.76)	0.462*** (10.22)	0.342*** (4.13)	-0.120* (1.67)
Overdraft facility (yes = 1)	-0.476*** (5.17)	-0.539*** (6.05)	-0.490*** (10.01)	-0.476*** (5.17)	0.014 (0.16)
Business licensing and permit (Likert scale)	0.338*** (10.25)	0.296*** (8.90)	0.310*** (17.37)	0.338*** (10.25)	0.029 (0.99)
Corruption (Likert scale)	0.206*** (7.37)	0.239*** (8.68)	0.252*** (16.65)	0.206*** (7.37)	-0.046* (1.85)

Results of the analysis are presented in columns (1) and (2) of Table 3. These demonstrate that larger and majority foreign-owned firms reported significantly lower obstacles to financing, both before and during the crisis. This suggests that these firms enjoyed easier access to substantial internal funds, such that financing was not a problematic issue, even during the crisis, pointing to the importance of size-specific policy initiatives (like the SME financing initiatives provided by the IDB Group) aimed at removing financing obstacles for SMEs and facilitating their access to financing. Alternatively, Beck *et al.* (2008) suggest that institutional reforms aimed at strengthening legal and financial systems help improve SME access to finance. Since SMEs are important engines of growth (up to 35% of GDP in

Table 3. (continued)

Variables	(1) 2006	(2) 2010	(3) Total	(4) Panel only	(5) (4)-(3)
Country level					
Annual export growth rates (%)	-0.026*** (6.39)	-0.006 (0.69)	-0.023*** (8.60)	-0.026*** (6.39)	-0.003 (1.06)
Bank NPL share of total gross loans (%)	-0.003 (0.19)	0.103 (1.52)	-0.001 (0.06)	-0.003 (0.19)	-0.003 (0.19)
Domestic credit to private sector (% of GDP)	-0.005*** (2.73)	-0.002 (1.09)	-0.005*** (5.11)	-0.005*** (2.73)	0.000 (0.02)
Share of foreign banks in total banks (%)	-0.006*** (2.88)	-0.010*** (3.29)	-0.001 (0.71)	-0.006*** (2.88)	-0.005*** (2.89)
South America (yes = 1)	0.658*** (5.35)	0.201* (1.95)	0.638*** (10.29)	0.658*** (5.35)	0.020 (0.18)
Industry dummies	YES	YES	YES	YES	YES
Constant	-0.682*** (3.37)	-0.551 (1.28)	-0.381*** (3.49)	-0.682*** (3.37)	
Constant	0.244 (1.21)	0.525 (1.22)	0.585*** (5.35)	0.244 (1.21)	
Constant	1.583*** (7.72)	2.020*** (4.66)	1.912*** (17.20)	1.583*** (7.72)	
Constant	2.931*** (13.72)	3.491*** (7.96)	3.252*** (28.08)	2.931*** (13.72)	
No of observations	2,621	2,796	8,608	2,621	
Pseudo R ²	0.0566	0.0585	0.0549	0.0566	
Log likelihood	-3737.9	-3988.7	-12390.1	-3737.9	
F-test					61.05
Prob>Chi2					0.003
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. The industry classification is based on ISIC revision 3.1.					

Latin America is generated by SMEs) and contribute greatly to job creation (Ayyagari *et al.*, 2003) showed that in Latin America SMEs account for between 50 and 80% of formal workforce employment) and poverty alleviation, removing financing hurdles constitutes a pivotal step towards exploiting untapped growth potential. Additionally, particularly for foreign-owned firms, evidence is found in favor of the internal market/funds hypothesis highlighted in the literature. This finding may come as a surprise since the crisis hit some developed countries particularly hard (such as the U.S. or some old EU member states) that host headquarters of foreign-owned firms operating in Latin America. Hence, a loss in profits and internal resources and

a crisis-related deterioration of access to funding may be expected among foreign-owned firms. However, recent empirical evidence from emerging economies in the EU demonstrates that, relative to their domestic-focused counterparts, foreign-owned firms weathered the crisis fairly well, as they experienced higher sales growth (due, for example, to better product quality or reputation, managerial experience, etc.) and lower exit rates, were less likely to abandon investment projects, had better access to intra-group lending (see Kolasa *et al.*, 2010 for Poland) or considered access to financing less difficult (see Tudor, 2010 for Romania and Bulgaria). These findings are particularly relevant due to the similar ownership structures between foreign-owned firms located in emerging EU economies and those in Latin America, as the majority of these firms are owned by corporations located in old EU member states. Hence, similar to their European counterparts, foreign-owned firms located in Latin America were able to generate higher sales growth and consequently faced lower financing hurdles during the crisis as they could draw on greater internal resources.

Moreover, there is evidence that access to financing is considered easier if pre-specified and readily available overdraft facilities are available so that temporary financing bottlenecks can more easily and flexibly be overcome. This observation appears to be independent of the state of the economy, though the effect is slightly stronger during the crisis.

Results also suggest that the business-group related internal market hypothesis as corroborated by the literature is strongly state-related. While business-group affiliation among Latin American firms was irrelevant for access to financing before the crisis, it became a crucial factor during the crisis as firms that were part of a group encountered and reported significantly lower funding obstacles. This suggests that once the crisis hit and internal funds quickly began to disappear, firms that were part of a group could resort to internal group capital markets to satisfy their capital needs and finance daily regular and special business operations, while single-unit firms faced fiercer competition for scarce financial resources in tighter financial markets.

Furthermore, as expected, irrespective of the state of the economy, access to financing was consistently more difficult for firms which considered their regulatory environment burdensome, risky and expensive, due to extensive red tape or rampant corruption. Hence, from a policy point of view, an improvement in the regulatory environment in which firms operate and efforts to reduce corruption should help improve access to funding, a fundamental prerequisite for firm survival and growth.

Similarly, firms that already used a credit line or loan from a financial institution faced significant difficulties in accessing funds, which is suggestive of a refusal of banks or non-bank financial institutions to grant additional credit to already indebted firms.

On the contrary, the crisis appears to have had an equalizing effect on access to financing for internationally trading firms. Specifically, before the crisis, exporters only and exporters and importers considered access to financing significantly more difficult than their purely domestically oriented counterparts, which corroborates the assertion put forward by Amiti and Weinstein (2009) that stronger uncertainty and risk of failure as well as higher working capital needs pose considerable obstacles to access to financing for exporters or exporters and importers. However, once the crisis struck, these differences vanished and accessing funds became equally difficult for all firms, irrespective of trading status.

Furthermore, the analysis also sheds light on the effect of country-level characteristics on the perceived difficulty of accessing financing. It suggests that prior to the crisis, firms located in economies characterized by higher export growth, a banking sector with strong private-sector credit provision or a strongly internationally integrated banking sector with significant presence of foreign-owned banks considered access to funding less troublesome.⁵ In the face of the crisis, however, all but one difference disappeared: During the crisis, the strong presence of foreign-owned banks helped stabilize a country's financial system and facilitate access to financing. The crucial crisis-related role of foreign-owned banks in Latin America is corroborated by Kamil and Rai (2010) who emphasized that since foreign-owned banks in Latin America mostly conducted their lending activities via their local subsidiaries, in domestic currency and funded from domestic deposit bases, the effects of the global financial crisis that materialized into a global deleveraging and reduction in foreign banks' lending activities were relatively weak. In addition, significant geographic differences emerge as firms located in South America tend to report stronger obstacles to obtaining funding, irrespective of the state of the economy. However,

5. Generally, the U.S. is a key trading partner and country of destination for products and tradable services originating in Latin America. However, over the course of the crisis, U.S. demand collapsed and exports from Latin America to the U.S. dropped dramatically as a consequence. To account for the effect of the slump of the U.S. export market on access to funding among Latin American firms, an alternative specification was tested with the annual growth rate of exports to the U.S. market instead of the overall annual export growth rate. The results demonstrate that both prior to as well as during the crisis, funding obstacles were significantly lower in countries whose export ties with the U.S. were strengthened the most/weakened the least. Due to space constraints, those results are not reported here but are available upon request from the authors.

given the variation in the data, results for country-level characteristics need to be interpreted carefully as they could pick up much of the prevailing unobserved heterogeneity, rendering them unreliable and difficult to interpret.

Finally, no significant effects are found for importers only, firms with technology licensed from a foreign-owned company or for majority state-owned firms. The latter result emphasizes that counter to related empirical evidence (e.g., Héricourt and Poncet, 2007), Latin American majority state-owned firms never enjoyed any preferential financial or budgetary treatment.

However, as outlined above, the panel may suffer from the presence of a non-negligible attrition bias which makes the interpretation of results problematic. Specifically, around 69% of the initial sample members in WBES-2006 did not participate in WBES-2010, largely as a result of refusal to participate, lack of response or an incorrect address. Nevertheless, as highlighted by Fitzgerald *et al.* (1998: 256) "...there is no necessary relationship between the size of sample loss from attrition and the existence or magnitude of attrition bias. Even a large amount of attrition causes no bias if it is 'random'". Hence, Table 3 also sheds light on the presence and scale of any attrition bias. Specifically, following Becketti *et al.* (1988), the sample that remains is compared with the total sample, and separate estimations are calculated for the group of establishments that remained in the sample between 2006 and 2010 (column (4)) as well as for the total group of establishments in 2006 (column (3)). The last column shows results for the difference between coefficients estimated for the panel sample only and the coefficients estimated from the total 2006 sample, and therefore reveals whether the firms that dropped out differ in their initial behavioral relationships. Z-statistics based on the standard errors of the differences between coefficients appear in parentheses. Column (5) demonstrates that relative to the overall sample, larger firms, firms with technology licensed from foreign-owned companies, indebted firms or entrepreneurs who considered corruption an obstacle to their business activities reported lower obstacles to financing while "exporters only" faced higher funding obstacles. Moreover, the F-test for the joint significance of the differences in all slopes (which tests the hypothesis that coefficients are the same across both samples) is rejected, which suggests that the panel sample indeed suffers from attrition bias. However, judging by the size of the coefficients, the attrition bias is rather small and therefore does not undermine any inferences drawn from the analysis.

5. COMPOSITION OF FUNDING SOURCES

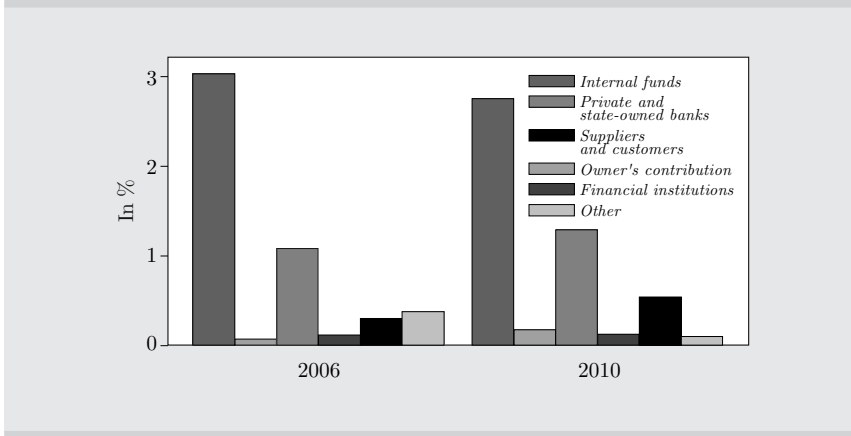
In their strategic investment decisions, entrepreneurs make adjustments to accommodate the consequences of any external shocks. And while in the face of a crisis some firms decide to postpone all investment projects until demand recovers and profits start mounting again, others proceed with fixed-asset purchases but adjust both the scale of total fixed-capital expenditure as well as the composition of funding sources. In what follows, the analysis focuses on the latter aspect and examines how the funding pattern of fixed-capital investments changed in response to the 2009 crisis, when internal funds quickly disappeared and external credit lines were at risk of drying up. For that purpose, and for the sake of comparison, we analyze firms that purchased fixed assets such as machinery and equipment both before and during the crisis and identify changes in funding patterns, particularly among firms that reported a deterioration in access to financing.⁶

To identify the composition of funding sources before and during the crisis, entrepreneurs were asked to provide information on the following: “Over the 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 financial institutions, f) Purchases on credit from suppliers and advances from customers, and g) Other (moneylenders, friends, relatives, etc).”

Figure 2 gives an overview of the proportion of potential sources for the two consecutive waves of 2006 and 2010, capturing how the composition of funding sources changed with the onset of the crisis. It highlights that, in 2006, 60% of all investments were backed by internal funds while 22% were financed by private and state-owned banks. In contrast, the remaining external sources were of limited importance and only accounted for between 1 and 2% (in the case of owner’s contribution and non-bank financial institutions, respectively) and 6% (for credit from suppliers and advances from customers and other sources). In comparison with 2006, in 2010 the proportion of internal funds decreased but still remained the dominant funding source with 55%. In contrast, despite the crisis, credit from private and state-owned banks became more

6. To account for the associated selection bias, the inverse Mill’s ratio is used in the analysis.

Figure 2. Proportion of sources of fixed-asset investments, 2006 and 2010



Source: World Bank Enterprise Survey, LAC 2006 and 2010.

important (almost 26%). The most remarkable changes are evident in credit from suppliers and advances from customers as well as owner's contributions, both of which doubled between 2006 and 2010. And while the proportion of financing from non-bank financial institutions remained almost unaltered, other sources plummeted, from almost 8% in 2006 to only 2% in 2010. For the ensuing analysis, however, owner's contribution, non-bank financial institutions and other were lumped together into a single category.

Generally, the analysis focuses on how entrepreneurs who reported a deterioration in access to financing responded to the crisis in terms of financing patterns. For that purpose, firms are grouped according to the change in perception, such that non-shifters refers to firms whose perception about access to financing has remained unchanged between 2006 and 2010, negative shifters refers to firms whose access to financing has become increasingly difficult, while positive shifters denotes firms for whom access to financing has become easier despite the crisis. An overview of the three groups is presented in Table 4, both in absolute terms and as shares of the total number of shifting firms in each country. It highlights that, in absolute terms, the total number of shifters was highest in larger economies such as 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 fairly balanced. However, at the country level, emerging

Table 4. Reported shifts in difficulty of accessing financing between 2006 and 2010, by country

Country	Real GDP growth rate in 2009	No. of non-shifters*	No. of negative shifters**	No. of positive 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
Honduras	-2.07%	34	46	26	32.08	43.40	24.53
Mexico	-6.54%	14	33	33	17.50	41.25	41.25
Nicaragua	2.58%	24	34	26	28.57	40.48	30.95
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		940	917	813	35.21	34.34	30.45

Source: Authors' calculations.

*Non-shifters: firms whose access to financing has remained the same.

**Negative shifters: firms for whom access to financing has become more difficult.

***Positive shifters: firms for whom access to financing has become easier.

Note: This sample includes all firms that invested both in 2006 and 2010.

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 almost reached the 60% threshold in Venezuela. These responses are not surprising 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, and hence the high share of negative shifters is an unexpected outcome. Finally, the share of positive shifters was generally rather small but highest in Paraguay, Mexico and Argentina. Given that Mexico and Paraguay were the two most severely hit economies in Latin America, the high share of positive shifters is somewhat surprising.

Next, the analysis examines the effects of the 2009 crisis on the composition of funding sources for fixed-capital investments. Methodologically, given the censoring of dependent variables at both 0 and 100, a Tobit approach with heteroskedasticity-robust estimates is applied. Specifically, since all different funding sources add up to 100, the following system of seemingly unrelated regressions is estimated:

$$\begin{aligned}
 y_{1ikt} &= \alpha_1 + \beta_1 \mathbf{X}_{1ikt} + \beta_1 \mathbf{Y}_{1ikt} + \beta_1 \mathbf{Z}_{1ikt} + u_{1ikt} \\
 y_{2ikt} &= \alpha_2 + \beta_2 \mathbf{X}_{2ikt} + \beta_2 \mathbf{Y}_{2ikt} + \beta_2 \mathbf{Z}_{2ikt} + u_{2ikt} \\
 y_{3ikt} &= \alpha_3 + \beta_3 \mathbf{X}_{3ikt} + \beta_3 \mathbf{Y}_{3ikt} + \beta_3 \mathbf{Z}_{3ikt} + u_{3ikt} \\
 y_{4ikt} &= \alpha_4 + \beta_4 \mathbf{X}_{4ikt} + \beta_4 \mathbf{Y}_{4ikt} + \beta_4 \mathbf{Z}_{4ikt} + u_{4ikt}
 \end{aligned} \tag{2}$$

where the dependent variables are the proportions of fixed-asset investment financed by firm i in country k at time t (with $t = 2006$ or 2010) through a) internal funds and/or retained earnings (y_{1ikt}), b) private and state-owned banks (y_{2ikt}), c) purchases on credit from suppliers and advances from customers (y_{3ikt}) and d) other sources, including owner's contribution or the issuance of new equity shares, non-bank financial institutions, or moneylenders, friends, relatives etc. (y_{4ikt}). $\mathbf{X}_{\bullet ikt}$ is a vector of firm characteristics, $\mathbf{Y}_{\bullet ikt}$ is a vector of country-level characteristics while $\mathbf{Z}_{\bullet ikt}$ is a vector of industry-level dummies. Finally, $u_{\bullet ikt}$ represents the error term.

At the firm level, \mathbf{X}_{ikt} includes dummy variables for a firm's negative shifter status and non-shifter status, which capture firms' funding strategies and are therefore the variables of interest. Specifically, they show how negative and non-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 has found 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 applied in 1999 to 48 developed and developing countries. Their study shows that on average smaller firms use less external funds, specifically, less bank financing. However, they extensively resort to informal sources for financing. This may occur to a greater extent during a crisis, when access to external bank funds becomes more difficult and internal funds dwindle. 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, because in the absence of extensive, 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 analyzed a sample of firms located in the EU and showed that young firms (less than 10 years old) perceived access to loans to be significantly more difficult than older firms (more than 20 years old). Furthermore, as suggested by Vickery (2005), these disadvantages in accessing credit also hold during episodes of economic crisis. He analyzed the financial crisis of 1997/1998 and showed that weak banking relationships reduce the availability of credit from domestic banks.

Furthermore, the literature indicates that business-group affiliation and ownership status are crucial determinants of firms' funding strategies: Both group-affiliated firms and foreign-owned firms may predominantly seek 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 support 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 when 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 can be expected to more increasingly 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) argued that exporters experience stronger credit constraints. This is because of their higher default risk due to the difficulties of enforcing payments across country boundaries, but is also attributable to their greater need for working capital, the result of longer time lags between production and receipt of payments. As a consequence, internal or non-bank sources should dominate exporters' funding sources. Empirical evidence to support this comes from Feenstra *et al.* (2011) who showed for a set of Chinese firms that exporters indeed faced more severe credit constraints. However, any prevailing funding differences may vanish during a global economic crisis, when exporters, like their domestically oriented counterparts, face a drop 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, $\mathbf{Y}_{\bullet ikt}$ includes a set of country-level variables that comprise 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 demand for a firm's products falls, firm cash flow, turnover and profits decline and the value of firm collateral drops, while 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 must resort to other external sources until the economy recovers and demand resumes. In contrast, internal funds and bank credit should be the dominant

funding sources during economic recoveries or upturns, when demand, cash flow and turnover increase and the value of collateral recovers, while alternative sources such as 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, the availability and attractiveness of credit or loans depend heavily on the state of the banking sector and its willingness to offer affordable loans. If endowed with adequate and sufficient capital—relative to accumulated assets—banks are protected against losses and should therefore be willing to grant additional credit. Hence, a high capital-to-asset-ratio (the ratio of bank capital and reserves to total assets) is expected to ease access to bank credit. In contrast, during economic crises when credit default rates increase, the availability of bank credit is expected to drop, forcing firms to look for alternative financing sources.

Finally, the real interest rate is included as an indicator of the cost of external bank-related funds, given that bank credit becomes more attractive with a decline in the real interest rate and vice versa.

Table 5 presents estimation results and demonstrates that in the face of the crisis, firms that experienced a deterioration in access to financing dramatically changed their financing behavior. Specifically, in response to the crisis, negative shifters significantly reduced the proportion of internal funds but relied more intensively on credit from private and state-owned banks on the one hand, and on purchases on credit from suppliers and advances from customers on the other, to finance investments in fixed assets. Hence, during the financial crisis, supply-chain financing became a more dominant funding strategy as suppliers extended additional credit to customers, probably due to their vested interest in maintaining long-standing business relationships (see Evans, 1998 or Wilner, 2000). In terms of marginal effects, negative shifters financed on average 5 percentage points more of their investment with credit from private and state-owned banks, 4 percentage points more with credit from suppliers and advances from customers, but 8 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.

Table 5. Composition of investment financing

Variables	(1)		(2)		(3)		(4)		(5)		(6)		(7)		(8)	
	Internal funds/retained earnings		Private and state-owned banks		Suppliers & customers		Other sources									
	2006	2010	2006	2010	2006	2010	2006	2010	2006	2010	2006	2010	2006	2010	2006	2010
Constant	-32.759 (1.31)	64.637** (2.56)	90.689** (2.40)	40.085 (1.21)	49.697 (0.79)	-113.774*** (2.62)	-49.815 (1.00)	48.878 (0.88)								
Negative shifters	0.223 (0.06)	-10.995*** (2.88)	12.447** (2.30)	8.971* (1.79)	-32.346*** (3.42)	18.361*** (2.74)	3.573 (0.51)	11.844 (1.37)								
Non-shifters	2.511 (0.71)	0.225 (0.06)	9.726* (1.82)	3.177 (0.65)	-19.516** (2.23)	6.329 (0.96)	-12.201* (1.67)	11.951 (1.43)								
Firm level																
Medium-sized	-4.236 (1.08)	-8.988** (2.03)	12.548** (2.10)	3.463 (0.59)	-9.037 (0.93)	-3.818 (0.50)	8.193 (1.06)	-14.805 (1.51)								
Large	4.358 (0.82)	-10.554* (1.80)	3.525 (0.43)	-0.180 (0.02)	-17.237 (1.25)	-7.387 (0.75)	-8.763 (0.82)	-14.623 (1.14)								
Log age	3.834** (2.23)	3.390 (1.49)	-1.199 (0.46)	-3.858 (1.30)	-0.954 (0.21)	7.820** (2.02)	-2.515 (0.72)	-5.436 (1.13)								
Part of a larger firm	1.611 (0.41)	1.404 (0.34)	-2.320 (0.39)	7.288 (1.37)	-5.638 (0.55)	-4.692 (0.65)	-5.273 (0.67)	-12.852 (1.35)								
Majority foreign-owned	9.293** (2.03)	11.398** (2.32)	-28.123*** (3.76)	-26.239*** (3.94)	20.997* (1.82)	8.639 (1.04)	-16.154* (1.68)	-11.453 (0.98)								
Exporter only	6.493 (1.36)	-1.294 (0.24)	0.637 (0.09)	-2.581 (0.36)	-13.552 (1.09)	-2.115 (0.23)	-28.659*** (2.80)	-12.580 (1.07)								
Importer only	12.540** (2.26)	2.290 (0.40)	-6.829 (0.82)	-2.678 (0.36)	-6.319 (0.46)	-3.346 (0.33)	-29.116** (2.45)	-25.946** (1.98)								
Exporter and importer	7.772 (1.46)	-3.839 (0.71)	-1.391 (0.17)	15.574** (2.22)	-21.182 (1.50)	-6.070 (0.65)	-13.135 (1.24)	-18.867 (1.56)								

Table 5. (continued)

Variables	(1)		(2)		(3)		(4)		(5)		(6)		(7)		(8)	
	2006	2010	Internal funds/retained earnings		Private and state-owned banks		Suppliers and customers		Other sources							
Country level																
Annual GDP growth rate	0.656 (0.77)	1.179 (1.54)	-2.370* (-1.799)	1.408 (1.36)	-7.517*** (-3.330)	-1.786 (-1.333)	2.481 (1.39)	0.179 (0.11)								
Capital-to-asset-ratio	2.055*** (3.19)	-0.197 (0.26)	-6.182*** (6.39)	-1.018 (1.02)	-2.556 (1.58)	5.374*** (4.04)	8.105*** (5.82)	-1.207 (0.71)								
Lending interest rate	-0.309 (1.28)	-0.585* (1.93)	0.807** (2.28)	0.812** (2.04)	-0.476 (0.81)	-0.090 (0.17)	-1.003* (1.96)	-0.114 (0.18)								
Industry dummies	YES	YES	YES	YES	YES	YES	YES	YES								
Inverse Mill's ratio	34.271*** (2.86)	-10.143 (0.81)	-35.223* (1.95)	-17.904 (1.08)	-35.308 (1.16)	-9.725 (0.46)	-46.679** (1.98)	-52.101* (1.88)								
No. of observations	1,103	1,038	1,103	1,038	1,103	1,038	1,103	1,038								

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

Before the crisis, medium-sized firms relied more heavily on credit from private and state-owned banks to finance their investment projects. In response to the crisis, medium-sized as well as larger firms drew less from internal sources, by almost 7 and 8 percentage points, respectively.

In a similar vein, firm age also matters little. Before the crisis, older firms relied more heavily on internal funds to finance their investments. However, once the crisis struck, these firms resorted more intensely to supply-chain financing.

However, no evidence is found in favor of the internal-market hypothesis of firms belonging to business-groups: Funding strategies are independent of business-group affiliation, both before and during the crisis.

In contrast, foreign ownership emerges as a key determinant of firms' funding behavior. Before the crisis, majority foreign-owned firms more intensively funded their fixed-capital investments from internal sources and through supply-chain financing but, compared to their domestically owned counterparts, used credit from private and state-owned banks or other sources less intensively. During the crisis, however, funding strategies were partially adjusted such that majority foreign firms predominantly used internal funds yet left aside bank credit as an underutilized option. In terms of marginal effects, before (during) the crisis, majority foreign-owned firms financed on average 7 percentage points (8 percentage points) more of their investment with internal funds but 9 percentage points (11 percentage points) less with bank credit.

Moreover, evidence is found that a firm's funding strategy is shaped by its particular trading status. Before the crisis, both exporters only as well as importers only generally drew significantly less from other sources (such as owner's contribution, non-bank financial institutions, money lenders, friends or relatives) to finance their investments, while importers only utilized internal funds more intensely. However, once the crisis struck, trading firms adjusted their financing patterns. Specifically, any pre-crisis differences in funding strategies between domestic firms and firms that export only vanished. In contrast, firms that import only maintained the substantially lower proportion of other sources. Finally, firms that both export and import more heavily availed themselves of bank credits. Specifically, the marginal effects suggest that compared to their purely domestically oriented counterparts, importers only financed on average around 3 percentage points less of their investment with funds from other sources, while firms that both export and import financed on average around 7

percentage points more of their investment with credit from private and state-owned banks.

In addition, the state of the economy and the state of the banking sector also substantially affect and shape firms' funding strategies. Before the crisis, firms located in faster-growing economies relied less on bank credit and supply-chain financing to pay for fixed-capital investments. With the crisis, however, any growth-related differences vanished.

Moreover, before the crisis, firms located in economies with healthier banking sectors sourced significantly less from private and state-owned banks and instead drew more heavily from internal funds and other sources. However, once the crisis began, firms' funding strategies became almost independent of the state of the banking sector, as only credit from suppliers and advances from customers increased among firms located in economies with healthier and better-capitalized banking sectors.

In addition, the composition of funding sources also hinges on the cost of external capital. And although before the crisis firms located in high interest rate countries used bank credits more intensively but left other sources underutilized, the onset of the crisis prompted entrepreneurs to partly revise their funding strategies and consequently draw less heavily from internal funds. At the same time, the proportion of funds obtained from private and state-owned banks remained higher, despite the relatively higher costs.

6. SUMMARY AND CONCLUSION

Following the Lehman Brothers bankruptcy in September 2008, Latin America suffered the effects of the global financial crisis: In 2009, real GDP growth fell dramatically, as did exports and inward FDI flows.

Against that background, the analysis focuses on firm responses to the global financial crisis in Latin America and seeks to provide evidence about whether access to financing deteriorated during the crisis and how entrepreneurs responded by adapting their funding strategies for fixed-capital investments, given lower profits and internal funds and the risk of external sources drying up.

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 certain 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 that already used a credit line or loan from a financial institution and were therefore constrained in obtaining additional bank loans, as well as for firms that considered their regulatory environment burdensome, risky and expensive, due to extensive red tape or rampant corruption. Hence, policy-wise, an improvement in the regulatory environment and efforts to reduce corruption should help ease access to funding. Furthermore, for some firms, there is evidence of 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, such as larger or majority foreign-owned firms, as well as for firms that could avail themselves of internal capital markets, such as firms that were part of a group. In addition, the analysis points to the equalizing effects of the crisis. Before the crisis, relative to their purely domestically oriented counterparts, firms that export only and firms that export and import faced greater obstacles to financing. With the onset of the crisis, however, access to financing became equally difficult for all firms, as given the global nature of the crisis and the widespread slump in demand firms were equally affected, irrespective of their trading status. In addition, no evidence of any preferential treatment of state-owned firms is found: No financial privileges were extended to state-owned firms, so access to financing was equally difficult for private and state-owned firms, regardless of the state of the economy. Finally, there is some indication that the presence of foreign-owned banks had a stabilizing effect on financial systems, helping to curtail the effects of the crisis and ease access to financing.

Moreover, the analysis reveals that firms modified their funding strategies for fixed-capital investments to accommodate the negative effects of the global financial crisis. In particular, firms that experienced a deterioration in access to financing used bank and supply-chain financing more intensively to finance their investments, while significantly cutting back on internal funds. Furthermore, the analysis finds that funding strategies and patterns depend heavily on specific firm characteristics. Hence, evidence supporting the pivotal role of ownership is found: Foreign-owned firms profited from the existence of internal capital markets and drew more heavily from internal funds to satisfy capital needs and finance investment projects, both before and during the crisis. 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 avoided other sources while firms that both export and import were more likely to seek bank credit. The analysis also demonstrates that the state of the banking sector affects and shapes firms' funding patterns. Once the crisis reached Latin America, credit from suppliers and advances from customers became more dominant funding sources among firms located in economies with healthier and better-capitalized banking sectors, while the proportion of credit from private and state-owned banks was significantly higher, and the proportion of internal funds significantly lower, among firms located in countries with higher credit costs.

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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: United Nations Conference on Trade and Development.											

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: United Nations Conference on Trade and Development.											

APPENDIX B

Table B1. Sector classification and frequency

ISIC	Name	Freq.	Percent
15	Food products	548	16
17-19	Textiles, garments and leather	559	16.32
20-22	Wood products, paper products, publishing etc.	66	1.93
23-24	Chemicals and chemical products & coke, refined petroleum	331	9.66
25	Rubber and plastic products	90	2.63
26	Other non-metallic mineral products	86	2.51
27-28	Basic metals, fabricated metal products	126	3.68
29	Machinery and equipment n.e.c.	142	4.14
31-33	Electrical machinery & apparatus, medical, precision & optical instruments	37	1.08
34-35	Motor vehicles, trailers and semi-trailers & other transport equipment	19	0.55
36-37	Furniture, manufacturing n.e.c., recycling	41	1.2
2	Other manufacturing	197	5.75
45	Construction	30	0.88
50-53	Wholesale and retail trade	891	26.01
55	Hotels and restaurants	54	1.58
60-64	Transport, storage and communication	88	2.57
72-74	Computer, R&D and other business activities	121	3.53
Total		3,426	100

Table B2. Basic sample characteristics, 2006 and 2010

Characteristics	2006	2010	2006 (in %)	2010 (in %)
Small and micro firms	1499	1368	43.75	39.93
Medium-sized firms	1265	1315	36.92	38.38
Large firms	662	743	19.33	21.69
Foreign owned firms	430	306	12.55	8.93
State-owned firms	157	14	4.58	0.41
Part of a group	564	622	16.46	18.16
Exporter only	384	326	11.21	9.52
Importer only	315	382	9.19	11.15
Exporter and importer	362	416	10.57	12.14
Domestic firms	2365	2302	69.03	67.19
Technology licensed	254	291	7.41	8.49
Credit line used	1843	2047	53.79	59.75
Total No. of firms	3426	3426		

Table B3. Descriptive statistics – access to financing, 2006

Variable	Obs	Mean	Std. dev.	Min	Max
Access to financing	2,621	1.465	1.278	0	4
Medium-sized firms	2,621	0.377	0.485	0	1
Large firms	2,621	0.202	0.402	0	1
Part of a larger firm	2,621	0.160	0.367	0	1
Majority state-owned	2,621	0.002	0.039	0	1
Foreign owned	2,621	0.081	0.272	0	1
Exporter only	2,621	0.119	0.324	0	1
Importer only	2,621	0.097	0.296	0	1
Exporter and importer	2,621	0.114	0.318	0	1
Technology licensed	2,621	0.076	0.266	0	1
Credit line	2,621	0.575	0.494	0	1
Overdraft facility	2,621	0.704	0.457	0	1
Business licensing and permit	2,621	1.161	1.199	0	4
Corruption	2,621	2.253	1.484	0	4
Annual export growth rate	2,621	22.959	10.917	7.766	47.519
Bank non-performing loans to total gross loans	2,621	4.155	2.648	0.900	11.300
Domestic credit to private sector (% of GDP)	2,621	33.551	25.076	11.700	87.100
Share foreign banks	2,621	44.279	17.511	15	77
South America	2,621	0.790	0.408	0	1

Table B4. Descriptive statistics – access to financing, 2010

Variable	Obs	Mean	Std. dev.	Min	Max
Access to financing	2,796	1.547	1.222	0	4
Medium-sized firms	2,796	0.387	0.487	0	1
Large firms	2,796	0.227	0.419	0	1
Part of a larger firm	2,796	0.172	0.378	0	1
Majority state-owned	2,796	0.004	0.063	0	1
Foreign owned	2,796	0.087	0.281	0	1
Exporter only	2,796	0.104	0.305	0	1
Importer only	2,796	0.113	0.316	0	1
Exporter and importer	2,796	0.137	0.344	0	1
Technology licensed	2,796	0.087	0.282	0	1
Credit line	2,796	0.624	0.485	0	1
Overdraft facility	2,796	0.713	0.453	0	1
Business licensing and permit	2,796	1.295	1.179	0	4
Corruption	2,796	1.950	1.459	0	4
Annual export growth rate	2,796	-19.299	5.563	-35.621	0.032
Bank non-performing loans to total gross loans	2,796	2.795	0.846	1.000	4.100
Domestic credit to private sector (% of GDP)	2,796	38.065	28.641	13.500	97.500
Share foreign banks	2,796	49.031	18.582	19.000	90.000
South America	2,796	0.799	0.401	0	1

Table B5. Correlation matrix – access to financing, 2006

	MEDIUM	LARGE	PART	STATE	FOREIG	EXP	IMP	EXPIMP	TECH	CREDIT	OVERDR	LICENSE	CORR	GR EXP	NP LOANS	DCRED	SH FB	SA
MEDIUM	1																	
LARGE	-0.390	1																
PART	-0.011	0.176	1															
STATE	0.002	0.000	0.005	1														
FOREIG	-0.003	0.160	0.204	0.082	1													
EXP	0.023	0.073	0.026	-0.016	0.063	1												
IMP	0.070	0.002	-0.016	-0.014	0.022	-0.121	1											
EXPIMP	0.012	0.202	0.084	-0.016	0.107	-0.132	-0.118	1										
TECH	-0.030	0.117	0.067	-0.013	0.151	-0.031	0.154	0.235	1									
CREDIT	0.082	0.120	0.004	0.020	-0.020	0.021	0.039	0.147	0.040	1								
OVERDR	0.084	0.111	0.054	0.010	0.047	0.038	0.052	0.120	0.084	0.372	1							
LICENSE	0.017	0.033	0.000	-0.013	-0.011	-0.014	0.012	0.030	-0.001	0.041	0.025	1						
CORR	-0.035	-0.034	-0.039	0.004	-0.037	0.004	-0.032	-0.028	-0.002	-0.020	-0.012	0.345	1					
GR EXP	0.036	-0.046	-0.087	-0.004	-0.035	-0.026	0.032	0.044	0.011	0.188	0.159	0.119	0.088	1				
NP LOANS	-0.047	-0.049	0.048	0.025	0.041	0.001	0.024	-0.002	-0.007	-0.040	-0.099	0.052	0.247	0.343	1			
DCRED	0.087	0.047	0.018	-0.017	-0.010	-0.058	0.047	-0.007	-0.003	0.157	0.112	-0.129	-0.264	-0.068	-0.420	1		
SH FB	0.007	-0.043	-0.009	-0.016	0.038	-0.051	0.054	-0.011	-0.030	-0.015	-0.149	-0.030	-0.108	-0.125	0.013	0.101	1	
SA	-0.012	-0.021	-0.004	0.023	-0.022	0.020	0.074	0.076	0.031	0.193	0.248	-0.009	0.022	0.501	0.344	-0.110	-0.170	1

Table B6. Correlation matrix – access to financing, 2010

	MEDIUM	LARGE	PART	STATE	FOREIG	EXP	IMP	EXPIMP	TECH	CREDIT	OVERDR	LICENSE	CORR	GR EXP	NP LOANS	DCRED	SH FB	SA
MEDIUM	1																	
LARGE	-0.430	1																
PART	-0.019	0.253	1															
STATE	-0.003	0.034	0.017	1														
FOREIG	-0.063	0.236	0.174	0.184	1													
EXP	0.061	0.031	0.011	-0.021	0.045	1												
IMP	0.059	0.055	0.028	0.014	0.031	-0.121	1											
EXPIMP	-0.038	0.322	0.067	-0.008	0.176	-0.135	-0.141	1										
TECH	-0.016	0.169	0.077	0.021	0.198	-0.001	0.151	0.224	1									
CREDIT	0.088	0.162	0.056	-0.010	-0.005	0.047	0.097	0.147	0.055	1								
OVERDR	0.053	0.146	0.050	-0.023	0.052	0.045	0.039	0.131	0.054	0.341	1							
LICENSE	0.051	0.043	0.080	-0.011	0.072	0.027	0.019	0.060	0.053	0.051	0.023	1						
CORR	0.039	-0.056	0.010	-0.002	0.001	-0.007	0.000	-0.003	0.022	-0.009	-0.031	0.382	1					
GR EXP	0.003	0.007	-0.044	0.009	0.009	0.080	-0.066	0.016	-0.056	0.069	-0.015	0.045	0.081	1				
NP LOANS	0.040	0.029	0.038	-0.040	-0.043	0.058	-0.038	-0.001	-0.004	0.115	0.085	0.089	0.128	0.284	1			
DCRED	0.042	-0.016	-0.006	-0.028	-0.036	-0.059	0.005	-0.043	0.003	0.024	0.066	-0.137	-0.262	-0.390	0.020	1		
SH FB	-0.007	-0.008	0.017	0.051	0.028	-0.028	0.003	-0.021	-0.028	-0.049	-0.164	-0.078	-0.148	0.122	-0.631	0.098	1	
SA	0.012	0.003	-0.040	-0.011	-0.026	-0.010	0.078	0.073	0.012	0.182	0.318	0.000	-0.067	-0.143	0.025	-0.038	-0.245	1

Table B7. Descriptive statistics – composition of funding sources, 2006

Variable	Obs	Mean	Std. dev.	Min	Max
Internal funds	1,103	60.262	42.408	0	100
Private and state-owned banks	1,103	22.255	36.464	0	100
Supplies and customers	1,103	6.372	20.955	0	100
Other	1,103	10.999	27.623	0	100
Negative shifter	1,103	0.313	0.464	0	1
Non-shifter	1,103	0.330	0.470	0	1
Medium-sized	1,103	0.395	0.489	0	1
Large	1,103	0.295	0.456	0	1
Log age	1,103	2.929	0.905	0	5.112
Part of a larger firm	1,103	0.210	0.407	0	1
Foreign	1,103	0.136	0.343	0	1
Exporter only	1,103	0.153	0.361	0	1
Importer only	1,103	0.115	0.319	0	1
Exporter and importer	1,103	0.177	0.382	0	1
GDP growth rate	1,103	6.346	2.103	2.880	10.300
Capital-to-asset ratio	1,103	10.067	2.363	6.900	12.900
Lending interest rate	1,103	12.913	7.451	6.160	29.900

Table B8. Descriptive statistics – composition of funding sources, 2010

Variable	Obs	Mean	Std. dev.	Min	Max
Internal funds	1,038	55.977	42.109	0	100
Private and state-owned banks	1,038	26.394	37.334	0	100
Supplies and customers	1,038	11.079	26.467	0	100
Other	1,038	6.550	20.855	0	100
Negative shifter	1,038	0.308	0.462	0	1
Non-shifter	1,038	0.353	0.478	0	1
Medium-sized	1,038	0.406	0.491	0	1
Large	1,038	0.348	0.477	0	1
Log age	1,038	3.187	3.187	1.609	5.136
Part of a larger firm	1,038	0.211	0.408	0	1
Foreign	1,038	0.124	0.330	0	1
Exporter only	1,038	0.133	0.340	0	1
Importer only	1,038	0.136	0.343	0	1
Exporter and importer	1,038	0.226	0.419	0	1
GDP growth rate	1,038	0.105	2.297	-6.080	3.360
Capital-to-asset ratio	1,038	10.412	2.335	7.400	13.600
Lending interest rate	1,038	14.732	5.684	7.070	28.300

Table B9. Correlation matrix – composition of funding sources, 2006

	NEGSH	NONSH	MEDIUM	LARGE	AGE	PART	FOREIG	EXP	IMP	EXPIMP	GR GDP	CTAR	LIR
NEGSH	1												
NONSH	-0.461	1											
MEDIUM	-0.010	-0.036	1										
LARGE	0.034	0.071	-0.519	1									
AGE	-0.059	0.034	-0.031	0.220	1								
PART	0.029	-0.024	-0.071	0.189	0.111	1							
FOREIG	0.083	0.012	-0.059	0.162	-0.018	0.215	1						
EXP	-0.031	-0.028	-0.024	0.080	0.017	0.044	0.067	1					
IMP	0.027	0.023	0.087	-0.034	0.070	-0.045	-0.014	-0.151	1				
EXPIMP	-0.052	0.064	-0.028	0.174	0.198	0.120	0.112	-0.192	-0.165	1			
GR GDP	-0.004	-0.040	-0.044	-0.106	0.090	0.156	0.189	0.074	-0.051	0.133	1		
CTAR	0.034	0.035	-0.031	-0.079	-0.046	0.082	0.068	0.102	-0.056	0.028	0.279	1	
LIR	-0.090	-0.027	0.050	-0.086	-0.100	-0.138	0.007	-0.039	0.043	-0.086	-0.399	-0.135	1

Table B10. Correlation matrix – composition of funding sources, 2010

	NEGSH	NONSH	MEDIUM	LARGE	AGE	PART	FOREIG	EXP	IMP	EXPIMP	GR GDP	CTAR	LIR
NEGSH	1												
NONSH	-0.491	1											
MEDIUM	-0.033	-0.030	1										
LARGE	0.025	0.059	-0.601	1									
AGE	-0.037	0.043	-0.069	0.274	1								
PART	-0.016	-0.022	-0.077	0.233	0.119	1							
FOREIG	0.036	0.043	-0.116	0.238	0.034	0.196	1						
EXP	-0.009	-0.031	0.038	-0.003	-0.054	0.010	0.026	1					
IMP	0.004	0.025	0.063	0.003	0.059	-0.001	-0.002	-0.157	1				
EXPIMP	-0.020	0.055	-0.114	0.313	0.224	0.095	0.218	-0.211	-0.213	1			
GR GDP	-0.011	0.032	0.028	-0.022	-0.024	-0.044	0.017	0.008	-0.042	-0.018	1		
CTAR	0.009	-0.002	-0.042	-0.006	-0.057	0.027	0.021	0.094	-0.099	0.080	0.372	1	
LIR	-0.057	-0.030	0.010	-0.050	-0.060	0.010	0.025	-0.017	0.077	-0.001	-0.007	0.185	1

Table B11. 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	FOREIG	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
Overdraft facilities	OVERDR	Whether firm has overdraft facility	LAC - WBES
Business licensing and permit	LICENSE	Likert-scale variable: business licensing and permits (0-4)	LAC - WBES
Corruption	CORR	Likert-scale variable: corruption (0-4)	LAC - WBES
South America	SA	Dummy for Southern American countries	LAC - WBES
Annual export growth rate	GR EXP	Annual export growth rates	DATINTAL
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
Lending interest rate	LIR	Lending interest rate (%)	WDI

