

External Finance and Firm Survival in the Aftermath of the Crisis

Evidence from Eastern Europe and Central Asia

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Abstract

Two data sets are used to study how country and firm characteristics affected firms' financial constraints and their likelihood of survival during the early phase of the recent global financial crisis in Eastern Europe and Central Asia, a region that was especially hard hit. The first data source provides information on the reported severity of financial constraints for 360 firms from 23 countries in 2002, 2005, and 2008. By following the same firms over time, the study summarizes both the gradual easing of financial constraints from 2002 to 2005 and their tightening during the crisis. Key findings are

that financial constraints during the crisis were less severe in countries with well-established foreign banks (entered prior to year 2000), and that changes in the severity of financial constraints were more pronounced for large firms than others during the crisis (although large firms continued to have less severe constraints on average). The second data source provides information on whether firms remained in operation in 2009 in six countries in Eastern Europe and Central Asia. Controlling for other relevant characteristics, firms were more likely to survive the crisis if they had access to external credit.

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**External Finance and Firm Survival in the Aftermath of the Crisis:
Evidence from Eastern Europe and Central Asia**

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I. Introduction

What started as a crisis in the sub-prime mortgage market in the United States in late 2007 quickly became a full-fledged global financial crisis. The financial crisis led to a massive worldwide economic slowdown, with gross worldwide product shrinking by 2.1 percent in 2009.² Although all regions were affected, Eastern Europe and Central Asia (ECA) was hit harder than most. After growing at an annual rate of 7.1 percent in 2007 and 4.2 percent in 2008, GDP in the region contracted by 5.3 percent in 2009—a larger contraction than in any other region (World Bank, 2010). This was accompanied by a large drop in private inflows of capital. In 2007, \$491 billion (16 percent of GDP) of private capital came into the region. By 2009, this had fallen to \$84 billion. The combination of a drop in demand and a drop in the availability of external financing affected firms throughout the region.

This paper uses two sources of data to assess how the crisis affected different firms in the ECA region. The first, a panel of firms that were interviewed in 2002, 2005, and 2008-9 as part of the Business Environment and Enterprise Performance Surveys (BEEPS), allows us to document how financial constraints evolved over time and to see how firm and country characteristics affected these constraints during the crisis. The second dataset, from the Financial Crisis Surveys (FCS) that were conducted as follow-ups to the BEEPS in six countries in 2009, allows us to look at how changes in access to financing affected firm survival rates during the crisis.

Other papers have used BEEPS data to study access to and use of financial services within the ECA region (Brown et al., 2011; Ongena and Popov, 2010; and Popov and Udell, 2010). Brown et al. (2011), which is the most similar to our analysis, uses data from the 2005 and 2008 BEEPS to compare application for and use of credit in Eastern and Western Europe. Like us, they find that credit constraints softened in Eastern Europe prior to the crisis, but they also find that loan application rates were lower and rejection rates higher in Eastern than Western Europe and that this was associated with the presence of foreign banks. We use data from the 2002, 2005, and 2008 BEEPS, which enables us to better capture both the easing and tightening

² Data in this paragraph are from World Bank (2010).

of financial constraints for the same set of firms over time. More importantly, we use the reported severity of financial constraints on a firm's operations as our dependent variable, whereas Brown et al. (2011) use measures of access to and use of credit. The reported constraints variables are likely to be forward-looking about the potential effects of the crisis, whereas the access/use variables better summarize the financial situation of firms before the crisis.

Other papers have used firm, bank, and country-level data to study past crises within the ECA region. Using data from large multinational banks from 1991 to 2004, de Haas and van Lelyveld (2010) find that their lending did not slow during systemic crises in a host country, which they attribute to the support received by subsidiaries from their parent banks. Similarly, domestic banks contracted their credit base during crises from 1993 to 2000, whereas greenfield foreign banks did not (de Haas and van Lelyveld, 2006). Furthermore, a study of banks and firms in 13 countries in Eastern Europe from 2000 to 2005 shows that lending relationships for foreign banks tended to be more stable than those of domestic banks in that foreign banks were less likely to drop their clients, even in the aftermath of an acquisition, and that the presence of foreign banks was associated with a lower probability of crisis in the ECA region (Giannetti and Ongena, 2009 a,b). Of course, the financial crisis episodes studied in those papers grew within ECA countries themselves, and thus the recent global crisis, which emanated from the banking sectors of advanced economies, offers an opportunity to test whether foreign affiliates behave differently when their parent banks face difficulties in their home markets.

Another strand of recent literature focuses on capital flows, particularly the cross-border component of bank flows, measured at the country level to assess the effects of the crisis (Cetorelli and Goldberg, 2009, 2011; Milesi-Ferretti and Tille, 2011; Hermann and Mihaljek, 2011). A number of those studies suggest that strong ties between home and host countries made it more likely that foreign banks would act to stabilize credit during the recent crisis within the ECA region.³

³ Hermann and Mihaljek (2011) find that greater financial and monetary linkages between lender and borrower countries were stabilizing forces, and many countries in ECA had relatively strong links to advanced economies. Similarly, cross-border bank-to-bank flows to Eastern European countries with a higher foreign bank asset share were more stable during the crisis than flows to other emerging markets (Vogel and Winkler, 2011). Based on the

Since most of the firms in our sample were unlikely to receive cross-border loans from the parents of multinational banks due to their small size, evidence on the local lending by the affiliates of foreign banks is likely to be more relevant for our study. For example, there is some evidence that foreign banks in ECA reduced their lending earlier and faster than domestic banks during the crisis (de Haas, Korniyenko, Loukoianova, and Pivovarsky, 2011; Mihaljek, 2010).⁴ However, like foreign banks, domestic banks did eventually adjust their lending towards less risky loans by reducing loan growth to firms and households (Mihaljek, 2010) and the foreign banks that participated in the Vienna Initiative – a public-private partnership between European governments, multinational banks, and international financial institutions in which foreign banks were eligible for financial support in return for commitments that they would maintain their exposures and keep subsidiaries adequately capitalized in affected host countries – were more stable lenders than those that did not, and had loan growth rates on par with domestic banks by the end of 2009 (de Haas, et al. 2011). Supply-side evidence on credit provision by banks does not, however, provide information on the types of firms that received that credit and their likelihood of survival during the crisis, which is our focus.

To summarize, we offer firm-level (rather than bank- or country-level) evidence to study how firm (and country) characteristics affected reported financial constraints and the likelihood of survival during the recent financial crisis in the ECA region. Our data on reported financial constraints in 2008-9 and firm survival in 2009 are more reflective of the effects of the crisis than other studies that have analyzed pre-crisis access to credit in 2008 using the BEEPS data. Moreover, because the most recent crisis episode began in advanced economies rather than in the ECA countries themselves, we offer a fresh look at the role of foreign banks when their parents are under financial pressure.

The empirical results in this paper show that firms that had access to financing were better able to weather the crisis than firms that did not. Larger and older firms were less likely to

sample of all syndicated loans to private borrowers from 2005 to 2009, de Haas and Van Horen (2011) find that geographic proximity, establishment as a subsidiary (rather than a branch), integration into a network of domestic co-lenders, and a history of syndicated lending to a particular country all enhanced the stability of foreign lending.

⁴ Evidence is from bank-level regressions for 1,275 banks in ECA in de Haas et al (2011) and from a survey of central bank governors in Mihaljek (2010).

have stopped operating by mid-2009 than similar smaller, younger firms. This could be because larger established firms have better access to financing. Because informational asymmetries between borrower and lender are less severe for large, old firms, lenders find it easier and cheaper to extend credit to them (Beck, Demirgüç-Kunt, and Maksimovic, 2008). Moreover, firms that had loans and overdraft facilities were also less likely to have stopped operating. Controlling for financial access and firm performance reduces the difference in survival rates between large and small firms. These results are consistent with the hypothesis that firms that lacked access to external funds were most vulnerable to the drop in demand that accompanied the crisis.⁵

Foreign banks, mostly from developed economies, held over half of banking assets in ECA by the middle of 2005 (Claessens et al., 2008a). Given the high foreign bank participation rates in many countries in the region—and that the financial crisis started in developed economies—it is plausible that foreign banks contributed to a contraction in credit. Although multinational banks might be able to extend capital to affiliates that were affected by a financial shock (the *support effect*), they might also shift capital among affiliates in response to real sector shocks that affect the profitability of lending (the *substitution effect*).⁶ Foreign bank participation might, therefore, have contributed to problems with access to financing during the crisis. However, the empirical analysis below suggests that having a well-established foreign bank presence helped to ease financial constraints during the crisis. That is, firms were less likely to report that access to financing was a serious problem in countries with high foreign participation in the banking sector.

The rest of the paper is organized as follows. The next section develops hypotheses about how the crisis affected different firms and how foreign bank participation affected the depth of the crisis in different countries in the region. The third section discusses the two sources of data used in the paper: the Financial Crisis Survey (FCS), which was conducted in six

⁵ When firm managers were interviewed, most said that the biggest problem that their firm faced during the crisis was a drop in demand—between 70 and 80 percent of the surveyed firms in each country identified this as the most serious problem. By comparison, less than 10 percent said reduced access to credit was the most serious problem (Ramalho et al., 2009).

⁶ See Morgan et al. (2004).

countries in the region in June and July 2009 and the Business Environment and Enterprise Performance Survey (BEEPS), which was conducted in 28 countries in the region in 2002, 2005, and late 2008 and early 2009.⁷ The fourth section discusses the estimation methodology used to test the various hypotheses; the fifth discusses the empirical results and presents robustness checks. The final section concludes.

II. Related Literature and Hypotheses

In this section, we develop hypotheses about how the economic crisis affected firms in the ECA region. Although our regressions will control for a number of factors that could affect firms' financial constraints and survival, the hypotheses in this section focus on two main themes: the pecking order theory of external finance and foreign bank participation.

A. Pecking Order Theory of Financial Services

The first set of hypotheses derives from the pecking-order theory of financial services. This theory holds that internal funds are less costly than external funds (Myers and Majluf, 1984), because borrowing firms have better information about the quality of their investment opportunities than lenders do. The lender, therefore, requires compensation in the form of higher interest rates. Because external funds are more costly, firm owners first exhaust internal funds before turning to credit markets, leading to a pecking order with respect to the two sources of finance.

Informational asymmetries between borrower and lender tend to be more severe for small, young firms, and lenders, therefore, charge them higher interest rates or do not extend credit to them at all. As a result, small, young firms use less external credit than others. This is the case in Eastern Europe and Central Asia. Whereas about 64 percent of large firms had loans or lines of credit in 2008-2009, only about 38 percent of small firms did.⁸

⁷ Though BEEPS was conducted in 28 countries, our sample is comprised only of firms that were interviewed in all three BEEPS rounds. That sample spans 23 countries.

⁸ Data from www.enterprisesurveys.org based upon BEEPS data. The regional averages are unweighted averages of the weighted country averages (i.e., all countries weighted equally but weighted averages are used for each country).

Many empirical studies support the notion of a pecking order between internal funding and external borrowing and find that large firms find it easier to trade off between the two than small firms.⁹ Small firms also face greater reported constraints to their growth than large firms and access to finance ranks high among those constraints. Relaxing financial constraints therefore has a greater effect on sales growth for small firms than for others (Beck, Demirgüç-Kunt, and Maksimovic, 2005). The protection of property rights, which helps mitigate informational asymmetries, increases external financing more significantly for small firms than for large firms, mainly due to its effect on bank finance (Beck, Demirgüç-Kunt, and Maksimovic, 2008).

Greater reliance on external finance, however, also makes firms more vulnerable to sudden stops in funding. In normal times, larger firms find it easier to expand external financing when they are constrained than small firms (Beck, Demirgüç-Kunt, and Maksimovic, 2008). The severity of the current crisis makes it likely that demands for finance from large firms exceeded the available supply. Lacking external finance prior to the crisis, smaller firms' sources of funding are less likely to have been affected (aside, of course, from a decline in retained earnings due to the drop in demand). We therefore develop the following hypothesis:

***Hypothesis 1:** Because of greater reliance on external finance in general, and on finance from the banks most likely to be affected by the crisis in particular, we expect the share of large firms that report that access to finance is not an obstacle to their business operations to decline more steeply as a result of the crisis than the same share for smaller firms.*

Note that we are not arguing that financial constraints were more severe for large firms than for small firms. For the reasons above, we expect small firms to continue to report more severe constraints during the crisis. Rather, we expect the change (increase) in the severity of reported financial constraints to be greater for large firms. The average share of large firms that reported finance was no obstacle in 2002, 2005, and 2008-9 is consistent with this conjecture (Figure 1). That figure was higher for large than for other firms in 2002 and 2005, but declined sharply to levels closer to but still higher than for other firms in 2008-9.

⁹ See Ayyagari, Beck, and Demirgüç-Kunt, 2007; Beck, Demirgüç-Kunt, Laeven, and Levine, 2008; Beck, Demirgüç-Kunt, Laeven, and Maksimovic, 2006; Beck, Demirgüç-Kunt, and Levine, 2005.

At the same time, recent evidence shows that most firm managers saw the contraction in demand to be the most important effect of the crisis rather than the credit crunch (Correa and Iooty, 2009), and that the sales growth of innovative and young firms was more affected by the crisis than other enterprises (Correa and Iooty, 2010). These findings are consistent with the notion that firms that lacked access to external funds were most vulnerable to the drop in demand, which leads to two additional hypotheses that we will test in our survival regressions:

***Hypothesis 2:** Because of their greater reliance on internal funds, much of which derives from sales, we expect young, small firms to be more vulnerable to the indirect effects of reduced demand brought about by the crisis. We therefore expect them to have a lower likelihood of survival than others.*

***Hypothesis 3:** Firms with a pre-existing relationship with a financial institution are more likely to attract external funding to compensate for reduced internal funding via sales resulting from the crisis. We therefore expect firms that had a loan, line of credit, or overdraft facility to have a greater likelihood of survival than others.*

B. Foreign Bank Participation

A second set of hypotheses comes from the literature on the effects of foreign bank participation. A key insight is that multinational banks operate internal capital markets through which they allocate capital and liquidity to their subsidiaries and branches. Morgan et al. (2004) derive a model in which multinational banks respond to shocks in both their home countries and the host countries of their affiliates, reallocating capital to equalize its rate of return across the countries in which they operate.¹⁰ They derive two main propositions: first, there is a support effect, by which multinational banks extend capital to affiliates that have been affected by a financial shock; and second, there is a substitution effect, by which multinational banks shift capital among affiliates in response to real sector shocks that affect the profitability of lending in a country.

Recent empirical evidence is consistent with both the “support” and “substitution” propositions. Using data from 45 of the largest multinational banks from 1991 to 2004, de Haas and van Lelyveld (2010) find a negative relationship between GDP growth in the home country

¹⁰ For ease of exposition, we use affiliates to refer to both branches and subsidiaries in foreign countries.

of the parent bank and credit growth in its affiliates operating in other countries, in line with the substitution effect. At the same time, they find multinational bank lending did not slow during systemic crises in the host country. They attribute this to the support received by subsidiaries from their parent banks. Because lending by domestic banks did slow during crises, multinational banks could be viewed as stabilizing forces in turbulent times. The same authors find that during crises in Central and Eastern Europe between 1993 and 2000, domestic banks contracted their credit base, whereas greenfield foreign banks did not (de Haas and van Lelyveld, 2006).

De Haas and van Lelyveld (2010) also find a positive relationship between the credit growth of an affiliate and the profitability of other affiliates in the multinational holding. This suggests that support effects are stronger than the substitution effects between affiliates. That is, parent banks are in a stronger position to assist affiliates when other affiliates are performing well. Since the recent international crisis emanated from developed countries, parent banks might not have been in a position to assist their subsidiaries in ECA. Indeed, this episode could stand the support motive on its head in that capital and loans from subsidiaries might have been used to assist the parent banks.

Regarding the substitution hypothesis, if parent banks were forced to retrench during the crisis, one might expect them first to pull resources out of countries where growth prospects were weak. Yet, if the results from de Haas and van Lelyveld (2010) also hold in our sample, one might expect the reverse – healthier affiliates would be called upon to support weaker ones, including the parent. On the other hand, if the negative relationship between home country GDP growth and the credit growth of affiliates holds, crisis-induced declines in GDP growth in developed countries, particularly in the U.S., could result in increased credit growth of affiliates with relatively better growth prospects. Implicit in our analysis, therefore, is a test of whether the relative strength of the substitution and support effects changes during a global economic crisis emanating from developed countries.

The literature on the determinants of foreign bank participation also offers clues about whether the support or substitution motive will dominate in a given context. Local profit opportunities, the absence of barriers to entry, and the presence of mechanisms to mitigate

information problems have been the main factors driving the process of foreign bank entry in developing countries.¹¹ Another recent strand of that literature emphasizes that the physical and cultural proximity between a parent bank's home country and the host country of its affiliate helps to ameliorate information problems and therefore affect its commitment to (and activities within) that host market (Claessens and Van Horen, 2008 a,b; 2009).

Wide variation in the participation levels of foreign banks at the end of the 1990s can be viewed as a reflection of the depth of commitment of foreign banks to those host countries.¹² This leads to the following hypotheses regarding the effect of the depth of foreign banks' commitment to a country on the relative severity of the crisis for firms in the ECA region:

***Hypothesis 4.** In host countries where foreign banks have a high level of commitment, as reflected in their initial participation level, we expect that reported financial constraints at the time of the crisis would be less severe than in countries with low initial levels of foreign bank participation.*

***Hypothesis 5.** We expect the increase in the severity of financial constraints at the time of the crisis to be less for firms in countries with high initial levels of foreign bank participation.*

It remains unclear, however, whether the current crisis, which started in developed countries, would deepen or lessen foreign banks' commitment to these countries for the reasons described above. Therefore, our regressions provide an implicit test of those conjectures.

III. Data

This paper uses data from two enterprise surveys. The first is the Business Environment and Enterprise Performance Surveys (BEEPS), which were conducted in most countries in Eastern

¹¹ For a summary of this literature see Cull and Martinez Peria (2010).

¹² A simple regression shows that the share of banking sector assets held by foreign-owned banks in 1999 is associated with cultural similarity between home and host country as reflected in a shared legal origin, the prospects for future growth at that time as reflected in low initial GDP per capita, and the quality of the contracting environment as reflected in indexes of institutional development (see World Bank. 2011). All of these features should tip the balance in favor of the support motive rather than the substitution motive for banks with high levels of foreign participation in banking in 1999.

and Central Europe and the Former Soviet Union in 2002, 2005, and late 2008 or early 2009.¹³ The second is the Financial Crisis Surveys (FCS), which were conducted in six countries in the middle of 2009.

The surveys provide complementary information. BEEPS provide information on perceived financial constraints over time for most countries in the region. Although the last round of surveys was conducted relatively early in the crisis, we can use BEEPS data to track responses to questions about financial constraints over time for a wide set of countries. As discussed below, because managers' perceptions are likely to be forward looking, the responses received at the onset of the crisis should reflect managers' initial views about the likely severity of the crisis. In contrast, although the FCS was only conducted in six countries, it provides concrete information on the effect of the crisis as it was unfolding.

A. Business Environment and Enterprise Performance Surveys

BEEPS covers a broad range of issues about the business environment, including access to and the use of financial services. Because one goal was to provide information on a panel of firms over time, considerable effort was made to collect accurate, detailed, and comparable information across survey waves. Despite these intentions, new questions were added to later rounds and some questions were modified in terms of wording or response options.¹⁴

Our study of financial constraints requires an indicator that is comparable over the three rounds. The best candidate is a broad measure of managers' views about access to financing:

“Is access to finance, which includes availability and cost, interest rates, fees and collateral requirements, No Obstacle, a Minor obstacle, a Moderate Obstacle, a Major Obstacle, or a Very Severe Obstacle to the current operations of this establishment?”

This question provides a comprehensive measure of managers' views about financial constraints.

¹³ The first round of the BEEPS was conducted in 1999 but the coverage of firms and format of questions was not sufficiently similar to later rounds to include that data in the regression analysis. For purposes of this analysis, we refer to the 2002 survey as being the first round.

¹⁴ These changes are described in detail in World Bank (2009).

An important reason for focusing on this measure is because, as noted, the last round of BEEPS took place in late 2008 and early 2009—towards the beginning of the crisis. In contrast to most other measures in those surveys, which focus on what the firm did in the previous fiscal year (i.e., before the crisis), this indicator refers to the current situation. Moreover, managers are likely to take into account the long-term potential effects of the crisis when answering questions about obstacles.¹⁵ Thus, the timing of the final round of the BEEPS is less worrisome for this question than it would be for backward-looking questions.¹⁶

The dependent variable that we use is a dummy variable equal to one if the manager of the firm responded that access to financial services was no obstacle. We focus on the ‘no obstacle’ category because it was unchanged throughout the surveys. In contrast, and as shown in the Appendix, there were some small changes in the categories other than ‘no obstacle’.

Even if the changes to the other response categories affect the (unchanged) ‘no obstacle’ category, this should not be a serious concern for our analysis.¹⁷ The analysis focuses on relative movements for different types of firms rather than on absolute levels. Within a survey round all firms were asked the same question, and thus changes in the questionnaire across rounds are less important for this analysis.

Because the sampling methodology changed slightly across BEEPS rounds, we rely primarily on a balanced panel of firms that participated in all three rounds of the survey. While this allows us to draw conclusions about the same firms over time, it does not necessarily produce a sample that is representative of ECA or the individual countries in the region.

¹⁵ For example, Clarke (2011) shows that concern about the long-term viability of the power sector in South Africa led to a rapid and sharp deterioration in views about power during the first weeks of a power crisis. Before the first blackouts, about 10 percent of firms said power was a serious problem. Shortly thereafter, almost 50 percent of firms said it was a serious problem. The decline was so rapid and steep that it seems unlikely to be attributable to only one week of blackouts but rather to predictions of years of future problems.

¹⁶ Note that the credit variables used in Brown et al. (2011) were from questions that asked about whether a firm currently had a loan. However, if a firm had a loan at the time of the BEEPS it must have applied for and received it before the survey. On loan applications, the 2008/9 BEEPS questions asked specifically about 2007, before the onset of the crisis. We therefore view the question about financial constraints as being more informative about the early phase of the crisis than the credit variables, which better summarize the financial situation of firms before the crisis. To the extent that our results on the correlates of financial obstacles differ from those in Brown et al. (2011) on the correlates of use of credit, this indicates that the obstacles variable provides different information.

¹⁷ Iarossi (2006), for example, discusses how changes in the number of categories might affect responses.

However, the characteristics of the balanced and the full sample (i.e., any firm that responded to a BEEPS survey in 2002, 2005, or 2008-9) are similar. One difference is that firms in the full sample come from countries with larger populations and that grew faster, while those in the balanced panel were more likely to be privatized and to be foreign owned (see Table 1). The full sample tips more heavily toward manufacturing firms, while the balanced panel tips more heavily toward trade. Finally, the balanced panel has a higher share of firms from countries with a pegged rather than a floating exchange rate regime. In practice, however, (unreported) regression results for the full sample were generally similar to those for the balanced panel.

B. Financial Crisis Surveys

The Financial Crisis Survey was implemented by the World Bank in June and July 2009 in six countries: Bulgaria, Hungary, Latvia, Lithuania, Romania and Turkey. Firms that were part of the 2008-9 BEEPS were re-interviewed to see whether they were still operating and, if so, how they were coping with the crisis. Of the 2,501 firms in manufacturing, services, and retail trade that had been interviewed during the third round of the BEEPS survey between April 2008 and March 2009, 1686 were re-interviewed during the FCS.¹⁸

The 2,501 firms in the third round of the BEEPS survey can be divided into four groups: (i) those that were still operating and were interviewed in the FCS; (ii) those that were still operating but were not interviewed during the FCS because enough firms had been interviewed, an interview could not be scheduled, or the firm manager refused to participate; (iii) firms that could not be located; and (iv) firms that had closed (see Table 2). We follow Ramalho et al. (2010) and classify firms as no longer operating if they fell into categories (iii) or (iv), or if they were in category (i) but reported that they had filed for insolvency or bankruptcy.

Although effort was made to collect reliable contact information to allow for the collection of panel data in BEEPS, it is possible that some firms could not be located because

¹⁸ See World Bank (2009) for a description of the sample. In Turkey, only the manufacturing subsample was targeted for follow-up in the financial crisis survey (Ramalho et al., 2010). Non-targeted firms (i.e., firms for which no information was collected on their operating status at the time of the financial crisis survey) are excluded from the sample by necessity.

contact information was recorded incorrectly at the time of the third round of BEEPS. Further, the classification treats firms that have shut down temporarily the same as firms that have closed permanently. Finally, some firms that were still operating but were not interviewed might have filed for insolvency or bankruptcy—although as shown in Table 2 this might not be a major concern given that only 26 of 1696 operating firms that were interviewed were in bankruptcy or liquidation. Despite these minor limitations, this is the most reasonable breakdown possible given the available information. The firms that we identify as no longer operating almost certainly struggled more during the early phase of the crisis than others.

The dependent variable in the survival analysis is a dummy indicating that the firm was not operating or was in the process of closing down at the time of the second survey—either because the firm had closed permanently, had filed for bankruptcy or insolvency, or had been temporarily shut down. This was the case for 296 of 2,501 firms interviewed in these countries during the third round of BEEPS (see Table 2).

IV. Estimation

As noted, we use the data from BEEPS and the FCS to look at the effect of the crisis on different firms in the region focusing on firm and country characteristics. The first part of the analysis focuses on whether firms were still operating in mid-2009 using data from the FCS. We refer to this analysis as the ‘survival analysis.’ The second exploits variation over time in firms’ reported financial constraints for a balanced panel of respondents to the 2002, 2005, and 2008-2009 BEEPS. We refer to this as the analysis of financial constraints.

For both analyses, the basic regression is:

$$Y_{it} = \alpha + \beta X_{it} + \gamma F_{it} + \delta C_{it} + \lambda S_{it} + \mu T_i + \varepsilon_{it}$$

In the survival analysis, Y is a dummy variable that takes the value 1 if the firm was not operating at the time of the FCS survey—but was operating at the time of the earlier BEEPS survey. Because the survival analysis is cross-sectional—we only have information on whether a firm survived at only one point in time (mid-2009)—the subscript “ t ” is relevant only for the second analysis of financial constraints.

In the financial constraints analysis, Y is a dummy variable that takes the value 1 if the firm owner reported that access to finance was *not* an obstacle to its operations. Because the dependent variables are dummy variables, the base regressions are estimated as standard Probit models.

X is a matrix containing information on firm characteristics. These include dummy variables indicating the size of the firm in terms of number of employees, the age of the firm, exports as a percent of sales, the shares of foreign and private ownership, and a dummy variable indicating whether the firm was privatized (i.e., as opposed to being established as a private).

In the financial constraints regressions, we interact the dummies indicating firm size with dummies indicating the year of the survey. This is to test whether firms of different sizes were affected differently by the crisis. For the reasons described above, we expect larger firms to have better access to external finance both in non-crisis and crisis periods and therefore to report being less constrained in all BEEPS rounds. However, because the crisis affected the availability of external finance that large firms relied on to a greater extent than small firms, we expect the *change* in the reported severity of their financial constraints from 2005 to 2008-9 to be greater for large firms. We therefore expect a negative coefficient for the coefficient for the $large*2008/9$ variable.

The X matrix also includes measures of firm performance. These include a dummy variable indicating that the firm has ISO certification, return on sales, employment growth, and a dummy variable indicating whether the firm made investments in the prior year. Unfortunately, only the employment growth variable is available in a consistent format across the three rounds of BEEPS. It is therefore the only firm performance variable that enters the financial constraints regressions that use data from all three years. Following Brown et al. (2011), we also include a proxy for the availability of internal finance (a dummy variable indicating that the firm did not apply for a loan within the past year because it had no need for external finance).¹⁹ We expect

¹⁹ We use a different variable than in Brown et al (2011), who use the percent of working capital financed with internal funds. We cannot use the same variable as in Brown et al (2011) because this question was not included in the 2008 BEEPS survey. A separate variable was included in all three rounds asking about the percent of fixed investment financed with internal funds. This second question, however, was only asked of firms that did invest. Therefore a large number of firms (about one-third) are excluded. Moreover, this exclusion is not random. That is,

this variable to be associated with less severe financial constraints (i.e., positively linked to the ‘finance no obstacle’ variable) and a greater likelihood of survival. The full set of performance variables enters the survival regressions.

For the survival analysis, all firm characteristics are measured at the time of the third round of the BEEPS survey—mostly in late 2008. There are two reasons for this. The first is practical—it allows us to include firms that were no longer operating at the time of the FCS survey in mid-2009 in the survival regressions. The second is that it reduces the likelihood of reverse causality. This is a particular concern for the measures of firm performance—performance is likely to have been affected by the crisis and those firms affected most seriously are also most likely to be forced to close during the crisis. It is important to note that many variables from the 2008-09 survey are actually measured for fiscal year 2007 or earlier (i.e., firms were reporting retrospective data for the previous completed fiscal year). For example, firm growth is for 2005 through 2007, return on sales is for fiscal year 2007 and the dummy variable for investment is for fiscal year 2007.

F is a matrix of variables that summarize firms’ use of financial services, which are relevant for the firm survival regressions. All else equal, we would expect firms that had readier access to finance to be more likely to survive. Although having access to finance would not affect firms that were basically insolvent, it might allow firms that have temporary liquidity problems due to the drop in demand to survive the crisis.

To reduce concerns about reverse causation, it would be best to have measures of use of financial services from before the start of the crisis (i.e., like for the performance measures). Unfortunately, the two best measures in the survey—whether the firm has a loan and whether the firm has a line of credit or overdraft—were asked ‘at the current time’ (i.e., at the time of the third round of the BEEPS survey). Although this was before the FCS survey (mid-2009), the BEEPS surveys were mostly conducted between September and December of 2008. To the

firms that did not invest in the previous year –and that therefore have to be dropped include (i) those that did not need to invest and (ii) those that are unable to invest because they did not have enough internal funds and could not get bank/supplier financing. Using this second variable would therefore be problematic.

Note also that the “no need for funds” question was available in a consistent format for only the 2005 and 2008-9 BEEPS. In constructing the “no need” variable, we assign a firm a value of 1 for all years if reported no need in 2005 and 2008-9. This is true for sixteen percent of the firms in our sample.

extent that banks either extended loans or overdrafts very early in the crisis to firms that they believed had long-term potential (if they could survive temporary liquidity problems) or ended lines of credit or loans for firms that they believed were the most likely to fail during the crisis, this could affect our estimates in the survival regressions. Still, it is likely that most of the repercussions of the crisis in terms of access to credit for firms in ECA had not been felt at the time of the last round of the BEEPS survey. Moreover, if a firm reported having a loan at the time of the BEEPS it must have applied for and received it prior to the survey.

Because the financial constraints regressions are designed to summarize firms' access to financial services, this set of variables represented by F is obviously less relevant. However, and as noted above, we do include proxies for the availability of internal funding in those regressions. C represents a matrix of country characteristics. Because the survival analysis is based on a cross-section and because the FCS was done in only six countries, it is not possible to include a full set of country-level controls in the survival regressions. In the survival analysis, we therefore include country dummies instead of country controls.

Because the BEEPS data offer time series variation and cover a much broader set of countries, we are able to include a rich set of country-level variables in the financial constraints regressions. These include GDP per capita, the KKM index of institutional development,²⁰ inflation, and GDP growth. All except inflation are likely to be associated with less severe financial constraints. We also include population and population density in the constraints regressions, though it is less clear how those variables are expected to affect financial constraints. We interact the GDP growth variable with dummy variables for the year of the survey to test whether that variable had differential effects on financial constraints in crisis and non-crisis years, in line with some predictions from the literature.

The country variables also include the share of banking sector assets in state-owned and foreign owned banks. For the reasons described above, the foreign bank participation variable is measured in 1999. Foreign bank participation in 1999 is therefore our proxy for the more stable, rooted local lending by foreign banks. In a robustness check described in section VI, we include

²⁰ This is the measure of broad institutional development created by Kaufmann, Kraay, and Mastruzzi (2007).

proxies for the more volatile cross-border lending conducted primarily by the parent banks of foreign affiliates in the ECA region. We interact the foreign participation variable with year dummies to test whether firms were better able to weather the crisis in countries with well-established foreign banks. The pattern of results that we find is robust to using different measures of foreign bank participation and different years between 1999 and 2002.²¹

S is a matrix of sector dummy variables because financial constraints and the probability of survival could vary across industries. Finally, T represents variables that control for the timing of surveys. In the case of the financial constraints, these are simple dummy variables corresponding to the round of the survey. For the survival analysis, we use time dummies indicating the month that the firm was surveyed in the 2008-9 BEEPS survey. Although the FCS were conducted within a tight two-month window (June and July 2009), most of the 2008-9 BEEPS were conducted over a three to six month window in individual countries. The dummies indicating the month of the 2008-9 BEEPS are included to control for differences in survival possibilities for firms first interviewed before the start of the global crisis and those that were first interviewed in the early part of the crisis.²²

V. Regression Results

This section presents results from the survival analysis and the financial constraints analysis. The results from the firm survival regressions are discussed first.

A. Firm Survival

Table 3 shows results from the firm survival regressions. The first column presents base results omitting the financial and performance variables, the second and third include the financial variables and the fourth and fifth include both financial and performance variables.

²¹ For example, although we use the 1999 share of total banking assets held by foreign-owned banks from Claessens and Van Horen (2008a), we derive similar results when we use the foreign claims on the countries in the ECA region (as a share of GDP) as reported by the Bank for International Settlements.

²² We also included the timing of the 2008-2009 BEEPS survey in a simple cross-sectional regression of the 2008-2009 financial constraints, although it was not significant. This could be because perceptions of financial constraints are forward looking and thus all respondents had a reasonable sense of the coming crisis, regardless of the month in which they were interviewed.

Base Results. The coefficients on the variables indicating firm size at the end of 2007 and the age of the firm are statistically significant—larger firms and older firms were more likely to be operating at the time of the second survey (see column 1). This supports the second hypothesis that firms that rely more heavily on internal funds were more vulnerable to the collapse in demand. Based upon the point estimates, medium-sized firms were about 3 percentage points less likely and large firms were about 5 percentage points less likely to have stopped operating by the time of the FCS.²³ Similarly, firms were about 0.3 percentage points more likely to have stopped operating during the crisis for each additional year that they had operated before the crisis.

The other coefficients are statistically insignificant. This suggests that there is little evidence that privatized firms as opposed to firms established as private, exporters and foreign-owned firms were either more or less likely to stop operations during the crisis.²⁴

Inclusion of financial variables. Column 2 includes results after adding a dummy variable indicating that the firm had either a loan or an overdraft at the time of the BEEPS interview (i.e., in 2008 or early 2009). The coefficient on this variable is negative and statistically significant. The point estimate suggests that firms with loans or overdrafts were about 3 percentage points more likely to still be operating in mid-2009 than firms without.

This is consistent with the idea that retaining access to finance was important for survival. Given that the most common concern about the crisis was the drop in demand, one explanation is that firms with access to finance were better able to maintain access to working capital and, as a result, could manage the drop in demand better than firms that did not have access. This supports hypothesis 3 that firms with pre-existing relationships with financial institutions were better able to compensate for reduced internal funding due to the drop in sales during the crisis.

The results are, however, consistent with other explanations. In particular, firm survival might be higher for firms with loans because of the intangible benefits of having a borrowing

²³ Marginal effects are estimated at sample means of all variables.

²⁴ Percent private-owned is dropped by the model because none of the small number of firms that were partly state-owned closed and thus this variable perfectly predicts responses for those firms.

relationship with a bank. It is difficult to assess what the benefits are of having a loan (i.e., only a direct benefit or indirect or intangible benefits like advice as well). However, both explanations are consistent with the idea that having a borrowing relationship with the bank helped firms survive the crisis.

Including the financial variables reduces the point estimates of coefficients on both size dummies—they become smaller in absolute value and the coefficient on the dummy indicating the firm is medium-sized becomes statistically insignificant. This suggests, consistent with the hypotheses from the previous section, that one reason why large firms fared better in terms of survival is that they had better access to finance than smaller firms did.

Including the financial variable does not affect most other results. The coefficients on the variables representing the age of the firm remains negative and statistically significant and the coefficients on the other variables remain statistically insignificant.

Given that overdrafts might be better for financing working capital and other expenses during a temporary drop in demand, we separate the financial access variable into two components: whether the firm has a loan or line of credit and whether it has an overdraft.²⁵ Although there is considerable overlap between these categories – about 73 percent of firms in the sample with overdrafts had loans or lines of credit compared with 40 percent of firms without overdrafts – potentially leading to multicollinearity, the differences in the estimated coefficients could be instructive.

The coefficients confirm the intuition in that the coefficient on the dummy variable indicating that the firm has an overdraft is larger and more highly significant than the coefficient on the dummy variable indicating that the firm has a loan. Results for the overdraft variable by itself, however, tend to be less robust than for the combined variable.

Performance Variables. One concern is that better performing firms might be more likely to survive the crisis and to have bank credit. Because of this, we include a set of variables intended to measure firm performance: a dummy variable indicating that the firm did not apply

²⁵ Although it would be useful to separate the firms into those with lines of credit from those with loans, this is not possible given the way the questionnaire is structured.

for a loan in 2007 because it had no need for external financing, a dummy variable indicating that the firm had obtained ISO certification, a dummy variable indicating that the firm invested in fixed assets in 2007, employment growth between 2005 and 2007, and return on sales in 2007. As noted above, with the exception of ISO certification, which is measured at the time of the first interview (i.e., in late 2008 or early 2009), the performance measures are for the fiscal year before the crisis started. The lag is useful because it reduces the likelihood that the crisis caused both failure and a drop in performance.

Column four includes all performance variables except return on sales and column four includes all performance variables. Return on sales is included separately because including it results in a large drop in sample size—the information needed to calculate return on sales was only collected for manufacturing firms.²⁶ The coefficients on these variables are mostly statistically insignificant.

Including them does not have a significant impact on the other results. Most notably the coefficient on the dummy variable indicating that the firm had access to credit remains statistically significant but becomes larger in absolute value. This suggests that the higher survival rates among firms with credit are not just due to better performing firms having access to credit and a better chance of survival during the crisis.

The main change after including the performance variables is that the coefficients on the dummies indicating firm size become smaller and statistically insignificant. This suggests that the better survival rate for large firms might also, in part, reflect better performance

B. Robustness Checks for Firm Survival

In this section, we perform some additional robustness checks on the results shown in Table 3. Because including return on sales reduces sample size considerably, we omit this variable from the regressions in Table 4.

²⁶ Return on sales is used rather than return on assets because capital is missing and is poorly measured for many firms in the sample.

Differences by Firm Size. Having access to credit might be more important for small firms than for large firms. If small firms are less likely to have access to non-bank financing than large firms, they might be especially vulnerable to drops in demand and therefore bank credit might be especially important to them.

To see whether this is the case, we interact the dummy indicating that the firm has credit with the dummies indicating firm size (see column 1). To assess the impact on small firms, we look at the coefficient on the dummy variable indicating that the firm has a loan. To assess the impact on medium-sized and large firms, we need to sum the coefficients on the dummy variable indicating the firm has a loan and the relevant interaction terms.

The coefficients on the interaction terms are statistically insignificant. That is, we are unable to reject the null hypothesis that bank credit improves the survival rates for small, medium-sized and large firms to similar degrees. Moreover, the sum of the coefficients is negative for both medium-sized and large firms. For medium-sized firms, however, we are unable to reject the null hypothesis that the sum is zero, suggesting a more ambiguous relationship for medium-sized firms than for large or small firms.

Omitted variables that might be related to firm performance. If banks only provide credit to the best performing firms and these firms are more likely to survive, this could introduce a spurious correlation between survival and access to bank credit. Although the regressions include multiple controls for enterprise performance, it is possible that an omitted variable problem might remain.

To try to correct for this possible omitted variable bias, we present results from a robustness check, using an instrumental variable approach. The instrument is the average probability that other firms in the same size group, industry and region have bank credit.²⁷ This instrument should control for unobserved heterogeneity at the firm level (i.e., it does not depend on characteristics of the firm itself). The results from this analysis are similar to the previous

²⁷ Note that the ‘leave-one-out’ average omits the firm itself (i.e., for each firm the average is only for other firms). These ‘leave-one-out’ averages are commonly used in firm level studies as instruments or in place of potentially endogenous variables. See, for example, Aterido and others (2011); Clarke (2009); Dollar and others (2005); Fisman and Svensson (2007); and Svensson (2003).

results. The coefficient on whether the firm has bank credit remains negative and statistically significant—although the point estimate is larger in absolute value (see column 2).

As an additional robustness check, and to partly control for firm heterogeneity, we add some additional control variables to see whether this appears to affect our results. The additional variables are similar to those that Brown et al (2011) used to explain access to credit in the some of the same countries. They are: (i) a dummy variable indicating that the owner is female; (ii) a dummy variable representing whether the firm has audited accounts; (iii) a variable representing the business environment that the firm faces (the average of the firm’s answers to perception questions on tax rates, tax administration, business licensing, and corruption) and (iv) a variable representing the number of competitors that the firm has in local product markets.²⁸

Including the first three variables reduces sample size from 1779 to 1726 observations. The point estimate for the credit variable becomes smaller (in absolute value)—although it remains larger than before we included the performance variables. Moreover, it remains statistically significant at conventional significance levels. The estimate suggests that firms with bank credit are about 4 percentage points less likely to die than firms without bank credit.

Because only manufacturing firms were asked about competition, sample size falls considerably when the competition index is included—from 1726 observations to 666. Despite this, the coefficient remains statistically significant and is slightly larger than before. The estimate suggests that firms with bank credit are about 8 percentage points less likely to die than firms without credit.

²⁸ Brown et al (2011) include two additional variables in their analysis that were not included in the 2008 BEEPS data set. The two variables are: (i) percent of firm earnings received through a bank account and (ii) the percent of working capital financed with retained earnings. We omit these because as noted above, there were no equivalent variables in the 2008 data set. Although the second variable was not available in the 2008-09 data set, we include a different proxy for the firm’s need for external financing in the analysis—a dummy variable indicating that the firm did not apply for a loan in 2007 because it had no need for external financing.

C. Financial Constraints

Table 5 reports the results from the second set of regressions—which examine how firms’ financing constraints changed over time for different types of firms and how changes differed between countries.

Changes in Perceptions over Time. Before controlling for any interaction terms (i.e., between time and firm size, GDP growth, foreign bank participation in 1999, and exchange rate regimes), firms were most likely to say that finance was no obstacle in 2005 (i.e., there are negative coefficients for 2002 and 2008-9). These regressions are omitted from Table 5, but available on request. The pattern is also illustrated in Figure 1.

This indicates that the dependent variable picks up both the easing of financial constraints from 2002 to 2005 and the effect of the crisis in 2008-2009. When interaction terms are included, the coefficients on the simple year dummies (2002, 2008-2009) are no longer significant (Table 5, models 1 and 2). In this sense, the interaction terms isolate the types of firms responsible for the negative coefficients on the year dummies in the simple unreported model. Following Brown et al. (2011), we also present OLS versions of our models that include interaction terms to address the general problem that coefficients on interaction terms can be biased in probit models (Ai and Norton, 2003). Results for the OLS models are similar to those for the probit models suggesting that the problems in interpreting coefficients for interaction terms may not be severe in our case.

Firm Characteristics. The most interesting results in this category are with respect to the variables indicating firm size. The coefficient on the dummy variable indicating that the firm is large is positive and statistically significant while the coefficient on the dummy variable indicating that the firm is medium-sized is positive, but smaller and statistically insignificant. The omitted category is small firms. The insignificant coefficient for medium-sized firms indicates that there is no significant difference in financial constraints between small and medium-sized firms.

Since large firms had better access to external sources of funding before the crisis, it is possible that they were more likely to be affected by a credit crunch than smaller firms were. To test this, we interact the dummy variable for large firms with dummies for the 2005 and 2008-9

BEEPS. The positive significant coefficient for the large firms dummy indicates that they were much more likely than smaller firms to report finance as being no obstacle in 2002. For the later years, the coefficients on the dummy variable need to be added to the coefficient on the interaction term for that year. Doing this suggests that large firms were still more likely to report finance as no obstacle in 2005—the coefficient on the interaction term (Large*2005) is negative, but small (in absolute value) and statistically insignificant. This indicates that large firms retained better access to credit in 2005.

For 2008-2009, the coefficient on the interaction term (Large*2008/2009) is negative and about the same size as the large firm dummy. Since the difference between large and small firms in 2008-2009 is the sum of the coefficients on the dummy indicating that the firm is large and the interaction term, this suggests that there was little difference between large and small firms in terms of financing constraints. That is, we cannot reject the hypothesis that sum of the two coefficients is zero. This confirms the results in Figure 1, where large firms come to look a lot more similar to other firms in terms of reported financial constraints in 2008-2009. The external financing of large firms, therefore, could be seen as being more affected by the crisis, in line with our first hypothesis. This does not imply that large firms had less access to external finance than others during the crisis. Indeed, the probit model indicates that large firms were still somewhat more likely to report finance as being no obstacle. However, the drop in the share of firms reporting that finance was not an obstacle from 2005 to 2008-9 was more pronounced for large firms than others.

The third and fourth models in Table 5 use ‘applied for a loan’ as the dependent variable to get a sense of which firms came to demand more credit during the crisis. The results indicate that large firms were much more likely to apply for credit in 2002 than small firms, a gap that was maintained in 2005. That gap, however, grew significantly larger in 2008-2009 as reflected in the positive significant coefficient on the interaction term between the dummy indicating the firm is large and the year dummy for 2008-2009. This suggests that large firms were much more likely to apply for external sources of funding in response to the dramatic drop in demand documented in Correa and Iooty (2009, 2010).

Taken together, the steep decline in the share of large firms that reported finance was not an obstacle to their firms' operations in 2008-9 and the steep increase in the share of large firms applying for loans shows that they were the firms whose financial status changed most during the crisis. None of the other firm characteristics is significant in the financial constraints regressions—although some of them are significant in the loan application regression.

Country Characteristics. If the substitution motive dominates, the crisis might have compelled foreign banks to pull back from countries where growth prospects were weak (Morgan et al., 2004). To test this hypothesis we interact GDP growth with the dummy variables for the BEEPS rounds. If this conjecture is correct, we would expect the coefficient for GDP growth*2008-9 to be positive and significant.

The coefficient on the interaction term is negative, small and statistically insignificant. There are several possible reasons for this. As described above, multinational banks have both substitution and support motives in assigning funds across affiliates in developing countries. The insignificant coefficient could arise because those motives cancel each other out—an explanation that could also account for the insignificant coefficients in the non-crisis years (2002, 2005). Another possibility is that, already subsumed within the foreign bank participation variable, is information about future growth prospects. Yet another is that although other papers have found links between host country growth and foreign bank participation, current growth might not be a strong predictor of future growth, especially during crisis.

Population density is the only other variable among the country characteristics that is significant in the financial constraints regressions (though again, there are some significant country variables in the loan application regression). The general insignificance of the country level variables in the financial constraints regressions might also arise because we allow for correlation between errors at the country level (i.e., we use clustered standard errors).

Banking Sector Variables. Firms in countries with large state-owned banking sectors do not appear to have better or worse access to finance than those in other countries. The coefficient on the variable indicating state ownership of banking sector assets is statistically insignificant in the regressions for reported financial constraints and loan applications (see Table 5).

The most interesting banking sector variable is the share of banking sector assets held by foreign-owned banks in 1999, which we interact with the dummy variables for the latter two survey rounds of the BEEPS (2005, 2008-9). The negative, significant coefficient for foreign participation level in 1999 therefore indicates that financial constraints were more severe in 2002 in countries with greater foreign participation. The positive, significant coefficient for the 1999 foreign bank participation share multiplied by the BEEPS 2005 dummy is of similar magnitude to the negative association for 2002, indicating that by 2005 constraints were similar across countries regardless of their level of foreign bank participation in 1999. However, the interaction term for the 2008-9 BEEPS is positive, significant, and twice as large (in absolute value) as the negative association for 2002, which indicates that financial constraints were substantially less severe during the crisis in countries with a high level foreign bank participation in 1999. As noted above, the pattern of results is robust to using different measures of foreign bank participation and different years between 1999 and 2002. The pattern of results therefore supports hypothesis 4, in that reported obstacles were much less severe during the early stages of the economic crisis in countries with high foreign bank participation levels at the end of the 1990s.

Hypothesis 5 was that the increase in reported financial constraints would be less severe in countries with well-established foreign bank participation. However, reported constraints were actually *less* severe in 2008-9 than they were in 2005 and, especially, 2002 in countries with such participation.²⁹ This pattern is consistent with the notion that foreign banks had entered relatively credit-starved countries seeking profit opportunities and were trying to meet that demand in 2002. Demand was being better met by 2005 in that constraints were on par with other countries in the region, and by 2008-9 constraints were less severe than ever despite the crisis.

Our results are consistent with others from the ECA region that lending relationships for foreign banks tended to be more stable than those of domestic banks in that foreign banks were less likely to drop their clients, even in the aftermath of an acquisition, and that over time, competition from foreign banks produced changes in the lending policies of domestic banks,

²⁹ That is, the coefficient for the large*2005 interaction is smaller (in absolute value) than that of the large*2008/9 coefficient.

making their lending relationships more stable and generally improving access to credit for all firms (Giannetti and Ongena, 2009b). Similarly, other firm-level evidence showed that lending by foreign banks was associated with growth in firms' sales, assets, and leverage (Giannetti and Ongena, 2009a). Again, however, those results were from before the global crisis studied in this paper.

Although the signs of the coefficients for the foreign participation variables are the same when we run these regressions on the full BEEPS sample, magnitudes and significance levels are smaller than for the balanced panel of BEEPS respondents (regressions not reported). It should therefore be kept in mind that these results hold for a sample that differs slightly from the full one as described above.

D. Financial Constraints during the Crisis – Discussion

At first blush, it may seem surprising that the changes in reported financial constraints were more severe for large firms than others during the crisis. Their size and age makes them more transparent for lenders to evaluate, often they have more and better collateral to pledge, and they are more likely to have long-standing relationships with multiple banks, all of which could help them obtain or retain external finance to a greater extent than other firms during the crisis. In this sub-section, we therefore compare the tendency to seek external finance and the evolution of financial constraints from 2005 to 2008-9 for large versus small firms.

While all firms were more likely to apply for loans in the 2008-9 BEEPS than in 2005 or 2002, the increase was especially pronounced for large firms (Table 6). Whereas 39.2% of large firms applied for a loan in the 2005 survey, 71.8% did so in the 2008-9 survey. For small firms the share that applied for loans hardly increased over the two surveys (from 25.8% to 26.7%). This does not necessarily imply that small firms were less affected by the drop in demand that accompanied the crisis than large ones. Both groups were affected, but large firms likely felt that their likelihood of obtaining credit in 2008-9 was reasonably high. By contrast, small firms, which Brown et al. (2011) shows were more likely to be discouraged from applying for loans in 2005 because of procedural hurdles and their belief that the application was likely to be rejected, remained much less likely to seek bank loans in 2008-9. If they were discouraged in 2005 about

their prospects of receiving a loan, how much more discouraged were they likely to be in the midst of a banking crisis?

A comparison of the reasons that firms did not apply for loans provides additional clues about why the financial constraints reported by small firms changed little during the early phase of the crisis. Among large firms that did not apply for loans in 2005, 32.3% reported that they had no need of external finance (Table 6). In the 2008-9 survey, that figure rose to 83.3%. In other words, nearly the only reason that large firms did not apply for loans in the early phase of the crisis was because they were financially self-sufficient. Among small firms, the percentage of non-applicants that reported no need for external finance rose, but only from 38.4% in 2005 to 56.9% in 2008-9. This too is consistent with the idea that lingering impediments to obtaining credit for small firms made them more reluctant to turn to banks for loans during the crisis.

Further evidence that large firms were more likely to change their status regarding financial constraints than small ones comes from a transition matrix similar to the one in Brown et al. (2011). Firms in the 2005 BEEPS were sorted into three categories in the left-hand column of Table 7: (1) had a loan; (2) did not apply for a loan because the firm reported no need for external finance; or (3) did not apply for a loan because firm owner was discouraged from doing so. Potential reasons for being discouraged were: application procedures for loans or lines of credit are complex; interest rates are not favorable; collateral requirements are too high; size and maturity of loan are insufficient; and firm owner did not think it would be approved. Because a sizable share of firm owners that did not apply for loans chose not to answer these questions, our sample is too small to present results for specific reasons. We therefore lump all non-loan applicants that did not respond that they had no need for external finance into a single category, "Discouraged."

In the 2005 survey, small firms were divided relatively evenly between the three categories: had loan, discouraged from applying, and had no need for a loan. By contrast, nearly sixty percent of large firms had loans, while a third of them reported no need. Less than ten percent of large firms were discouraged from applying for any of the reasons listed above. The pattern confirms much better access to credit for the large firms in our sample as was found in

Brown et al. (2011) for a somewhat larger sample of BEEPS firms.³⁰ This is also confirmed by the responses to the 2008-9 survey for firms that had a loan in 2005. Only 37.9% of small firms that had loans in 2005 also had a loan in 2008-9. For large firms, 76.2% of firms that had a loan in 2005 also had one in 2008-9, suggesting greater persistence in the lending relationships for large firms.

There was also persistence among small firms that reported having no need for a loan. Sixty-five percent of those that reported no need in 2005 also reported no need in 2008-9. Large firms showed less persistence on that measure. Only half that reported no need in 2005 also reported no need in 2008-9; 41.7% of them reported that they had a loan in 2008-9 while 8.3% reported that they applied for a loan but were rejected. A relatively high share of the large firms that had loans in 2005 had their loan applications rejected in 2008-9 (14.3%). In comparison, the share of small firms that had their loan applications rejected in 2008-9 was only about 7%, a figure that was similar regardless of the firms' credit status in 2005. This pattern is also consistent with the notion that small firms were unlikely to apply for loans if their owners felt the probability of rejection was high. It is also telling that a large share (22-37%) of small firms was discouraged from applying for loans in 2008-9 regardless of their credit status in 2005. By contrast, no large firm reported being discouraged in 2008-9.

In all, the patterns suggest strongly that small firms had substantially less access to credit than large firms, and were therefore less willing to apply for loans, both in 2005 and 2008-9. By contrast, large firms, many of whom reported having no need of a loan in 2005, turned to banks as a response to the crisis in 2008-9. A surprisingly high share of those applications was rejected, but no large firms reported being discouraged from applying for loans. Against this backdrop, it is not surprising that the change in reported financial constraints was greater from 2005 to 2008-9 for the large firms that were actively involved in acquiring credit to manage the crisis than the small firms that tended to remain outside the formal banking system.

³⁰ Recall that our identification strategy is based on following reported financial constraints for the same firms over time, which restricts our sample to only firms that responded to all three rounds of the BEEPS. Brown et al. (2011) do not restrict their sample in this way.

E. Robustness Checks for Financial Constraints

Competition. One potential concern about our results and conclusions is that the large firm variable could be a proxy for another omitted variable such as the degree of competition. Larger firms are likely to have larger buffers and are more diversified than smaller firms, which reduces their vulnerability to a collapse in demand and makes it more likely that they would report less severe financial obstacles. This is why we control for firms that reported no need for external funds in the regressions. Large firms may also enjoy market power that is not fully captured by that variable, since strong and large companies could conceivably squeeze their customers (requiring immediate payment) and suppliers (providing deferred payment) in difficult times.

We construct two measures, one indicating that a firm faces no competitors and another indicating that it faces four or more competitors in the market for its main product.³¹ Firms that face no competitors are more likely to report that finance is not an obstacle to their operations, though the coefficient is not significant (Table 8, models 1 and 2). Firms that face four or more competitors are significantly less likely to report that finance is not an obstacle, and the magnitude of that coefficient is large (5-6 percentage points). However, controlling for the level of competition faced by firms does not alter our main findings regarding firm size and foreign bank participation. The findings are also very similar in both probit and OLS models, reducing concerns about the misinterpretation of coefficients for interacted variables in probit models.

Additional Controls. Although we have more explanatory variables in our analysis of financial constraints than Brown et al. (2011) use in their analysis of credit usage, we have not used all of the variables that they used. To confirm that our results are not driven by the omission of a key variable from their analysis, we include two additional variables described above – a dummy variable indicating whether a firm has female ownership and another indicating whether the firm’s financial statement is audited by an outside party. Brown et al. (2011) found that firms

³¹ This is slightly different from the index variable used in Brown et al (2011). We do this because the question changed between surveys and so a consistent index cannot be constructed. The question on number of competitors was asked only of manufacturing firms in the 2008-9 BEEPS, which reduces our sample substantially. We therefore have assigned the 2005 values for number of competitors to all firms in 2008-9 under the assumption that basic competitive conditions change slowly.

with audited financial statements are more likely to apply for loans than others and that female ownership of firms was associated with a higher probability of loan rejection.

When we include those variables in our financial constraints regressions, neither is significant (Table 8, models 3 and 4). Their inclusion does not, however, change our main conclusions regarding firm size and foreign bank participation. We were unable to include two additional variables used in Brown et al. (2011) in this part of the analysis, the share of firm earnings received through a bank account and a general index of the severity of business obstacles.³² As noted above, the share of firm income received through a bank account is not available in the 2008 BEEPS survey.³³ Because our dependent variable is based on perceptions of business obstacles, it did not make sense to include another measure of the perceived severity of business obstacles as an explanatory variable. In addition, changes in question format made it impossible to construct the business obstacles variable that Brown et al. (2011) use for all BEEPS surveys. In all, however, our results are robust to the inclusion of the explanatory variables used in Brown et al. (2011) that it was feasible to include.

Fixed Exchange Rates, Current Account Deficits. As a final robustness check, we attempt to distinguish the rapid, perhaps de-stabilizing increase in some types of foreign lending from the steady, gradual growth in lending through the subsidiaries and branches of foreign banks. Relative to local lending, direct cross-border flows to ECA had been growing much more quickly than those to other regions. When foreign claims are separated into direct cross-border flows (including overseas lending by the parents of multinational banks) versus local lending in host markets by the subsidiaries and branches of foreign-owned banks, it becomes clear that the decline in 2008 was attributable to reductions in cross-border flows.³⁴ Figure 2 shows that total foreign claims (as a share of GDP) had declined for the ECA region by 2008, whereas no such decline had occurred in other developing regions.

³² The index is based on questions about tax rates and administration, licensing, and corruption as obstacles to growth.

³³ The main results are robust to the inclusion of a variable indicating that the firm has a bank account (regressions unreported).

³⁴ See Kamil and Rai (2010) for breakdowns of foreign claims by region.

Lacking detailed, bank-level data on the nature and currency composition of foreign banks' loans, we rely on country-level proxies to capture these two effects. Fortunately, the literature on crisis episodes suggests some readily available proxies for capturing de-stabilizing lending: the current account deficit and the exchange rate regime.³⁵ We control for each country's exchange rate regime with dummy variables for pegged and crawling exchange rates. The coefficients on those variables reflect differences in constraints relative to the omitted category, firms in countries with floating exchange rates. We interact the exchange rate regime dummy variables with the current account deficit, and test whether the coefficients on those variables indicate looser financial constraints prior to the crisis (2002 and 2005), and steep increases in constraints in 2008-2009. In those regressions, our measure of the share of sector assets held by foreign-owned banks in a host country controls for the relatively more stable local lending by the branches and subsidiaries of foreign banks located in the ECA region. The coefficients for the exchange rate variables (interacted with current account deficit) are as expected, positive in 2005 and negative in 2008-9, but only the positive coefficient for countries with fixed pegs in 2005 is significant. While those variables do not explain substantial variation in reported financial constraints, their inclusion does not change our main results regarding bank size and local foreign bank participation.

VI. Conclusions

The global financial crisis greatly affected firms in Eastern Europe and Central Asia. Survey responses from firm managers show that a decline in demand was their most serious problem. But financial constraints also became more binding. This was especially the case for larger firms. Small firms, which often lacked access to external finance before the crisis, were less likely to report a change in the severity of their financial constraints during the crisis.

Although firms' greatest concern was the drop in demand—not reduced access to credit—the results from this paper suggest that firms that had access were better able to manage

³⁵ Other recent papers have used measures for exchange rate regimes and/or the current account deficit to explain the path of the crisis in the ECA region (Hermann and Mihaljek, 2011; Milesi-Ferretti and Tille, 2011; Vogel and Winkler, 2011).

the drop than firms that did not. As a result, they were less likely to close down during the crisis. This stresses that although access to finance might not be the biggest concern during a crisis, it can be crucial for ensuring the survival of some firms. At the same time, the financial status of large firms was changing during the crisis, with more firms seeking loans, a higher share of denied loan applications, and a sharply declining share of firms reporting no need for external finance. As finance was becoming more crucial for firms, many large firms found their access to it increasingly uncertain.

So what can policy-makers do to encourage continued access to finance during a crisis? Although the crisis started in the financial sectors of developed economies, our results suggest that well-established foreign banks were a stabilizing influence in the ECA region. This is consistent with studies of previous crises that have found that foreign banks were associated with a lower risk of banking crisis and that foreign banks have often managed to maintain lending better than domestic banks during crises.³⁶ Perhaps it is more surprising that foreign banks appear to have improved stability during this crisis given that it started as a financial crisis in the developed economies where most foreign-owned banks in the ECA region came from. Encouraging foreign banks to continue—or set up—a full local presence might therefore be beneficial to host countries. References

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³⁶ For example, Dages et al. (2000) find that loan growth during the Tequila Crisis was stronger and less volatile for foreign-owned banks in Argentina and Mexico. Peek and Rosengren (2000) reach a similar conclusion. Demirgüç-Kunt and Detragiache (2005) survey this literature.

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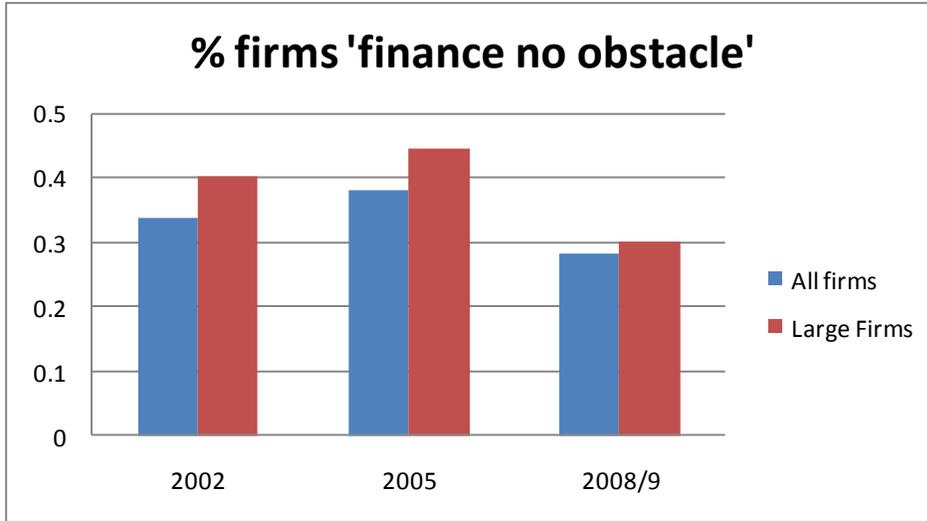


Figure 1

Source: Authors' calculations from full BEEPS samples in 2002, 2005, and 2008/9.

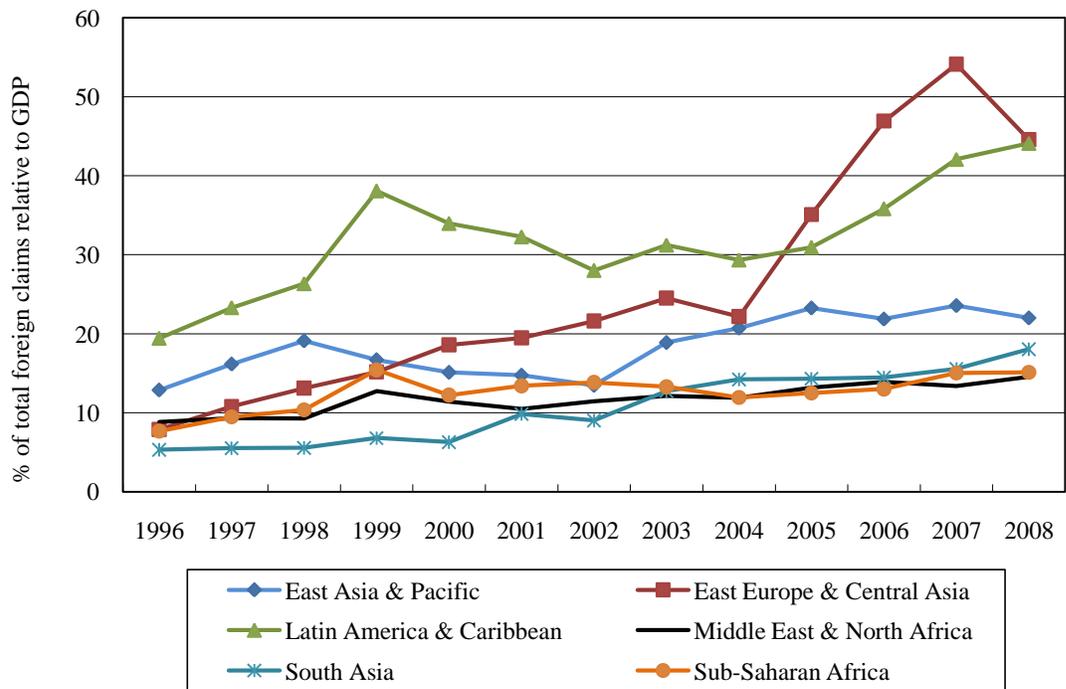


Figure 2

Source: Data reported by Bank for International Settlements (BIS)

Table 1: Summary Statistics

Variable	Balanced Panel					Full BEEPS Sample		
	Obs.	Mean	Std. Dev.	Min	Max	Obs.	Mean	Std. Dev.
Finance No Obstacle (dummy)	920	0.35	0.48	0	1	22340	0.34	0.47
Small Firms (<=19 workers)	920	0.50	0.50	0	1	22340	0.47	0.50
Medium Firms (20-99 workers)	920	0.32	0.47	0	1	22340	0.32	0.46
Large Firms (>=100 workers)	920	0.18	0.38	0	1	22340	0.22	0.41
Firm Age (Years)	920	16.6	16.8	1	141	22340	15.6	16.4
Employment Growth (%)	920	24.0	96.7	-96.7	1400	22340	33.9	220.8
Private ownership share (%)	920	79.0	38.1	0	100	22340	82.5	35.7
Foreign ownership share (%)	920	12.8	30.9	0	100	22340	9.2	26.6
Privatized? (dummy)	920	0.23	0.42	0	1	22340	0.14	0.35
Exports as a % of sales	920	10.1	24.1	0	100	22340	10.5	24.8
GDP Growth %	920	5.8	4.6	-4.6	26.4	22340	5.8	4.0
GDP per capita (1000s \$US 2002)	920	3.2	3.1	0.3	13.7	22340	3.4	2.5
% of banking assets in state banks	920	14.7	20.6	0.0	75.2	22340	18.6	20.4
% of banking assets, foreign banks 1999	920	31.6	30.1	0.0	92.3	22340	31.4	28.5
KKM, Institutional development	920	-0.02	0.66	-1.06	1.04	22340	-0.001	0.61
Population density, residents per sq .mile	920	76.3	32.2	5.5	135.0	22340	77.1	38.3
Population (millions)	920	12.4	21.5	1.3	145.0	22340	28.4	40.0
Inflation (%)	920	9.1	9.6	0.2	53.4	22340	9.4	8.5
Hotel, Services Industry (dummy)	920	0.13	0.34	0	1	22340	0.14	0.35
Construction Industry (dummy)	920	0.13	0.33	0	1	22340	0.09	0.29
Trade Industry (dummy)	920	0.37	0.48	0	1	22340	0.26	0.44
Transport Industry (dummy)	920	0.06	0.24	0	1	22340	0.06	0.23
Manufacturing Industry (dummy)	920	0.30	0.46	0	1	22340	0.40	0.50
Pegged Exchanged Rate (dummy)	920	0.36	0.48	0	1	22340	0.22	0.42
Crawling Peg Exch. Rate (dummy)	920	0.53	0.50	0	1	22340	0.54	0.50
Band, Managed floating Ex. Rate (dummy)	920	0.09	0.29	0	1	22340	0.16	0.37
Current Account Deficit as % GDP	920	7.0	6.2	0.0	25.2	22340	6.6	6.5

Source: Authors' calculations based upon data from the World Bank Enterprise Survey, BEEPS data and from other sources

Table 2: Firm status at time of Financial Crisis Survey

	Number of firms
Group 1: Interviewed	1,686
<i>Of which: In bankruptcy or insolvency</i>	26
Group 2: Not interviewed but operating	545
Group 3: Could not be located	201
Group 4: Confirmed as closed	69
Total	2,501

Source: Authors' calculations based upon data from the World Bank Enterprise Survey

Table 3: Results from Probit regression of firm death on enterprise characteristics before crisis

Observations	2362	2325	2283	1779	724
Country Dummies	Yes	Yes	Yes	Yes	Yes
Sector Dummies	Yes	Yes	Yes	Yes	Yes
Month of Interview Dummies	Yes	Yes	Yes	Yes	Yes
Bank Credit					
Firm has loan, line of credit or overdraft (dummy)		-0.178** (-2.21)		-0.273*** (-2.70)	-0.427** (-2.42)
Firm has overdraft (dummy)			-0.213*** (-2.59)		
Firm has line of credit or loan (dummy)			0.033 (0.41)		
Firm Characteristics					
Firm is medium-sized (dummy)	-0.163** (-1.97)	-0.131 (-1.55)	-0.167* (-1.96)	-0.112 (-1.10)	0.041 (0.24)
Firm is large (dummy)	-0.295*** (-2.93)	-0.263** (-2.54)	-0.288*** (-2.75)	-0.170 (-1.32)	0.092 (0.43)
Age of firm (natural log)	-0.252*** (-4.78)	-0.246*** (-4.59)	-0.240*** (-4.44)	-0.141* (-1.68)	-0.366*** (-2.68)
Percent foreign-owned (percent)	0.001 (0.49)	0.000 (0.31)	0.001 (0.52)	-0.002 (-1.11)	-0.005 (-1.42)
Firm was privatized (dummy)	0.136 (1.02)	0.140 (1.05)	0.163 (1.21)	0.055 (0.34)	-0.627* (-1.65)
Exports (% of sales)	-0.002 (-1.47)	-0.002 (-1.55)	-0.002 (-1.59)	-0.001 (-0.65)	-0.001 (-0.42)
Firm Performance					
Firm has no need for external financing (dummy)				-0.121 (-1.32)	-0.223 (-1.46)
Firm has ISO certification (dummy)				-0.197** (-2.00)	-0.327** (-2.03)
Firm Growth 2005-2007 (employment growth, %)				0.003 (0.78)	0.001 (0.29)
Firm invested in 2007 (dummy)				-0.031 (-0.33)	0.036 (0.24)
Return on Sales in 2007 (percent)					-0.002 (-0.72)
Joint test for significance of overdraft and loan variables			6.91		
P-value			0.03		
Pseudo R-Squared	0.06	0.06	0.06	0.07	0.12

***, **, * Significant at 1, 5, and 10 percent level. T-statistics in parentheses.

Source: Authors' calculations based upon World Bank Enterprise Surveys

Note: Since dependent variables are dummy variables, probit regressions are used. Percent private-owned is omitted due to co-linearity. Country dummies are used rather than country controls because of the small number of countries in the regressions. All regressions include dummy variables indicating sector, country, and month of first interview (i.e., in 2008 or early 2009). Dependent variable is dummy variable indicating firm in existence in late 2008/early 2009 was no longer operating at time of second survey

Table 4: Robustness checks for Probit regression of firm death on enterprise characteristics before crisis

	Probit	IV Probit	Probit	Probit
Observations	1779	1618	1726	666
Country Dummies	Yes	Yes	Yes	Yes
Sector Dummies	Yes	Yes	Yes	Yes
Month of Interview Dummies	Yes	Yes	Yes	Yes
Bank Credit				
Firm has loan, line of credit or overdraft (dummy)	-0.358*** (-2.65)	-2.211*** (-4.25)	-0.231** (-2.23)	-0.355** (-2.09)
Firm has loan, line of credit or overdraft*Medium-sized firm (interaction)	0.316 (1.49)			
Firm has line of credit or loan *large firm (interaction)	-0.051 (-0.22)			
Firm Characteristics				
Firm is medium-sized (dummy)	-0.327* (-1.88)	0.187 (1.28)	-0.088 (-0.84)	-0.061 (-0.38)
Firm is large (dummy)	-0.102 (-0.50)	0.170 (1.01)	-0.115 (-0.86)	-0.205 (-0.90)
Age of firm (natural log)	-0.145* (-1.72)	-0.055 (-0.72)	-0.129 (-1.49)	-0.105 (-0.83)
Percent foreign-owned (percent)	-0.002 (-1.18)	-0.005** (-2.51)	-0.002 (-0.99)	0.002 (0.32)
Firm was privatized (dummy)	0.051 (0.32)	-0.029 (-0.23)	0.004 (0.03)	-0.545 (-1.38)
Exports (% of sales)	-0.001 (-0.66)	0.000 (0.02)	-0.001 (-0.80)	-0.005 (-1.18)
Firm Performance				
Firm has no need for external financing (dummy)	-0.119 (-1.29)	-0.662*** (-4.52)	-0.091 (-0.98)	-0.259* (-1.71)
Firm has ISO certification (dummy)	-0.206** (-2.08)	-0.093 (-0.90)	-0.177* (-1.76)	-0.176 (-1.06)
Firm Growth 2005-2007 (employment growth, %)	0.002 (0.75)	0.001 (0.27)	0.003 (0.93)	0.002 (0.51)
Firm invested in 2007 (dummy)	-0.029 (-0.31)	0.261** (2.06)	-0.050 (-0.53)	-0.043 (-0.29)
Additional Control Variables				
Firm has female owner (dummy)			0.031 (0.35)	0.018 (0.13)
Firm has audited accounts (dummy)			-0.058 (-0.62)	0.059 (0.40)
Obstacles to doing business (index)			0.095** (2.09)	0.039 (0.58)
Level of Competition (index)				0.020 (0.19)
Pseudo R-Squared	0.07		0.07	0.11

***, **, * Significant at 1, 5, and 10 percent level. T-statistics in parentheses.

Source: Authors' calculations based upon World Bank Enterprise Surveys

Note: See Table 3 for additional notes

Table 5: Regressions for Financial Constraints and Loan Application

	Dep. Var: Finance is NO Obstacle		Dep. Var: Applied for Loan	
	Probit	OLS	Probit	OLS
Observations	920	920	748	748
Sector Dummies	Yes	Yes	Yes	Yes
Year Dummies				
2002 dummy (dummy)	-0.068 (0.092)	-0.051 (0.088)	-0.115 (0.135)	-0.093 (0.129)
2008-9 dummy (dummy)	-0.125 (0.096)	-0.107 (0.092)	0.057 (0.104)	0.043 (0.092)
Firm Characteristics				
Firm is medium-sized (dummy)	0.046 (0.041)	0.043 (0.038)	0.209*** (0.043)	0.178*** (0.038)
Firm is large (dummy)	0.190** (0.093)	0.172* (0.089)	0.297*** (0.100)	0.182** (0.072)
Firm is Large*2005 (interaction term)	-0.003 (0.090)	-0.001 (0.091)	-0.071 (0.079)	-0.033 (0.094)
Firm is Large*2008/9 (interaction term)	-0.144* (0.075)	-0.156 (0.092)	0.215* (0.135)	0.234** (0.105)
Firm Age (natural log)	-0.022 (0.034)	-0.021 (0.032)	-0.038 (0.035)	-0.028 (0.030)
Percent private-owned (percent)	-0.0004 (0.001)	-0.0003 (0.001)	0.003*** (0.001)	0.0025*** (0.0005)
Percent foreign-owned (percent)	0.0002 (0.001)	0.0003 (0.001)	0.001 (0.001)	0.001 (0.001)
Firm was privatized (dummy)	0.012 (0.059)	0.011 (0.056)	-0.047 (0.038)	-0.048 (0.036)
Exports (% of sales)	-0.0002 (0.001)	-0.0002 (0.001)	0.001 (0.001)	0.001 (0.001)
Firm Performance				
Firm Growth (employment growth, %)	-0.001 (0.020)	-0.007 (0.017)	0.046* (0.025)	0.037** (0.016)
Country Characteristics				
GDP Growth*2002 (interaction term)	0.004 (0.010)	0.004 (0.010)	-0.022 (0.014)	-0.019 (0.011)
GDP Growth*2005 (interaction term)	-0.010 (0.007)	-0.007 (0.004)	-0.009 (0.011)	-0.008 (0.007)
GDP Growth*2009 (interaction term)	-0.008 (0.008)	-0.008 (0.007)	0.005 (0.007)	0.005 (0.006)
GDP Per Capita (1000s, 2002 US\$)	0.003 (0.008)	-0.004 (0.008)	0.030* (0.016)	0.025* (0.014)
KKM Instit. Development (index)	0.104* (0.059)	0.105* (0.058)	-0.087 (0.083)	-0.072 (0.071)
Population Density (residents per square mile)	-0.002*** (0.001)	-0.002*** (0.001)	0.0002 (0.001)	0.0002 (0.001)
Population (millions)	0.001 (0.001)	-0.001 (0.001)	0.001 (0.001)	-0.001 (0.001)
Inflation (percent)	-0.00005 (0.002)	0.0001 (0.002)	-0.005 (0.003)	-0.005* (0.003)
Banking Sector				
state bank assets (percent)	-0.0004 (0.001)	0.0005 (0.001)	-0.001 (0.001)	-0.001 (0.001)
foreign bank assets 1999 (percent)	-0.002* (0.001)	-0.002* (0.001)	0.003 (0.002)	0.0017 (0.0013)
% Foreign in 1999*2005 (interaction term)	0.003** (0.001)	0.0031** (0.0014)	-0.002 (0.002)	-0.0017 (0.0020)
% Foreign in 1999*2008/9 (interaction term)	0.004*** (0.001)	0.0042*** (0.001)	-0.004*** (0.002)	-0.003** (0.001)

Credit Constraints				
No need for external finance	0.244*** (0.060)	0.231*** (0.057)	-0.363*** (0.029)	-0.355*** (0.033)
constant		0.537*** (0.158)		0.181 (0.118)
Pseudo R-Squared/R-Squared	0.085	0.107	0.235	0.240

***, **, * Significant at 1, 5, and 10 percent level. T-statistics in parentheses.

Source: Authors' calculations based upon data from the World Bank Enterprise Survey, BEEPS data and from other sources

Note: Since dependent variables are dummy variables, probit regressions are used. Performance variables used in analysis in Table 3 are omitted because they were not available for all years. All regressions include dummy variables indicating sector. Robust standard errors are in parentheses. Errors are clustered at country level. Marginal effects calculated at sample means for each variable are shown. Dependent variable is a dummy variable indicating that firm manager responded that access to finance was no obstacle to firm operations.

Table 6: Loan Application During the Crisis, By Firm Size

	Full Sample	Small Firms	Large Firms
<i>% that applied for a loan</i>			
2002	22.0%	15.4%	30.4%
2005	30.8%	25.8%	39.2%
2008/9	41.4%	26.7%	71.8%
<i>Non-loan applicants: % reporting no need for external finance</i>			
2002	n.a.	n.a.	n.a.
2005	37.2%	38.4%	32.3%
2008/9	61.6%	56.9%	83.3%

Notes: n.a. means not available.

Table 7: Evolution of financial constraints: Transition matrix 2005 to 2008/9

2005 Status	2008/9 Status			
	Has Loan	Loan Application Rejected	Discouraged from Applying for Loan	No Need for Loan
<i>Full Sample</i>				
Had Loan (n=78; 40.8%)	56.4%	12.8%	12.8%	17.9%
Discouraged (n=45; 23.6%)	15.6%	4.4%	40.0%	40.0%
No Need (n=68; 35.6%)	14.7%	4.4%	13.2%	67.6%
<i>Small Firms</i>				
Had Loan (n=29; 30.2%)	37.9%	6.9%	27.6%	27.6%
Discouraged (n=30; 31.3%)	16.7%	6.7%	36.7%	40.0%
No Need (n=37; 38.5%)	8.1%	5.4%	21.6%	64.9%
<i>Large Firms</i>				
Had Loan (n=21; 58.3%)	76.2%	14.3%	0.0%	9.5%
Discouraged (n=3; 8.3%)	0.0%	0.0%	0.0%	100.0%
No Need (n=12; 33.3%)	41.7%	8.3%	0.0%	50.0%

Table 8: Robustness Checks, Regressions for Financial Constraints

	Dep. Var: Finance is NO Obstacle					
	Probit	OLS	Probit	OLS	Probit	OLS
Observations	856	856	911	911	920	920
Sector Dummies	Yes	Yes	Yes	Yes	Yes	Yes
Year Dummies	Yes	Yes	Yes	Yes	Yes	Yes
Firm Characteristics						
Firm is medium-sized (dummy)	0.048 (0.043)	0.043 (0.040)	0.060 (0.041)	0.054 (0.040)	0.051 (0.041)	0.045 (0.038)
Firm is large (dummy)	0.168* (0.093)	0.154* (0.089)	0.209** (0.096)	0.187* (0.092)	0.193** (0.091)	0.173* (0.087)
Firm is Large*2005 (interaction term)	-0.044 (0.087)	-0.047 (0.092)	-0.002 (0.090)	-0.0001 (0.091)	0.012 (0.090)	0.006 (0.089)
Firm is Large*2008/9 (interaction term)	-0.121 (0.076)	-0.136 (0.090)	-0.147* (0.077)	-0.161 (0.095)	-0.146* (0.074)	-0.159* (0.092)
Banking Sector						
foreign bank assets 1999 (percent)	-0.002* (0.001)	-0.002* (0.001)	-0.002* (0.001)	-0.002* (0.001)	-0.0017 (0.001)	-0.0018 (0.001)
% Foreign in 1999*2005 (interaction term)	0.0035** (0.001)	0.0035** (0.001)	0.0033** (0.001)	0.0031** (0.001)	0.0019 (0.0012)	0.0019 (0.0011)
% Foreign in 1999*2008/9 (interaction term)	0.0049*** (0.001)	0.0047*** (0.001)	0.0042*** (0.001)	0.0040*** (0.001)	0.0039*** (0.001)	0.0038*** (0.001)
Credit Constraints						
No need for external finance	0.239*** (0.060)	0.226*** (0.058)	0.246*** (0.060)	0.233*** (0.057)	0.259*** (0.064)	0.237*** (0.058)
Competition						
No competitors	0.017 (0.073)	0.012 (0.068)				
More than 4 competitors	-0.059* (0.033)	-0.055* (0.031)				
Additional Controls						
Audited financial statement			-0.040 (0.039)	-0.035 (0.036)		
Female Owner			0.010 (0.044)	0.005 (0.041)		
Exchange Rate Regime						
Current Account Deficit/GDP					0.010 (0.008)	0.008 (0.008)
Fixed Peg*current account deficit*2002 dummy					-0.004 (0.008)	-0.002 (0.008)
Fixed Peg*current account deficit*2005 dummy					0.020** (0.008)	0.020** (0.008)
Fixed Peg*current account deficit*2009 dummy					-0.004 (0.007)	-0.003 (0.007)
Crawling*current account deficit*2002 dummy					0.013 (0.011)	0.014 (0.011)
Crawling*current account deficit*2005 dummy					0.011 (0.011)	0.011 (0.010)
Crawling*current account deficit*2009 dummy					-0.004 (0.009)	-0.003 (0.008)
constant		0.516** (0.154)		0.553*** (0.154)		0.354** (0.169)
Pseudo R-Squared/R-Squared	0.089	0.111	0.083	0.105	0.101	0.127

***, **, * Significant at 1, 5, and 10 percent level. T-statistics in parentheses.

Source: Authors' calculations based upon data from the World Bank Enterprise Survey, BEEPS data and from other sources

Note: Since dependent variables are dummy variables, probit regressions are used. Performance variables used in analysis in Table 3 are omitted because they were not available for all years. Additional controls used in Table 4 for firm characteristics, country characteristics, firm performance, and year dummies are also included in these regressions, but are not presented in the table to conserve space. All regressions

include dummy variables indicating sector. Robust standard errors are in parentheses. Errors are clustered at country level. Marginal effects calculated at sample means for each variable are shown. Dependent variable is a dummy variable indicating that firm manager responded that access to finance was no obstacle to firm operations.

Appendix 1

BEEPS 2002 & BEEPS 2005

Q.54	Can you tell me how problematic are these different factors for the operation and growth of your business?
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Access to financing (e.g., collateral required or financing not available from banks).	No Obstacle	Minor Obstacle	Moderate Obstacle	Major Obstacle	Don't Know
	1	2	3	4	5

BEEPS 2008-9

k.30	“Is access to finance, which includes availability and cost, interest rates, fees and collateral requirements, No Obstacle, a Minor obstacle, a Moderate Obstacle, a Major Obstacle, or a Very Severe Obstacle to the current operations of this establishment?”
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Access to Finance	No Obstacle	Minor Obstacle	Moderate Obstacle	Major Obstacle	Very Severe Obstacle	Do not Know (spontaneous)	Does Not Apply (spontaneous)
	0	1	2	3	4	-9	-7