Financial Globalization and the Transmission of Credit Supply Shocks: Evidence from an Emerging Market

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Abstract

This paper analyzes whether equity holdings of international lenders affect the transmission of credit supply shocks from developed countries to emerging markets. I exploit the 1998 Russian debt default as an exogenous credit supply shock to international lenders and trace out the impact on bank lending in Peru. I find that after the shock international lenders with equity holdings in Peruvian banks increased financing to banks in Peru, while international lenders without equity holdings reduced financing to banks in Peru. This effect could be driven either by differential credit supply from international lenders or by heterogeneity in credit demand across banks. I control for credit demand by examining firms that have loans from both banks with international equity holders and banks without international equity holders and find evidence for the credit supply explanation. The change in credit supply has real effects: I find a lower bankruptcy rate among firms borrowing from banks with international equity holders than among firms borrowing from banks without international equity holders. These results suggest that equity holdings of international lenders mitigate the transmission of credit supply shocks to emerging markets.

Keywords: Emerging Markets, Foreign Banks, Financial Contagion
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I Introduction

The increasing globalization of financial and banking markets provides important advantages in terms of diversification and efficiency gains. However, the globalization of financial markets also creates possible channels for the transmission of financial shocks across markets. An important question in finance is whether or not financial institutions transmit financial shocks across markets and whether or not such shocks impact real economic activity. On the one hand, efficient market theory suggests that, as long as investment opportunities are constant, shocks to financial institutions in one market have no effect on lending in other markets. On the other hand, if financing frictions prevent financial institutions from accessing alternative financing sources to cover shortfalls as a result of a shock, one market may affect lending in other markets.[1]

In this paper I investigate the transmission of a foreign financial shock to banks in an emerging market as one example of whether financial institutions transmit financial shocks across markets. I develop a simple model that suggests that international lenders with equity holdings in emerging market banks are less likely to transmit shocks than international lenders without equity holdings. The intuition is simple: a lender that is also an owner of an emerging market bank can directly monitor the bank's lending decisions. As a result, banks are not tempted to increase the risk of their loan portfolios in response to a shock. In contrast, a lender without an equity stake cannot prevent an emerging market bank from increasing the risk of its loan portfolio after a shock. The optimal response of lenders without equity stakes is therefore to reduce lending to banks in emerging markets.[2]

I analyze the transmission of financial shocks empirically by examining the effect of the negative credit supply shock resulting from the 1998 Russian debt default on bank lending in Peru. I focus on a single country as it allows me to control for country-wide shocks to investment opportunities by using cross-sectional variation in the response of international lenders to credit supply shocks.[3] I focus on Peru because at the time of the Russian default there were no direct trade or financial links between Russia and Peru and the main impact of the Russian default on Peru was arguably via international lenders. Moreover, I use a unique dataset that covers all corporate loans in Peru to control directly for changes in firm investment opportunities (lending opportunities) and to trace out the impact on real

[1] The financial frictions view requires a violation of the Modigliani-Miller Theorem for banks.

[2] Put differently, lenders without equity stakes cannot prevent asset substitution (Jensen and Meckling (1976)).

[3] Examples of country-wide shocks that affect investment opportunities are common price shocks or general updating of investor beliefs about investment opportunties in a market. See Summers (2000) for a discussion of potential mechanisms.

economic activity.

The following example illustrates the channel under investigation. *Citibank* and *UBS* are both international lenders that provide financing to banks in Peru. I distinguish between international lenders with equity holdings (owner/lenders) and international lenders without equity holdings (arm's-length lenders). *Citibank* has a Peruvian subsidiary (*Citi-Peru*) and is therefore an owner/lender, while *UBS* has no equity holdings in Peru and is therefore an arm's-length lender. As a result, there are two types of Peruvian banks: foreign-owned banks (e.g. *Citi-Peru*) that have international lenders as equity holders and domestically-owned banks (e.g. *Banco Wiese*) that have no international lenders as equity holders. I ask the following question: Do credit supply shocks to arm's-length lenders (e.g. *UBS*) have the same impact on financing to banks in Peru as credit supply shocks to owner/lenders (e.g. *Citibank*)?

I first examine the impact of the Russian default on international lenders. I find that after the Russian default both arm's-length lenders (e.g. *UBS*) and owner/lenders (e.g. *Citibank*) experience a large decline in share prices. I find no difference in the impact across the two types of lenders which I interpret as evidence that the Russian default represents a negative credit supply shock to both types of lenders. I then analyze the impact of the credit supply shock on financing to banks in Peru. I find that owner/lenders (e.g. *Citibank*) increase financing to their subsidiaries in Peru (e.g. *Citi-Peru*), while arm's-length lenders (e.g. *UBS*) decrease financing to banks in Peru (e.g. *Banco Wiese*). As a result, financing to foreign-owned banks (e.g. *Citi-Peru*) increases, whereas financing to domestically-owned banks (e.g. *Banco Wiese*) decreases. I interpret these findings as evidence that equity holdings of international lenders mitigate the transmission of credit supply shocks.

I then trace out the impact of the credit supply shock on real firm outcomes. The credit supply shock affects real outcomes under two conditions. The first condition is that *banks* cannot offset the shock through accessing other sources of financing. The second condition is that *firms* cannot offset the shock by switching across banks or borrowing from other financial intermediaries. In other words, the transmission of financial shocks to the real economy requires financial frictions at both the bank and the firm level.[4]

To evaluate the first condition, I estimate the impact of the credit supply shock on lending by

[4]The literature on the bank lending channel emphasizes these conditions as prerequisites for the transmission of financial shocks to the real economy (e.g. Bernanke and Blinder (1988)).

foreign- and domestically-owned banks. This estimation poses an identification problem because after the Russian default firms borrowing from foreign-owned banks may experience different shocks to investment opportunities than firms borrowing from domestically-owned banks. For example, suppose that all exporters borrow from foreign-owned banks (e.g. *Citi-Peru*) and all non-exporters borrow from domestically-owned banks (e.g. *Banco Wiese*). If the Russian default increases export demand, for example via its effect on exchange rates, exporters may have better investment opportunities and higher credit demand which would bias the estimation of the credit supply shock.

I therefore develop an empirical estimator to control for changes in investment opportunities. I exploit the fact that many firms have loans with both foreign- and domestically-owned banks and compare the change in borrowing across loan relationships *within* firms (e.g. for the same firm comparing borrowing from *Citi-Peru* versus borrowing from *Banco Wiese*). Using within-firm variation allows me to control for changes in investment opportunities and I can therefore identify the impact of the credit supply shock on bank lending.

I find that lending by foreign-owned banks increases by 15.6 percent compared to lending by domestically-owned banks after controlling for investment opportunities. I find a similar effect of 16.2 percent when I estimate the effect without controlling for investment opportunities. These findings suggest that banks cannot offset the credit supply shock and the shock therefore affects bank lending. To ensure robustness, I also estimate the impact of the credit supply shock using variation in financing by international lenders instead of bank ownership and find qualitatively and quantitatively similar results. I also examine trends prior to the Russian default and rule out that the results are driven by differential pre-trends across foreign- and domestically-owned banks.

To analyze whether firms can offset the shock, I examine how established bank relationships with foreign- and domestically-owned banks affect firm outcomes after the Russian default. For each firm I compute the share of lending with foreign-owned banks prior to the Russian default. I find that a one standard deviation increase in the share of lending with foreign-owned banks increases borrowing by 9.3 percent and raises the likelihood of firm survival by 2.3 percentage points after the Russian default. This result shows that firms cannot offset the credit supply shock by switching across banks or borrowing elsewhere.

In short, the findings in this paper suggest that financial institutions transmit financial shocks across markets and that financial shocks affect real economic activity. Specifically, I show that arm's-

length lenders (e.g. *UBS*) are more likely to transmit credit supply shocks than owner/lenders (e.g. *Citibank*). The differential transmission reduces bank lending by domestically-owned banks (e.g. *Banco Wiese*) compared to foreign-owned banks (e.g. *Citi-Peru*). As a result, firms banking with foreign-owned banks have better access to bank lending after a credit supply shock than firms banking with domestically-owned banks, which affects real firm outcomes such as firm survival.

This paper relates to a large literature on the transmission of financial shocks across countries. Theoretical work by Shleifer and Vishny (1997) and Calvo (1998) emphasizes the importance of common leveraged creditors and lack of liquidity in the transmission of financial shocks. Empirical work focuses on distinguishing the different channels of transmission such as trade or financial linkages. On trade linkages, Eichengreen, Rose, and Wyplosz (1996), Forbes (2002), and Forbes (2004) find evidence of the transmission of shocks via trade channels. On financial linkages, empirical work examining international investors (Kaminsky, Lyons, and Schmukler (2004), Kaminsky and Reinhart (2000), and Van Rijckeghem and Weder (2000)) or country-specific shocks (Peek and Rosengreen (2000a)) finds evidence that foreign investors spread crises across markets. The empirical approach in this paper differs in that I use cross-sectional variation in the way that financial institutions respond to shocks within one country and control directly for changes in investment opportunities using loan-level data.

The estimation of real firm outcomes connects to a large literature on the impact of financial shocks to banks on the real economy. Theoretical work by Bernanke and Blinder (1988), Bernanke and Gertler (1989), Holmstrom and Tirole (1997) and Stein (1998) shows that financial shocks affect real firm outcomes only if there are credit market imperfections both at the bank and firm level. The early empirical literature by Bernanke (1983) and Bernanke and Blinder (1992) uses correlations between aggregate changes in liquidity and aggregate changes in output to show that financial shocks affect real outcomes. However, aggregate correlations may be driven by omitted variables that affect both bank credit supply and firm investment opportunities. Recent work by Kayshap, Lamont and Stein (1994), Kashyap and Stein (2000) and Ashcraft (2006) uses variation across banks and firms or natural experiments (Peek and Rosengren (2000a), Ashcraft (2005), Khwaja and Mian (2007), Paravisini (2007)) to control for omitted variables. This paper is different in that I develop an empirical estimator using loan-level data to determine whether changes in credit supply are correlated with changes in investment opportunities.[5]

[5]Khwaja and Mian (2007) use a similar empirical approach to identify the bank lending channel. However, their paper

The paper also relates to a literature on differences between foreign- and domestically-owned banks in emerging markets. Empirical work using cross-sectional data on lending (Berger, Klapper and Udell (2001), Mian (2006)) or panel data on foreign bank entry (Gormley (2007)) finds that foreign-owned banks tend to finance larger firms, whereas domestically-owned banks tend to finance smaller, informationally opaque firms. Regarding financial shocks, Arena, Reinhart, and Vazquez (2006) find little difference in the lending channel of foreign- and domestically-owned banks using panel data on emerging market banks and Goldberg (2002) finds mixed results on the responsiveness of foreign subsidiaries of American banks to macroeconomic conditions in the United States. However, using bank-level data for Latin American and Asian countries, several authors (Diamond and Rajan (2001), Peek and Rosengreen (2000b), Crystal, Dages, and Goldberg (2001), Detragiache and Gupta (2004)) find that foreign-owned banks increase lending as compared to domestically-owned banks after financial crises. This paper is different in that I exploit a natural experiment to identify the impact of an exogenous financial shock and use loan-level data to control for differences between foreign- and domestically-owned banks.

The paper proceeds as follows. Section II describes the institutional background and summarizes the main non-parametric results. Section III provides a simple model of international lenders and their response to a credit supply shock. Section IV outlines the identification problem of estimating the impact of the credit supply shock and proposes an empirical strategy to solve the identification problem. Section V summarizes the data. Section VI estimates the effect of the credit supply on bank lending. Section VII estimates the impact of the credit supply shock on firm outcomes. Section VIII concludes.

II Background and non-parametric results

A Background

In 1992, Russia implemented far-reaching economic reforms to replace an order based on state ownership and central planning with a private market economy and voluntary exchange. The reforms led to a large increase in private-sector employment and the formation of capital markets but also created macroeconomic instabilities. In 1995, after several unsuccessful attempts, Russia implemented an eco-

focuses on a domestic shock to bank deposits rather than the transmission of financial shocks by financial institutions.

nomic reform program to stabilize the economy and restore fiscal discipline. The reform successfully reduced inflation, but over the following two years, an uncontrolled decline in federal tax revenues sharply increased Russia's debt burden. Starting in July 1997, the Asian Financial Crisis prompted concerns about emerging market investments and eventually international lenders started to withdraw international funds from Russia. In August 1998, the decline in international funds triggered a massive default on government debt. As a result, many Russian banks went bankrupt, the domestic payment system collapsed, and the Russian currency went into a free fall.[6]

The default was unexpected for many international lenders because Russia had cooperated closely with the International Monetary Fund on its stabilization plan. Hence, many international lenders suffered major losses from both the debt default and the devaluation of the Russian currency and some international lenders went bankrupt as a consequence. The bankruptcies and general uncertainty in interbank lending markets increased bank liquidity needs, which in turn triggered a rise in interest rates. Moreover, widely used value-at-risk models prompted international lenders to liquidate risky investments, which included reductions in financing of emerging market banks. Since all international lenders were liquidating investments at the same time, the sell-offs further increased interest rates and prompted more sell-offs. Some observers also argue that the Russian default directly raised investor expectations of the likelihood of default in other emerging markets, which further raised interest rates on emerging market investments.[7]

For the empirical analysis in this paper, it is not necessary to separate out the different mechanisms that prompted the rise in interest rates. Instead I interpret the aggregate effect of the Russian default on international lenders as a credit supply shock, which raised the cost of capital to international lenders and therefore raised the interest rate charged to banks in emerging markets.

In the case of Peru, the impact of the Russian default operated primarily via international lenders. At the time of the Russian default, there were no direct financial or trade links between Russia and Peru. Also, Peru had been unaffected by the preceding Asian Financial Crisis and had been growing at an annual rate of 4 percent during the three years prior to the Russian default. However, Peru's financial system was exposed to the credit supply shock because Peruvian banks were borrowing heavily from international lenders. In total, international lenders provided $3bn in financing, equivalent to 23

[6] For a more detailed account of the Russian default see Shleifer and Treisman (2000).

[7] For a discussion of potential mechanisms see Summers (2000).

percent of total bank credit. Most financing by international lenders was bank-to-bank loans with a maturity of less than one year.[8]

To illustrate lending between international lenders and Peruvian banks, I list the three largest international lenders for each of the twenty largest Peruvian banks in Table 1. On the lender side, there are both arm's-length lenders (e.g. *UBS*) and owner/lenders (e.g. *Citibank*). On the borrower side, there are foreign-owned banks (e.g. *Citi-Peru*) and domestically-owned banks (e.g. *Banco Wiese*).

As shown in the table, the main international lender of foreign-owned banks is almost always the owner/lender. For example, the largest international lender to *Citi-Peru*, the Peruvian subsidiary of *Citibank,* is *Citibank*. Similarly, the main international lender to *Banco Continental*, which is a joint venture between the Spanish bank *BBVA* and a Peruvian business group, is *BBVA*.

For comparison, consider Peru's largest domestically-owned bank *Banco de Credito*. The three largest international lenders to *Banco de Credito* are *Barclays, UBS and ING Bank*, none of which owns an equity stake in *Banco de Credito*. Similarly, Peru's second largest bank, *Banco Wiese,* borrows from international lenders *Citibank, Rabobank* and *Standard Chartered*, none of which owns an equity stake in *Banco Wiese*.

The table also shows that both foreign- and domestically-owned banks receive significant financing from international lenders. Moreover, many international lenders provide financing to more than one Peruvian bank. For example, owner/lender *Cititbank* provides financing to both its subsidiary *Citi-Peru* and domestically-owned *Banco Wiese*. Similarly, arm's-length lender *Barclays* provides arm's-length financing to both foreign-owned *Banco Continental* and domestically-owned *Banco de Credito*. I use these cross-linkages for identification in the empirical analysis.

B Non-Parametric Results

This section analyzes the impact of the credit supply shock using aggregate data. The analysis proceeds in three steps. First, I document the impact of the Russian default on international lenders and analyze the differential response by arm's-length lenders and owner/lenders. Second, I estimate the impact on lending by foreign-owned banks and domestically-owned banks. Third, I trace out the impact on firms borrowing from foreign-owned banks versus firms borrowing from domestically-owned banks.

[8] For a detailed account of the impact of the Russian default on Peru see Superintendency of Banking, Insurance and Pension Funds (2006).

Figure I plots the relative change in share prices of arm's-length lenders (e.g. *UBS*) and owner/lenders (e.g. *Citibank*) one year before and after the Russian default.[9] I interpret the change in the share price as a measure of the magnitude of the credit supply shock to international lenders. The figure shows that share prices of both owner/lenders and arm's-length lenders suffered a decline of 50 percent in the months after the Russian default. Importantly, there is no difference in the impact of the credit supply shock between arm's-length lenders and owner/lenders. I interpret this figure as evidence that the Russian default was a negative credit supply shock to all international lenders.

On the international lender side, I use micro-data on bank-to-bank loans to analyze the impact of the credit supply shock on banks in Peru. I aggregate bank financing by owner/lenders to subsidiaries (e.g. *Citibank* lending to *Citi-Peru*) and bank financing by arm's-length lenders (e.g. *UBS* lending to *Banco Wiese*). Figure IIa plots the two time-series for the period three months before and one year after the Russian default. I do not plot earlier data because the bank regulator only started collecting bank-to-bank lending data four months prior to the Russian default. The figure shows that arm's-length financing is significantly larger than owner/lender financing. This difference in levels reflects the fact that domestically-owned banks have a larger market share than foreign-owned banks and foreign-owned banks also take out some arm's-length debt.

To assess relative changes, Figure IIb plots the natural logarithm of the two time-series. I normalize the time-series to zero at the time of the Russian default such that the y-axis represents the relative change in financing compared to the date of the Russian default. The figure shows that financing by owner/lenders increased by 30 percent in the months after the Russian default. In comparison, financing by arm's-length lenders decreases by 30 percent within one year after the Russian default. I interpret this figure as evidence of the differential response to the credit supply shock by arm's-length lenders and owner/lenders.

On the borrower side, I aggregate total bank-to-bank loans by foreign- and domestically-owned banks. The total by borrower can be different from the total by lender because foreign-owned bank also take out arm's-length financing. Figure IIIa and Figure IIIb plot the time-series of total international bank financing to foreign- and domestically-owned banks in logs and levels, respectively. Figure IIIa shows that financing to domestically-owned banks is larger than financing to foreign-owned banks

[9] I use data on all owner/lenders and the twenty largest arm's-length lenders for which share prices are available. In total, the figures uses share prices for 27 international lenders. The share prices were obtained from Bloomberg.

which reflects the difference in market shares. Figure IIIb shows that financing to domestically-owned banks declines by 29 percent, while financing to foreign-owned banks only declines by 3 percent. The differential response by arm's-length lenders and owner/lenders thus translates into lower financing to domestically- versus foreign-owned banks.

I then use microdata on all corporate loans to trace out the effect on bank lending. I aggregate total lending for foreign- and domestically-owned banks. Figure IVa and Figure IVb plot the two time series in logs and levels, respectively. Again, Figure IVa shows a difference in levels, which reflects the difference in market shares of domestically- and foreign-owned banks. Figure IVb shows that after the Russian default bank lending by foreign-owned banks declined by 7 percent, but bank lending by domestically-owned banks declined by 21 percent. Hence, differential financing by arm's-length lenders and owner/lenders translates into differential lending by foreign- and domestically-owned banks.

Importantly, the figure also reveals a pre-trend across foreign-owned versus domestically-owned banks. This pre-trend is driven by foreign banks that had entered the Peruvian markets after financial liberalization in the early 1990s and were expanding their activities. However, the pre-trend is small compared to the differential effect after the Russian default and therefore cannot explain the observed difference between foreign- and domestically-owned banks. Assuming the pre-trend would have continued at a similar rate after the Russian default, the trend would account for 18 percent of the observed difference between foreign-owned and domestically-owned banks. I address the pre-trend in more detail in the empirical section.

I then divide firms in two groups: firms for which the main bank before the Russian default is a foreign-owned bank and firms for which the main bank before the Russian default is a domestically-owned bank. I aggregate total borrowing for the two groups. Figure Va and Figure Vb plot the time-series in levels and logs, respectively. The figures show that firms banking with domestically-owned banks decrease borrowing by 20 percent, while firms banking with foreign-owned banks decrease borrowing by 5 percent. These figures suggest that firms cannot offset the credit supply shock by switching across banks or borrowing elsewhere.

In short, I find that after the Russian default owner/lenders (e.g. *Citibank*) increase financing to subsidiaries (e.g. *Citi-Peru*), while arm's-length lenders (e.g. *UBS*) decrease financing to all banks (e.g. *Banco Wiese*). Second, as a result lending by foreign-owned (e.g. *Citi-Peru*) banks remains stable, while lending by domestically-owned banks (e.g. *Banco Wiese*) declines. Third, firms banking

with foreign-owned banks have better access to bank lending after the Russian default than firms banking with domestically-owned banks.

III A simple model of international lenders

This section provides a simple model of international lending. The model formalizes the differential response of arm's-length lenders and owner/lenders to a credit supply shock. I also discuss possible extensions and alternative explanations for a differential effect between the two types of lenders.

Assume banks in emerging markets finance domestic investment projects. All investment projects are of the same size, which is normalized to one. There are two types of projects: safe and risky. If a bank invests in a safe project, the project yields $S > 1$. If the bank invests in a risky project, the project yields $R > S$ with probability p and zero with probability $(1 - p)$. Risky projects have a lower expected net present value than safe projects such that $pR < S$.

Bank refinance their lending by borrowing from international lenders. There are two types of international lenders: arm's-length lenders (e.g. *UBS*) and owner/lenders (e.g. *Citibank*). As a result, there are two types of banks in emerging markets: foreign-owned banks (e.g. *Citi-Peru*) and domestically-owned banks (e.g. *Banco Wiese*). Banks are operated by bank managers, who maximize the bank value for equity holders.

Suppose a domestically-owned bank (e.g. *Banco Wiese*) borrows one unit of capital from an arm's-length lender (e.g. *UBS*) and promises to repay D. If the bank manager invests in safe projects, the payoff is $(S-D)$. If the manager invests in risky projects, the expected payoff is $p(R-D)$. The manager maximizes the bank equity value and therefore invests in safe projects if and only if $D \leq \frac{S-pR}{(1-p)}$. Let $D = (1 + r)$ such that r denotes the net interest rate on arm's-length lending. This yields the first proposition.

Proposition 1 *Banks financed by arm's-length debt can sustain safe projects if and only if*

$$(1 + r) \leq \frac{S - pR}{(1 - p)}. \tag{1}$$

This proposition states that arm's-length lenders cannot sustain safe projects once interest rates become too high.

For comparison, suppose a foreign-owned bank (e.g. *Citi-Peru*) borrows one unit of capital from its owner/lender (e.g. *Citibank*). If the manager invests in safe projects, the payoff is $(S - D)$. If the manager invests in risky projects, the expected payoff is $(pR - D)$. Since $pR < S$ the manager never invests in risky projects. I summarize this result as the second proposition.

Proposition 2 *Banks financed by owner/lenders can sustain safe projects if and only if*

$$(1 + r) \leq S. \tag{2}$$

The difference between owner/lenders and arm's-length lenders is that the manager of an owner/lender internalizes the cost of default $(1-p)D$, whereas the manager of an arm's-length lender does not. Therefore owner/lender continue financing safe projects at higher interest rates, even if arm's-length lending breaks down at those higher rates. Moreover, note that safe projects are only financed by both types of lenders if the rate of return S is higher than the gross interest rate $(1 + r)$.

A simple example illustrates this model. Assume safe return $S = 1.2$, risky return $R = 1.3$, and the probability of default $p = \frac{1}{2}$. If $r = 8\%$, then $(S-D) = 0.12$ and $p(R-D) = 0.11$, such that safe projects can be financed both by arm's-length lenders or owner/lenders. If $r = 12\%$, then $(S - D) = 0.08$ and $p(R - D) = 0.09$, such that arm's-length lending breaks down because managers choose risky projects. However, safe projects are still financed by owner/lenders because they yield a positive net present value. In fact, safe projects are financed by owner/lenders if and only if $r \leq 20\%$.

The example makes clear that there are three regions of interest for interest rate r. I summarize this result as the third proposition.

Proposition 3 *If* $(1 + r) \leq \frac{S-pR}{(1-p)}$ *(low region), safe projects can be financed both by arm's-length lenders and owner/lenders. If* $\frac{S-pR}{(1-p)} < (1 + r) \leq S$ *(middle region), safe projects can be financed only by owner/lenders. If* $S < (1 + r)$ *(high region) no safe projects can be financed.*

This proposition shows that there exists a set of parameter values for interest rate r, such that arm's-length lenders forego profitable investment opportunities.

I now consider the impact of a credit supply shock to international investors. I define a credit supply shock as the change in the lender's cost of capital r. Consider the perspective of a domestically-owned bank (e.g. *Banco Wiese*) with lending financed by arm's-length lenders (e.g. *UBS*). To focus

on the most interesting case, consider a credit supply shock that raises the arm's-length lender's cost of capital r from the low to the middle region. As a result, arm's-length lenders cut financing and lending by domestically-owned banks drops to zero. For comparison, consider a foreign-owned bank (e.g. *Citi-Peru*) with lending financed by owner/lenders (e.g. *Citibank*). If a credit supply shock raises the owner/lender's cost of capital r from the the low to middle region, the owner/lender continues to provide financing. I summarize this result as the fourth proposition.

Proposition 4 *Consider an increase in the opportunity cost of capital r from the low region to the middle region. As a result,*

(i) arm's-length investors reduce financing but owner/lenders continue financing, and

(ii) lending by domestically-owned banks decreases compared to lending by foreign-owned banks.

The first result follows directly from the third proposition. The second result follows from the assumption that domestically-owned banks borrow from arm's-length lenders and foreign-owned banks borrow from owner/lenders.

This simple model can be extended in several ways. First, the model assumes that managers act in the interest of equity holders. If there is an agency problem between equity holders and managers, for example if managers can earn private benefits from taking on risky projects, owner/lenders need to monitor managers directly to limit the scope for the manager's self-interest. For example, owner/lenders might review investment projects to prevent risky lending. In this case, the observed results are at least partly due to better corporate governance in foreign-owned banks. I view this explanation as complementary because in this version of the model owner/lenders institute better corporate governance because they internalize the impact of debt default. Better corporate governance in foreign-owned banks is thus a complementary mechanism that results from the same underlying difference between owner/lenders and arm's-length lenders as in the model outlined above.

Second, the model can be extended to endogenize the choice of international lenders to invest at arm's-length or as owner/lenders. This is important for the empirical analysis if the characteristics that prompt international lenders to enter as owner/lenders directly affect lending after a credit supply shock. For example, suppose that owner/lenders enter because they are better at managing subsidiaries than arm's-length lenders and better managements skills yield a comparative advantage in maintaining safe projects after a credit supply shock. Under this assumption, the differential response

of owner/lenders versus arm's-length lenders is at least party driven by management skills. Again, I view this explanation as a complementary mechanism because it directly assumes that owner/lenders are better at maintaining a safe project mix, which is the main difference between arm's-length lenders and owner/lenders. I leave it to future research to distinguish between these alternative mechanisms.

More generally, an entry model would also shed light on the question of the socially efficient bank ownership structure. The model in this paper suggests that foreign ownership is more efficient than domestic ownership because under domestic ownership banks sometimes forego profitable investment opportunities. However, the model could be extended to allow for other benefits of domestically-owned banks such as better monitoring or screening abilities.[10] In this case, the entry model may yield an efficient ownership structure with both foreign- and domestically-owned banks.

Finally, the model suggests that banks may engage in risk-taking at the cost of lower expected profits. More generally, banks may also engage in other activities that benefit bank owners at the expense of arm's-length lenders. For example, banks may engage in tunneling, related lending or looting.[11] Instead of modeling such activities explicitly, I interpret risk-taking as a proxy for such activities.

IV Identification Strategy

This section outlines the strategy to identify the impact of the credit supply shock empirically. The identification strategy proceeds in three steps. First, I discuss the impact of the credit supply shock on bank financing by international lenders. Second, I outline the identification problem in distinguishing between credit supply and credit demand and develop an estimator using loan-level data to control for credit demand. Third, I discuss how to estimate the impact of the credit supply shock on firms.

A Effect of Foreign Ownership on Bank Financing

The first step of the analysis is to examine the impact of international lenders on bank financing to foreign- and domestically-owned banks. The model predicts that after a credit supply shock arm's-

[10] For example, Mian (2006) finds evidence that domestically-owned banks are better at relationship lending that foreign-owned banks.

[11] Akerlof and Romer (1996) discuss bank owner incentives for looting as banks enter financial distress. La Porta et al (2003) provide empirical evidence on lending to firms owned by bank shareholders during the Mexican financial in the mid-90s.

length lenders decrease financing to all banks, while owner/lenders increase financing to their subsidiaries.

To test this prediction empirically, I estimate the OLS-regression

$$D_{bt} = \alpha_b + \alpha_t + \alpha_1 F_b After_t + \varepsilon_{bt} \tag{3}$$

where D_{bt} denotes debt financing by international lenders to bank b at time t. The dummy variable $After_t$ denotes months after the Russian default, α_b and α_t are bank and time fixed-effects, and foreign ownership F_b denotes the ownership share of international lenders. The coefficient α_1 captures the differential transmission of the credit supply shock to foreign- and domestically-owned banks.

The identifying assumption is that financing of international lenders to foreign- and domestically-owned banks would not have changed differentially in the absence of the Russian default. In the empirical section I examine pre-trends of financing by international lenders to provide evidence on this assumption. I also estimate the impact of the Russian default on bank financing via deposits to ensure that the results are not driven by variation in other financing sources.

Moreover, the model suggests that after a credit supply shock, owner/lenders increase financing to its subsidiaries, but decrease financing to non-subsidiaries. To test this prediction, I exploit cross-linkages between international lenders and banks and analyze financing of owner/lenders (e.g. *Citibank*) to its subsidiaries (e.g. *Citi-Peru*) versus financing of owner/lenders (e.g. *Citibank*) to non-subsidiaries (e.g. *Banco Wiese*).

B Credit Supply versus Credit Demand: The Identification Problem

The second step of the analysis is to estimate the impact of the differential transmission of the credit supply shock across foreign- and domestically-owned banks. This estimation poses an identification problem because we need to distinguish between the impact of the credit supply shock to financing by international lenders and changes in investment opportunities of borrowers.

The following example illustrates the identification problem. Suppose that all exporters borrow from foreign-owned banks and all non-exporters borrow from domestically-owned banks. If the Russian default improves export opportunities, for example via its effect on the exchange rate, borrowers of foreign-owned banks may demand more credit than borrowers from domestically-owned banks. As

a result, observed differences in lending by foreign- versus domestically-owned banks may reflect the composite effect of both credit supply and credit demand shocks. More generally, any variation across borrowers of foreign- versus domestically-owned banks that directly affects credit demand after the shock may bias the estimation of the credit supply shock.

I modify the model from the previous section to illustrate this identification more formally. The main purpose of the modified model is to highlight the identification problem and develop an empirical estimator to distinguish between credit supply and credit demand. Assume the model lasts for two periods. For simplicity, assume that banks only finance a single firm but firms can lend from several banks. Bank b provides a loan of size L^t_{bj} to firm j, where superscript t denotes the period.

On the credit supply side, assume banks are financed with debt from international lenders F^t_b and other forms of financing K^t_b (e.g. equity, deposits, bonds). Total bank assets L^t_b are equal to total bank liabilities $K^t_b + F^t_b$. I assume international investors provide funding at a constant rate and other forms of financing have a convex cost function $\gamma\frac{(K^t_b)^2}{2}$. The marginal cost of bank financing is therefore γK^t_b. The cost parameter γ denotes the slope of the marginal cost curve.

On the credit demand side, I assume firm j earns return $\theta_j L^t_{bi} - \beta\frac{(L^t_{bj})^2}{2}$ on each loan.[12] The firm quality parameter θ_j allows for variation in loan returns across firms. The marginal loan return is given by $\theta_j - \beta L^t_{jb}$.

I solve for the first period equilibrium by setting the marginal cost of financing γK^1_b equal to marginal loan return $\theta_j - \beta L^1_{jb}$. This yields the equilibrium loan amount $L^1_{jb} = \frac{\theta_j + \gamma F^1_b}{(\beta+\gamma)}$. The equilibrium loan amount is increasing in firm quality θ_j and decreasing in the financing cost parameter γ.

At the end of the first period, the economy experiences two shocks. First, there are bank-specific credit supply shocks S_b to financing by international lenders such that $F^2_b = F^1_b + S_b$. Second, there are firm-specific credit demand shocks D_j to marginal loan returns such that marginal loan returns in the second period are $\theta_j - \beta L^2_{jb} + D_j$.

Solving for the second-period equilibrium, the equilibrium loan amount is $L^2_{jb} = \frac{\theta_j + \gamma(F^1_b + S_b) + D_j}{(\beta+\gamma)}$.

[12] A more general model would endogenize the allocation of loans across banks. This simplified formulation takes the allocation of loans across banks as exogenous and assumes decreasing marginal returns for each loan. This formulation can be justified by assuming that aggregate loan demand of firm j has decreasing marginal returns and firm j splits loan demand in fixed proportions across banks.

The change in loan amount from first to second period $\Delta L_{jb} = L^2_{jb} - L^1_{jb}$ is given by

$$\Delta L_{jb} = \frac{1}{(\beta+\gamma)} D_j + \frac{\gamma}{(\beta+\gamma)} S_b. \tag{4}$$

The change in loan amount ΔL_{jb} consists of two terms. The first term on the right-hand side $\frac{1}{(\beta+\gamma)} D_j$ denotes the impact of the firm-specific credit demand shocks on loan amount L_{jb}. The second term on the right-hand side $\frac{\gamma}{(\beta+\gamma)} S_b$ denotes the impact of the bank-specific credit supply shock on loan amount L_{jb}.

Now suppose we use foreign bank ownership F_b as a proxy for credit supply shocks S_b and run the OLS-regression

$$\Delta L_{jb} = \beta_0 + \beta_1 F_b + \varepsilon_{ib} \tag{5}$$

where $\varepsilon_{ib} = \eta_j + \epsilon_{jb}$. The error term ε_{jb} in the OLS regression consists of a firm-specific component η_j and a firm-bank specific component ϵ_{jb}. The model suggests that $Cov(\eta_j, F_b) \neq 0$ if the credit demand shock D_j are correlated with foreign bank ownership. In this case, the foreign ownership coefficient F_b is biased.

It is difficult to sign this bias because the sign depends on the distribution of credit demand shock D_j across foreign- and domestically-owned banks. Consider the example in which all exporters borrow from foreign-owned banks and all non-exporters borrow from domestically-owned banks. If the credit supply shock improves export opportunities (e.g. via a reduction in the exchange rate), then $Cov(\eta_j, F_b) > 0$ and the estimated coefficient β_1 is biased upwards. If the credit supply shock weakens export opportunities (e.g. because other countries devalue and export more), then $Cov(\eta_j, F_b) < 0$ and the estimated coefficient is biased downwards. More generally, variation in borrower composition across foreign- and domestically-owned banks that directly affects credit demand after the shock biases the foreign ownership coefficient β_1. This problem is the standard identification problem of separating out credit supply and credit demand.

C Testing Credit Supply versus Credit Demand

To address the identification problem, I propose a simple estimator. I exploit the fact that many firms borrow from both foreign- and domestically-owned banks. Denote a foreign-owned bank with subscript

F and and a domestically-owned bank with subscript D. Consider a firm j that has one loan with each type of bank and compute the difference in changes in loan amounts:

$$\Delta L_{jF} - \Delta L_{jD} = \frac{\gamma}{(\beta + \gamma)}(S_F - S_D). \tag{6}$$

Note that the firm-specific credit demand shock cancels out and the difference between foreign- and domestically-owned banks captures the impact of bank-specific credit supply shocks. Using variation *within* firms across loan relationships allows me to control for firm-specific credit demand shock and I can therefore identify the impact of the credit supply shock.

Now consider running an OLS-regression that includes firm-fixed effects β_j such that

$$\Delta L_{jb} = \beta_0 + \beta_j + \beta_1 F_b + \varepsilon_{ib}. \tag{7}$$

The firm-fixed effects β_j absorb the firm-specific credit demand shocks and foreign ownership coefficient β_1 identifies the impact of the credit supply shock across foreign- and domestically-owned banks.

The identifying assumption is that $Cov(F_b, \varepsilon_{ib}) = 0$. This assumption holds if the firm-loan specific shocks ε_{ib} are uncorrelated with foreign bank ownership F_b. I address the validity of this assumption in the empirical estimation.

D Estimating the Impact of Credit Supply on Firms

The impact of the credit supply shock on firms depends on whether firms can offset the shock by switching across banks. If credit markets work perfectly, we expect firms with the highest rate of return to switch from domestically- to foreign-owned banks, leading to an efficient reallocation of bank credit across firms. However, if there are information asymmetries in credit markets, firms may not be able to offset the credit supply shock by switching across banks. In this case, firms banking with foreign-owned banks have better access to bank credit than firms banking with domestically-owned banks. Moreover, if firms cannot borrow elsewhere, the differential access to bank credit affects firm real outcomes such as loan default rates and firm survival.

To address this question, I analyze outcomes at the firm-level. For each firm j, I construct the loan-weighted share of lending with foreign-owned banks F_j prior to the Russian default. For example, if a

firm only borrows from foreign-owned banks, F_j is zero and if a firm only borrows from domestically-owned banks, F_j is one. This variable captures whether a firm had established bank relationships with foreign- or domestically-owned banks prior to the Russian default.

Let Y_j be the outcome of interest such as total borrowing or loan default and denote the change before and after the Russian default as ΔY_j. Consider running the OLS regression

$$\Delta Y_j = \gamma_0 + \gamma_1 F_j + \varepsilon_j. \tag{8}$$

where ε_j denotes the error term. The coefficient on foreign ownership share γ_1 identifies the impact of pre-existing bank relationships with foreign- versus domestically-owned banks.

The identifying assumption is that the error term ε_j is uncorrelated with the share of lending from foreign-owned banks F_j. The concerns about this identifying assumption are similar to the ones about identifying credit supply versus credit demand. In the empirical section, I use the results from the loan-level regressions to assess the validity of this assumption.

V Data

The empirical analysis in this paper uses loan data, firm data, and bank data from Peru. The loan data come from the public credit registry. The firm data are from official tax records. The bank data are from regulatory filings and bank financial statements. The loan and bank data were obtained directly from the Peruvian bank regulator *Superintendency of Banking, Insurance and Pension Funds (SBS)*. The official tax records were obtained via an automated internet query from the website of the Peruvian tax administrator *Superintendency of Tax Administration (SUNAT)*.

The bank data contain financial statements for all 25 commercial banks and 21 municipal banks for the years 1996 to 2000.[13] All commercial banks are privately-owned with the exception of one small government bank. Municipal banks are owned by local municipalities or individuals. I define foreign-owned banks as financial institutions in which the largest shareholder is based outside Peru. If a bank is owned jointly by domestic residents and a shareholder outside Peru, the bank is defined

[13] The credit registry also contains lending data on three finance companies and two microfinance organizations. I drop these institutions because finance companies primarily provide consumer loans and microfinance organizations primarily provide microloans in underserved areas. The aggregate market share in corporate lending of these institutions is less than one percent.

as 50 percent foreign-owned. If a bank is wholly owned by domestic residents, the bank is defined as domestically-owned. All foreign shareholders are international lenders based in North American, European, or other Latin American countries. Appendix I provides a list of all international lenders with equity stakes in Peruvian banks.

The loan level data contains all corporate loans in the years 1996 to 2000. A loan is defined as a single loan relationship between a bank and a firm. If a firm has several loans products with the same bank (e.g. overdraft, working capital loan), all loan products are aggregated to a single loan. There is practically no missing data because financial institutions are legally required to report monthly data on all loans above a threshold of US$ 5,000.[14] The data includes variables on tax identification number, lending bank, loan amount, collateral, borrowing currency, loan type, and default status. One small commercial bank (*Banco Solventa*) is missing from the dataset. This should not be a concern because the bank only operated for two years and had a market share of less than two percent.[15] In total, the data contains loan-level information from 25 commercial banks and 21 municipal banks covering 98 percent of corporate lending.

The loan data are generally of high quality. The bank regulator invests considerable resources to ensure complete coverage and conducts regular bank audits to verify the accuracy of the dataset. Personal interviews with managers from several banks confirm that all banks refer to this data for credit approvals and credit monitoring. The data is also used for credit reports sold by private credit bureaus. An interview with the general manager of the main private credit bureau *Equifax* confirmed that the data quality is comparable to the United States. In addition, I conducted several consistency checks of the data. I found no missing data once a financial institution entered the dataset. Also, there is a high correlation between total credit from bank balance sheets and total credit from the registry with a correlation coefficient of 0.99.

Most of the analysis restricts the dataset to firms with loan relationships with both foreign- and domestically-owned banks. This restriction is chosen because the empirical analysis uses variation within firms which requires loan relationships with each type of bank for empirical identification. This gives me a sample of 20,568 loan relationships and 7,095 firms. The average number of loans per firms

[14] In 1999, the bank supervisor lowered the threshold to zero. For consistency I drop all loans below US$5,000.

[15] Discussions with the bank regulator suggest that new banks have several months until they start reporting to the credit registry. *Bank Solventa* apparently went out of business even before starting to report. The bank license was later transformed in a license for a finance company.

is 2.81, which reflects the fact that all firms have at least two loan relationships.

Table 1 presents summary statistics at the loan-level, firm-level, and bank-level by foreign bank ownership. Appendix II describes the construction of all variables. The summary statistics show that foreign- and domestically-owned banks engage in similar lending activities. Both types of banks denominate about 80 percent of loans in US dollars and have about 40 percent of lending covered by collateral. With respect to loan types, both foreign- and domestically-owned banks provide similar loan products. Foreign-owned banks lend 37 percent long-term, 36 percent short-term, 7 percent as leasing and the remainder as overdraft or export financing. Domestically-owned banks lend 36 percent long-term, 39 percent short-term, 3 percent as leasing and the remainder as overdraft or export financing. Overall, these summary statistics show no difference in the lending mix across foreign- and domestically-owned banks.

Some of the analysis on the impact of the credit supply shock on firms uses the full dataset. I therefore also provide summary statistics for the full dataset in Appendix Table A1. The summary statistics for the full dataset show little differences in loan characteristics between the full dataset and the restricted dataset.

VI Results: Impact on Lending

A Effect of Foreign Ownership on Bank Financing

This section examines the impact of the credit supply shock on financing by international lenders to foreign- and domestically-owned banks. I start by estimating regression (3). The outcome variable is the natural logarithm of total debt financing by international lenders.

Table 3 presents the results. Column (1) shows that financing to domestically-owned banks decreases 39 percent compared to financing to foreign-owned banks. As shown in the non-parametric results, this finding is driven by the differential response to the credit supply shock by arm's-length lenders and owner/lenders. Column (2) weights the regression by bank size. The coefficient on foreign bank ownership decreases to 30 percent but remains statistically significant. Thus, after the credit supply shock domestically-owned banks experience a significant decrease in financing as compared to foreign-owned banks.

For robustness, I estimate similar regressions with other sources of bank financing (e.g. deposits,

interbank-loans, equity) as outcome variables. Deposits are the main source of financing and the theory developed for arm's-length lenders may also apply to depositors, especially to larger and financially more sophisticated ones. Furthermore, depositors may also switch banks, or leave the banking system altogether, if they expect international lenders to reduce financing to domestically-owned banks.

Column (3) and Column (4) report the results. Column (3) shows a positive but not statistically significant effect of foreign bank ownership on deposits of 6.9 percent. Column (4) shows that the coefficient decreases to 4.1 percent after weighting the regressions by bank size. These results are suggestive that some depositors switch from domestically- to foreign-owned banks, but the effect is quantitatively small. Using the coefficients from the weighted regressions, I estimate that the shift of deposits from domestically- to foreign-owned banks accounts for 17 percent of the total change in financing of domestically- and foreign-owned banks. I therefore attribute the change in financing to banks in Peru primarily to international lenders. I also examine the impact of the credit supply shock on other sources of bank financing such as interbank loans and equity and find no statistically or economically significant effect.

I then estimate the impact of the credit supply shock separately for arm's-length lenders and owner/lenders. I find that arm's-length lenders (e.g. *UBS*) reduce financing to both foreign- (e.g. *Citi-Peru*) and domestically-owned banks (e.g. *Banco Wiese*) equally by about 40 percent. In contrast, owner/lenders (e.g. *Citibank*) increase financing to their subsidiaries (e.g. *Citi-Peru*) by 30 percent but decrease bank financing to non-subsidiaries (e.g. *Banco Wiese*) by 43 percent. These results are not statistically significant due to the small sample size of owner/lenders. However, the findings are suggestive that financing after the credit supply shock is indeed driven by an increase in financing of owner/lenders to their subsidiaries and by a decrease in financing of arm's-length lenders to all banks.

B Testing for Credit Supply versus Credit Demand

This section implements the empirical estimator developed in the identification strategy. I separately estimate the impact on loan size (intensive margin) and whether a loan relationship enters or exists during the analysis period (extensive margin). I estimate the intensive and extensive margin separately because loan size is censored at zero, which may bias the OLS estimator. Also, separate estimation of the intensive and extensive margin allows me to identify the relative importance of each margin.

The unit of observation is a loan relationship (or loan) at a given point in time. A loan relationship

is defined as single firm-bank pair. I restrict the analysis to firms that have both loans with foreign- and domestically-owned banks at the beginning of the dataset. The restriction is chosen because the preferred estimator with firm fixed-effects only identifies off those firms and the restriction therefore ensures comparability across specifications. The restricted dataset yields a sample of 7,095 firms and 26,784 loan relationships.[16]

To facilitate computation, I collapse and time-average the data one year before and one year after the Russian default. The collapsing smooths out variation and generates conservative standard errors. I choose the period one year around the Russian default because one year after the Russian default the Peruvian government initiates a program to purchase non-performing loans from banks in financial difficulties. The program is primarily targeted at domestically-owned banks and therefore improves their credit supply. To the extent that the program is anticipated, it should bias the estimation against finding an effect of the credit supply shock since the program offsets some of the reduction of financing to domestically-owned banks.

To compute the intensive margin, I only include observations with positive loan amounts to avoid bias coming from large drops in loan size as firms enter or exit loan relationships. Therefore the number of observations for estimating the intensive margin is smaller than the number of observations for estimating the extensive margin. For the extensive margin, I use a dummy set to one if a loan relationship has a positive loan amount and zero otherwise. I weight the regression using firm size one year before the Russian default. The weighting is chosen to reflect the larger economic importance of big firms and ensures that the results are not driven by a large number of small firms. I also estimate regressions without weights and find similar results. With respect to standard errors, I cluster all standard errors at the bank level to allow for correlation of error terms across loans within banks. I choose this level of clustering because the coefficient on foreign ownership only varies at the bank level.

Following the identification strategy, I estimate the regression

$$\Delta Y_{ijb} = \beta_0 + \beta_j + \beta_b F_b + \varepsilon_{ijb} \tag{9}$$

where ΔY_{ijb} denotes the change in the outcome of interest of loan i of firm j with bank b, such as

[16] The number of loan relationships is larger than the number of loan relationships in the summary statistics because the summary statistics are restricted to loan relationships active in October 1997, while the estimation also includes loan relationships started after October 1997.

the natural logarithm of loan size. The regression controls for firm fixed-effects β_j and the coefficient of interest is the coefficient on foreign bank ownership β_b.

In some regressions I add controls for loan or firm characteristics. The controls for loan characteristics are a dummy whether the loan is denominated in foreign currency, the share of lending covered by collateral, and the share of long-term lending, short-term lending and leasing. The controls for firm characteristics are dummies for firm age, location dummies, industry dummies, and dummies for firm size deciles. I include these controls to test whether the results are driven by variation in loan or firm characteristics across foreign- and domestically-owned banks.

Table 4 presents the results. Column (1) reports the preferred specification with firm fixed-effects. I find that loans relationships with foreign-owned banks increase 15.6 percent compared to loan relationships with domestically-owned banks. Since the estimation controls for firm fixed-effects, this result is identified off variation within firms. This means that after controlling for credit demand, there is an economically and statistically significant difference between loan relationships of foreign- and domestically-owned banks. The result suggests that banks cannot offset the credit supply shock and the shock therefore affects bank lending.

Column (2) controls for loan relationship characteristics such as foreign currency, collateral and loan type. I include these variables to test whether the results are driven by variation in loan characteristics across banks. The coefficient on the dummy where the loan is denominated in foreign currency is negative. This may reflect the fact that dollar-denominated loans are less attractive after the credit supply shock because the exchange rate depreciated. The coefficient on the share covered by collateral is positive, which may reflect the fact that higher collateralized loans are more likely to be continued after the Russian default. However, neither of the two coefficients is statistically significant. Importantly, the coefficient on foreign bank ownership decreases only slightly to 13.6 percent and remains statistically significant. This finding shows that the result in Column (1) is not driven by variation in loan characteristics across foreign- and domestically-owned banks.

For comparison, I also estimate regression (9) without controlling for firm fixed-effects. Column (3) presents the result corresponding to Column (1). I find that loans relationships with foreign-owned banks increase 16.2 percent compared to loan relationships with domestically-owned banks. This coefficient is not statistically significantly different from the coefficient with firm-fixed effects. This result suggests that the difference between foreign- and domestically-owned banks after the Russian

default can be fully explained by the credit supply shock.

Column (4) controls for firm characteristics such as firm age, firm size, location and industry. The controls increase the statistical fit of the regression but there is little effect on the coefficient of interest. Even after controlling for firm characteristics, loans relationships with foreign-owned banks increase 15.1 percent compared to loan relationships with domestically-owned banks. This finding suggests that the results are not driven by firm heterogeneity across foreign- and domestically-owned banks.

Column (5) further adds controls for loan characteristics. Similarly to the fixed-effects estimation in Column (2), these controls slightly decrease the coefficient on foreign bank ownership to 13.5 percent, but the result remains statistically significant. This finding suggests that the observed differences are not driven by variation in the loan types across banks, similarly to the results found with the fixed-effects regression.

Table 5 presents the regression results for the extensive margin (exit and entry of loan relationships). In these regressions I drop the specifications with controls for loan characteristics because these variables are not defined for new loan relationships.[17] Column (1) reports the preferred specification with firm fixed-effects. I find that firms are 7.8 percent more likely to enter, or less likely to exit, a loan relationship with a foreign-owned bank versus a domestically-owned bank after the Russian default. This result provides further evidence that the credit supply shock reduces bank lending of domestically- versus foreign-owned banks.

Column (2) and Column (3) report the corresponding specifications to Columns (3) and Column (4) in the previous table. Without controlling for firm fixed-effects, Column (2) shows that the coefficient of interest remains practically unchanged with 7.9 percent. Similarly to the result on the intensive margin, this finding suggests that the difference between foreign- and domestically-owned banks after the Russian default can be fully explained by the credit supply shock. Column (3) presents the results after adding controls for firm characteristics. Adding those controls increases the statistical fit but has little effect on the coefficient of interest. This finding suggests that the results are not driven by firm heterogeneity across foreign- and domestically-owned banks.

In short, the estimation on both the intensive and extensive margin shows that domestically-owned banks reduce lending compared to foreign-owned banks. The results are practically unchanged after

[17] To avoid endogeneity, I only control for loan characteristics *prior* to the Russian default. That is the reason why these variables are not defined for loan relationships that start after the Russian default.

adding loan or firm controls and estimating the coefficient of interest with and without firm fixed-effects. These findings provide strong evidence that banks cannot offset the credit supply shock and the shock therefore affects bank lending.

C Robustness

This section discusses the validity of the identification assumption and explores the robustness to alternative specifications. First, the non-parametric results show that there is a slight pre-trend between foreign- and domestically-owned firms. To explore this issue in more detail, I estimate a placebo regression using data from two years before the Russian default until right before the Russian default. I assume that the placebo cut-off date is one year before the Russian default. I estimate regression (9) and construct the dataset in the same way as described previously. In the absence of pre-trends, I should not find differential effects across foreign- and domestically-owned banks.

Table A1 reports the results for the placebo regression. Column (1) shows that there is no economically or statistically significant difference across foreign- and domestically-owned banks. The coefficient on foreign bank ownership is 1.7 percent. The 95th percent confidence interval rules out a coefficient of more than 5.6 percent. Column (2) adds loan controls and the coefficient slightly increases to 2.0 percent but remains statistically insignificant. Column (3) to Column (5) estimate the regression without firm-fixed effects. Similarly to the results in the previous section, the coefficient on foreign bank ownership remains practically unchanged. I also conduct placebo regressions using different time-periods and cut-off dates and find similar results. These findings suggest that the results are not driven by pre-trends.

However, since the non-parametric results indicate a slight pre-trend, I also examine the full dataset. I find that the pre-trend at the aggregate level is driven by firms that initially borrow from domestically-owned banks and then start a loan relationship with a foreign-owned bank. Since the restricted dataset only includes firms that have loan relationships with both types of banks at the beginning of the dataset, the firms driving the pre-trend are not included in the main regressions. Importantly, those firms represent less than 24 percent of lending and the pre-trend accounts for only 18 percent of the aggregate difference in bank lending between foreign- and domestically-owned banks.

Second, regression (9) uses foreign ownership as a proxy for the impact of the credit supply shock. To ensure that the results are indeed driven by changes in financing by international lenders, I estimate

regression equation (9) using directly the variation in financing by international lenders. The advantage of this strategy is that I can exploit variation within domestically- and foreign-owned banks instead of the more coarse measure of foreign ownership. However, the disadvantage is that financing by international lenders may vary for reasons other than the credit supply shock.

Table A2 reports the results. Column (1) shows that an increase in financing by international lenders by one percent increases average loan size by 0.38 percent. As shown in Table 3, the average difference between foreign- and domestically-owned banks is 30 percent. This implies that the differential change in foreign debt across foreign- and domestically-owned banks explains a change in loan size of 11.2 percent. This coefficient is similar to the one estimated using foreign bank ownership. Columns (2) to Columns (5) explore the robustness to controlling for loan and firm characteristics. Similarly to the regressions in the previous section, the results are robust to the different specifications.

Third, the regression uses the restricted dataset with firms that have loans from both foreign- and domestically-owned banks at the beginning of the dataset. Some of the results may therefore come from a relative shift of domestically-owned banks from borrowers that also borrow from foreign-owned banks to borrowers that borrow exclusively from domestically-owned banks. This finding would not invalidate the main results but it would alter the interpretation of the impact of the credit supply shock. I therefore estimate regression equation (9) for the entire sample.

Table A3 reports the results. Column (1) shows that the results with the full dataset are similar to the results with the restricted dataset. I find that loan relationships with foreign-owned banks increase 15.2 percent compared to loan relationships with domestically-owned banks. Column (2) reports the results after controlling for loan characteristics. Similarly to the main regressions, the coefficient on foreign ownership slightly decreases to 13.3 percent. Column (3) to Column (5) report the results on foreign ownership without controlling for firm-fixed effects. Again the coefficients remain practically unchanged. However, these coefficients need to be corrected for the pre-trend discussed above. After the correction, the coefficients on foreign ownerships are slightly smaller than the ones estimated in the main regressions but not statistically significantly different. I thus find a similar effect of the credit supply shock with the full dataset as with the restricted dataset.

VII Results: Impact on Firms

A Impact on Firm Borrowing

The previous section finds a differential credit supply shock to foreign-owned and domestically-owned banks. The differential credit supply shock affects firm borrowing, if firms cannot offset the credit supply shock by switching across banks or borrowing from other financial intermediaries. This might be the case if information asymmetries in credit markets prevent firms from starting loan relationships with new banks. To test whether firms can offset the shock, I compare outcomes of firms banking with foreign-owned banks before the Russian default with outcomes of firms banking with domestically-owned banks before the Russian default.

The unit of observation is a firm at a given point in time. To ensure comparability to the previous section, I estimate the impact using both the restricted and the full dataset. The restricted dataset contains 7,095 firms with a total of 26,784 loan relationships. The full dataset contains 38,691 firms with a total of 58,653 loan relationships.

To facilitate computation, I again collapse and time-average the data one year before and one year after the Russian default. I again weight the regression using firm size before the Russian default. I cluster standard errors at the bank level to allow for correlation in error terms within banks. Since firms can borrow from several banks, I cluster for each firm on the bank with the largest share of lending.

I construct a new variable to capture whether a firm had established bank relationships with foreign- or domestically-owned banks before the credit supply shock. For each firm j, I compute the loan-weighted share F_j of borrowing with foreign-owned banks one year prior to the Russian default. For example, if a firm only banks with foreign-owned banks prior to the Russian default, this variable is one. If a firm only banks with domestically-owned banks prior to the Russian default, this variable is zero.

Following the identification strategy I estimate the regression

$$\Delta Y_j = \gamma_0 + \gamma_1 F_j + \varepsilon_j. \tag{10}$$

where ΔY_j denotes the outcome of interest such as the log change in total borrowing of firm j.

The regression is similar to the loan-level regression from the previous section. The main difference is that the regression does not control for firm fixed-effects because those would be collinear with the foreign-bank share F_j. For some regression, I add controls for firm observables such as firm age, location, industry, and firm size.

Table 4 presents the results for both the restricted and the full dataset. Using the restricted dataset, Column (1) shows that a one standard deviation increase in the foreign-bank share F_j increases total borrowing by 7.1 percent. Column (2) controls for firm-level observables. The controls slightly increase the coefficient on foreign-bank share F_j to 9.3 percent but the difference between the two coefficients is not statistically significant. These results suggest that exposure to foreign-owned banks prior to the Russian default raises access to credit after the credit supply shock.

The result is identified off variation in the exposure to foreign- versus domestically-owned banks. Importantly, the loan-level results from the previous section suggest that the variation is not confounded by changes in firm investment opportunities and rather represents the impact of the credit supply shock. Moreover, the robustness to firm controls suggests that the difference is not driven by variation in the type of firms borrowing from foreign- and domestically-owned banks.

Column (3) and Column (4) estimate the corresponding regression for the extensive margin. The outcome variable is a dummy equal to one if there is a positive amount outstanding and zero otherwise. Column (3) shows that a one standard deviation increase in the foreign-bank share F_j decreases the likelihood of having a positive amount outstanding by 0.8 percentage points. After controlling for firm observables, Column (4) shows that the coefficient remains practically unchanged at 0.7 percentage points. These results are not statistically significant. The main effect of the credit supply shock is thus on the intensive margin rather than the extensive margin. This is not surprising because the restricted dataset only contains large firms, which are less likely than smaller firms to completely stop borrowing after the credit supply shock.

Column (5) to Column (8) estimate the corresponding regressions for the full dataset. The main difference between the restricted and the full dataset is that the full dataset adds firms that have loans with only foreign- or domestically-owned banks. Column (5) and Column (6) report results for the intensive margin. After controlling for firm observables, a one standard deviation increase in the foreign-bank share F_j increases total borrowing by 4.2 percent. Column (7) and Column (8) report results for the extensive margin. After controlling for firm observables, a one standard deviation

increase in the foreign-bank share F_j increases the likelihood of having a positive amount outstanding by 2.1 percentage points.

Compared to the restricted dataset, the full dataset shows a smaller effect on the intensive margin and a larger effect on the extensive margin. This result probably reflects the fact that the full dataset includes smaller firms that are more likely than large firms to be completely cut off from borrowing after the credit supply shock. Overall, the results suggests that the credit supply shock lowers access to credit for firms borrowing from domestically-owned banks compared to firms borrowing from foreign-owned banks.

B Impact on Loan Default and Firm Survival

This section estimates the impact on real firm outcomes. The credit supply shock affects real firm outcomes, if firms cannot offset the shock to bank lending by borrowing elsewhere. I measure the real impact using two outcome variables: loan default and firm survival. Loan default is measured using loan performance from the loan-level dataset and firm survival is measured using a separate dataset from official tax records. These variables measure the impact on firms that default on their loans or close down their business due to the credit supply shock. However, these outcomes variables do not capture the real effect on firms that avoid loan default or business closure by cutting back investment or other business expenses. I therefore interpret these measures of loan default and firm survival as a lower bound of the real effects of the credit supply shock because they do not measure the entire impact of the credit supply shock.

I estimate regression (10) using both the full and the restricted dataset. The first set of regressions uses the change in loan default as outcome variable. Loan default is measured as a dummy variable equal to one if a loan is in default and zero otherwise. Loans are defined as in default if a borrower is delinquent for more than 60 days. The second set of regressions uses as outcome variables whether a firm was in operation after the Russian default. This variable is measured from official tax records and indicates whether a firm was active as of June 2005.

Table 7 reports the results. Column (1) and Column (2) estimate the impact on loan default for the restricted dataset. After controlling for firm observables, a one standard deviation increase in the foreign-bank share F_j decreases the probability of loan default by 2.5 percentage points. Column (3) and Column (4) estimate the impact of the credit supply shock on firm survival. After controlling for

firm observables, a one standard deviation increase in the foreign-bank share F_j increases the likelihood of firm survival by 2.3 percentage points. These findings suggest that firms cannot offset the credit supply shock by borrowing elsewhere and as a result some firms close down their business.

Columns (5) to Columns (8) report the corresponding results for full dataset. After controlling for firm observables, a one standard deviation increase in the foreign-bank share F_j decreases the likelihood of loan default by 2.7 percentage points and increases the likelihood of firm survival by 2.9 percentage points. Again, these results suggest that firms cannot offset the credit supply shock.

The results show that the impact of the credit supply shock is larger for smaller firms. This result is not surprising since it may be more difficult for small firms than for large firms to switch to other banks after the credit supply shock. Interestingly, the difference between small and large firms is small, which suggests that even large firms cannot offset the impact of the credit supply shock.

VIII Conclusion

This paper analyzes whether financial institutions transmit financial shocks across markets and whether such shocks affect real economic activity. I exploit the 1998 Russian default as an exogenous credit supply shock to international lenders and trace out the impact on bank lending in Peru. I find three main results. First, international lenders without equity holdings in banks in Peru are more likely to transmit a credit supply shock than international lenders with equity holdings. Second, as a result banks without international lenders as equity holders decrease lending compared to banks with international lenders as equity holders. Third, firms borrowing from banks without international equity holders have worse access to bank lending after the credit supply shock than firms borrowing from banks with equity holders, which affects real firm outcomes such as firm survival. These findings suggest that financial institutions transmit financial shocks across markets and that the shocks affect real economic activity.

A natural question that arises from these findings is whether this mechanism is relevant to other emerging markets. Financing by international lenders is generally an important source of capital for emerging market banks, which suggests that a credit supply shock to international lenders may have a similar impact elsewhere. Importantly, the analysis suggests that restrictions on foreign bank ownership imposed by bank regulators to limit exposure to financial shocks may be the wrong policy.

Instead, policies should assess the potential exposure to financial shocks by analyzing the share of lending provided by international lenders with equity holdings versus international lenders without equity holdings.

Another natural question that arises from these findings is whether foreign ownership of emerging market banks is more efficient than domestic ownership. It is difficult to judge from the results in this paper whether domestically-owned banks are inefficient because the analysis is conditional on a credit supply shock. If domestically-owned banks have other benefits during times without a credit supply shock, then the observed ownership structure with both foreign- and domestically-owned banks may be an efficient equilibrium outcome. However, the large increase in cross-border financial flows and the simultaneous increase in market shares of foreign-owned banks over the last two decades is consistent with a comparative advantage of foreign-owned banks compared to domestically-owned banks.

References

[1] Ashcraft, Adam (2005), 'Are Banks Really Special? New Evidence from the FDIC-Induced Failure of Healthy Banks', *American Economic Review*, Volume 95(5), pp. 1712-1730

[2] Ashcraft, Adam (2006), 'New Evidence on the Lending Channel', *Journal of Money, Credit, and Banking*, Volume 38(3), pp. 751-776

[3] Arena, Marco, Carmen Reinhart and Francisco Vazquez (2007), 'The Lending Channel in Emerging Economies: Are Foreign Banks Different?', NBER Working Paper, March 2007

[4] Akerlof, George and Paul Romer (1993).'Looting: The economic underworld of bankruptcy for profit', *Brookings Papers on Economic Activity*, 1993(2), pp. 1–60.

[5] Berger, Allen, Leora Klapper, and Gregory Uddell (2001), 'The ability of banks to lend to informationally opaque small businesses', *Journal of Banking and Finance* 25, pp. 2127-2167

[6] Bank of International Settlements (2004), 'Foreign direct investment in the financial sector of emerging market economies', Committee on the Global Financial System, Publications No 22, March 2004

[7] Bernanke, Ben (1983) 'Non monetary Effects of the Financial Crisis in the Propagation of the Great Depression', *American Economic Review* 82(4), pp. 901-921

[8] Bernanke, Ben and Alan Blinder (1988). 'Credit, Money and Aggregate Demand', *American Economic Review* 78(2), pp. 435-439

[9] Bernanke, Ben and Alan Blinder (1992), 'The Federal Funds Rate and the Channels of Monetary Transmission', *American Economic Review* 82(4), pp. 901-921.

[10] Bernanke, Ben and Mark Gertler (1989), 'Agency Costs, Net Worth, and Business Fluctuations.', *American Economic Review* 79(1), pp. 14-31.

[11] Calvo, Guillermo (1998), 'Capital Market Contagion and Recession: An Explanation of the Russian Virus' in: *Wanted: World Financial Stability*, Baltimore, Johns Hopkins University Press, 2000

[12] Crystal, Jennifer, Gerard Dages and Linda Goldberg 'Does Foreign Ownership Contribute to Sounder Banks in Emerging Markets?', *Open Doors: Foreign Participation in Financial Systems in Developing Countries*, eds. R. Litan, P. Masson, M. Pomerleano, Brookings Press, 2001, pp. 217-266

[13] Detragiache, Enrica and Poonam Gupta, 'Foreign Banks in Emerging Market Crises: Evidence from Malaysia', IMF Working Paper, July 2004

[14] Diamond, Douglas and Raghuram Rajan (2001), 'Banks, Short Term Debt and Financial Crises: Theory, Policy Implications and Applications', *Carnegie Rochester Conference on Public Policy*, 54 (2001), pp. 37-71

[15] Eichengreen, Barry, Andrew Rose, and Charles Wyplosz. (1996). 'Contagious Currency Crises: First Tests', *Scandinavian Journal of Economics*, 98, pp. 463-484

[16] Forbes, Kristin (2002), 'Are trade linkages important determinants of country vulnerability to crises?' In: Edwards, Sebastian and Jeffrey Frankel (Eds.), *Preventing Currency Crises in Emerging Markets*. University of Chicago Press, Chicago, pp. 77–124.

[17] Forbes, Kristin (2004), 'The Asian flu and Russian virus: the international transmission of crises in firm-level data', *Journal of International Economics*. June, 63, pp. 59-92.

[18] Goldberg, Linda (2002), 'When is U.S. Bank Lending to Emerging Markets Volatile?' In: In: Edwards, Sebastian and Jeffrey Frankel (Eds.), *Preventing Currency Crises in Emerging Markets*. University of Chicago Press, Chicago

[19] Gormley, Todd (2007), 'Banking Competition in Developing Countries: Does Foreign Bank Entry Improve Credit Access?', Working Paper, November 2007

[20] Holmstrom, Bengt and Jean Tirole, (1997), 'Financial Intermediation, loanable funds, and the real sector', *Quarterly Journal of Economics*: 112, 665-691

[21] Jensen, Michael and William Meckling, 'Theory of the Firm: Managerial Behavior, Agency Costs and Ownership Structure,' *Journal of Financial Economics* 3(4), pp. 305-360

[22] Kaminsky, Graciela and Carmen Reinhart (2000), 'On Crises, Contagion, and Confusion', *Journal of International Economics*. June, 51:1, pp. 145-168.

[23] Kaminsky, Graciela, Richard Lyons and Sergio Schmukler, 'Managers, Investors, and Crises: Mutual Fund Investment Strategies in Emerging Markets', *Journal of International Economics*, October 2004

[24] Kashyap, Anil, Owen Lamont, and Jeremy Stein, (1994), 'Credit Conditions and the Cyclical Behavior of Inventories', *Quarterly Journal of Economics* 109(3), pp. 565-592.

[25] Kashyap, Anil and Jeremy Stein, (2000), 'What do One Million Observations on Banks Have to Say About the Transmission of Monetary Policy', *American Economic Review* 90(3), pp. 407-428.

[26] Khwaja, Asim and Atif Mian (2007), 'Tracing the Impact of Bank Liquidity Shocks: Evidence from an Emerging Market,' Harvard University Working Paper, March 2007.

[27] La Porta, Rafael and Florencio López-de-Silanes, 'Related Lending', *Quarterly Journal of Economics*, February 2003.

[28] Levine, Ross, 1996, 'Foreign Banks, Financial Development, and Economic Growth', in Claide E. Barfield (Ed.), International Financial Markets: Harmonization versus Competition (Washington: AEI Press).

[29] Mian, Atif. 'Distance Constraints: The Limits of Foreign Lending in Poor Economies', *Journal of Finance*, Volume 61(3), June 2006, pp 1465-1505.

[30] Paravisini, Daniel. 'Local Bank Financial Constraints and Firm Access to External Finance', *Journal of Finance*, August 2007

[31] Peek, Joe and Eric Rosengren, Eric (2000a), 'Collateral Damage: Effects of the Japanese Bank Crisis on Real Activity in the United States' *The American Economic Review*. 90(1), pp. 30-45.

[32] Rogoff, Kenneth, Ayhan Kose, Eswar Prasad and Shang-Jin Wei (2003), 'Effects on Financial Globalization on Developing Countries: Some Empirical Evidence', Working Paper, March 2003

[33] Peek, Joe and Eric Rosengren (2000b), 'Implications of Globalisation of the Banking Sector: The Latin American Experience', *New England Economic Review*, September/October 2000.

[34] Summers, Lawrence (2000), 'International Financial Crises: Causes, Prevention, and Cures' *American Economic Review P&P*, Vol. 90,(2), pp. 1-16

[35] Superintendency of Banking, Insurance and Pension Funds (2006), 'The Impact of Economic and Political Shocks on Banking in Peru: 1998-2001', In: *History of Banking Regulation and Banking Supervision in Peru*, pp. 147-175

[36] Stein, Jeremy (1998) 'An Adverse Selection Model of Bank Asset and Liability Management with Implications for the Transmission of Monetary Policy', *RAND Journal of Economics* 29(3), pp. 466-486.

[37] Shleifer, Andrei and Robert Vishny. The Limits of Arbitrage, *Journal of Finance*, vol. LII, no 1, March 1997, pp. 35-55

[38] Shleifer, Andrei and Daniel Treisman (2000), *Without a Map: Political Tactics and Economic Reform in Russia* , MIT Press, Cambridge, Massachusetts

[39] van Rijckeghem, Caroline and Beatrice Weder (2000), 'Spillovers Through Banking Centers - A Panel Data Analysis', IMF Working Paper

Table 1: International Lenders

Bank	Market Share (in %)	Foreign Ownership	Int'l Debt/ Credit (in %)	International Lender 1st	2nd	3rd
Banco Credito	21.3	No	18.7	Barclays Bank	UBS	ING Bank
Banco Wiese	17.2	No	38.0	Citibank	Rabobank	Standard Chartered
Banco Continental	11.4	BBVA (Spain)	17.7	**BBVA**	Standard Chartered	Barclays
Interbank	7.3	No	40.6	Bank of America	Dresdner Bank	Rabobank
Santander	6.0	Santander (Spain)	52.8	**Santander**	ING Bank	Deutsche Bank
Lima Sudameris	5.7	Sudameris (Italy)	27.4	**Sudameris**	Rabobank	ING Bank
Nuevo Mundo	4.7	No	33.4	Dresdner Bank	Hamilton Bank	Deutsche Bank
Banco Latino	4.6	No	12.8	West Merchant Bank	Ango Irish	First Union National
Bancosur	4.0	Central Hispano (Spain)	31.7	**Central Hispano**	West Merchant Bank	Rabobank
Sudamericano	3.2	Scotiabank (Canada)	31.0	**Scotiabank**	Prime Bank	Toronto Dominion
Progreso	2.2	No	44.6	Swiss Bank Corp	EFG Bank	UBS
Citibank	2.2	Citibank (US)	73.8	**Citibank**	Cobank	Standard Chartered
Financiero	1.8	Pichincha (Ecuador)	35.6	CCC Bank	**Pichincha**	
Banex	1.5	No	6.8	Popular Bank	UBS	Hamilton Bank
NBK	1.4	No	25.8	Hamilton Bank	Tribank	Santander
Extebandes	1.3	No	48.8	Nations Bank	Toronto Dominion	Midland Bank
BIF	1.3	Banco Fierro (Spain)	48.4	Banca Della Svizzera	Lloyds Bank	EFG Bank
Republica	1.3	No	8.9	Commerzbank	Standard Chartered	Banco do Brasil
Comercio	0.9	No	6.0	Bank Austria	Hamilton Bank	Pacific National Bank
Orion	0.5	No	14.7	Tribank	Socimer International	Bank Florida
Bank of Boston	0.4	Bank Boston (US)	100	**Bank Boston**		

This table lists the twenty largest banks in Peru in order of market share. For each bank the column 'Foreign Ownership' denotes whether the bank has an international lender as equity holder. I denote in parentheses the country of origin of the international lender. The column 'Int'l Debt/Credit' denotes debt by international lenders as share of total credit calculated from bank balance sheets. The column 'International Lender' lists the three largest international lenders for each banks. International lenders that both have equity holdings in Peruvian and also provide debt to the same bank are marked in bold. The table shows that most international lenders with equity holdings in Peruvian banks are also the largest international lender for the same bank.

Table 2: Summary Statistics by Foreign Bank Ownership

Panel A: Loan-level Variables				
Bank Ownership	Foreign (>=0.5)		Domestic (<0.5)	
Loan Size (Mean)	209,097	(1,234,212)	361,774	(1,608,715)
Loan Size (Median)	33,769		49,655	
% Foreign Currency	0.82	(0.33)	0.81	(0.33)
% Collateral	0.41	(0.47)	0.40	(0.45)
% Long-term Loan	0.37	(0.44)	0.36	(0.42)
% Short-term Loan	0.36	(0.42)	0.39	(0.42)
% Leasing	0.07	(0.24)	0.03	(0.16)
% Other Credit	0.20	(0.33)	0.22	(0.33)
N	10,521		10,047	
Panel B: Firm-Level Variables				
Bank Ownership	Foreign (>=0.5)		Domestic (<0.5)	
Loan Size (Mean)	461,021	(2,177,222)	940,668	(4,606,825)
Loan Size (Median)	88,334		111,499	
Loan Relationships	2.63	(1.18)	2.98	(1.63)
Firm Age	9.47	(8.80)	11.16	(9.97)
Located in Lima	0.65	(0.48)	0.66	(0.47)
N	1,750		5,345	
Panel C: Bank-Level Variables				
Bank Ownership	Foreign (>=0.5)		Domestic (<0.5)	
Total Assets (mil, Mean)	543	(747)	427	(1,180)
Total Assets (mil, Median)	298		112	
Share Deposit	0.62	(0.17)	0.62	(0.10)
Share Foreign Debt	0.18	(0.12)	0.14	(0.08)
Share Credit	0.63	(0.04)	0.60	(0.06)
Return on Assets	0.01	(0.01)	0.01	(0.01)
Return on Equity	0.13	(0.08)	0.14	(0.08)
Interest Rate	0.16	(0.02)	0.16	(0.08)
N	12		34	

This table provides summary statistics at loan-level, firm-level and bank-level by foreign bank ownership. A bank is classified as foreign, if one of the bank owners is based outside Peru and holds at least 50 percent of control rights. A loan is classified as foreign if the bank providing the loan is classified as foreign. A firm is classified as foreign if at least 50 percent of borrowing are with banks classified as foreign. The loan and firm-level data is restricted to firms that have at loan relationships in good standing with both foreign- and domestically-owned banks at the beginning of the analysis period (October 1997). The bank-level data is for all banks operating at the beginning of the dataset. All values are in US dollars at the beginning of the analysis period (October 1997). A loan (or loan relationship) is defined as a single bank-firm pair. If a firm has several loan products with the same bank, loan products are aggregated to a single loan. '% Long-Term Loan', '% Short-term Loan', '% Leasing' and '% Other Credit' denote the respective shares of loan types. 'Foreign Currency' denotes the share of lending denominated in US dollars. 'Collateral' denotes the share of lending covered by collateral calculated by dividing collateral value through total amount outstanding. 'Loan Relationships' denotes the number of loan relationships. 'Firm Age' denotes time since incorporation. 'Located in Lima' is a dummy set to one if the firm headquarters are in Lima. The bank-level variables are based on bank balance-sheets at the end of the last fiscal year before the Russian default (December 1997).

Table 3: Effect of Foreign Bank Ownership on Bank Financing

Dependent Variable	Foreign Debt		Deposits	
	(1)	(2)	(3)	(4)
After*Foreign Ownership	0.394	0.297	0.069	0.041
	[0.142]	[0.134]	[0.083]	[0.061]
After	-0.321	-0.302	0.034	-0.032
	[0.098]	[0.071]	[0.048]	[0.032]
Bank Fixed Effects	Y	Y	Y	Y
Weighted	N	Y	N	Y
Banks	46	46	46	46
N	1,058	1,058	11,058	1,058
R-squared	0.99	0.97	0.94	0.99

These regressions examine the effect of foreign bank ownership on financing by international lenders before and after the Russian default. The dataset includes all banks operating as of October 1997. The unit of observation is bank-time. Columns (1) and (3) are unweighted and Columns (2) and (4) are weighted using bank assets in October 1997. In Columns (1) to (2) the dependent variable is the natural logarithm of total foreign debt. In Columns (3) to (4) the dependent variable is the natural logarithm of total deposits. Standard errors in brackets are clustered at the bank level (46 banks).

Table 4: Effect of Foreign Bank Ownership on Bank Lending, Intensive Margin

Dependent Variable	Change in Lending				
	FE	FE	OLS	OLS	OLS
	(1)	(2)	(3)	(4)	(5)
Foreign Ownership	0.156	0.134	0.162	0.151	0.135
	[0.075]	[0.071]	[0.064]	[0.066]	[0.068]
Foreign Currency		-0.142			-0.134
		[0.141]			[0.082]
Collateral		0.004			0.052
		[0.082]			[0.054]
Firm Fixed Effects	Y	Y	N	N	N
Firm Controls	N	N	N	Y	Y
Loan Controls	N	Y	N	N	Y
Firms	5,895	5,895	5,895	5,895	5,895
Loan Relationships	12,408	12,408	12,408	12,408	12,408
R-squared	0.35	0.35	>0.01	0.18	0.18

These regressions examine the effect of foreign bank ownership on bank lending before and after the Russian default. The data is restricted to (i) loans in good standing at the beginning of the dataset and (ii) firms with at least one loan each with a foreign-owned bank and domestically-owned bank at the beginning of the dataset (63% of volume of lending). The unit of observation is loan relationship-time and a loan relationship is defined as a single bank-borrower pair. The regressions are weighted using firm size prior to the Russian default. The dependent variable is the change in the natural logarithm of total lending per loan relationship. All monthly data is collapsed and time-averaged one year before and one year after the Russian default. Zero values are dropped from the time-averaging because the extensive margin is analyzed separately in Table 5. Column (1) and Column (2) include firm fixed-effects. Column (2) and (5) include loan controls. Column (4) and Column (5) includes firm controls. Loan controls include (i) borrowing currency, (ii) share of loan type and (iii) share covered by collateral before the Russian default. Firm-controls include 253 industry dummies, 25 state dummies, 40 firm-age dummies and 10 firm size deciles dummies. Standard errors in brackets are clustered at the bank level (46 banks).

Table 5: Effect of Foreign Bank Ownership on Bank Lending, Extensive Margin

Dependent Variable	Entry and Exit		
	FE	OLS	OLS
	(1)	(3)	(4)
Foreig Ownership	0.078	0.079	0.079
	[0.032]	[0.037]	[0.034]
Firm Fixed Effects	Y	N	N
Firm Controls	N	N	Y
Firms	7,095	7,095	7,095
Loan Relationships	26,784	26,784	26,784
R-squared	0.26	0.01	0.08

These regressions examine the effect of foreign ownership on exit and entry of loan relationships before and after Russian default. A loan relationship is defined as a single bank-borrower pair. The data is restricted to loan relationship of firms with at least two loan relationships in good standing at the beginning of the dataset (63% of lending). The regressions are weighted using firm size prior to the Russian default. The dependent variable is a dummy variable whether there is positive amount outstanding (=1) or there is no amount outstanding (=0). All monthly data is collapsed and time-averaged one year before and one year after the Russian default. Column (1) includes firm-fixed effects. Column (3) includes firm controls. The regressions do not include loan controls because loan controls are not available for loan relationships that enter the dataset during the analysis period. Firm-controls include 253 industry dummies, 25 state dummies, 40 firm-age dummies and 10 firm size deciles dummies. Standard errors in brackets are clustered at the bank level (46 banks).

Table 6: Effect of Foreign Ownership Share on Firm Borrowing

	Restricted Sample				Full Sample			
	Change in Lending		Exit		Change in Lending		Exit	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Foreign Ownership Share	0.214	0.161	0.008	0.007	0.089	0.146	-0.018	-0.046
	[0.085]	[0.064]	[0.048]	[0.036]	[0.012]	[0.007]	[0.017]	[0.089]
Firm Controls	N	Y	N	Y	N	Y	N	Y
Observations	6,120	6,120	7,095	7,095	27,349	27,349	38,691	38,691
R-squared	0.01	0.09	>0.01	0.10	>0.01	0.15	0.01	0.11

These regressions examine the effect of foreign bank ownership on firm borrowing before and after the Russian default. Column (1) to Column (4) restrict the dataset to firms with loan relationships with both foreign- and domestically-owned banks. Column (5) to Column (8) includes all firms. All regressions are at the firm level. The regressions are weighted using firm size prior to the Russian default. The dependent variable in Columns (1) to (2) and Columns (5) to (6) is the change in the natural logarithm of total lending per loan relationship. In Columns (3) to (4) and Columns (7) to (8) the dependent variable is the change in a dummy variable whether a firm has any borrowing outstanding (=1) or no borrowing outstanding (=0). The data is collapsed and time-averaged one year before and one year after the Russian default. The 'Foreign Ownership Share' is computed for each firm and denotes the loan-weighted share of lending with foreign- versus domestically-owned banks one year before the Russian default. Firm-controls include 253 industry dummies, 25 state dummies, and 40 firm-age dummies and 10 dummies for size deciles. Standard errors in brackets are clustered at the main bank level (46 banks).

Table 7: Effect of Foreign Ownership Share on Loan Default and Firm Survival

	Restricted Sample				Full Sample			
	Loan Default		Firm Survival		Loan Default		Firm Survival	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Foreign Ownership Share	-0.033	-0.061	0.033	0.057	-0.073	-0.067	0.051	0.074
	[0.041]	[0.028]	[0.032]	[0.034]	[0.027]	[0.020]	[0.031]	[0.032]
Firm Controls	N	Y	N	Y	N	Y	N	Y
Observations	6,480	6,480	7,063	7,063	29,160	29,160	37,078	37,078
R-squared	>0.01	0.18	>0.01	0.28	>0.01	0.13	>0.01	0.15

These regressions examine the effect of foreign bank ownership on firm borrowing before and after the Russian default. Columns (1) to (4) restrict the dataset to firms with loan relationships with both foreign- and domestically-owned banks. Columns (5) to (8) include all firms. All regressions are at the firm level. The regressions are weighted using firm size prior to the Russian default. The dependent variable in Columns (1) to (2) and Columns (5) to (6) is the change whether a loan is in default (defined as being delinquent for more than 60 days). In Columns (3) to (4) and Columns (7) to (8) the dependent variable is a dummy whether the firm is still operating according to official tax records in June 2005. The data in Columns (1) to (2) and Columns (5) to (6) is collapsed and time-averaged one year before and one year after the Russian default. The 'Foreign Ownership Share' is computed for each firm and denotes the loan-weighted share of lending with foreign- versus domestically-owned banks one year before the Russian default. Firm-controls include 253 industry dummies, 25 state dummies, and 40 firm-age dummies and 10 dummies for size deciles. Standard errors in brackets are clustered at the main bank level (46 banks).

Figure I: Share Prices of International Lenders

Figure I plots the average relative change in share prices of owner/lenders and arm's-length lenders. Owner/lenders are international lenders with equity holdings in banks in Peru. Arm's-length lenders are international lenders that do not have equity holdings in banks in Peru. The data includes all owner/lenders and the twenty largest arm's-length lenders for which share price data is available. The graphs shows that both type of lenders suffered a sharp decline in the share price after the Russian default. There is no difference in the impact of the Russian default on arm's-length lenders versus owner/lenders.

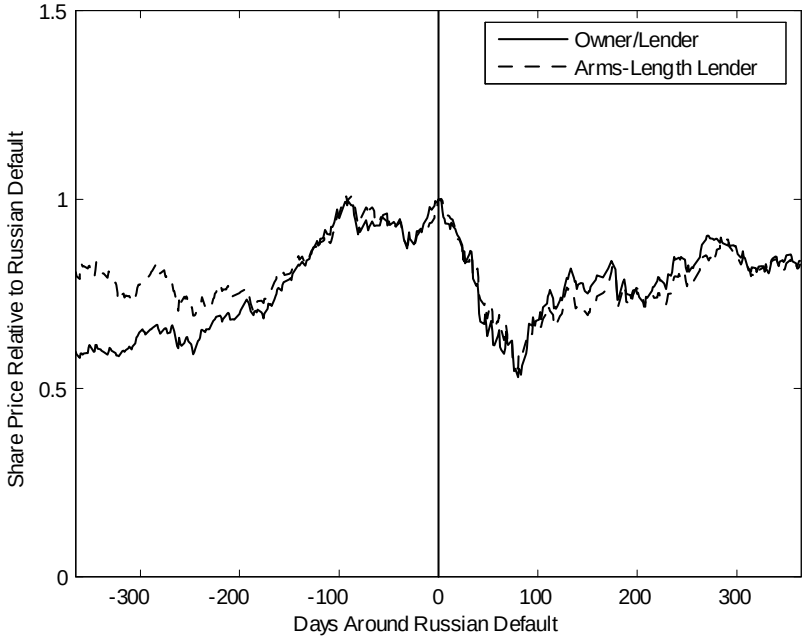


Figure IIa: Financing by International Lenders (Absolute)

Figure IIa plots total financing by arm's-length lenders (international lenders without equity holdings) and owner/lenders (international lenders without equity holdings) to banks in Peru Financing by owner/lenders is defined as bank-to-bank loans of owner/lender to banks in which the owner/lender hold equity stakes. Arm's-length financing is defined as bank-to-bank loans by international lenders to banks in which they have no equity stakes. The figure shows that financing owner/lenders increased after the Russian default, whereas lending by arm-length's lenders decreased.

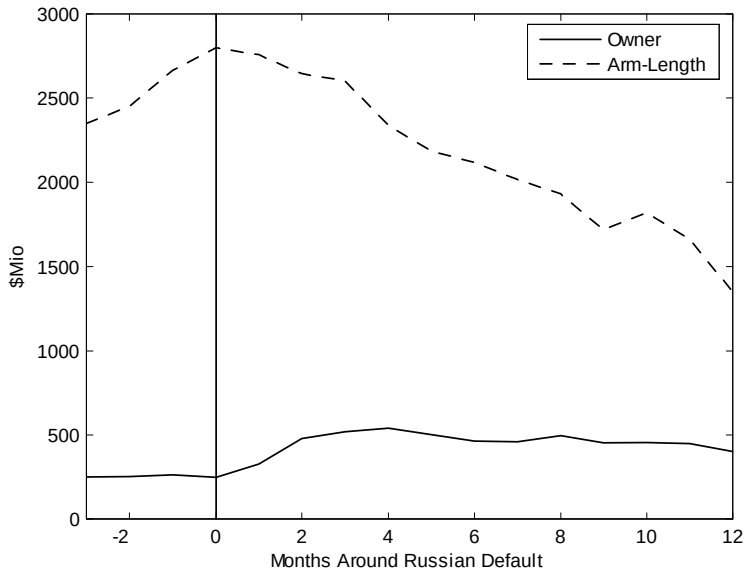


Figure IIb: Financing by International Lenders (Relative)

Figure IIb plots the natural logarithm of the time-series from Figure IIa. To facilitate the comparison, the time-series are normalized to zero with respect to the date of the Russian default. The y-axis therefore represents the relative change in financing compared to the date of the Russian default.

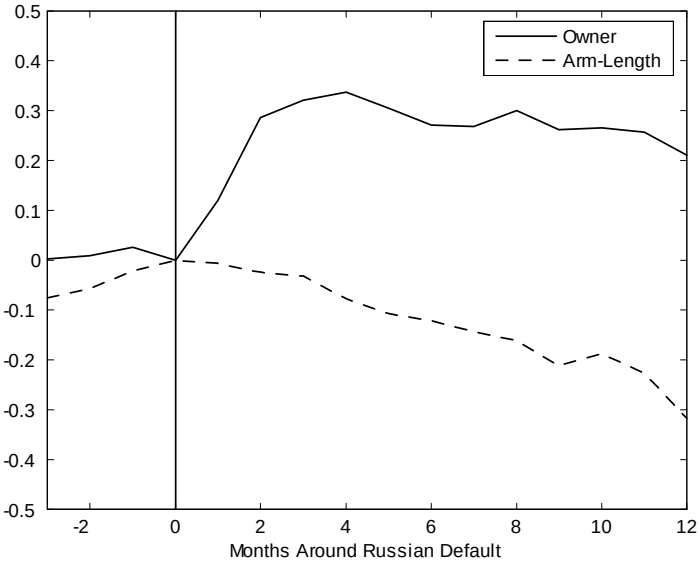


Figure IIIa: Financing by Bank Ownership (Absolute)

Figure IIIa plots total financing provided to foreign-owned banks and domestically-owned banks. Foreign-owned banks are banks with an international lender as equity holder, whereas domestically-owned banks have no international lender as equity holder. The figure differs from Figure IIa because foreign-owned banks also take out some arm's-length debt. The figure shows that financing to foreign-owned banks remained stable after the Russian default, while financing to domestically-owned banks decreased.

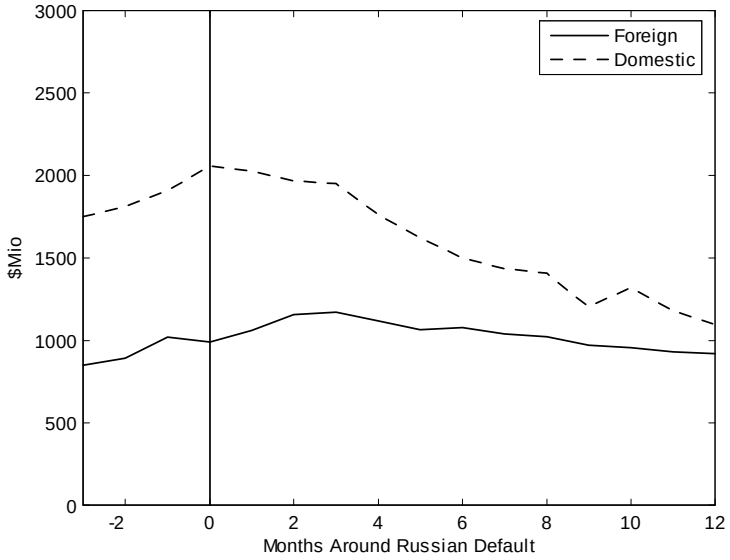


Figure IIIb: Financing by Bank Ownership (Relative)

Figure IIIb plots the natural logarithm of the time-series from Figure IIIa. To facilitate the comparison, the time-series are normalized to zero with respect to the date of the Russian default. The y-axis therefore represents the relative change in financing compared to the date of the Russian default.

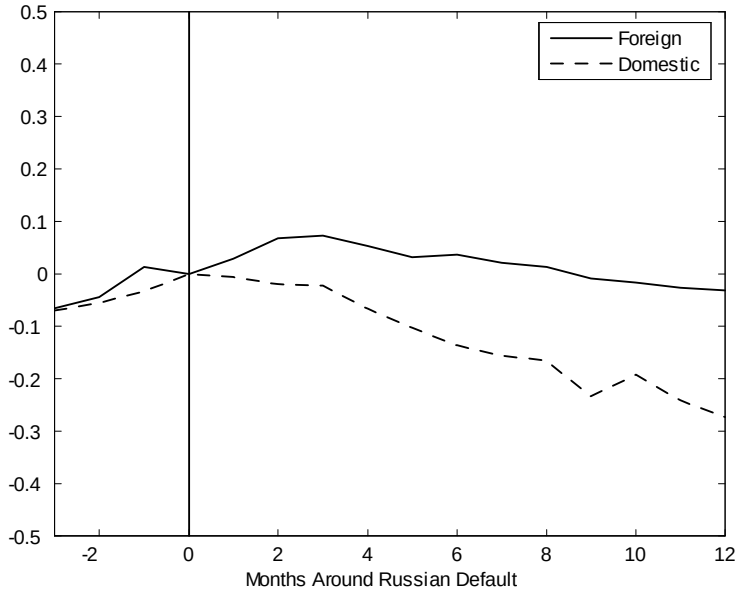


Figure IVa: Lending by Bank Ownership (Absolute)

Figure IVa plots total lending of foreign-owned banks and domestically-owned banks. Foreign-owned banks are banks with an international lender as equity holder, whereas domestically-owned banks have no international lender as equity holder. The figure differs from Figure IIa because foreign-owned banks take financing both from owner/lenders and arm's-length lenders. The figure shows that lending of foreign-owned banks remained stable after the Russian default, while lending of domestically-owned banks decreased.

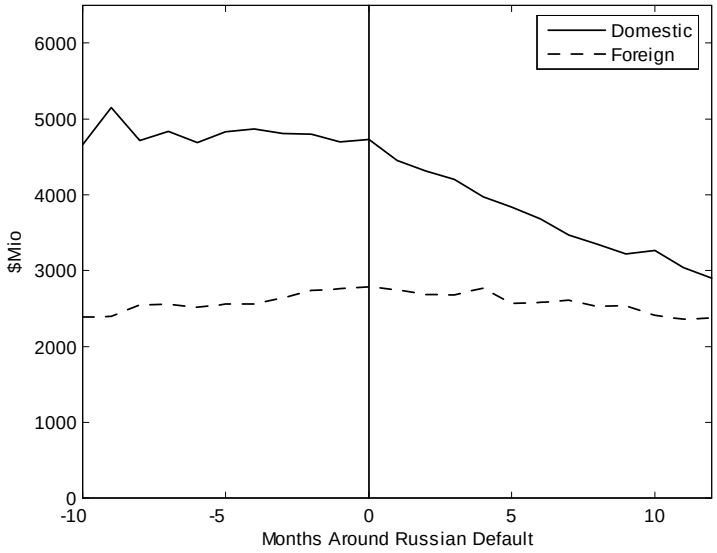


Figure IVb: Lending by Bank Ownership (Relative)

Figure IVb plots the natural logarithm of the time-series from Figure IVa. To facilitate the comparison, the time-series are normalized to zero with respect to the date of the Russian default. The y-axis therefore represents the relative change in lending compared to the date of the Russian default.

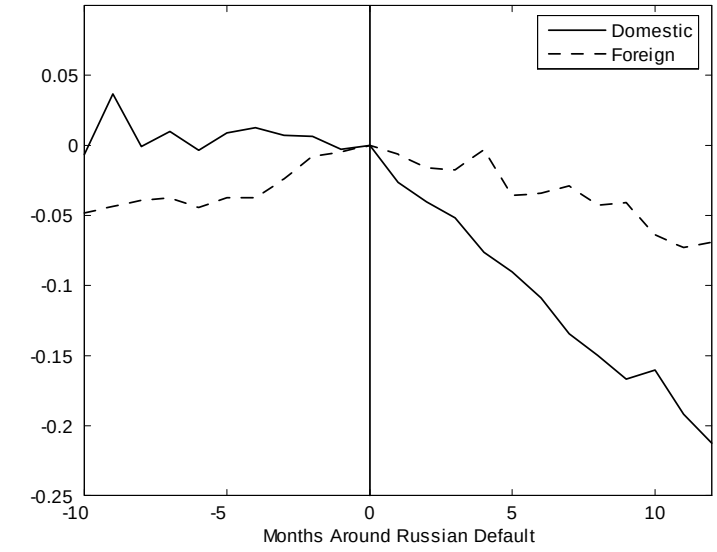


Figure Va: Borrowing by Domestic Firms (Absolute)

Figure Va plots total borrowing by the main bank of firms. For each firm I define the main bank as the largest lender before the Russian default. I separate the firms in two groups: firms with a foreign-owned bank as main bank and firms with a domestically-owned banks as main bank. I aggregate total lending for each group of firms. The figure shows that borrowing by firms banking with foreign-owned banks remains stable after the Russian default, while borrowing of firms banking with domestically-owned banks declines..

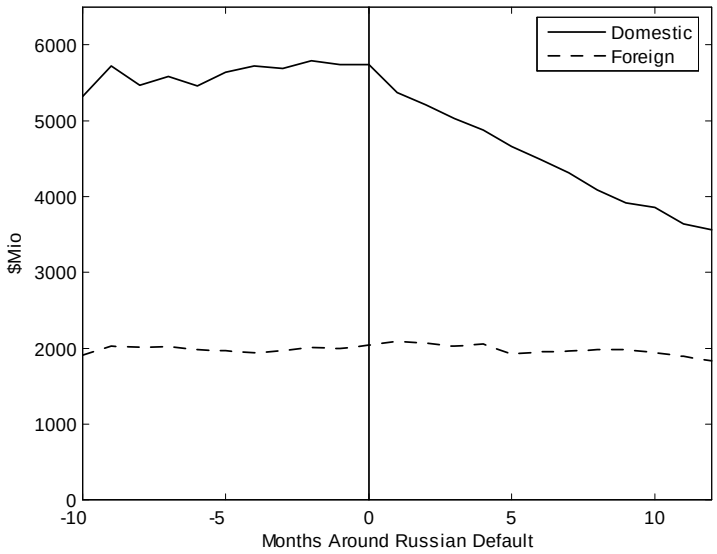
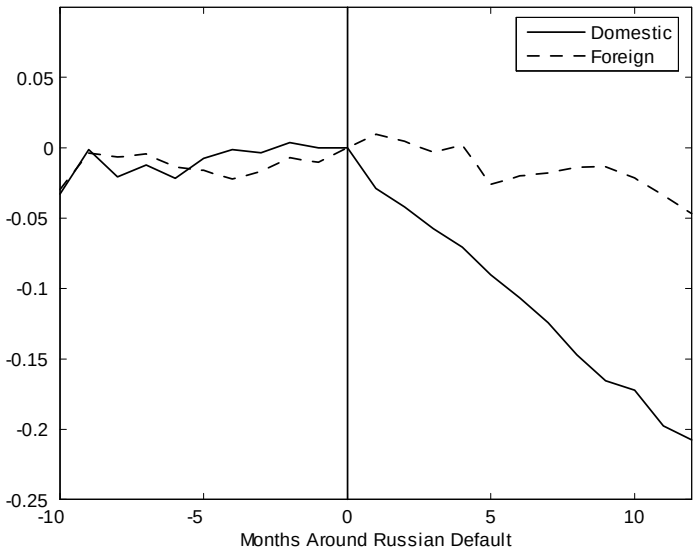


Figure Vb: Borrowing by Domestic Firms (Relative)

Figure Vb plots the natural logarithm of the time-series from Figure IVa. To facilitate the comparison, the time-series are normalized to zero with respect to the date of the Russian default. The y-axis therefore represents the relative change in borrowing compared to the date of the Russian default.



Appendix I: Foreign Bank Ownership

Bank	Country	Ownership	Source
Banco Credito	Peru	Grupo Romero	Bank Regulator
Banco del Pais	Chile	Empresa Econosur	Business News, Sep 2000
Banco Latino	Peru	Grupo Picasso	Financial Times, December 1998
Banco Wiese	Peru	Grupo Wiese	Financial Times, June 1999
Bancosur	Chile/Spain	Grupo Luksic/BCH	Latin Finance, June 97
Banex	Peru	Grupo Nicolini, Tizon, Marsano	Business News Amercias, Nov 1999
Bank of Boston	United States	Bank Boston	Bank Regulator
BIF	Spain	Grupo Fierro	IFC Lending Document, 2006
Citibank	United States	Citibank United States	Bank Regulator
Comercio	Peru	Caja de Pensiones Militar Policial	Comerico, Website, October 2006
Banco Continental	Peru	BBAV/Grupo Brescia	Bank Regulator
Extebandes	Peru/Venzuela	Regional Central Banks	Financial Times, November 1995
Financiero	Ecuador	Banco Pichincha	Financial Times, 31 January 1995
Interbank	Peru	Gropu Rodriguez	Financial Times, 1994
Nuevo Mundo	Peru	Grupo Levy	Business News, Dec 2000
NBK	Peru	Grupo Levy	Financial Times, December 2000
Orion	Peru	Grupo Carsa	Business News America, September 2000
Progreso	Peru	Grupo Galsky	Business News America, June 1999
Republica	Chile	Grupo Errazuriz	Financial Times, November 1998
Santander	Spain	Banco Santander	Financial Times, October 1995
Serbanco	Chile	Grupo Cruz Blanca	Latin Finance, Oct 2000
Solventa	Chile	Grupo Yaconi Santa Cruz	Business News, July 1999
Sudamericano	Canada	Scotiabank/Grupo Calda	Financial Times, October 1999
Trajabo	Chile	Grupo Cummins	Bank Regulator

Note: All municipal banks are owned by domestic residents.

Appendix II: Loan and Firm Variables

Loan Variables

(i) Foreign Currency: Dummy variable whether a loan is provided in US dollars (=1) or domestic currency (=0).

(ii) Collateral; Share of lending that is covered by collateral. If the share is larger than one, I set the variable to one.

(iii) Loan Size: Aggregate loan size in good standing for one firm-bank pair.

(iv) Default: Share of lending that is classified as in default.

(v): Share Long-Term Loan: Share of lending that is classified as long-term lending.

(vi) Share Short-Term Loan: Share of lending that is classified as short-term lending.

(vii) Share Leasing: Share of lending that is classified as leasing.

(viii) Share Other Credit: Share of lending that is not classified as long-term loan, short-term loan or leasing (primarily export financing and overdrafts).

Firm Variables

(i) Location: This variable denotes the state in which a firm is incorporated. The empirical analysis uses a dummy for each state (25 states).

(ii) Firm age: This variable denotes the number of years since the year of incorporation (max: 40 years). The empirical analysis uses a dummy for firm age (40 dummies).

(iii) Industry: This variable denotes the 4-digit industry following the Peruvian industry classification system (based on to the North American SIC codes). The empirical analysis uses a dummy for each industry (253 dummies).

(iv) Firm Size: This variable measures firm size by aggregating up total borrowing for each firm one year prior to the Russian default. I replace all values below the 1st percentile and above the 99th percentile with the respective cut-off value to limit the impact of outliers.

(v) Firm Size Decile: The firm size deciles denote the corresponding decile of firm size. I add an extra dummy for all firms that have no lending one year before the Russian default (11 dummies)

(vi) Firm Survival: A dummy variable whether a firm is operating in June 2005 according to official tax records.

Appendix III: Robustness Tables

Table A1: Summary Statistics by Foreign Bank Ownership [Full Dataset]

Panel A: Loan-level Variables				
Bank Ownership	Foreign (>=0.5)		Domestic (<0.5)	
Loan Size (Mean)	134,080	(881,715)	173,102	(1,029,021)
Loan Size (Median)	20,968		22,329	
% Foreign Currency	0.78	(0.38)	0.78	(0.37)
% Collateral	0.41	(0.47)	0.42	(0.46)
% Long-term loan	0.41	(0.45)	0.43	(0.45)
% Short-term loan	0.31	(0.41)	0.32	(0.41)
% Leasing	0.05	(0.21)	0.02	(0.14)
% Other Credit	0.23	(0.35)	0.23	(0.35)
N	22,272		35,623	
Panel B: Firm-Level Variables				
Bank Ownership	Foreign (>=0.5)		Domestic (<0.5)	
Loan Size (Mean)	124,400	(930,212)	281,621	(2,197,579)
Loan Size (Median)	18,643		25,383	
Loan Relationships	1.30	(0.82)	1.57	(1.63)
Firm Age	7.66	(7.72)	8.82	(9.14)
Located in Lima	0.62	(0.48)	0.46	(0.49)
N	11,090		27,601	

This table provides summary statistics at loan-level, firm-level and bank-level by foreign bank ownership. A bank is classified as foreign, if one of the bank owners is based outside Peru and holds at least 50 percent of control rights. A loan is classified as foreign if the bank providing the loan is classified as foreign. A firm is classified as foreign if at least 50 percent of borrowing are with banks classified as foreign. The loan and firm-level data includes all loan relationships in good standing at the beginning of the analysis period (October 1997). The bank-level data is for all banks operating at the beginning of the dataset. All values are in US dollars at the beginning of the analysis period (October 1997). A loan (or loan relationship) is defined as a single bank-firm pair. If a firm has several loan products with the same bank, loan products are aggregated to a single loan. '% Long-Term Loan', '% Short-term Loan', '% Leasing' and '% Other Credit' denote the respective shares of loan types. 'Foreign Currency' denotes the share of lending denominated in US dollars. 'Collateral' denotes the share of lending covered by collateral calculated by dividing collateral value through total amount outstanding. 'Loan Relationships' denotes the number of loan relationships. 'Firm Age' denotes time since incorporation. 'Located in Lima' is a dummy set to one if the firm headquarters are in Lima. The bank-level variables are based on bank balance-sheets at the end of the last fiscal year before the Russian default (December 1997).

Table A2: Placebo Regression

Dependent Variable	Change in Lending				
	FE	FE	OLS	OLS	OLS
	(1)	(2)	(3)	(4)	(5)
Foreign Ownership	0.017	0.020	0.028	0.015	0.012
	[0.039]	[0.040]	[0.037]	[0.031]	[0.030]
Foreign Currency		-0.045			-0.016
		[0.034]			[0.032]
Collateral		-0.005			0.029
		[0.029]			[0.022]
Firm Fixed Effects	Y	Y	N	N	N
Firm Controls	N	N	N	Y	Y
Loan Controls	N	Y	N	N	Y
Firms	5,106	5,106	5,106	5,106	5,106
Loan Relationships	10,988	10,988	10,988	10,988	10,988
R-squared	>0.01	0.05	0.05	0.47	0.47

These placebo regressions examine the effect of foreign bank ownership on bank lending using data prior to the Russian default. The data is restricted to (i) loans in good standing at the beginning of the dataset and (ii) firms with at least one loan each with a foreign-owned bank and domestically-owned bank at the beginning of the dataset. The unit of observation is loan relationship-time and a loan relationship is defined as a single bank-borrower pair. The regressions are weighted using firm size prior to the Russian default. The dependent variable is the change in the natural logarithm of total lending in good standing per loan relationship. All monthly data is collapsed and time-averaged two years to one year before the Russian default and one year to right before the Russian default. Zero values are dropped from the time-averaging. Column (1) and Column (2) include firm fixed-effects. Column (2) and (5) include loan controls. Column (4) and Column (5) includes firm controls. Loan controls include (i) borrowing currency, (ii) share of loan type and (iii) share covered by collateral in pre-period. Firm-controls include 253 industry dummies, 25 state dummies, 40 firm-age dummies and 10 firm size deciles dummies. Standard errors in brackets are clustered at the bank level (46 banks).

Table A3: Effect of Foreign Bank Debt on Bank Lending, Intensive Margin

Dependent Variable	Change in Lending				
	FE	FE	OLS	OLS	OLS
	(1)	(2)	(3)	(4)	(5)
Change in Foreign Debt	0.386	0.439	0.277	0.331	0.385
	[0.125]	[0.125]	[0.087]	[0.096]	[0.099]
Foreign Currency		-0.157			-0.144
		[0.148]			[0.088]
Collateral		-0.002			0.052
		[0.078]			[0.056]
Firm Fixed Effects	Y	Y	N	N	N
Firm Controls	N	N	N	Y	Y
Loan Controls	N	Y	N	N	Y
Firms	5,887	5,887	5,887	5,887	5,887
Loan Relationships	12,347	12,347	12,347	12,347	12,347
R-squared	0.35	0.36	0.01	0.18	0.19

These regressions examine the effect of the change in foreign debt on bank lending before and after the Russian default. The data is restricted to (i) loans in good standing at the beginning of the dataset and (ii) firms with at least one loan each with a foreign-owned bank and domestically-owned bank at the beginning of the dataset (63% of volume of lending). The unit of observation is loan relationship-time and a loan relationship is defined as a single bank-borrower pair. The regressions are weighted using firm size prior to the Russian default. The dependent variable is the change in the natural logarithm of total lending in good standing per loan relationship. All monthly data is collapsed and time-averaged one year before and one year after the Russian default. Zero values are dropped from the time-averaging. For each bank, the variable 'Change in Foreign Debt' denotes the log change in total foreign debt per bank. Column (1) and Column (2) include firm fixed-effects. Column (2) and (5) include loan controls. Column (4) and Column (5) includes firm controls. Loan controls include (i) borrowing currency, (ii) share of loan type and (iii) share covered by collateral in pre-period. Firm-controls include 253 industry dummies, 25 state dummies, 40 firm-age dummies and 10 firm size deciles dummies. Standard errors in brackets are clustered at the bank level (46 banks).

Table A4: Effect of Foreign Bank Ownership on Bank Lending [full dataset]

Dependent Variable	Change in Lending				
	FE	FE	OLS	OLS	OLS
	(1)	(2)	(3)	(4)	(5)
Foreig Bank Ownership	0.152	0.133	0.152	0.138	0.132
	[0.064]	[0.080]	[0.056]	[0.055]	[0.069]
Foreign Currency		-0.133			-0.107
		[0.133]			[0.064]
Collateral		0.013			0.060
		[0.069]			[0.043]
Firm Fixed Effects	Y	Y	N	N	N
Firm Controls	N	N	N	Y	Y
Loan Controls	N	Y	N	N	Y
Firms	25,384	25,384	25,384	25,384	25,384
Loan Relationships	32,965	32,965	32,965	32,965	32,965
R-squared	0.40	0.41	>0.01	0.14	0.15

These regressions examine the effect of foreign bank ownership on bank lending before and after the Russian default. The data includes all loan relationships. The unit of observation is loan relationship-time and a loan relationship is defined as a single bank-borrower pair. The regressions are weighted using firm size prior to the Russian default. The dependent variable is the change in the natural logarithm of total lending in good standing per loan relationship. All monthly data is collapsed and time-averaged one year before and one year after the Russian default. Zero values are dropped from the time-averaging. Column (1) and Column (2) include firm fixed-effects. Column (2) and (5) include loan controls. Column (4) and Column (5) includes firm controls. Loan controls include (i) borrowing currency, (ii) share of loan type and (iii) share covered by collateral in pre-period. Firm-controls include 253 industry dummies, 25 state dummies, 40 firm-age dummies and 10 firm size deciles dummies. Standard errors in brackets are clustered at the bank level (46 banks).