ARGENTINE BANKS AND MACROECONOMIC RISK: OVERBORROWING AND CREDIT DYNAMICS

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Abstract: Explanations of the boom / bust economic cycle characteristic of emerging markets have emphasized the role of institutional weaknesses in the financial sector in creating macroeconomic instability. Testing this proposition using aggregate data is complicated by the difficulty of identifying banks' credit supply decisions independently of credit demand by the domestic non-financial private sector. In this paper, a panel of Argentine bank balance sheet data is used to investigate the cross-sectional variation in bank lending decisions in response to macroeconomic shocks. The emergence of systematic cross-sectional patterns suggests bank characteristics – and thus bank behavior – play an important role in transmitting macroeconomic shocks to emerging market economies.

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1. Introduction

In a series of papers with Ronald McKinnon,[1] I have analyzed the macroeconomic impact of financial liberalization on previously repressed emerging economies. We describe how apparently well-designed programs of macroeconomic stabilization and structural economic reform can act as the catalyst for a boom / bust cycle, which eventually culminates in concurrent currency and financial crises. This "overborrowing syndrome" characterized many emerging markets at the turn of the century. Examples abound: Mexico in 1994-95; Thailand, Korea and Indonesia in 1997-98; Russia and Brazil in 1998; and Argentina in 2001-02.

Institutional weakness in the domestic financial sector lies at the heart of our explanation of overborrowing. Using a simple Fisherian framework, in our model institutional frailty becomes manifest in the form of a poorly designed government deposit insurance scheme. The consequent moral hazard in the financial sector results in an over-expansion of domestic credit. Such overlending initially produces short-term macroeconomic results that are observationally equivalent to successfully implemented structural reform. Foreign investors thus remain prepared to channel further resources to emerging markets in the form of capital inflows. Such inflows merely serve to stoke the unsustainable initial boom phase of the overborrowing episode, while exposing the country to the risk of capital flight. The cycle culminates in currency and financial crisis as the underlying weaknesses become manifest, confidence is lost and capital flows reverse.

This account of overborrowing resonated in both policy and academic circles.[2] Yet empirical evaluation is not straightforward. While the McKinnon and Pill hypothesis appears broadly consistent with macroeconomic data, this hardly constitutes a powerful test of the importance of the specific financial mechanisms we have emphasized. Having placed the domestic financial sector at the heart of the analysis, a more meaningful test might investigate whether the financial sector in emerging markets plays an "active" role in the relationship between capital inflows and macroeconomic performance. However, undertaking such a test is complicated by the difficulty of distinguishing financial sector behavior from firm and individual decisions. In other words, one needs to identify the impact of credit supply separately from that of credit demand.

Drawing on the credit channel literature, one approach to solving this identification problem is to investigate cross-sectional variation in the behavior of financial institutions. In this paper, I analyze the lending behavior of a cross-section of Argentine banks during the period 1997-2001. If the sensitivity of lending to macroeconomic shocks varies systematically across banks, one can

1 McKinnon and Pill (1996; 1997; 1998).

2 For the perspective of leading Mexican policy makers on the 1994-95 crisis and the role of institutional weaknesses in the domestic financial sector, see Gil Diaz and Carstens (1996). Wei (2001) discusses the role of broader institutional problems ("crony capitalism") in the East Asian financial crisis.

conclude that the banking sector plays some active role in the propagation of these shocks, rather than simply responding passively to ongoing developments in the real economy. Patterns identified in this systematic cross-sectional variation are suggestive of the underlying behavior of financial institutions.

The remainder of the paper is organized as follows. Section 2 briefly reviews some of the related literature. Section 3 outlines a small analytical model to clarify a number of propositions. The data is described in Section 4 and the results of empirical analysis are presented in Section 5. Section 6 discusses these results and Section 7 offers some brief concluding remarks.

2. Related literature

Many papers have investigated the role of banks and institutional weaknesses in the financial system in overborrowing episodes. For example, Radelet and Sachs (1998) emphasize their importance in the context of the East Asian financial crisis. Against the background of this and similar descriptive and policy-oriented papers, a number of more recent theoretical and empirical contributions have been made.

Burnside, et al. (2001) explain the macroeconomic dynamics of a currency crisis by relating the fiscal cost of bailing out insolvent banks to the imposition of the inflation tax and a consequent sharp depreciation of the nominal exchange rate. Having articulated a simple macroeconomic model, they argue that "a principal cause of the 1997 Asian currency crisis was large prospective deficits associated with implicit bailout guarantees to failing banking systems".

Focusing on the microeconomic aspects of the financial explanation of overborrowing, La Porta, et al. (2001) describe and analyze related lending by Mexican banks. On the basis of a thorough analysis of bank data, they demonstrate that one-fifth of all Mexican bank lending was to related parties and that such lending was more likely to enter default. La Porta, et al. thus conclude that related lending in Mexico represented "a manifestation of looting" (in the sense initially suggested by Akerlof and Romer (1993)), rather than an efficient approach to collecting and monitoring information about borrowers. They thus support the view that poor governance and institutional weakness in the financial sector was a primary cause of the Mexican economic crisis of the mid-1990s.

In part because of the quality of the publicly available bank balance sheet data, a number of empirical studies have recently been undertaken for Argentina, which are naturally of relevance to this paper. Three in particular stand out.

Calomiris and Powell (2000) describe in detail the institutional reforms introduced in the Argentine banking sector after 1995, following the Mexican crisis, and its impact on Argentina and

the Argentine financial system. These reforms centered on the introduction of market-based mechanisms for supervision and regulation of the banking system (e.g., the requirement that all banks obtain credit ratings and issue traded subordinated debt). While noting some shortcomings in the new regime,[3] Calomiris and Powell conclude (in May 2000) that "Argentina's bank regulatory system now is widely regarded as one of the two or three most successful among emerging market economies". This conclusion is supported by a detailed empirical study of the relationship between bank's funding costs and the structure and quality of their asset portfolio, which suggests that market-based supervision offers greater insight and discipline on bank behavior.

Using a similar data set, the other two papers focus more narrowly on the impact of foreign bank entry on the Argentine banking sector.

Clarke, et al. (1999) investigate how foreign entry affected the profitability of indigenous financial institutions. They demonstrate that the additional competitive pressure stemming from foreign entry squeezed interest margins and bank profitability in the mortgage and corporate lending markets. However, much more modest effects were found in consumer lending, where entering foreign banks showed less interest.

Goldberg, et al. (2000) compare the responses of foreign and domestic bank lending to various macroeconomic stimuli. In particular, they investigate whether a substantial presence of foreign banks exacerbates or moderates the impact of financial crisis. These authors show that foreign bank lending has tended to be less volatile than domestic bank lending in Argentina over recent years. They also find that the sensitivity of lending growth to aggregate demand fluctuations does not differ in an economically or statistically significant sense between foreign and domestic banks. Moreover, the behavior of foreign and domestic banks in crisis periods is shown to be similar. In particular, the evidence provided by Goldberg, et al. offers no support for the proposition that foreign banks are more likely to curtail lending in a crisis, thereby exacerbating the magnitude of the crisis as liquidity dries up.

This paper is most similar in spirit to the Goldberg, et al. exercise. It also uses a panel of Argentine bank balance sheet data to investigate cross-sectional variations in bank lending decisions. However, the focus here lies on the response of lending to changes in the level and structure of interest rates. Thus, rather than evaluating how bank lending decisions influence the magnitude of swings in real activity, this paper considers how shocks to international and domestic financial markets are transmitted to the economy via the banking system.

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[3] In particular, Calomiris and Powell criticize the introduction of a government funded deposit insurance scheme (albeit only for deposits up to the relatively modest amount of $20,000) and the practical difficulties of issuing subordinated debt given market conditions prevailing in Argentina after 1997.

3. Analytical framework

3.1 Some terminology

It is first useful to develop some terminology. Relying on uncovered interest parity and Fisher equations, the Argentine real interest rate can be decomposed into five elements:

$$\mathbf{r}_t^{ARG} = \mathbf{r}_t^* + r_t^{currency} + E_t \hat{\mathbf{e}}_{t+1}^{regime\ change} + r_t^{country} + (E_t \hat{\mathbf{e}}_{t+1}^{within\ regime} + E_t p_{t+1}^* - E_t p_{t+1}^{ARG})$$

where:

$\mathbf{r}_t^{ARG}$	=	real interest rate in Argentina at time t;
$\mathbf{r}_t^*$	=	international real interest rate at time t;
$r_t^{currency}$	=	$(i_{P,t} - i_{H,t}^{\$}) - E_t \hat{e}_{t+1}$ = (conventional) currency risk premium;
$E_t \hat{\mathbf{e}}_{t+1}^{regime\ change}$	=	expected depreciation in the event of a regime change;
$r_t^{country}$	=	$(i_{H,t}^{\$} - i_{F,t}^{\$})$ = country risk premium;
$E_t \hat{\mathbf{e}}_{t+1}^{within\ regime}$	=	expected depreciation if existing regime persists;
$E_t p_{t+1}^*$	=	expected international inflation;
$E_t p_{t+1}^{ARG}$	=	expected inflation in Argentina.

Using the label introduced in McKinnon and Pill (1999), it is convenient to construct a "super risk premium" that combines the conventional currency risk premium and the current expectation of a breakdown in the existing exchange rate regime.

$$r_t^{super\ risk} = r_t^{currency} + E_t \hat{\mathbf{e}}_{t+1}^{regime\ change}$$
$$= (i_{P,t} - i_{H,t}^{\$}) - E_t \hat{\mathbf{e}}_{t+1}^{within\ regime}$$

By decomposing exchange rate expectations in this manner, one can account more straightforwardly for the within regime expected depreciation. After the introduction of the Convertibility Plan in 1991, the resulting currency board established a one-to-one parity between the Argentine peso and the U.S. dollar. The within regime expected depreciation for Argentina is thus zero.

$$E_t \hat{\mathbf{e}}_{t+1}^{within\ regime} = 0$$

Finally, I assert that the (within regime expectation of the) real exchange rate is stable during the period after 1997 (relevant for the empirical evaluation undertaken below). This implies:

$$(E_t \hat{\mathbf{e}}_{t+1}^{within\ regime} + E_t p_{t+1}^* - E_t p_{t+1}^{ARG}) = 0$$

Of course, this assertion is controversial. Many people have argued that Argentina's recent economic crisis is a consequence of real overvaluation.[4] I do not address this issue here. Note however that the behavior of the real exchange rate is common to all borrowers and financial institutions. It therefore cannot account for the cross-sectional variation in behavior that is the focus of the empirical study presented below.

Combining these assumptions and definitions, one arrives at the following expression:

$$\begin{aligned} \mathbf{r}_t^{ARG} &= \mathbf{r}_t^* + r_t^{super\ risk} + r_t^{country} \\ &= i_{F,t}^{\$} - E_t p_{t+1}^* + (i_{H,t}^{\$} - i_{F,t}^{\$}) + (i_{P,t} - i_{H,t}^{\$}) \end{aligned}$$

In the empirical section of this paper, I investigate cross-sectional variation in the impact of changes to $i_F^{\$}$ (the offshore dollar interest rate), ($i_H^{\$} - i_F^{\$}$) (the spread between onshore and offshore dollar interest rates) and ($i_P - i_H^{\$}$) (the spread between onshore peso and dollar interest rates) on the growth rate of real bank lending. Implicitly, I assume that $E_t p_{t+1}^*$ (U.S. inflation expectations) are stable and thus subsumed into the estimated constant. This assumption is probably reasonable for the period 1997-2001 investigated in this paper, given the widely admired performance of the Greenspan Federal Reserve.

3.2 A simple model

McKinnon and Pill (1999) argue that "well behaved" banks – i.e., banks that are well regulated and supervised – will hedge the foreign exchange exposure implied by borrowing offshore in dollars and lending domestically in pesos. The real cost of funding credit expansion for these well regulated banks then rises with the hedging cost as the super risk premium increases. This naturally curbs the expansion of lending as currency risks rise. In turn, this helps to stabilize an emerging economy following the implementation of stabilization and structural reform since the initial boom phase of the overborrowing cycle is moderated by a curtailment of credit expansion.

In contrast, "poorly behaved" banks – i.e., those banks that enjoy implicit guarantees from the government and yet remain poorly regulated and supervised – will not hedge foreign exchange risk. Instead, they will exploit the moral hazard created by the government guarantee. McKinnon and Pill (1999) emphasized that such banks will have a lower cost of funds than well regulated banks and will thus tend to lend more, exacerbating the overborrowing problem. A further implication of this framework is that poorly regulated banks' lending decisions – in contrast to those of well regulated banks – will be insensitive to fluctuations in the super risk premium.

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[4] Note however that this argument concerns the level of the real exchange rate, not its stability. By 1997 Argentine inflation had fallen to low, U.S. levels. With the fixed nominal exchange rate, this points to real exchange rate stability albeit possibly at an unsustainable level.

To make matters concrete, consider the following very simple framework. The banking sector is monopolistically competitive and each bank *j* faces a constant elasticity credit demand.

$$\mathbf{L}_j^D = A\, i_{L,j}^{-f}$$

where $\mathbf{L}_j^D$ = demand for lending from bank *j*;
$i_{L,j}$ = interest rate on lending by bank *j*;
f = elasticity of the demand for lending.

A profit-maximizing bank will set the marginal revenue derived from increased lending equal to the marginal cost of funding that lending (assumed to be from the wholesale market). Because of the constant elasticity demand curve, the marginal revenue is a constant mark-up over the marginal cost. Therefore, lending by bank *j* is given by:[5]

$$\mathbf{L}_j = \nu\, MC_j^{-f}$$

We investigate short-run effects and therefore assume that entry to the banking sector is imperfect. Banks thus earn supernormal profits in the short term.

In the model suggested by McKinnon and Pill (1999), the marginal cost of funding for the poorly behaved bank is simply the offshore interest rate ($MC_{poor} = i^*$). However, for the well regulated bank the marginal cost includes the cost of hedging currency risks ($MC_{well} = i^* + r_t^{super\ risk}$). Therefore we can derive interest rate semi-elasticities of credit supply as follows:

for poorly behaved banks

$$\partial \ln L_{poor} / \partial i^* = -f\, i^{*-1} < 0$$

$$\partial \ln L_{poor} / \partial r_t^{super\ risk} = 0$$

for well behaved banks

$$\partial \ln L_{well} / \partial i^* = -f\, (i^* + r_t^{super\ risk})^{-1} < 0$$

$$\partial \ln L_{well} / \partial r_t^{super\ risk} = -f\, (i^* + r_t^{super\ risk})^{-1} < 0$$

This very simple result clarifies the earlier intuition of McKinnon and Pill (1999) and suggests a straightforward way to test whether a bank is well or poorly regulated. Lending by well regulated banks will be sensitive to fluctuations in currency risk in the short term, with increases in currency risk reducing credit creation. Lending by poorly regulated banks will be insensitive to shocks to currency risk in the short term.

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5 ν is a function of the exogenous parameters A and ϕ (and thus constant).

3.3 Extending the McKinnon and Pill (1999) framework to other macroeconomic risks

McKinnon and Pill (1999) only consider lending in domestic currency funded by borrowing in foreign currency. They thus focus entirely on developments in the super risk premium. However, as the example of Argentina amply demonstrates, in practice more complicated borrowing structures are possible, which expose banks to a broader set of macroeconomic risks. Loans to domestic borrowers can be denominated in either pesos or dollars, and may be funded either domestically or offshore.

McKinnon and Pill (1999) do not make these distinctions. In particular, they do not distinguish between onshore and offshore sources of funds for credit expansion. In general, if a peso-denominated loan is funded by offshore dollar borrowing, the bank making the loan is exposed to country risk, in addition to the super risk premium originally discussed by McKinnon and Pill. For the reasons outlined with regard to the super risk premium in the preceding subsection, lending by a poorly regulated bank exploiting moral hazard will be insensitive to developments in either country or currency risks. Such a bank will not hedge against either macroeconomic risk, but simply exploit the moral hazard created by government guarantees. In contrast, a well regulated bank will reduce lending in response to increases in either currency or country risk, since it will take appropriate risk management measures against this risk and thus face a higher marginal cost of funds.[6]

McKinnon and Pill also do not consider the currency denomination of bank loans. If a loan is denominated in dollars, the currency risks are transferred from the bank to the borrower. This makes credit supply decisions independent of variations in currency risk, regardless of whether the bank is well or poorly regulated.

However, because changing the currency denomination of a loan simply transfers currency risks to the borrower, borrowers will simply incur costs in hedging against the additional risk they face. They will thus reduce their demand for credit. Prima facie, dollar denominated lending growth should therefore diminish as currency risk rises, albeit due to demand rather than supply effects. Note however that under the maintained assumption that banks have similar customer bases, changes in the demand for credit should not produce systematic cross-sectional variation in lending made by different types of banks.

This analysis suggests that dollar denominated lending by poorly regulated banks is more sensitive to fluctuations in currency risks than peso denominated lending. For well regulated banks, the transfer of risk has ambiguous effects on the sensitivity of observed peso denominated lending to currency risks (since there is no insurance against currency risk in either case). Under the

[6] To cover country risk, a bank may maintain an open offshore credit line, paying a fee for the facility.

assumption of a constant interest elasticity of credit demand, the sensitivity of lending to currency risk will be unchanged by denominating loans in dollars rather than pesos.

However, in many emerging markets, borrowers may also enjoy implicit government guarantees. For example, they may be publicly owned corporations or have politically well connected owners. Such borrowers are also likely to exploit the moral hazard implied by such costless government insurance. In this environment, transferring currency risks to borrowers by making dollar denominated loans will have quite different effects.

First, in the case of poorly regulated banks, making dollar denominated rather than peso denominated loans does not shift the incidence of the currency risks. In both cases, currency risks ultimately fall on the government that is offering implicit guarantees. With dollar loans, these guarantees are made to borrowers, while with peso denominated loans they are made to banks. Since neither borrower nor lender bears currency risks, neither credit demand nor credit supply will be affected and thus fluctuations in currency risk should not change the growth rate of dollar denominated lending by poorly regulated banks.

Second, consider a well regulated bank making *only* dollar denominated loans. As noted above, this bank does not bear the currency risks. Therefore lending supply decisions are independent of fluctuations in currency risk. Where domestic borrowers enjoy government guarantees, they will exploit the resulting moral hazard and transfer the currency risk implied by dollar denominated borrowing to the government. Therefore credit demand decisions are independent of currency risks. In this situation, with neither credit demand nor credit supply affected by changes in the super risk premium, actual dollar denominated lending by well regulated banks will be insensitive to currency risks.

Third, consider a well regulated bank making *both* peso and dollar denominated loans. Increases in currency risk would prompt banks to shift their asset portfolio into the latter. If borrowers enjoy government guarantees, they are indifferent between peso and dollar denominated borrowing. Therefore increases in currency risk would *increase* dollar denominated loans by well regulated banks, since (relative to peso denominated loans) these loans are subsidized by an implicit government guarantee.

Of course, in this environment, well regulated banks would be expected to make *only* dollar denominated loans since only loans of this type enjoy the implicit government subsidy. They would thus be in the situation discussed previously. However, the implicit guarantees offered to borrowers may be non-linear. For example, they might only cover the risk of a large systemic breakdown in the exchange rate regime (i.e., when $E_t \, \hat{\mathbf{e}}_{t+1}^{\,regime\ change}$ is large), but not the conventional currency risk premium ($r_t^{\,super\ risk} - E_t \, \hat{\mathbf{e}}_{t+1}^{\,regime\ change} = r_t^{\,currency}$). (Such certainly appears to have been the case ex post in

Argentina.) Such non-linearities in the implicit guarantees to borrowers can have two important effects. First, they may account for well regulated banks making some peso denominated loans (since in the absence of a guarantee, lending by well regulated banks should be mix both dollar and peso denominated in a combination that optimally distributes currency risks between borrower and lender). Second, they may imply that lending by well regulated banks will *rise* as currency risks increase, if the government guarantee of borrowers only becomes active at high levels of currency risk. Once the super risk premium exceeds the level at which the borrower obtains a government guarantee, dollar denominated loans by well regulated banks to those borrowers enjoying this guarantee will rise.

Table 1 summarizes the results derived in this section.

4. The data

As noted in Section 2, several studies have already exploited the rich source of publicly available Argentine bank balance sheet data. These data are published by the Central Bank of Argentina in the publication *Informacion de Entidades Financieras* (also available at www.bcra.gov.ar).

These data have a monthly frequency and cover all financial institutions operating in Argentina (banks, savings banks and finance companies). The available information is very extensive and includes a detailed breakdown of each bank's balance sheet, data on the profitability of the bank and information about the characteristics of the bank (e.g., ownership; number and geographical distribution of branches; credit rating, etc.). I use the lattermost information to construct a set of dummy variables that capture the characteristics of each bank.

The quality of these data reflect, in part, the efforts made to improve the regulation and supervision of the Argentine banking system in the aftermath of the tequila crisis in 1994-95, as discussed in Calomiris and Powell (2000).

In this paper, I focus on bank lending data to the domestic non-financial private sector. These data are broken down by currency of denomination and by type of loan (mortgages; consumer loans, etc.). In the analysis presented below, I focus on developments in the growth rate of real lending, where the lending series is deflated using the consumer price index.

Argentine interest rate data are also obtained from the Central Bank of Argentina. I use the one-month interbank rate (BAIOR, the Buenos Aires interbank offer rate) on pesos and dollars to capture the onshore level of interest rates. Data for offshore rates (dollar LIBOR rates) are taken from the Federal Reserve Board of Governors. The remaining macroeconomic data are taken from the IMF's *International Financial Statistics*. Given the monthly frequency of the balance sheet data, I use the industrial production index as a proxy for Argentine real activity.

5. Empirical specification and estimates

The purpose of the empirical exercise is to evaluate systematic cross-sectional variations in the responsiveness of banks' lending supply decisions to changes in the level and structure of interest rates. To this end, I first control for credit demand effects by conditioning developments in real lending growth on industrial production. To allow for short-run dynamic patterns in the high frequency monthly data, I also include lags of both real lending growth and industrial production growth in the specification.

The level of offshore interest rates (one-month dollar LIBOR), the country risk (the difference between the onshore and offshore dollar interest rate) and the currency risks (the difference between the onshore peso interest rate and the onshore dollar rate) are included in the regression. To investigate how the impact of changes in these three variables on bank lending decisions varies across different types of banks, the dummy variables for each bank type are interacted with the interest rate terms. With the variables defined in Table 2, the resulting specification is:

$$
\begin{aligned}
\Delta \ln(L^{m}_{j,t}/p_t) \;=\;& (\alpha_j + \nu_j) && \textit{bank-specific random effects}\\
&+ \Sigma_{k=1}\,\beta_k \Delta \ln(L^{m}_{j,t-k}/p_{t-k}) && \textit{short-term dynamics}\\
&+ \Sigma_{k=0}\,\chi_k \Delta \ln y_{t-k} && \textit{sensitivity to real economic growth}\\
&+ \varphi_P\,(i_{P,t} - i^{\$}_{H,t}) + \varphi_P^{J}\,((i_{P,t} - i^{\$}_{H,t}) \times \delta_I) && \textit{sensitivity to currency risk}\\
&+ \varphi_H\,(i^{\$}_{H,t} - i^{\$}_{F,t}) + \varphi_H^{J}\,((i^{\$}_{H,t} - i^{\$}_{F,t}) \times \delta_I) && \textit{sensitivity to country risk}\\
&+ \varphi_F\, i^{\$}_{F,t} + \varphi_F^{J}\,(i^{\$}_{F,t} \times \delta_I) && \textit{sensitivity to the level of interest rates}\\
&+ \varepsilon_t && \textit{residual}
\end{aligned}
$$

This specification is estimated as a random effects model using OLS. The results are reported in Table 3. Since no dummy variable is included for domestically owned, private Argentine banks, the coefficients on the interaction terms can be interpreted as differences in the sensitivity of lending to interest rates from a benchmark level of sensitivity associated with domestically owned, private banks. The following basic conclusions can be drawn from this exercise.

First, the growth rate of total bank lending falls as the general level of interest rates (represented by one-month dollar LIBOR) rises. On the basis of the point estimates shown in Table 3, a one percentage point rise in LIBOR reduces total real lending by Argentine banks by 0.8% on impact (and cumulatively by slightly over 1.1%). The sign of this estimate accords with prior expectations and the magnitude appears plausible.

As LIBOR rises, one would anticipate lending growth to decline. However, the negative estimated interest rate semi-elasticity does not distinguish between two competing explanations of the decline in lending growth. One the one hand, the demand for credit may have diminished as the cost of borrowing rose, reflecting inter-temporal substitution by firms and consumers as interest rates changed (i.e., a demand effect). On the other hand, the cost of funding for banks to increase credit expansion (at the margin from the wholesale market) would have risen because of increases in the interbank interest rate (i.e., a supply effect).

Second, (at the conventional 5% level) there is no statistically significant systematic cross-sectional variation in the responsiveness of bank lending to developments in the general level of interest rates (as proxied by LIBOR). Moreover, the point estimates reported in column (1), panel C of Table 3 suggest that the economic significance of such variation is also modest.

If changes in the demand for credit accounted for the entire fall in lending growth following an interest rates increase, one might anticipate that all banks would reduce lending by broadly the same amount. In particular, assuming that banks have similar customer bases, one would not anticipate a systematic relationship between the decline in lending growth and the characteristics of a particular bank. The lack of cross-sectional variation in the sensitivity of bank lending decisions to changes in LIBOR in the reported estimates therefore suggests that the decline in lending following an increase in LIBOR largely reflects credit demand rather than credit supply effects.

Third, in response to increases in country risk (i.e., the spread between onshore and offshore dollar interest rates), foreign bank subsidiaries curtail their lending in an economically and statistically significant manner. Lending by other types of bank is essentially unresponsive to increases in country risk. The point estimates reported in column (1), panel B of Table 3 suggest that, on impact, a one percentage point increase in country risk reduces total real lending by subsidiaries of foreign banks by almost 0.9% in Argentina (and cumulatively by approximately 1.2%). Although not statistically significant, the point estimates reported in Table 3 also suggest that publicly owned provincial banks and savings banks tend on average to reduce lending in response to increases in country risk, although the within category variation in response is large (resulting in relatively large standard errors for the estimated coefficients).

Using the identifying assumption suggested above, it appears that credit supply (and thus bank behavior) plays an important role in determining the response of bank lending to changes in country risk. Assuming similar customer bases across the various types of bank considered, the systematic cross-sectional variation in the estimated responses of bank lending to country risk suggests that bank behavior and the structure of the banking sector may have an important role to play in the evolution of lending (and, as a result, prices and the broader real economy) in response to changes in

country risk. For example, the greater the penetration of foreign bank subsidiaries in the domestic Argentine market, the greater the stimulus to the economy that a decline in country risk will induce. Other things equal, foreign subsidiaries will make credit more easily available to the domestic private sector, thereby relaxing credit constraints and stimulating demand.

Fourth, in response to increases in currency risk (i.e., the spread between onshore peso and dollar interest rates), lending by foreign bank subsidiaries falls less (in a statistically significant sense) than lending by domestically owned, private Argentine banks. Indeed, on the basis of the coefficient estimates reported in column (1), panel A of Table 3, lending by foreign bank subsidiaries rises (albeit modestly) following an increase in currency risk. Lending by publicly owned, provincial banks is also less responsive to rises in currency risk than lending by domestically owned, private banks. Lending by other categories of banks appears to be relatively unresponsive to developments in currency risk (in either a statistically or economically significant sense).

Following similar logic to that discussed above, the systematic cross-sectional variation in the response of bank lending to changes in currency risk can be interpreted as suggesting that the estimated coefficients embody supply-side rather than demand-side behavior.

Finally, inspection of columns (2) and (3) of Table 3 suggests that the results outlined above are driven largely by the response of dollar-denominated lending by the subsidiaries of foreign banks.

Total peso-denominated real lending growth is negatively related to the general level of interest rates, but does not demonstrate the systematic cross-sectional variation in response to the evolution of country and currency risk that is characteristic of the total real lending growth data analyzed above. Indeed, on the basis of the point estimates reported in column (2), panel A of Table 3, it appears that peso-denominated lending by foreign bank subsidiaries is somewhat more responsive to increases in currency risk than lending by domestically owned, private banks (albeit not in a statistically significant manner). Moreover, inspection of the point estimates reported in column (2), panel B of Table 3 suggests that the responsiveness of lending by foreign bank subsidiaries is only slightly greater than that of domestically owned, private banks and that other categories of banks exhibit more pronounced responses. In other words, the cross-sectional variation in the relationship between peso-denominated lending and interest rates does not follow the pattern of the total lending data.

By implication, the behavior of total lending must largely be driven by developments in its dollar-denominated component. This is illustrated by column (3) of Table 3. Dollar-denominated real lending growth by foreign bank subsidiaries is negatively related to increases in country risk in both an economically and statistically significant manner (panel C). In contrast, rises in currency risk appear to have a less negative impact on the real dollar-denominated lending of foreign bank

subsidiaries than domestically owned private banks (and the point estimates suggest that dollar-denominated lending by foreign bank subsidiaries may even rise).

Table 4 reports an estimation of the same empirical specification using fixed effects. Broadly speaking, the results point to the same conclusions outlined above. Tables 5 and 6 report random and fixed effects regressions respectively for a simpler specification that does not allow for the same richness of dynamic effects (i.e., does not include lagged terms for real activity and the dependent variable). Again, these simpler specifications suggest similar results.

6. Discussion

After comparing the relationships anticipated on the basis of the underlying conceptual framework (summarized by Table 1) with the estimated lending semi-elasticities (focusing on the coefficients from the dynamic random effects regression, reported in Table 3), a number of results emerge.

First, a systematic cross-sectional variation exists in the elasticities of lending supply to country and credit risks. This suggests that the institutional structure of the banking sector and its impact on bank decisions play an active role in the transmission of financial shocks emanating in the international capital market to the Argentine macroeconomy. If the financial system merely passively responded to developments in the real economy and fluctuations in credit expansion were demand driven, one would not anticipate such systematic cross-sectional variation. This result thus supports one of the essentials of the McKinnon and Pill (1996) explanation of overborrowing, namely the emphasis it places on the behavior of the financial sector.

Second, inspection of the pattern of cross-sectional variation in bank lending elasticities suggests that subsidiaries of foreign banks operating in Argentina are well regulated, since – in line with the implications of the simple analytical framework for well regulated banks – they reduce lending in response to increases in country risk. Other banks operating in Argentina (including private foreign owned Argentine banks and foreign finance companies) do not curtail real bank lending growth in response to increases in country risk, suggesting they are poorly regulated.

This result accords with many observers' intuition about the efficacy of financial regulation. Proponents of foreign bank entry often argue that host countries are able free ride on the effective supervision of entering foreign banks provided by home country regulators. A priori, one would therefore anticipate that foreign bank subsidiaries are likely to be better regulated than domestic Argentine banks, an intuition supported by the data in this empirical exercise. The pattern of cross-sectional variation found in the data therefore appears consistent with the explanations of

overborrowing made by McKinnon and Pill (inter alia), which have seen (possibly implicit) government guarantees of poorly regulated banks as a cause of overborrowing.

Another implication of these findings is that foreign ownership of a bank is a less important determinant of how well it is supervised and governed (at least in the short run) than the structure and form of that ownership. Former private domestically owned Argentine banks that are bought by foreign owners do not appear to be better regulated than those that are not purchased by foreigners. Rather it is subsidiaries of foreign banks that appear to be better regulated and thus better behaved. This may have some policy implications. For example, policy makers would be ill advised to believe that selling indigenous banks to foreign owners will quickly or easily solve problems of supervision and governance.

The results also provide some evidence suggesting that the publicly owned Argentine provincial banks are well regulated (see, in particular, Table 5, which reports the random effects regression with a less complex dynamic structure). One explanation of the seemingly better regulation of this group of Argentine banks might be the perceived need to improve their governance in anticipation of privatization, a process that has been acclaimed by the World Bank as a model of its kind (cf. Clark and Cull, 1999).

Most importantly, the results in Table 3 also suggest that most Argentine banks are poorly regulated, even in the period 1997-2001. This period postdates the introduction of many market-based regulatory and supervisory schemes, which have received some international acclaim. The result stands in contrast to the positive assessment of Argentine bank regulation made by Calomiris and Powell (2000), which was mentioned in Section 2. They also support the McKinnon and Pill hypothesis with its emphasis on institutional weakness as a cause of overborrowing.

Third, the increase in dollar denominated lending by foreign bank subsidiaries in response to increases in currency risk that is reported in Table 3 is consistent with the view that Argentine borrowers may enjoy government guarantees. (More precisely, this evidence suggests that Argentine borrowers anticipate being bailed out by the government in the event of a collapse of the exchange rate regime, even if they are not hedged by the government against the risks implicit in the conventional currency risk premium; i.e., the government guarantee enjoyed by borrowers is non-linear.) This suggests that problems of institutional weakness extend beyond the financial sector.

7. Conclusion

Using Argentine bank balance sheet data, this paper has provided empirical evidence in favor of the McKinnon and Pill (1996) explanation of overborrowing in emerging markets. More specifically, the study has demonstrated the active role played by the financial sector in overborrowing episodes

and identified shortcomings in the regulation of (possibly implicit) government guarantees that are extended to Argentine banks and borrowers.

Calomiris and Powell (2000) have argued that the system of bank supervision introduced in Argentina after 1995 was designed to very high standards. The analysis presented in my paper thus suggests that even well designed systems of financial regulation are likely to have practical shortcomings. Where the general level of institutional development[7] is low (as is the case in Argentina), even well designed regulatory systems can fail because of irregularities in information flows, lapses in enforcement and an inability for the authorities to credibly pre-commit to avoid ex post bail outs.

The paper also cautions against "quick fixes" for the institutional problems that are apparently so prevalent in emerging markets. Two issues stand out. First, the paper suggests that simply selling domestic banks to foreign owners is unlikely to improve governance in the short term. It is subsidiaries of foreign banks – rather than all foreign owned banks – that appear to be well regulated in Argentina. Second, the paper also suggests that fixing institutional problems in the financial and banking sector alone is insufficient. Governments are likely to offer (implicit) guarantees to domestic borrowers – especially to cover against the breakdown of the currency regime – that, regardless of how well the banking sector is regulated, also encourage overborrowing and render the country vulnerable to financial and currency crises. Ex post, this certainly appears to have been the case in Argentina.

The institutional development required to manage or eliminate the macroeconomic instability created by overborrowing therefore needs to be thorough and is thus likely to be lengthy in time and vulnerable to pauses and reverses.

[7] As proxied by indicators of corruption or legal development, for example.

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Table 1 Summary of anticipated relationships between lending and interest rates

Response of real bank lending funded by offshore dollar deposits to increases in:		**Type of bank**	
		Well regulated	*Poorly regulated*
Offshore dollar interest rate		¾	¾
For peso denominated loans	*Currency risk*	¾	0
	Country risk	¾	0
For dollar denominated loans *(with no borrower guarantees)*	*Currency risk*	¾ *(demand effect)*	¾ *(demand effect)*
	Country risk	¾	0
For dollar denominated loans *(with borrower guarantees)*	*Currency risk*	0	0
	Country risk	¾	0
For dollar denominated loans *(with non-linear borrower guarantees)*	*Currency risk*	+ *(demand effect)*	+ *(demand effect)*
	Country risk	¾	0

Table 2 Data

Series	Description	Source
$L^{m}_{j,t}$	Nominal lending of type *m* by bank *j* at time t. (*m* = (total; peso-denominated; dollar-denominated; mortgage, etc.)	Central Bank of Argentina, *Informacion de Entidades Financieras,* March 2002.
p_t	Consumer price index.	International Monetary Fund, *International Financial Statistics,* March 2002.
y_t	Index of industrial production.	*Ditto*
$i^{\$}_{F,t}$	One-month dollar LIBOR (offshore dollar interest rate).	Federal Reserve Board of Governors.
$i^{\$}_{H,t}$	One-month dollar BAIOR (onshore dollar interest rate).	Central Bank of Argentina.
$i_{P,t}$	One-month peso BAIOR (onshore peso interest rate).	*Ditto*
δ_I	Zero / one dummy variable for type of bank. I = foreign-owned bank; publicly-owned national bank; publicly-owned provincial bank; private cooperative bank; subsidiary of foreign bank; savings bank (*caja de credito*); foreign finance company; domestic finance company.	Central Bank of Argentina, *Informacion de Entidades Financieras,* March 2002.

Table 3 Random effects dynamic regression

Numbers in parentheses following coefficient estimates are standard errors.

Coefficients that are statistically significant at the 5% level are shown in bold; those that are statistically significant at the 10% level are shown in italics.

	Dependent variable		
Random effects N=128, T = 46	**Total real lending growth** (1)	**Peso-denominated real lending growth** (2)	**Dollar-denominated real lending growth** (3)
Panel A: Sensitivity to developments in currency risk			
($i^{\$}$ - $i_H^{\$}$)	-0.193 (0.168)	-0.257 (0.305)	-0.208 (0.245)
($i^{\$}$ - $i_H^{\$}$) × foreign-owned	-0.104 (0.266)	-0.044 (0.464)	0.212 (0.391)
($i^{\$}$ - $i_H^{\$}$) × public national	0.194 (0.872)	0.457 (1.581)	-0.286 (0.946)
($i^{\$}$ - $i_H^{\$}$) × public provincial	*0.610* (0.311)	0.642 (0.565)	*0.791* (0.460)
($i^{\$}$ - $i_H^{\$}$) × private coop.	0.387 (0.618)	0.448 (1.121)	0.389 (0.913)
($i^{\$}$ - $i_H^{\$}$) × foreign subsidiary	**0.883** (0.305)	**-0.765** (0.552)	**1.250** (0.423)
($i^{\$}$ - $i_H^{\$}$) × savings bank	*0.729* (0.427)	0.876 (0.774)	0.506 (0.630)
($i^{\$}$ - $i_H^{\$}$) × foreign fin comp.	0.018 (0.414)	0.134 (0.710)	0.794 (0.511)
($i^{\$}$ - $i_H^{\$}$) × dom. fin comp.	0.147 (0.367)	0.282 (0.665)	0.314 (0.542)
Panel B: Sensitivity to developments in country risk			
($i_H^{\$}$ - $i_F^{\$}$)	-0.111 (0.196)	-0.295 (0.355)	-0.020 (0.287)
($i_H^{\$}$ - $i_F^{\$}$) × foreign-owned	-0.093 (0.302)	-0.002 (0.527)	-0.215 (0.443)
($i_H^{\$}$ - $i_F^{\$}$) × public national	-0.017 (0.986)	-0.271 (1.787)	0.584 (1.072)
($i_H^{\$}$ - $i_F^{\$}$) × public provincial	-0.541 (0.355)	-0.475 (0.644)	-0.791 (0.524)
($i_H^{\$}$ - $i_F^{\$}$) × private coop.	-0.222 (0.698)	-0.254 (1.264)	-0.234 (1.031)
($i_H^{\$}$ - $i_F^{\$}$) × foreign subsidiary	**-0.749** (0.352)	-0.113 (0.633)	**-1.119** (0.487)
($i_H^{\$}$ - $i_F^{\$}$) × savings bank	-0.475 (0.514)	-0.529 (0.931)	-0.324 (0.759)
($i_H^{\$}$ - $i_F^{\$}$) × foreign fin comp.	0.080 (0.471)	0.388 (0.807)	0.852 (0.580)
($i_H^{\$}$ - $i_F^{\$}$) × dom. fin comp.	-0.070 (0.415)	-0.386 (0.754)	-0.037 (0.614)

continued /…

Table 3 Random effects dynamic regression (continued)

	Dependent variable					
	Total real lending growth		Peso-denominated real lending growth		Dollar-denominated real lending growth	
Panel C: Sensitivity to developments in general level of interest rates						
$i_{F}^{\$}$	**-0.795**	(0.353)	**-1.707**	(0.637)	-0.693	(0.511)
$i_{F}^{\$}$ × foreign-owned	-0.180	(0.137)	-0.189	(0.241)	-0.247	(0.200)
$i_{F}^{\$}$ × public national	-0.033	(0.444)	-0.077	(0.806)	-0.302	(0.486)
$i_{F}^{\$}$ × public provincial	-0.155	(0.158)	*-0.485*	(0.285)	*-0.399*	(0.232)
$i_{F}^{\$}$ × private coop.	-0.105	(0.310)	-0.243	(0.563)	-0.069	(0.459)
$i_{F}^{\$}$ × foreign subsidiary	*-0.299*	(0.157)	-0.076	(0.281)	-0.291	(0.221)
$i_{F}^{\$}$ × savings bank	-0.475	(0.514)	-0.351	(0.401)	-0.196	(0.326)
$i_{F}^{\$}$ × foreign fin comp.	-0.007	(0.233)	0.037	(0.412)	0.014	(0.322)
$i_{F}^{\$}$ × dom. fin comp.	-0.059	(0.183)	-0.126	(0.332)	-0.037	(0.270)
Panel D: Short-term dynamics						
(dep. variable)$_{t-1}$	**0.163**	(0.016)	**-0.113**	(0.017)	*0.029*	(0.015)
(dep. variable)$_{t-2}$	-0.016	(0.016)	**-0.135**	(0.018)	*0.027*	(0.016)
(dep. variable)$_{t-3}$	-0.021	(0.017)	0.021	(0.018)	0.005	(0.017)
(dep. variable)$_{t-4}$	0.026	(0.174)	-0.004	(0.018)	0.002	(0.017)
(dep. variable)$_{t-6}$	**0.042**	(0.017)	-0.024	(0.018)	-0.011	(0.017)
(dep. variable)$_{t-12}$	**0.109**	(0.020)	0.019	(0.021)	**0.037**	(0.015)
Panel E: Sensitivity to real economic activity						
Δy_{t}	-0.078	(0.088)	-0.079	(0.159)	-0.103	(0.128)
Δy_{t-1}	-0.050	(0.090)	-0.000	(0.162)	0.115	(0.131)
Δy_{t-2}	**0.250**	(0.092)	0.237	(0.166)	**0.280**	(0.134)
Δy_{t-3}	-0.096	(0.097)	0.078	(0.174)	-0.156	(0.141)
Δy_{t-4}	0.030	(0.091)	0.006	(0.163)	0.005	(0.132)
Δy_{t-6}	0.053	(0.087)	0.095	(0.157)	-0.050	(0.127)
Δy_{t-12}	**0.298**	(0.094)	**0.395**	(0.169)	**0.229**	(0.136)

Table 4 Fixed effects dynamic regression

Numbers in parentheses following coefficient estimates are standard errors.

Coefficients that are statistically significant at the 5% level are shown in bold; those that are statistically significant at the 10% level are shown in italics.

	Dependent variable		
Fixed effects N=128, T = 46	**Total real lending growth** (1)	**Peso-denominated real lending growth** (2)	**Dollar-denominated real lending growth** (3)
Panel A: Sensitivity to developments in currency risk			
($i^{\$}$ - $i_H^{\$}$)	-0.227 (0.169)	-0.302 (0.305)	-0.277 (0.239)
($i^{\$}$ - $i_H^{\$}$) × foreign-owned	-0.050 (0.267)	-0.177 (0.465)	0.050 (0.381)
($i^{\$}$ - $i_H^{\$}$) × public national	0.207 (0.884)	0.457 (1.601)	-0.305 (0.924)
($i^{\$}$ - $i_H^{\$}$) × public provincial	*0.610* (0.311)	0.609 (0.565)	*0.759* (0.447)
($i^{\$}$ - $i_H^{\$}$) × private coop.	0.321 (0.627)	0.334 (1.137)	0.343 (0.902)
($i^{\$}$ - $i_H^{\$}$) × foreign subsidiary	**0.791** (0.306)	-0.879 (0.553)	**1.172** (0.412)
($i^{\$}$ - $i_H^{\$}$) × savings bank	*0.737* (0.428)	0.874 (0.776)	0.411 (0.615)
($i^{\$}$ - $i_H^{\$}$) × foreign fin comp.	0.023 (0.415)	0.171 (0.711)	0.789 (0.501)
($i^{\$}$ - $i_H^{\$}$) × dom. fin comp.	0.090 (0.367)	0.147 (0.665)	0.152 (0.527)
Panel B: Sensitivity to developments in country risk			
($i_H^{\$}$ - $i_F^{\$}$)	-0.093 (0.200)	-0.247 (0.362)	0.125 (0.284)
($i_H^{\$}$ - $i_F^{\$}$) × foreign-owned	-0.002 (0.306)	0.117 (0.532)	-0.014 (0.436)
($i_H^{\$}$ - $i_F^{\$}$) × public national	-0.009 (0.983)	-0.192 (1.782)	0.682 (1.040)
($i_H^{\$}$ - $i_F^{\$}$) × public provincial	**-0.709** (0.358)	-0.681 (0.649)	**-1.167** (0.514)
($i_H^{\$}$ - $i_F^{\$}$) × private coop.	-0.162 (0.702)	-0.112 (1.272)	-0.231 (1.009)
($i_H^{\$}$ - $i_F^{\$}$) × foreign subsidiary	**-0.821** (0.387)	-0.993 (0.694)	**-1.289** (0.518)
($i_H^{\$}$ - $i_F^{\$}$) × savings bank	-0.523 (0.572)	-0.436 (1.035)	-0.060 (0.821)
($i_H^{\$}$ - $i_F^{\$}$) × foreign fin comp.	0.144 (0.518)	0.784 (0.884)	**-1.543** (0.626)
($i_H^{\$}$ - $i_F^{\$}$) × dom. fin comp.	-0.031 (0.456)	0.048 (0.826)	-0.146 (0.655)

continued /…

Table 4 Fixed effects dynamic regression (continued)

	Dependent variable		
	Total real lending growth	Peso-denominated real lending growth	Dollar-denominated real lending growth
Panel C: Sensitivity to developments in general level of interest rates			
$i_{F}^{\$}$	-0.703 (0.442)	-1.215 (0.793)	-0.137 (0.625)
$i_{F}^{\$}$ × foreign-owned	0.031 (0.354)	0.022 (0.636)	-0.268 (0.508)
$i_{F}^{\$}$ × public national	-0.017 (0.814)	-0.050 (1.473)	-1.181 (1.086)
$i_{F}^{\$}$ × public provincial	**-1.502** (0.387)	**-2.541** (0.699)	**-2.799** (0.554)
$i_{F}^{\$}$ × private coop.	-0.262 (0.744)	-0.276 (1.348)	-0.431 (1.070)
$i_{F}^{\$}$ × foreign subsidiary	-1.304 (0.993)	**-6.466** (1.789)	-1.378 (1.364)
$i_{F}^{\$}$ × savings bank	-0.670 (1.411)	-0.430 (2.553)	0.900 (2.026)
$i_{F}^{\$}$ × foreign fin comp.	0.216 (1.501)	3.085 (2.614)	**-5.219** (1.984)
$i_{F}^{\$}$ × dom. fin comp.	0.241 (1.212)	2.004 (2.206)	-1.952 (1.751)
Panel D: Short-term dynamics			
$(\text{dep. variable})_{t-1}$	**0.122** (0.016)	**-0.149** (0.017)	**-0.067** (0.015)
$(\text{dep. variable})_{t-2}$	**-0.049** (0.017)	**-0.175** (0.018)	-0.022 (0.016)
$(\text{dep. variable})_{t-3}$	**-0.049** (0.017)	-0.015 (0.018)	**-0.039** (0.016)
$(\text{dep. variable})_{t-4}$	0.001 (0.176)	**-0.039** (0.019)	**-0.036** (0.017)
$(\text{dep. variable})_{t-6}$	*0.033* (0.018)	**-0.047** (0.018)	**-0.036** (0.017)
$(\text{dep. variable})_{t-12}$	**0.101** (0.021)	0.003 (0.021)	0.017 (0.016)
Panel E: Sensitivity to real economic activity			
Δy_{t}	-0.075 (0.088)	-0.096 (0.157)	-0.066 (0.124)
Δy_{t-1}	-0.059 (0.090)	-0.012 (0.161)	0.169 (0.127)
Δy_{t-2}	**0.263** (0.092)	0.241 (0.165)	**0.315** (0.130)
Δy_{t-3}	-0.068 (0.096)	0.097 (0.173)	-0.114 (0.136)
Δy_{t-4}	0.063 (0.090)	0.055 (0.162)	0.056 (0.128)
Δy_{t-6}	0.049 (0.087)	0.074 (0.156)	-0.048 (0.123)
Δy_{t-12}	**0.334** (0.094)	**0.476** (0.169)	**0.306** (0.132)

Table 5 Random effects simple regression

Numbers in parentheses following coefficient estimates are standard errors.

Coefficients that are statistically significant at the 5% level are shown in bold; those that are statistically significant at the 10% level are shown in italics.

	Dependent variable		
Random effects N=132, T = 56	**Total real lending growth** (1)	**Peso-denominated real lending growth** (2)	**Dollar-denominated real lending growth** (3)
Panel A: Sensitivity to developments in currency risk			
($i^{\$}$ - $i_H^{\$}$)	-0.260 (0.158)	-0.327 (0.301)	*-0.410* (0.244)
($i^{\$}$ - $i_H^{\$}$) × foreign-owned	0.205 (0.264)	-0.451 (0.482)	0.491 (0.401)
($i^{\$}$ - $i_H^{\$}$) × public national	0.252 (0.858)	0.381 (1.637)	0.041 (0.980)
($i^{\$}$ - $i_H^{\$}$) × public provincial	**0.657** (0.309)	0.702 (0.589)	**0.960** (0.477)
($i^{\$}$ - $i_H^{\$}$) × private coop.	0.562 (0.603)	0.705 (1.152)	0.639 (0.932)
($i^{\$}$ - $i_H^{\$}$) × foreign subsidiary	**0.645** (0.295)	-0.709 (0.561)	**0.943** (0.435)
($i^{\$}$ - $i_H^{\$}$) × savings bank	0.650 (0.422)	0.864 (0.804)	0.585 (0.651)
($i^{\$}$ - $i_H^{\$}$) × foreign fin comp.	0.039 (0.039)	0.319 (0.712)	*0.900* (0.530)
($i^{\$}$ - $i_H^{\$}$) × dom. fin comp.	0.247 (0.363)	0.286 (0.692)	0.594 (0.560)
Panel B: Sensitivity to developments in country risk			
($i_H^{\$}$ - $i_F^{\$}$)	-0.136 (0.187)	-0.247 (0.356)	0.164 (0.288)
($i_H^{\$}$ - $i_F^{\$}$) × foreign-owned	0.233 (0.299)	0.509 (0.546)	-0.603 (0.456)
($i_H^{\$}$ - $i_F^{\$}$) × public national	-0.041 (0.966)	-0.199 (1.841)	0.268 (1.109)
($i_H^{\$}$ - $i_F^{\$}$) × public provincial	*-0.603* (0.352)	-0.622 (0.672)	**-1.235** (0.545)
($i_H^{\$}$ - $i_F^{\$}$) × private coop.	-0.421 (0.678)	-0.607 (1.293)	-0.590 (1.048)
($i_H^{\$}$ - $i_F^{\$}$) × foreign subsidiary	-0.445 (0.340)	0.034 (0.643)	*-0.844* (0.503)
($i_H^{\$}$ - $i_F^{\$}$) × savings bank	-0.380 (0.507)	-0.615 (0.968)	-0.449 (0.789)
($i_H^{\$}$ - $i_F^{\$}$) × foreign fin comp.	0.030 (0.449)	0.023 (0.815)	*-1.104* (0.606)
($i_H^{\$}$ - $i_F^{\$}$) × dom. fin comp.	-0.202 (0.412)	-0.395 (0.785)	-0.442 (0.640)

continued /…

Table 5 **Random effects simple regression** (continued)

	Dependent variable		
	Total real lending growth	Peso-denominated real lending growth	Dollar-denominated real lending growth
Panel C: Sensitivity to developments in general level of interest rates			
$i_{F\$}$	-**0.853** (0.332)	**-1.735** (0.630)	-0.588 (0.525)
$i_{F\$}$ × foreign-owned	-0.195 (0.154)	-0.380 (0.324)	0.037 (0.367)
$i_{F\$}$ × public national	-0.227 (0.468)	-0.284 (0.982)	0.003 (0.828)
$i_{F\$}$ × public provincial	-**0.485** (0.179)	-0.629 (0.386)	-**1.575** (0.420)
$i_{F\$}$ × private coop.	-0.157 (0.322)	-0.126 (0.690)	-0.275 (0.750)
$i_{F\$}$ × foreign subsidiary	-0.296 (0.181)	-0.007 (0.406)	-0.214 (0.512)
$i_{F\$}$ × savings bank	-0.337 (0.249)	-0.317 (0.554)	-0.396 (0.718)
$i_{F\$}$ × foreign fin comp.	0.284 (0.255)	-0.337 (0.539)	0.465 (0.639)
$i_{F\$}$ × dom. fin comp.	-0.154 (0.211)	-0.249 (0.474)	-0.415 (0.624)
Δy_t	0.035 (0.718)	-0.040 (0.135)	-0.079 (0.109)

Table 6 Fixed effects simple regression

Numbers in parentheses following coefficient estimates are standard errors.

Coefficients that are statistically significant at the 5% level are shown in bold; those that are statistically significant at the 10% level are shown in italics.

	Dependent variable		
Fixed effects N=132, T = 56	**Total real lending growth** (1)	**Peso-denominated real lending growth** (2)	**Dollar-denominated real lending growth** (3)
Panel A: Sensitivity to developments in currency risk			
($i^{\$}$ - $i_H^{\$}$)	*-0.266* (0.158)	-0.332 (0.298)	*-0.408* (0.244)
($i^{\$}$ - $i_H^{\$}$) × foreign-owned	0.205 (0.264)	-0.297 (0.477)	0.489 (0.400)
($i^{\$}$ - $i_H^{\$}$) × public national	0.261 (0.858)	0.384 (1.621)	0.061 (0.980)
($i^{\$}$ - $i_H^{\$}$) × public provincial	**0.661** (0.308)	0.707 (0.583)	**0.971** (0.476)
($i^{\$}$ - $i_H^{\$}$) × private coop.	0.551 (0.603)	0.710 (1.139)	0.633 (0.931)
($i^{\$}$ - $i_H^{\$}$) × foreign subsidiary	**0.607** (0.295)	-0.774 (0.555)	**0.934** (0.435)
($i^{\$}$ - $i_H^{\$}$) × savings bank	0.661 (0.422)	0.850 (0.797)	0.549 (0.652)
($i^{\$}$ - $i_H^{\$}$) × foreign fin comp.	0.007 (0.392)	0.255 (0.705)	*0.873* (0.530)
($i^{\$}$ - $i_H^{\$}$) × dom. fin comp.	0.216 (0.362)	0.231 (0.685)	0.589 (0.560)
Panel B: Sensitivity to developments in country risk			
($i_H^{\$}$ - $i_F^{\$}$)	-0.136 (0.190)	-0.248 (0.359)	0.187 (0.293)
($i_H^{\$}$ - $i_F^{\$}$) × foreign-owned	-0.210 (0.301)	0.153 (0.547)	-0.589 (0.459)
($i_H^{\$}$ - $i_F^{\$}$) × public national	-0.026 (0.963)	-0.190 (1.820)	0.305 (1.109)
($i_H^{\$}$ - $i_F^{\$}$) × public provincial	**-0.759** (0.354)	-0.741 (0.669)	**-1.374** (0.547)
($i_H^{\$}$ - $i_F^{\$}$) × private coop.	-0.418 (0.680)	-0.609 (1.284)	-0.577 (1.050)
($i_H^{\$}$ - $i_F^{\$}$) × foreign subsidiary	*-0.657* (0.373)	-0.728 (0.696)	*-0.891* (0.545)
($i_H^{\$}$ - $i_F^{\$}$) × savings bank	-0.457 (0.563)	-0.475 (1.063)	-0.159 (0.870)
($i_H^{\$}$ - $i_F^{\$}$) × foreign fin comp.	0.361 (0.496)	0.655 (0.889)	*-1.196* (0.656)
($i_H^{\$}$ - $i_F^{\$}$) × dom. fin comp.	-0.060 (0.453)	0.058 (0.855)	-0.527 (0.700)

continued /…

Table 6 **Fixed effects simple regression** (continued)

	Dependent variable		
	Total real lending growth	Peso-denominated real lending growth	Dollar-denominated real lending growth
Panel C: Sensitivity to developments in general level of interest rates			
$i_{F\$}$	-**0.852** (0.416)	**-1.767** (0.776)	-0.438 (0.635)
$i_{F\$}$ × foreign-owned	0.099 (0.324)	0.228 (0.606)	0.053 (0.499)
$i_{F\$}$ × public national	-0.111 (0.679)	-0.219 (1.283)	0.336 (0.994)
$i_{F\$}$ × public provincial	-**1.542** (0.357)	-**1.427** (0.674)	-**2.382** (0.551)
$i_{F\$}$ × private coop.	-0.183 (0.657)	-0.105 (1.241)	-0.197 (1.015)
$i_{F\$}$ × foreign subsidiary	-1.430 (0.974)	-**4.539** (1.825)	-0.482 (1.418)
$i_{F\$}$ × savings bank	-0.760 (1.420)	0.483 (2.679)	1.201 (2.191)
$i_{F\$}$ × foreign fin comp.	*2.621* (1.410)	4.397 (2.528)	-0.161 (1.864)
$i_{F\$}$ × dom. fin comp.	0.691 (1.229)	2.567 (2.319)	-0.967 (1.897)
Δy_t	0.041 (0.071)	-0.025 (0.133)	-0.071 (0.108)