ABSTRACT

Title of Dissertation:	THE LENDING CHANNEL IN EMERGING ECONOMIES: A LOOK AT THE INTERNATIONAL EVIDENCE
	Francisco Vazquez, Doctor of Philosophy, 2005
Dissertation Directed By:	Professor Carmen Reinhart, Department of Economics

This thesis studies the role of banks in the transmission of nominal shocks into credit markets in emerging countries. It builds on the lending channel hypothesis, which states that, due to imperfections in capital markets, banks may not be able to completely offset a negative shock to deposits with other sources of finance. As a result, they may choose to cut credit, affecting the financing possibilities of bank-dependent firms and amplifying the effects of monetary shocks on economic activity.

Empirical work on the lending channel in emerging countries is scarce. This thesis argues that, since the mechanism relies on the presence of imperfections in capital markets, it should be expected to be stronger in emerging countries. Therefore, looking at the cross-country evidence provides a source of variation that has not been previously exploited in the literature.

The thesis is divided in three chapters. The first develops a model of the lending channel in a small open economy to study how differences in the severity capital market imperfections affect the power of the mechanism. The second takes of

the model to the data, using a bank-level panel dataset of 832 banks in 27 countries during 1986-1998. The chapter tests for systematic cross-sectional differences in the response of loan growth to monetary conditions across banks of various characteristics and across developed and emerging countries. The third chapter further looks at the evidence from emerging markets, using differences in bank ownership to proxy for unobserved financial constraints facing banks. In particular, it builds on the presumption that foreign banks operating in emerging markets are less financially constrained than domestic. The test exploits a novel bank-level dataset comprising 1565 banks in 20 emerging countries during 1989-2001, to look for systematic differences across domestic and foreign banks.

The results obtained are supportive of the existence of a lending channel mechanism that is stronger in emerging countries. On the other hand, the behavior of domestic and foreign banks is not found to be markedly different, which may imply that foreign banks in emerging countries are prevented from freely resorting to upstream financing from their mother institutions.

THE LENDING CHANNEL IN EMERGING ECONOMIES: A LOOK AT THE INTERNATIONAL EVIDENCE

By

Francisco Vázquez

Thesis submitted to the Faculty of the Graduate School of the
University of Maryland, College Park, in partial fulfillment
of the requirements for the degree of
Doctor of Philosophy
2005

Advisory Committee:
Professor Carmen Reinhart, Chair
Professor Michael Pries
Dr. Sergio Schmukler
Professor Lemma Senbet
Professor John Shea

Foreword

I am indebted to Carmen Reinhart and John Shea for their advice and continuous support. I am also grateful to Michael Binder, Fernando Broner, Klauss Desmet, Michael Ehrmann, Alicia García-Herrero, Soledad Martínez Peria, Jorge Portillo, Plutarkos Sakellaris, Philip Schellekens, and Sergio Schmukler for their comments and suggestions. I also benefited from discussions with several of my former classmates, especially Marco Arena, Daniel Ortega, Pedro Rodríguez, and Rafael Romeu. I would like to thank an anonymous referee, the participants of the LACEA 2001-2003 Conferences, and the participants of the Macro-International Seminar at the University of Maryland at College Park.

Dedication

A Nelly, Amalia, Daniela y Alejandra, sin las cuales este proyecto no hubiera existido

Table of Contents

Lists of Tables

List of Figures

Chapter 1: Introduction

What is the role of banks in the transmission of nominal shocks into credit markets in developing countries? By now, there is a vast literature, grouped under the lending channel hypothesis, suggesting that banks play an active role in the transmission of monetary shocks into credit markets in the United States.[1] In contrast, there is a surprisingly scarce amount of research using data from other countries, in particular from developing countries.[2] This thesis is an attempt to fill this gap by providing a first pass at the international evidence.

It is already well established by the Modigliani-Miller theorem that, in a setting of perfect capital markets, firms' investment decisions are independent from their financial structure. In this world, changes in the supply of credit by banks do not have any effect on the real economy. Banks are mere *financial veils*. However, a vast literature has questioned the practical relevance of this proposition for macroeconomic analysis.[3] The basic hypothesis is that asymmetric information problems make financial markets incomplete. This opens the door for a large set of possible ways through which banks may play a non-trivial role in the functioning of the economy.

---

[1] See, for example, Bernanke, and Blinder (1992), Bernanke B. and M. Gertler (1995), Kashyap and Stein (1995, 2000), Ashcraft (2000), Kishan and Opiela (2000).

[2] The few exceptions include a study on the transmission of monetary policy in emerging economies by the BIS (1998), and Edwards and Végh (1997), who study the role of banks in the transmission of nominal shocks in Mexico and Chile. Also, deBondt (1999) studies the lending channel in Europe, and Agung (1998) focuses on the case of Indonesia.

[3] See Brainard and Tobin (1963), Bernanke and Gertler (1987), Bernanke and Blinder (1988), Blinder and Stiglitz (1983), Kashyap and Stein (1995).

In the United States, it has been well documented that changes in *monetary policy* have an effect on aggregate bank lending volume. While this observation is consistent with the traditional money channel of monetary transmission, which states that changes in monetary policy have an effect on short-term interest rates and, through them, on the demand for bank credit, the apparent excess sensitivity of bank lending and output to monetary policy has driven economists to search for additional mechanisms through which policy-induced changes in short-term interest rates may be amplified. Along this line, a mechanism known as the *lending channel*, states that imperfections in capital markets may limit the capacity of banks to completely offset a policy-induced contraction of deposits with other sources of financing. As a result, a contraction in the supply of bank credit may result, affecting the financing possibilities of bank-dependent firms and amplifying the effects of monetary policy on economic activity. This effect may occur on top of the money channel, which operates through loan demand.

To date, there is a large amount of empirical literature, mostly focused on the United States case, that tends to support this proposition. Most studies have found that banks identified a priori as more financially constrained tend to display a larger sensitivity of loan growth to monetary policy shocks. This evidence is consistent with the existence of loan supply effects, and has been frequently interpreted as supportive of the lending channel hypothesis. However, this interpretation has been contested, since the results are also consistent with the existence of systematic differences in loan demand across banks. In other words, there is an underlying identification problem

that has not been completely resolved: disentangling whether the observed movements in equilibrium bank credit are completely explained by changes in loan demand, as suggested by the money channel view, or if they can be partially attributed to changes in loan supply, as suggested by the lending channel hypothesis.

This thesis argues that mixing bank-level evidence from countries with different levels of capital market development provides further insight into this problem. Since the lending channel mechanism relies on the existence of capital market imperfections, it should be expected to be stronger in countries with less developed capital markets. Therefore, comparing the response of bank credit to monetary conditions across countries with different levels of capital market development provides a source of variation that has not been exploited in the literature. This may be an alternative, albeit still imperfect, way to tackle the longstanding identification problem.

Looking at the evidence from developing countries is also an end in itself. It has already been documented that firms operating in developing countries tend to be more dependent on bank financing (Rojas-Suarez and Weisbrod (1995)). Moreover, since small open economies are more vulnerable to changes in the conditions of international capital markets, understanding the role of the banking system in the transmission of these shocks into domestic credit markets, and the policy responses to ameliorate undesirable real effects, is an important objective.

The dissertation is structured in three chapters. The first provides a theoretical framework to study the functioning of the lending channel in a small open economy.

Most of the existing theoretical models refer to the closed economy case,[4] and therefore are not necessarily well suited for studying the mechanism in open economies. The model builds on previous theoretical results, but emphasizes the role of international capital markets and the foreign exchange market as potential sources of shocks to bank deposits. It also studies how differences in the degree of capital market imperfections—caused by differences in bankruptcy costs—affect the power of the mechanism. Since developing countries tend to have weaker accounting and legal systems, this setting provides a foundation for the cross-country analysis presented in the empirical part.

The model shows that the sensitivity of bank credit to changes in monetary conditions tends to be larger for more financially constrained banks, which is a well known result in this literature. A novel, albeit intuitive, result is that banks paying higher interest rates on non-insured debt are shown to be more financially constrained. This sets the basis for looking into the effective cost of non-deposit debt as a proxy for unobserved financial constraints on banks. Finally, the model shows that the lending channel will tend to be stronger for banks operating under weaker bankruptcy regimes.

Before continuing, three comments are convenient to place this thesis in context. First, while the literature on the lending channel focuses on the role of banks in the transmission of *monetary policy* into the credit market, this thesis takes a broader approach. It studies the effects of changes in *monetary conditions* on the credit market, regardless of whether these changes are induced, or not, by monetary policy.

---

[4] For example, Bernanke and Blinder (1988), Kashyap and Stein (1995), Repullo and Suarez (1999), Ashcraft (2000).

This difference in emphasis is necessary. The lending channel literature has mostly focused on the channels of monetary policy transmission in the United States, and therefore refers to policy-induced shocks to deposits. Conversely, this thesis studies emerging markets, where monetary policy is typically constrained by an open capital account.

Second, the lending channel literature ignores the role of the external sector as a potential source of instability to bank deposits, which is natural considering that the United States is a relatively closed economy. In contrast, by focusing on emerging markets, the role of the external sector comes to the front. Thus, monetary conditions here not only include money market rates, as usual in the lending channel literature, but also international interest rates, and the change of the foreign exchange rate. The justification for the latter is straightforward, since currency depreciation increases the opportunity cost of holding bank deposits denominated in local currency, which directly affects the stability of bank reserves. In fact, the uncovered interest parity postulates a benchmark relationship between local interest rates, international interest rates, and the exchange rate, which is exploited here.

Third, monetary conditions also include reserve requirements, which are safely ignored in the lending channel literature since they are not longer used as a monetary policy tool in the United States. In contrast, reserve requirements still are used as a policy instrument in emerging markets, and thus have to be incorporated in the set of monetary conditions.

Going now into the empirical part, the second chapter uses a bank-level panel database (balance sheets, income statements, and cash flows) for a sample of 832 banks in 27 countries (both developed and emerging) during 1986-1998, and tests the implications of the model. As mentioned before, the testing strategy exploits the idea that the lending channel—if it exists—should be stronger in countries with less developed capital markets. The exercise uses panel regressions with bank-level fixed effects, to test for systematic differences in the response of bank credit to monetary conditions across banks of different characteristics, and across banks operating in developed versus developing countries.

The results support the idea that banks play an active role in the transmission of monetary conditions into the credit market, and that the channel is stronger in developing countries. In particular, loan growth of banks operating in developing countries is more sensitive to changes in monetary conditions, and bigger banks are more capable of isolating loan growth from changes in monetary conditions, particularly in developing countries. An additional exercise indicates that loan growth of banks paying higher effective interest rates on non-deposit debt is more sensitive to changes in monetary conditions, particularly in developing countries. These results hold when the sample is restricted to non-US banks, and to episodes of exchange rate depreciation below 25 percent per year (the maximum for the developed countries in the sample), so that they cannot be attributed to differences in the size of the shocks across countries.

The third chapter further looks at the evidence from emerging countries, exploiting both an alternative identification strategy and data. Typically, empirical work on the lending channel is based on sample partitions between banks classified *ex-ante* as more financially constrained, and a group that serves as a control. Since financial constraints are not directly observable, in practice these have been usually proxied by observable bank characteristics such as size, liquidity and capitalization. This chapter follows a different route. It takes advantage of the large increase in foreign bank participation in emerging countries during the 1990s and exploits differences in bank ownership (i.e. domestic versus foreign) to proxy for financial constraints. The idea of using ownership to proxy for financial constraints is not new but has not been previously applied in this way.[5] To implement this idea, the chapter uses a panel of 1565 banks in 20 Asian and Latin American countries during 1989-2001, and keeps track of the evolution of bank ownership by mixing current shareholders information with a comprehensive database on mergers and acquisitions. The chapter tests for systematic differences in the sensitivity of loan and deposit growth to various measures of monetary conditions, across domestic and foreign banks. It also looks for systematic differences in the response of bank-specific lending and deposit rates to monetary conditions across domestic and foreign banks. As an additional exercise, the chapter further explores differences in the behavior of domestic and foreign banks during normal times and periods of financial distress, exploiting various definitions of banking and currency crises available in the literature.

[5] See for example, Houston et al. (1997), Ashcraft (2000), Peek and Rosengren (1997).

The results indicate that the response of loans and deposits to monetary conditions is similar across domestic and foreign banks. In particular, periods of tighter monetary conditions are associated with lower loan and deposit growth, especially for domestic banks, but differences tend to be weak. The results also show that differences in the sensitivity of loan growth to monetary conditions across domestic and foreign banks are driven by banks with lower capitalization and/or asset liquidity. At the same time, the behavior of domestic and foreign banks is roughly similar during tranquil periods and during periods of financial distress. If any, differences across domestic and foreign banks appear to be more closely related to the behavior of interest rates. In particular, lending and deposit rates of foreign banks display a lower sensitivity to monetary conditions, and they also react smoothly during periods of financial distress, suggesting that foreign banks are in better position to attract deposits. Combined, the results presented in the third chapter only provide weak evidence in support of the lending channel hypothesis.

Chapter 2: The Lending Channel in a Small Open Economy

This chapter develops a basic framework to study the lending channel in a small open economy. The model builds on the results of previous theoretical work and in fact differs more in emphasis than in substance.[6]

Departures from existing models concentrate in three aspects. First, previous models refer to the closed economy case. Consequently, they ignore the role of international capital markets and the foreign exchange market as potential sources of shocks to bank deposits, and focus on the role of *monetary policy* in the credit market. For the purposes of this thesis, which deals with the lending channel in small open economies, the importance of international capital markets and foreign exchange markets as potential sources of shocks to bank deposits comes to the forefront. Therefore, the model explicitly considers the role of the international interest rates and the exchange rate as potential sources of shocks to bank deposits.

Second, most previous models do not explicitly consider the role of reserve requirements in the transmission mechanism. In contrast, the model presented here explicitly introduces reserve requirements as a monetary policy tool, given its relevance for the empirical section (during the nineties, reserve requirements were actively used in most developing countries). In fact, the model shows that the power of

[6] See for example Stiglitz and Weiss (1981), Bernanke and Blinder (1988), Fuerst (1992, 1993), Stein (1995) Kashyap and Stein (1995), Holmstrom and Tirole (1997), and Repullo and Suarez (1999).

the lending channel mechanism directly depends on the tax-like effect of reserve requirements.

Third, to provide a basis for the cross-country analysis that follows, the model illustrates how differences in bankruptcy costs—that could originate from underlying differences in the institutional setting across countries—shape the power of the mechanism.

The model studies a partial equilibrium setting in a small open economy with three agents: banks, firms, and households. Banks provide liquidity to firms, in the form of loans, and to households, in the form of insured deposits. In addition, banks can issue non-insured debt (a domestic bond), which can be purchased by international investors. Deposits and bonds differ in two aspects. First, deposits are insured and subject to reserve requirements, while bonds are not. Second, deposits can be used to pay for transactions while bonds do not render liquidity services. The model is similar to Edwards and Végh (1997) in that banks are price takers both in the loan and deposit markets, but departs from them by allowing for imperfect substitutability between the domestic bond and a risk-free international asset. Imperfect substitutability is introduced using a costly state verification setup (Townsend (1978), Gale and Hellwig (1985), Williamson (1987)).

To introduce an asymmetric information problem between banks and bondholders, banks are subject to uncertain operating costs that affect the net returns of their loan portfolio. The probability distribution of the operating costs is known by all market participants, but the particular realizations (and therefore the ex-post returns

on the loan portfolio) are observed at no cost only by banks. All other agents must pay a cost to verify the net return on loans. Under non-negative liabilities, banks declare bankruptcy if their return on assets is insufficient to cover their average cost of funds. In that event, bondholders must pay a bankruptcy cost that reduces their recovered value. This produces an excess return on bank bonds over the risk-free rate, to compensate bondholders for the event of bank bankruptcy, even under universal risk neutrality. Under this setup, the slope of the marginal cost of bond financing increases with bankruptcy costs.

The funding mix of banks is determined as follows. Deposits are the preferred (cheapest) source of bank financing since they are insured and render a liquidity service. In fact, in equilibrium, interest rates on deposits are lower than the risk-free interest rate. Now, if for some reason If for some reason deposits are not enough to finance loan opportunities, banks resort to bond financing, increasing the average cost of bank funds and therefore their probability of bankruptcy. Thus, the contractual return on bonds goes up with the amount of bond financing. With this result, the model produces imperfect substitution between insured deposits and non-insured debt, which is a well known necessary condition for the existence of a lending channel.

Comparative static exercises are used to study the effects of changes in monetary conditions (measured by exchange rate depreciation, international interest rates, and reserve requirements) on equilibrium loans. The model shows that a tightening in monetary conditions translates into a decrease in equilibrium loans via both loan demand and supply effects. Similarly, a tightening in monetary conditions

leads to an increase in both deposit rates and lending minus deposit spreads. Finally, the model shows that banks paying higher interest on non-insured debt are more financially constrained, which provides an alternative way to proxy for unobservable financial constraints facing banks in the empirical section that follows. All these effects are shown to be more pronounced for larger bankruptcy costs. Therefore, under the presumption that developing countries have weaker bankruptcy procedures and legal systems, this result provides the basis for the cross-country comparison presented in the empirical part.

The rest of the chapter is as follows. The first section presents the setup of the model. Section two performs comparative static exercises for the case of perfect capital markets, and section three studies the case of imperfect capital markets.

A Model of the Lending Channel in a Small Open Economy

The framework presented here uses a reduced from approach. Consider a two period small open economy freely integrated with the rest of the world in both goods and capital markets. By the law of one price, the domestic price index, used as a *numeraire*, is given by $P=EP^*$, where E stands for the exchange rate and P^* for the foreign price index. The economy is populated by a continuum of infinitely-many price-taker banks located on [0,1]. The role of banks is to provide liquidity services both to firms, in the form of loans, and to households, in the form of demand deposits. The components of bank balance sheets are as follows. On the assets side, they hold reserves, h, and loans, z. On the liabilities side, they issue insured deposits, d, and non-insured debt (or bonds), b. In addition, banks are endowed with $k \in [0, \bar{k}]$ units of

internal capital at the beginning of period 0. Deposits and bonds differ in two dimensions. First, deposits are used to pay for transactions (i.e. they render a liquidity service), while bonds do not. Second, deposits are insured by a government agency and subject to reserve requirements of δ per unit of deposits, while bonds are not.

Interest rates are as follows. Loans pay a real (gross) rate $R^l(=I^l-\pi^*-\varepsilon)$, where I^l is the (gross) nominal rate on loans, π^* is the foreign inflation rate, and ε is the depreciation of the exchange rate. Similarly, I^d and I are the (gross) nominal rates on deposits and bonds, respectively. Banks face the same loan and deposit rates, which they take as given, while bond interest rates are bank-specific.

There is universal risk neutrality and the bond market is open to international investors, who invest in the bank's bond, b, as long as its expected gross return equals the international interest rate converted into local currency $I^*(=R^*+\pi^*+\varepsilon)$.

To introduce uncertainty on bank assets, assume that loans are risk-free, but that running a bank requires paying an uncertain end-of-period cost c, with mean $\bar{c}$, per unit of loans. Thus, the ex-post nominal return on bank loans is $g=I^l-c$. The realization of c is observed at no cost only by banks. All other agents must pay a cost to verify the ex-post return on bank loans. This captures the costly state verification setup due to Townsend (1978), Gale and Hellwig (1985), and Williamson (1987). Under this assumption, it is well established that if bondholders cannot commit to a stochastic monitoring technology, then the optimal contract between bondholders and banks will have all the characteristics of a standard debt contract, where banks pay the contractual interest rate on bonds I if they stay in business; otherwise bondholders take

over bank assets after paying the monitoring (bankruptcy) costs. Following this, assume that in the event of bankruptcy, bondholders receive a fraction of the promised bond return (1-γ)I, where $\gamma \in [0,1]$ are bankruptcy costs per unit invested. Denoting by $q \in [0,1]$ the probability of bank bankruptcy, the bondholders participation constraint is given by $(1-\gamma)qI + (1-q)I \geq I^*$. In words, the expected return on bonds cannot be lower than the international interest rate expressed in local currency. The gross interest rate on bonds can be expressed as:

$$I = I^* + \phi(\gamma, q) \tag{1}$$

Where $\phi \equiv \frac{I^* q\gamma}{1-q\gamma}$ is the *contractual* interest spread on bank bonds (or bond spread) that compensates bondholders for the event of banks going bankrupt. Following from the observation that debt yields tend to increase with debt to equity ratios of the borrowing institutions (see for example Steigum (1983)), assume that the probability of default is an increasing function of the bond to equity ratio, that is: $q = f(b/k)$, with $f'>0$. For the results that follow, the function f has to satisfy $\frac{f''}{f'} > -\frac{\gamma f'}{1-\gamma q}$. In words, the function is frre to be convex, linear, or concave in b, provided it is not too concave. Further assume that the function f satisfies the following regularity conditions: $f(0)=0$, $\lim_{b/k \to \infty} f(b/k) = 1$.

For banks, the total cost of bond financing is $I(\gamma,b/k)b$, and the marginal cost $m(.)=I(\gamma,b/k)+\phi_b b$. Under the previous assumptions, the marginal cost is increasing in the level of outstanding bonds, that is, $m_b(.)=2\phi_b+\phi_{bb}b>0$. Also, it is easy to check that

$\phi(0,b/k)=0$, $\phi(\gamma,0)=0$, $\phi_b>0$, $\phi_{b\gamma}>0$, $\phi_{bk}<0$. In words, for a given level of capital, the bond spread is increasing in the amount of outstanding bonds. In addition, the bond spread increases with bankruptcy costs and decreases with bank capital. Clearly, in absence of bankruptcy costs the bond spread is zero. This is the setup considered in Romer and Romer (1990) where banks are able to freely substitute deposits with bond financing without incurring any additional cost. Below, this case will be used as a benchmark, and labeled as the "perfect capital markets case". It is important to note the asymmetry between bondholders and banks with respect to the interest on bonds. Since bondholders are risk-neutral, the expected return on bonds is equal to the international interest rate. On the other hand, from the bank's perspective, the bond spread introduces a real gap between the risk free interest rate and the cost of bond financing, since the relevant comparison for them is conditional on staying in business.

Consider now the banks' problem. Banks take the loan and deposit rates as given and choose the optimal mix of liabilities to maximize expected profits:

$$\max_{d,b} E\Omega = (I^l - c)z - I^d d - Ib, \tag{2}$$

subject to the bondholder's participation constraint (1), the balance sheet constraint:

$$h + z = d + b + k, \tag{3}$$

and the reserve requirements. In equilibrium, the interest rate charged to loans will be higher than the opportunity cost of money. Therefore, excess reserves are always zero ($h = \delta d$). Plugging this into the balance sheet constraint, gives the following optimality conditions:

$$I^l - \bar{c} = \frac{I^d}{(1-\delta)} \tag{4}$$

$$I^l - \bar{c} = I^* + \phi + \phi' b \tag{5}$$

These two equations give the equilibrium (cost-minimizing) relationship that must hold between lending, deposit, and bond rates. Equation (4) indicates that the (net) return on loans has to be equal to the effective rate paid on deposits, after taking into account the extra cost implied by the reserve requirements. Equation (5) further equates the (net) return on loans to the marginal cost of bond financing. In the case of perfect capital markets, the last two terms in the right hand side of (5) collapse to zero and the interest rate on loans will be equalized to the international interest rate plus the operating costs of banks. Notice that, for an internal solution (with both deposit and bond financing), the equilibrium deposit rate (inclusive of the opportunity cost of holding required reserves) has to be above the international interest rate (i.e. $\frac{I^d}{1-\delta} > I^*$). In what follows the paper will focus in this case.[7] These two equations can be rewritten to define the loan supply and deposit demand by banks. Letting $F(.)=\phi+\phi_b b$ gives:

---

[7] In fact, notice that the equilibrium interest rate on deposits (inclusive of the opportunity cost of holding the required reserves) cannot be lower than the international interest rate. To see why, suppose that it is (i.e. $\frac{I^d}{(1-\delta)} < I^*$). In this case, banks will choose not to issue bonds but finance their loans exclusively through deposit issuance. Furthermore, banks will find optimal to issue deposits in excess of their loan demand and acquire international bonds, which will tend to increase equilibrium deposit rates (provided there is an upward sloping aggregated supply of deposits).

$$I^l - I^* = F(\gamma, b/k) + \bar{c} \tag{4'}$$

$$I^* - I^d = \delta(I^* + \bar{c}) - (1-\delta)F(\gamma, b/k) \tag{5'}$$

Equation (4') is the loan supply by banks. In the case of perfect capital markets (γ=0), $F(.)$ collapses to zero and the difference between the lending rate and the international rate (the lending spread) boils down to a constant ($\bar{c}$). On the other hand, under capital market imperfections, the lending spread becomes an increasing function of the level of bond financing.

Equation (5') is the deposit demand by banks. Again, in the perfect capital markets case, the second term in the right hand side disappears and the difference between the international rate and the deposit rate (the deposit spread) becomes constant. In the presence of capital market imperfections, the deposit spread decreases with the level of bond financing (i.e. deposit rates become closer to the risk-free international rate). The reason is that by cost minimization, the equilibrium deposit rate goes up with the bond spread. Notice also that the deposit spread cannot be negative. As deposits are insured, there will be an infinite supply of deposits at the risk-free international rate. Accordingly, equation (5') implicitly defines a maximum amount of bond financing for each bank. In general, banks facing steeper marginal costs of bond financing will have a lower equilibrium level of bonds and a lower size in equilibrium. Based on this, the empirical section uses bank size as a proxy for financial restrictions facing banks.

To ease aggregation and close the model in the simplest way, assume that all banks have an equal endowment of capital and that the supply of deposits decreases

linearly in the opportunity cost of holding deposits (i.e., the difference between the interest rate on deposits and the international rate, or deposit spread).

$$d = d_0 - d_1(I^* - I^d) \tag{6}$$

Similarly, assume that the demand for bank loans is a linear function of the real rate of loans R^l, that is $z=z_0-z_1R^l$.[8] Noting that $R^l=R^*+(I^l-I^*)$ gives

$$z = z_0 - z_1R^* - z_1(I^l - I^*) \tag{7}$$

Equation (7) encompasses the traditional *money channel* and the *bank lending channel*. If banks are able to freely offset shocks to deposits with non-insured debt financing, the lending spread (I^l-I^*) collapses to a constant ($\bar{c}$) and the equilibrium in the credit market (equations (4') and (7)) depends solely on the international interest rate. In this case, higher interest rates discourage the *demand* for bank loans, as suggested by the money view. On the other hand, if banks face an upward sloping supply curve of non-insured debt financing, then the lending spread becomes positive and an additional loan *supply* mechanism enters into action. The assumption that banks operating in developing countries face stronger restrictions on non-insured debt financing provides a fundamental source of variation across countries for the empirical section.

This concludes the model. The equilibrium entails solving the system of equations (1), (3), (4'), (5'), (6), and (7), on six unknowns: deposits, bonds, loans, and

[8] The linear functional forms are unimportant for the results below, but they simplify the exposition.

the interest spreads (lending-, deposit-, and bond-spreads). The next section presents comparative static results in the perfect capital markets case.

Benchmark case: equilibrium under perfect capital markets

Plugging equation (4') into (7) gives the equilibrium in the loan market, which in the case of perfect capital markets becomes

$$z = z_0 - z_1(R^* + \bar{c}) \tag{8}$$

Similarly, plugging equation (5') into (6) gives the equilibrium in the deposit market

$$d = d_0 - \delta d_1(I^* + \bar{c}) \tag{9}$$

Equations (8) and (9) imply:

Result 1: In the perfect capital markets case, the credit market is isolated from changes in currency depreciation or in required reserves.

This result falls directly from equations (8) and (9). Recalling that $I^*=R^*+\pi^*+\varepsilon$, then an increase in exchange depreciation increases the opportunity costs of holding bank deposits, and reduces equilibrium deposits. Nevertheless, banks isolate the credit market by substituting bond for deposit financing. A similar result holds for changes in required reserves. Note also that an increase in the real international rate reduces equilibrium loans only by affecting the *demand* for bank loans. This is the money channel mechanism.

Equilibrium under imperfect capital markets

Performing the same substitutions, equilibrium loan and deposits are now given by:

$$z = z_0 - z_1 R^* - z_1[F(\gamma, b/k) + \bar{c}] \tag{10}$$

$$d = d_0 - \delta d_1(I^* + \bar{c}) + (1-\delta) d_1 F(\gamma, b/k) \tag{11}$$

Accordingly, in the imperfect capital markets case, the level of bond financing affects the equilibrium levels of loans and deposits. Using equations (1), (3), (10) and (11), it is easy to show that under imperfect capital markets, an increase in depreciation or in required reserves affects the credit market via a change the loan *supply* (an increase in the loan spread). More specifically,

Result 2: Under imperfect capital markets, an increase in currency depreciation, or in required reserves, increases the lending spread (I^l-I^*), and reduces the equilibrium level of loans. In addition, the lending-minus-deposit spread (I^l-I^d), goes up, and the deposit spread (I^*-I^d) goes down.

Proof: See Appendix.

The intuition behind this result is straightforward. An increase in currency depreciation increases the opportunity cost of holding bank deposits. As banks try to substitute deposit financing for bond financing, by equation (1) the bond spread (I-I^*) goes up. Given that $I^*(=R^*+\pi^*+\varepsilon)$ is increasing, this implies that the bond rate has to increase more than proportionally. By cost minimization, equilibrium deposit rates must increase by more than I^* and thus the deposit spread goes down. Finally, the increase in the average cost of funds to banks translates into the credit market, producing a contraction in the loan *supply* and equilibrium lending. Similar effects arise in response to an increase in required reserves.

Note that the response of interest rates implies that lending-minus-deposit spreads should display a positive correlation with exchange rate depreciation, particularly in countries with less developed capital markets. Evidence of this is provided in the next section.

As an additional exercise, it is easy to see that an increase in the international real interest rate has two effects on the loan market. First, there is an effect on loan demand, similar to the perfect capital markets case considered above. Second, on top of that, there is a reduction in loan supply that further lowers equilibrium loans. This is the lending channel mechanism.

Before going into the empirical part, note that the effects of monetary conditions on the loan market are expected to be stronger for banks facing a steeper marginal cost curve of bond financing. This provides a basis for looking at differences across banks of different sizes, and across developed and developing countries. An additional source of cross sectional variation is provided in the next result.

Result 3: A decrease in bankruptcy costs increases the equilibrium level of bond financing, and lowers the equilibrium bond spread.

Proof: See Appendix.

The first part of this statement does not require any comment. The second implies that banks facing steeper marginal costs of bond financing will also have higher bond rates in equilibrium. This provides an additional test for the empirical part that follows, since it implies that it is possible to use the interest rates on bonds as a

measure of financial constraints on banks. The next chapter takes the implications of this model to the data.

Chapter 3: A Look at the International Evidence

This chapter takes the main results of the model to the data using panel regressions with fixed effects at the bank level. The idea is to test whether the sensitivity of loan growth to monetary conditions varies systematically across banks and among groups of countries. In particular, the following specification is used:

$$\Delta Loans_{i,c,t} = \mu_i + d_t + z_{c,t}\beta_1 + x_{i,c,t}\beta_2 + z_{c,t}x_{i,c,t}\beta_3 + \\ + z_{c,t}D_c\beta_4 + x_{i,c,t}D_c\beta_5 + z_{c,t}x_{i,c,t}D_c\beta_6 + \varepsilon_{i,t}$$

Where i=1,...,N, c=1,...,C, and t=1,...,T. Here N is the number of banks in the sample, C is the number of countries, and T is the maximum number of periods. The sample is unbalanced, so the number of observations varies across banks. The left-hand side variable, $\Delta Loans_{i,c,t}$, represents the first difference of the log of loans in constant (1995) local currency.[9] The model is specified in growth rates, as customary in the literature, to account for the autocorrelation of loans.

The vector $z_{c,t}$ includes country-specific variables, i.e., variables that are common across banks operating in the same country. Data sources for the macro variables are the World Bank's World Development Indicators, and the International Monetary Fund's International Financial Statistics (*IFS*). In particular, GDP GROWTH, the yearly growth rate of the gross domestic product, is included to control for the potential effects of the business cycle on loan demand. In order to provide a test of the theoretical framework above, the vector $z_{c,t}$ also includes four measures of monetary

[9] Loan growth was also measured in constant US$ to check robustness, with results similar to those reported in this chapter.

conditions. The first, DEPRECIATION, is computed as first difference of the log of the yearly average of the market exchange rate (series rf of the *IFS*). The second, MONEY MARKET RATE, is the yearly average interest rate for short-term borrowings between financial institutions (line 60b of the *IFS*). The third, RESERVE REQUIREMENTS, is an indicator variable that reflects the evolution of required reserves. This indicator ranges from 1 to 3, where a higher value means higher levels of required reserves. The indicator is based on Reinhart and Reinhart (1999) and Kaminsky and Schmukler (2001).[10] The fourth measure of monetary conditions, TREASURY BILL RATE, is the rate of US Treasury Bills (line 60c of the *IFS*). This is included to account for international interest rates.[11] Of course, this variable is common to all countries.

The vector $x_{i,c,t}$ includes three bank-specific variables intended to capture cross-sectional differences in the degree of liquidity constraints that banks are facing. The first, LAGGED LIQUIDITY, is computed as the sum of cash and liquid investments[12] over total assets at the end of the previous fiscal year. The rationale here is that banks with more liquid assets are in better position to offset an exogenous contraction in deposits without cutting their loan's portfolio, and therefore should be better prepared to isolate loan growth from changes in monetary conditions.

---

[10] I am indebted to Graciela Kaminsky and Sergio Schmukler for sharing their data on required reserves.

[11] Regressions were also performed using the LIBOR (series 11260EA of the IFS) with results similar to those reported here.

[12] Liquid investments include financial assets such as stocks, bonds and other marketable securities, treasury bills, short-term government obligations, municipal securities, and mutual fund shares.

The second, LOG ASSETS, is the log of bank assets (in 1995 US$). The model above suggests that smaller banks face steeper marginal costs of non-insured debt financing, and thus should be less able to isolate loan growth from changes in monetary conditions. In fact, studies on the lending channel in the United States show ample evidence that the size of the bank is related to its ability to raise non-insured debt. A widely used strategy makes use of indicator variables to group banks of similar sizes. Here, the use of a continuous variable is somewhat more stringent.

The third variable, DUMMY COST OF DEBT, is used to identify banks facing higher costs of non-deposit debt in a given year. For each bank-year, WorldScope reports interest expenses on non-deposit debt. Dividing this over total non-deposit debt at the beginning of the period gives an estimate of the average effective interest rate on non-insured debt at the bank level. As the nominal cost of debt differs across countries as well as over time, depending on macro conditions, the dummy compares the costs of non-insured debt between banks operating in the same country and on a yearly basis. In particular, DUMMY COST OF DEBT equals one if the effective rate on non-insured debt of a bank in a given year is above the 75^{th} percentile of the effective rates paid by all banks operating in the same country-year. According to the model above, banks facing higher effective rates of non-insured debt are expected to have a higher sensitivity of loan growth to monetary conditions.

To test for cross-sectional differences, the bank-specific variables included in the vector $x_{i,c,t}$ are interacted with the monetary conditions in vector $z_{c,t}$. The model above implies that bigger banks, and banks facing lower costs of non-deposit

financing, should be more able to isolate loan growth from changes in monetary conditions. This is a test commonly used in the lending channel literature, as well as in the credit channel literature. The present exercise goes a step further, by splitting the sample across groups of countries with the help of a dummy variable, D_c, that equals one for countries classified as low- or medium-income according to the World Bank (i.e., developing countries), and zero otherwise. This variable is interacted with the country- and bank-specific variables, as well as with the interaction between these two variables.

A time trend is represented by d_t, and μ_i stands for the bank-specific constant or fixed effect, which is assumed to be invariant over time. In all regressions performed, the Hausman test rejected the random effects specification. The error term $\varepsilon_{i,t}$ is assumed to have the usual properties (mean zero, serially uncorrelated, uncorrelated with the exogenous variables, and homoskedastic).

Data

The exercise uses bank-level data from Worldscope. The available information, presented in Table 1, comprises balance sheets, income statements and flow of funds for 832 banks in 27 countries (both developed and developing) during the 1986-1998 period. The sample is unbalanced, resulting in 6,648 balance sheets and income statements, and 3,748 cash flows gathered from the primary source. Worldscope reports both original data as published by the bank, as well as standardized figures that are adjusted to account for cross-country variations in accounting practices.

According to the source, the database includes only publicly traded banks with large market capitalization. This raises two concerns regarding bank size. The first is that one may expect a tendency of bigger banks to be located in developed countries, so the comparisons between bank sizes may mask cross-country differences. On the other hand, as the Worldscope sample is skewed towards publicly traded banks with large market capitalization, it introduces a bias against the hypothesis being tested, since small, non-listed banks are likely to be the ones facing higher liquidity constraints. In other words, the sample used in this chapter limits the power of the test. It may fail to detect differences in behavior across bank sizes, even if those differences are present for the whole population of banks.

The sample distribution by quintiles of bank sizes for both developed and developing countries is presented in Table 2. The cut-off values that separate the quintiles of bank size are defined using the asset distribution of the whole sample, measured in constant 1995 US$. Banks are allowed to jump across size categories, but a filter is used to try to eliminate years in which a merger or acquisition may be under way. Specifically, all observations showing a variation in total assets greater than 50 percent in absolute value between two consecutive years are eliminated from the sample. According to this criterion, 128 observations are deleted. It is apparent that median assets in each category are similar across developed and developing countries, with the exception of the fifth quintile, where the median assets of banks operating in developed countries almost double the median assets of banks operating in developing countries. Also, as should be expected, developed countries tend to represent a higher

proportion of the sample in the upper quintiles of bank size, although the difference is moderate. Most likely, the similarities in the distribution of bank sizes across developed and developing countries are a consequence of sample selection bias and not a reflection of true similarities in the population of banks. Again, this bias goes contrary to the hypothesis of the lending channel being stronger in developing countries, since the under-representation of smaller banks is expected to be greater in developing counties.

Table 3 presents the median structure of bank balance sheets across developed and developing countries by quintiles of bank size. Several regularities are apparent. For the total sample, larger banks tend to have a lower proportion of their assets in liquid assets (cash and total investments in securities). This has been documented in previous studies using data for the United States (Kashyap and Stein, 1995) and interpreted as consistent with the hypothesis of smaller banks facing higher liquidity constraints (so they optimally decide to hold a buffer stock of liquid assets). By far, loans are the most important component of bank assets, accounting for roughly ⅔ of total assets. Fixed assets represent a very small proportion of total assets (generally less than 2 percent), and decrease steadily with bank size. This stands in sharp contrast with non-financial firms, where fixed assets typically represent a much larger proportion of total assets.

On the liabilities side, total deposits are roughly the same size as loans, with smaller banks having lower loan to deposit ratios. This is also consistent with a story of buffer stocks being held by smaller banks. In addition, larger banks tend to rely

more on non-secured debt financing, and less on deposits and equity. This pattern, also documented in previous studies, is consistent with differences in market access to non-secured debt across banks of different sizes. In particular, if smaller banks face higher marginal costs of issuing non-secured debt, they will optimally choose to have a lower proportion of debt financing in equilibrium. Note also that the magnitude of cash flows relative to loans decreases steadily with bank size and is very small (lower than 3 percent). This suggests that the role of cash flows in the financing of loans is irrelevant, again standing in sharp contrast with the case of non-financial firms, which tend to rely on retained earnings to finance investment.

Similar regularities emerge by looking across groups of countries. Banks operating in developing countries tend to have fewer loans relative to assets, and appear to be systematically more capitalized. Flows from operation relative to loans are also higher in developing countries, and decrease with bank size. This feature suggests the existence of systematic differences in the structure of bank's balance sheets across bank sizes, and between developed and developing economies. In particular, banks in developing countries seem to have a more liquid asset structure, and to rely less on non-insured debt financing.

Descriptive Evidence from Aggregate Data

In order to provide some preliminary evidence, it is convenient to take a look at the co-movements of interest spreads, loan and deposit growth, and exchange rate depreciation between groups of countries. The model above provides testable implications regarding the effects of monetary conditions on interest spreads, and loan

and deposit growth. Table 4 presents pair-wise correlations on selected variables based on yearly information for the period 1986-1998. The sample excludes the United States (given that depreciation is defined against the US$), as well as episodes of exchange rate depreciation above 25 percent (the largest depreciation for the developed countries in the sample). Nevertheless, the results presented here hold for the whole sample. The correlations are divided across developed and developing countries in order to highlight differences among groups of countries with different levels of capital market development.

The list of variables includes the yearly rate of loan and deposit growth for each country, based on the median of the sampled banks, and various series taken from the World Bank's World Development Indicators database: interest rates (lending and deposit), interest spreads (lending-minus-deposit and lending-minus-LIBOR), and exchange rate depreciation. All these are yearly averages, which is more appropriate, since bank-level data are point figures taken at the end of the fiscal year for each bank, so they tend to be distributed throughout the calendar year. All growth rates are computed as the difference in the logarithms of the variables, expressed in constant 1995 local currency. Growth rates were also computed in constant US$ but results are not reported here. The resulting correlations show similar patterns in both cases.

The results reveal important differences in the co-movements of the series across developed and developing countries. Consider first depreciation and interest rates. In developed countries, currency depreciation is not correlated with interest

spreads, and shows a low negative correlation with lending and deposit rates in levels. In contrast, in developing countries, currency depreciation shows a correlation close to one both with interest spreads, and with lending and deposit rates in levels. A similar pattern arises when looking at the relationship between deposit rates and lending-minus-deposit spreads.

These results are consistent with the model presented above. Currency depreciation induces a substitution of non-insured debt for deposit finance , increasing the external finance premium facing banks, particularly in countries with less developed capital markets. By cost minimization, equilibrium deposit rates have to increase, and this translates into the loan market through a reduction in the supply of loans. Of course, there may be other explanations. For example, suppose that currency depreciation is perceived as a once-and-for-all adjustment in developed countries, while regarded as a sign of further instability in developing economies. If this is the case, the high correlation between lending-minus-deposit spreads and currency depreciation may indicate that the risk attached to the projects being financed by bank loans increases with currency depreciation. Moreover, these correlations may also reflect a reverse causality. Suppose that for some unspecified reason, projects in developing countries become riskier. Interest spreads will increase and capital will flow out of the country, inducing currency depreciation. Trying to disentangle the mechanisms operating behind these empirical regularities is beyond the scope of this chapter. For now, it suffices to note that the co-movements are consistent with the hypothesis being tested.

Turning to deposit growth, similar differences across groups of countries emerge. In developed countries, deposit growth commoves positively with deposit interest rates, implying an expansion in the deposit *demand* by banks in periods of high deposit rates (and vice-versa). On the contrary, in developing countries the correlation between deposit growth and deposit interest rates is negative, implying that periods of high deposit rates are dominated by a contraction in the deposit *supply*. Taking together this and the correlations between depreciation and deposit rates, suggests that periods of high depreciation are accompanied by a contraction in deposit supply, as implied by the model. Moreover, the correlation between loan growth and lending interest rates is *negative* in developing countries, implying that periods of low loan growth are dominated by a contraction in the supply of bank loans. In contrast, the correlation of loan growth with lending rates and lending spreads in developed countries is not statistically significant.

Finally, the correlation between deposit growth and loan growth in developing countries is close to one (0.97) and more than twice the corresponding figure for developed countries (0.41). This is also consistent with a lending channel being stronger in developing countries, because it suggests that loan growth is less isolated from deposit growth in these countries.

Overall, the picture that emerges from these simple correlations is consistent with a lending channel being stronger in developing economies and suggests that there are remarkable differences in the behavior of interest spreads, depreciation, and bank credit across groups of countries. In particular, it suggests that loan and deposit supply

shocks predominate demand shocks in developing economies, and that depreciation is an important supply shock. Further research exploiting the time series properties of these variables is left for future work. The next section provides evidence from bank-level data.

Evidence from Bank-Level Data

In order to describe the behavior of loan growth and deposit growth across banks, Table 5 presents summary statistics on these two variables. Growth rates are computed as the yearly difference of the logs in constant (1995) local currency. The sample is divided between banks operating in developed and developing countries, and further divided into two categories according to the costs of non-deposit debt financing facing banks. In particular, a bank-year is classified as "HIGH-COST-DEBT", if its effective interest rate on non-deposit debt is above the average for the corresponding country-year, and classified as "LOW-COST-DEBT" in the opposite case.

Panel A shows the summary statistics taken over the whole sample. In general, banks operating in developing countries have higher average rates of loan and deposit growth, and the series are also less stable. Comparing within country groups, loan growth of high-cost banks is lower than loan growth of low-cost banks both in developed and developing countries. Moreover, deposit growth is not significantly different across these two groups. The latter result is important, since it suggest that loan demand does not substantially differ across high- and low-cost banks, which is an important condition for the validity of the tests presented here. Of course, this evidence is in line with the lending channel hypothesis, while there may be other

possible explanations, including reverse causality. Panel B shows the summary statistics during periods of deposit contraction. Again, the evidence is supportive of the lending channel being stronger in developing countries. The contraction in loans is more severe for high-cost banks both in developed and in developing countries. Interestingly, high-cost banks operating in developing countries actually show a *lower* average contraction in deposits. Panel C displays the summary statistics during periods of deposit expansion. Here the difference in loan growth across high- and low-cost banks is not significant.

Overall, the descriptive evidence is consistent with the existence of a lending channel. The next two exercises provide more formal tests. Consider first the effects of exchange rate movements on loan growth. The lending channel model has testable implications regarding the cross-sectional behavior of bank loans in response to exchange rate depreciation, which can be stated as follows.

Hypothesis 1: Loan growth is more sensitive to exchange rate depreciation for smaller banks, for banks operating in developing countries, and for banks facing higher costs of non-insured debt financing.

The hypothesis being tested states that depreciation has a more negative effect on loan growth for banks facing steeper marginal costs of non-insured debt financing. Under the presumption that these are the smaller banks, as well as the banks operating in developing countries, this implies that the interaction between depreciation and the developing country dummy should be negative, and that the interaction between depreciation, size and the 'developing country' dummy should be positive. Column 1

in Table 6 presents the results. As expected, loan growth is higher for banks having a more liquid asset structure at the beginning of the period, which may reflect a tendency to relocate the bank's portfolio in favor of less liquid assets. Also, in line with the hypothesis, loan growth is higher for bigger banks and decreases with currency depreciation. The effect of depreciation on loan growth is significantly stronger in developing countries. Note also that the interaction between depreciation and bank size implies that loan growth of bigger banks operating in developing countries is less affected by depreciation, which again is consistent with the hypothesis.

A possible explanation of the above differences in the sensitivity of loan growth to depreciation across developed and developing countries is that they come from differences in the size of shocks. This would bias the results if the underlying relationship between depreciation and loan growth were non-linear. Throughout the period studied, depreciation rates are very different across both groups of countries. While the highest rate of depreciation for developed counties is 24 percent (Italy in 1993), the sample includes several episodes of high inflation for Latin American countries (for example Peru: 425 percent in 1990, Brazil: 318 percent in 1990, Venezuela: 87 percent in 1989, and Mexico: 81 percent in 1987). Thus, the differences between developing and developed countries may be due to differences in the size of the exchange rate shocks. To control for this, the results reported in Column 2 exclude years with exchange rate depreciation higher than 25 percent. The results remain valid. As a third exercise, to explore the sensitivity of this result to the inclusion of United

States banks (whose corresponding depreciation rate is zero by definition), Column 3 reports the same regression excluding all United States banks (as well as years with depreciation rates higher than 25 percent). The results also remain consistent with the stated hypothesis.

One shortcoming of this test is that it relies on the assumption that smaller banks, as well as banks operating in developing countries, face steeper marginal costs of non-insured debt. A more direct approach can be obtained by using information on the actual costs on non-insured debt for each bank. The result 3 above suggests that a bank facing a steeper marginal cost of non-insured debt will also pay higher average interest rates in equilibrium. This provides a basis for including the DUMMY COST OF DEBT in the regressions. The results are presented in Table 6, Column 4. They reveal that loan growth decreases with exchange rate depreciation, and that bigger banks operating in developing countries experience a lower contraction in loan growth. Moreover, banks facing higher costs of non-insured debt financing have a higher sensitivity of loan growth to exchange rate depreciation, particularly in developing countries. This result is robust to the exclusion of periods with exchange rate depreciation higher that 25 percent per year (Column 5) as well as to the exclusion of the United States banks (Column 6). Therefore, the evidence shows that banks identified a priori as facing steeper marginal costs of non-deposit debt have a higher sensitivity of loan growth to depreciation. The next test considers the sensitivity of loan growth to changes in other indicators of monetary conditions.

Hypothesis 2: Loan growth is more sensitive to tight monetary conditions for smaller banks, for banks operating in developing countries, and for banks facing higher costs of non-insured debt financing.

This hypothesis is tested with two sets of regressions. The first includes two measures of monetary conditions: money market rates, and an indicator of reserve requirements. Money market rates are included to provide a measure of the degree of liquidity in the financial system. In terms of the model above, they reflect foreign interest rates and exchange rate depreciation. Thus, one may expect that much of the information content in exchange rate depreciation is actually embedded in money market rates. The second set of regressions includes the three month treasury bill rate, exchange rate depreciation, and the indicator on reserve requirements.

As before, these variables are interacted with bank characteristics to look for cross-sectional differences in the response of loan growth.

The results of the first set of regressions are shown in Table 7. The first column presents the results of the regression based on the whole sample, and the second excludes United States banks. To simplify the presentation, the coefficients are grouped in two panels. Panel A reports those associated with reserve requirements, and Panel B reports those associated with money market rates.

As in the previous exercise, the results show that banks with more liquid assets at the beginning of the fiscal year tend to have higher rates of loan growth. More interesting, this effect is stronger for banks operating in developing countries. Going now to Panel A, there is some evidence that loan growth is lower in periods of higher

than average reserve requirements, and that loan growth of bigger banks is less sensitive to changes in required reserves, with no significant differences between developed and developing countries. A possible explanation for the weak relationship between loan growth and reserve requirements within countries is the use of reserve requirements to counteract capital flows. In particular, if reserves are increased in periods of large capital inflows, as argued in Reinhart and Reinhart (1999), they may not be associated with a reduction of available funds to banks.

Going now to Panel B, the evidence strongly supports the stated hypothesis. Loan growth is lower than average in periods of higher than average money market rates, and the sensitivity of loan growth to money market rates is stronger for banks operating in developing countries. In addition, loan growth of bigger banks is less sensitive to fluctuations in money market rates, and banks with high costs of non-insured debt display a higher sensitivity of loans to money market rates. Also in line with hypothesis 2 is the fact that banks operating in developing countries show significantly higher coefficients (in absolute value). The second column shows that the results on money market rates for banks operating in developed countries are driven by the sub-sample of banks operating outside the United States.

The results of the second set of regressions are shown in Table 8. The coefficients of the control variables are omitted for convenience. Panel A presents the results on reserve requirements. There is some evidence that loan growth goes down in periods of higher than average reserve requirements, with no significant difference across groups of countries. In addition, bigger banks are more able to isolate loan

growth from changes in reserves, while banks facing high costs of non-deposit debt display the opposite tendency, especially in developing countries. Panel B presents the results on Treasury Bill rates. The evidence shows that changes in international interest rates have no significant effect on loan growth. This result was also obtained by using LIBOR as an indicator of international rates. Panel C presents the results on depreciation, which are similar to those obtained before and do not require further comment.

So far, the evidence is consistent with the idea that banks are unable to freely substitute deposit financing with other sources, and therefore play a role in the transmission of shocks to deposits to the market for bank loans. In fact, similar results have been found using data on United States banks and have frequently been interpreted as supporting the lending channel hypothesis. However, this interpretation has not been free of debate, since the finding is also consistent with the presence of systematic differences in the response of loan demand to interest rates across banks with different characteristics. In particular, it has been argued that the observed differences in loan growth across bank sizes may also arise if smaller banks lend a higher proportion of their portfolio to more procyclical small businesses. In the present exercise, the reported differences in bank loan behavior across developed and developing countries shed additional light into the picture. One may still argue that, in developing countries, periods of high interest rates may coincide with particularly unstable macroeconomic conditions, so that movements in loan demand may still be causing the observed cross-country differences, even after controlling for GDP

growth. Similarly, the fact that loan growth varies systematically across banks facing different costs of non-insured debt could also be attributable to systematic differences in loan demand. For example, banks facing higher cost of debt may have riskier borrowers or a loan portfolio more sensitive to shocks.

An Alternative Specification

The regressions presented in the previous section, while suggestive, may still be subject to some caveats. First, while the models were specified in growth rates to reduce the incidence of serial autocorrelation, this treatment restricts the autocorrelation coefficient to unity, while the use of growth rates could introduce mean reversion in the results. Second, the use of bank balance sheet variables to proxy for liquidity constraints, even if lagged, introduces the possibility of endogeneity bias. For example, bank assets and loans, or liquid assets and loans are probably jointly determined, and the use of lags may not be sufficient to control for this problem. A more appropriate treatment would be to model these variables as predetermined. Third, by directly testing of the sensitivity of loans to monetary conditions, the previous specification neglects the underlying hypothetical channel operating though deposits.

This section, presents an alternative—and to some extent more basic—specification. It regresses the log of loans (in levels) against their lagged values and the log of deposits, instrumented by monetary conditions (i.e. MONEY MARKET RATE, exchange DEPRECIATION, RESERVE REQUIREMENTS and the US TREASURY BILL RATE). The specification also includes GDP GROWTH to control for loan changes in demand

and adds interacting terms with the DEVELOPING dummy to explore for differences in the response of loans to deposits across developed and developing countries. Under this specification, a lending channel being more severe in developing countries would imply a higher coefficient for the interaction of deposits with the developing country dummy.

An alternative specification including the lagged values of liquidity and capitalization, as well as their interactions with deposits and with the developing dummy was also computed. A priori, the sensitivity of loans to leposits would be expected to be lower for banks with higher capitalization and/or liquidity in the previous period.

Due to the inclusion of the lagged values of the dependent variable, the regression was computed with GMM, using the Arellano-Bond (1991) estimator. The results of the one-step estimation with robust standard errors are presented in Table 9. The regressions in columns [1] to [3] employ the whole sample, excluding episodes of exchange rate depreciation above 25 percent per year, while the regressions presented in columns [4] to [6] also exclude United Stated banks.

In general, the results confirm the high autocorrelation of loans (in most cases around 0.6), which provides a reassuring support for the specifications presented in the previous section. At the bottom of the table, the tests reject the null of no first-order autocorrelation in the differenced residuals, but is not possible to reject the null of no second-order autocorrelation in all cases. The presence of first-order autocorrelation, however, does not imply that the estimates are inconsistent. Going to the coefficients,

loans are shown to be more pro-cyclical and also more closely correlated with deposits in developing countries. In columns [2] and [5], there is some evidence that banks with higher capitalization tend to have a larger loan portfolio at the end of the following year. This relationship is somewhat weaker for banks operating in developing countries, but the difference is not statistically significant. Perhaps more importantly, the regressions in columns [3] and [6] add interacting terms between deposits and bank characteristics, as well as further interactions with the developing country dummy. The results strongly indicate that banks with higher capitalization and/or liquidity tend to have a larger loan portfolio at the end of the following year, with a significantly lower coefficient for developing countries. Also, the sensitivity of loans to deposits is lower for banks with higher (lagged) capitalization and/or liquidity, but less so for developing countries.

Concluding Remarks

This chapter looks at the international evidence on the lending channel. The results presented strongly support the hypothesis that banks play a role in the transmission of these disturbances into the economy, and that the transmission is stronger precisely where banks are more important as a source of firm financing, that is, in developing countries. The chapter makes two contributions to the existing literature. First, by looking at cross-country data, it uses a source of variation not exploited in previous work, namely, differences in the degree of capital market imperfection across countries. It is well known that the lending channel hinges on the existence of capital market imperfections. In particular, it requires frictions preventing banks from freely

substituting deposit financing with other sources, and it requires that (at least some) firms be dependent on bank loans to execute their investment decisions or to operate normally. While the measurement of capital market imperfections is elusive, it may be argued that they tend to be more intense in developing countries. In fact, existing evidence shows that firms operating in developing countries are more dependent on bank loans. This provides the basis for the cross-sectional variation exploited in this chapter.

The second contribution is that the paper stresses the importance of the foreign exchange market as a potential source of shocks to bank deposits. By focusing on United States data, the existing literature on the lending channel restricts the attention to the role of banks in the transmission of *monetary policy*. Overlooking of the relationship between the foreign exchange market and the bank deposit market is natural since the United States is a relatively closed economy. Nevertheless, in the open economy case, the importance of the foreign exchange market comes to the front. Accordingly, this chapter argues that banks may also play an active role in the transmission of shocks to the foreign exchange market into the economy.

The results strongly support the hypothesis that banks play an active role in the transmission of monetary and exchange rate shocks, especially in developing countries. At the macro-level, the co-movement of interest spreads and exchange rate depreciation systematically differs across developed and developing countries. In particular, lending-minus-deposit spreads increase with exchange rate depreciation in developing countries, while showing no apparent change in developed countries. This

holds true for similar rates of currency depreciation in both groups of countries. A similar result is obtained with lending-minus-LIBOR spreads. While these results may be consistent with several alternative explanations, it is also implied by the predictions of a lending channel model. This empirical regularity across groups of countries seems to be robust and opens the door for further research.

At the bank level, this chapter compares the response of bank loan growth to monetary conditions across banks of different characteristics. Specifically, four variables are considered: exchange rate depreciation, money market rates, Treasury Bill rates, and changes in reserve requirements. Among these four indicators, exchange rate depreciation and money market rates appear to have the stronger effects on loan growth. On the other hand, international interest rates, frequently blamed as a shock to developing countries financial systems, do not have any significant effect on loan growth.

From the policy perspective, the results presented in this chapter show the importance of the foreign exchange market as a source of credit fluctuations and support the idea of contractionary devaluations, particularly in developing countries. On the other hand, the results also call for policies aimed at developing local capital markets, or to ease the access of domestic banks to international markets. In this sense, opening the local stock markets to foreign investors, a policy implemented in most developing countries since the 80's, seems to be a movement in the right direction. Complementary policies to improve the institutional structure of local capital markets and to increase transparency (i.e., bankruptcy laws, shareholders' protection,

accounting standards) may also contribute to the development of domestic capital markets.

Regarding bank regulation, the results suggest that allowing deposits in foreign currency could contribute to stabilize the local deposit base, by shielding their value against currency fluctuations. An alternative would be to allow foreign banking entry. If foreign banks are able to use internal funds from their parent companies in response to a liquidity squeeze, they may help isolate the credit market from shocks to deposits. Moreover, foreign banks may also have an effect on the stability of deposits themselves if they are perceived as being stronger than local banks. Evaluating whether foreign bank participation helps to isolate the credit market from monetary disturbances is a natural extension of the exercise presented here and is the main focus of the next chapter.

The results presented here are a first pass, and additional empirical research is called for. On the one hand, the sample used here is skewed towards large, public banks, which are less likely to be liquidity constrained. In that sense, it is remarkable that the results obtained still support the existence of a bank lending channel.

Chapter 4: Are Foreign Banks Different?*

Are foreign banks less responsive to monetary conditions in emerging economies? This chapter uses a panel dataset of 1565 banks in 20 Asian and Latin American countries during 1989-2001, to test for systematic differences in the sensitivity of loan and deposit growth to various measures of monetary conditions, across domestic and foreign banks. It also looks for systematic differences in the response of bank-specific lending and deposit rates to monetary conditions across domestic and foreign banks. As a robustness check, the chapter further explores differences in the behavior of domestic and foreign banks during normal times and periods of financial distress, exploiting various definitions of banking and currency crises available in the literature.

The results indicate that the response of loans and deposits to monetary conditions is similar across domestic and foreign banks. In particular, periods of tighter monetary conditions are associated with lower loan and deposit growth, but differences across domestic and foreign banks appear to be weak. In contrast, the sensitivity of loan growth to monetary conditions tends to be correlated with observable bank characteristics such as capitalization and asset liquidity. However, differences across domestic and foreign banks do emerge in the behavior of interest rates. Lending and deposit rates of foreign banks display a lower sensitivity to monetary conditions, and they also react smoothly during periods of financial distress, suggesting that foreign banks are in a better position to attract deposits.

---

* This chapter is based on join work with Carmen Reinhart and Marco Arena.

A possible interpretation of these results is that foreign banks are not less financially constrained than domestic, due perhaps to organizational arrangements that prevent them from receiving funding from their mother institutions. Otherwise, if foreign banks are in fact less financially constrained, the results presented here only provide weak evidence in support of the bank-lending hypothesis of monetary transmission. At a more general level, the evidence indicates that foreign bank participation in emerging economies has not led to increased instability in credit markets.

Foreign bank participation in emerging economies is a relatively recent phenomenon that in most cases goes back to the mid-1990s, reflecting global trends of consolidation and integration in the banking industry, as well as privatization and financial liberalization in emerging economies. In major Latin American countries, the percent of total bank assets controlled by foreign institutions reached 25 percent in 1999 (45 percent excluding Brazil and Mexico) from 7.5 percent in 1994 (International Monetary Fund (2000)). In Asian countries, foreign bank participation has been relatively less important, increasing after the removal of entry restrictions in the aftermath of the 1998 financial crisis.

The increased foreign bank presence in emerging economies has triggered interest in assessing its potential effects on efficiency in the banking industry, as well as on financial stability. So far, studies comparing the behavior of domestic and foreign banks in emerging economies are still incipient, and most of them focus on the

efficiency effects of foreign bank entry.[13] This chapter belongs to the strand that focuses on the effects of foreign bank entry on financial stability. The main interest is to assess whether foreign bank entry has altered the response of the banking system to domestic and external shocks.

A priori, arguments on the potential effects of foreign banks on the stability of the banking sector are mixed. On the positive side, it has been argued that foreign banks may help stabilize the supply of credit if they are able to resort to upstream financing from their mother companies, especially during bad times. Moreover, foreign banks themselves may have a more stable deposit base if they are perceived as more robust than their domestic counterparts. On the negative side, it has been argued that foreign banks may easily pull out from emerging countries, and that they could in fact transmit external shocks into host countries.

This chapter is closely related to Dages et al. (2000), which compares the lending behavior of domestic and foreign banks in Mexico and Argentina during the nineties, and finds no significant differences. Nevertheless, their coverage is much smaller and their approach studies the behavior of lending before- and after-crisis periods, as well as the sensitivity of lending to economic activity and real interest rates. Instead, this chapter studies the sensitivity of bank lending to various measures of monetary conditions.

---

[13] The working hypothesis is that foreign bank entry leads to increased competition and efficiency in the banking industry, since foreign banks tend to use more modern management and risk-taking practices. To date, the empirical evidence indicates that competitive pressures caused by foreign entry have led to improvements in banking system efficiency (see for example, Barajas et al. (2000); Claessens and Glaessner (1999); Claessens et al. (2001); Crystal et al. (2001)).

This chapter is also related to the literature on the lending channel of monetary transmission, which focuses on the role of banks in the transmission of monetary shocks into credit markets, via loan-supply effects.[14] The basic hypothesis is that capital market imperfections may prevent (at least some) banks from freely substituting away a negative shock to deposits with other sources of funding. In consequence, financially constrained banks may optimally choose to cut lending in response to a shock to deposits, affecting the availability of funds to bank-dependent firms. A longstanding issue in the lending channel literature is how to disentangle whether the responses of credit to monetary shocks come from loan demand—as implied by interest rate channels—or if loan supply effects are also present.

In order to get around this identification problem, empirical studies have increasingly resorted to the use of bank-level data, testing for cross-sectional differences in the response of bank lending to monetary shocks across banks with different degrees of financial constraints. Since financial constraints are not directly observable, they have been usually proxied by bank characteristics such as liquidity, size, and capitalization (for example, Jayaratne and Morgan (2000), Kishan and Opiela (2000), Kashyap and Stein (2000)). Financial constraints have also been proxied by bank ownership. Houston et al. (1997) explored the role of internal markets in banking, and found that the loan growth of bank subsidiaries is sensitive to the financial position of their holding companies. A similar approach was applied by Ashcraft (2000), who exploited a panel database of U.S. banks, using bank affiliation

[14] Among others, earlier contributions include Bernanke and Blinder (1988), Kahyap, et al. (1993), Bernanke and Gertler (1995), Kashyap and Stein (1995).

with multi-bank holding companies to proxy for financial constraints. In the international context, a similar approach was implemented by Peek and Rosengren (1997), who looked at data on Japanese banks operating in the U.S., and found that binding risk-based capital requirements associated with the Japanese stock market decline of end-1980s translated into a decline in lending by their U.S. branches.

This chapter follows a parallel approach and exploits the presence of internal financial markets as a source of cross-sectional variation between domestic and foreign banks. However, the emphasis here is completely different, since the main purpose is to study the response of bank lending to monetary conditions in the host country, instead of dealing with the role of foreign banks in the transmission of shocks across countries.

To the extent that foreign banks are less financially constrained than domestic—especially during periods of tight monetary conditions—comparing the relative responses of loan growth to monetary conditions across domestic and foreign banks provides an alternative way to tackle the identification problem. This test hinges on the validity of two assumptions. First, all else equal (i.e. capitalization levels, asset liquidity, and other observable bank characteristics), foreign banks have to be less financially constrained than domestic, either because they can resort to internal funds, or because they face a more stable deposit base. Second, loan demand facing domestic banks cannot be systematically different from the loan demand of foreign banks.

This identification strategy is implemented with the use of bank-level fixed effects regressions, splitting the sample of banks between domestic and foreign with

the use of a dummy variable. A baseline exercise compares the response of selected balance sheet components to monetary conditions across domestic and foreign banks, after controlling for changes in loan demand, proxied by GDP growth, and observable bank characteristics such as size, liquidity and capitalization. A second, more restrictive set of tests further splits the sample of banks by their liquidity and capitalization levels, and explores for systematic differences in the response of loan growth across domestic and foreign banks, in the subsets of banks with lower liquidity and capitalization relative to other banks operating in the same country. Finally, a third test uses various definitions of currency, banking and debt crises and compares the behavior of domestic and foreign banks throughout crises and tranquil periods.

The main contributions of the chapter are as follows. First, it adds to the scarce literature on the lending channel outside the United States, particularly in emerging markets. Second, it exploits a novel approach to identify supply-side effects in the credit market, which is one of the main challenges of the lending channel literature. Specifically, it uses differences in bank ownership (i.e. domestic versus foreign) to capture variations in liquidity constraints across banks. Third, it uses a comprehensive bank-level panel dataset, covering most Latin American and emerging Asian countries during the nineties, and reconstructs the evolution of bank ownership by intersecting the sample of banks with a complete list of mergers and acquisitions during the period. Fourth, the chapter assembles a dataset of reserve requirements for a sample of 20 emerging market countries, using information from central bank reports. Finally, this chapter also explores the response of bank-specific deposit and lending rates to

changes in monetary conditions. Previous work has mainly concentrated on the behavior of bank loans, neglecting the additional information provided by the behavior of bank spreads.

The rest of the chapter is divided as follows. The next section discusses the methodology and the hypotheses tested, as well as potential sources of bias and endogeneity problems. The third section describes the data. The fifth section presents the results of the regressions of selected balance sheet components on monetary conditions, splitting the sample between domestic and foreign banks. The sixth section focuses more closely on the response of loan growth to monetary conditions, further splitting the sample of banks by capitalization and liquidity levels. Section seven explores for systematic differences in the behavior of domestic and foreign banks during tranquil and crises periods, and section eight summarizes the main conclusions and presents a brief discussion of possible extensions.

Methodology

As mentioned above, in recent years the empirical literature on the lending channel has increasingly focused on bank-level data to identify changes in the supply of bank credit. The strategy usually consists in testing for systematic differences in the response of loan growth to monetary conditions, across banks facing different degrees of financial constraints. Since financial constraints cannot be directly measured, they are usually proxied by observable bank characteristics such as size, liquidity, and capitalization. This chapter uses a parallel approach, and goes a step further, since it also uses an alternative measure of cross-sectional variation in the degree of financial

constraints, namely, bank ownership. The underlying hypothesis is that, all else equal, foreign banks may be less financially constrained than domestic if they are able to resort to upstream funds from their mother companies, especially during periods of financial distress.

To implement this idea, the chapter implements a series of tests to explore the response of selected balance sheet and income statement components to changes in monetary conditions, across domestic and foreign banks, after controlling for other bank characteristics. More specifically, it uses six separate models that share the general form:

$$y_{i,c,t} = \alpha_i + \sum_{s=1}^{r} \beta_s x_{c,t-s} + \rho z_{i,c,t-1} + \sum_{s=1}^{q} \delta_s m_{c,t-s} + u_{it} \qquad (12)$$

In this equation, i=1,...,N refers to individual banks (panels), c=1,...,C to countries, and t=1,...,T_i to time. The sample is unbalanced, so T_i varies across banks. The constants α_i, are the bank-level fixed effects. Each one of the six groups of regressions uses a different (bank-level) dependent variable, y_{ict}, including: LOAN GROWTH, DEPOSIT GROWTH, the ratio of net LOANS TO DEPOSITS, LENDING RATES, DEPOSIT RATES, and LENDING MINUS DEPOSIT SPREADS. Loan and deposit growth were computed by taking the first difference of the (log) of the corresponding series, measured in constant (1995) local currency units. Bank-specific lending and deposit rates were estimated by combining information from income statements and balance sheets. Specifically, lending rates were computed by dividing interest revenues by average loans, and deposit rates were computed by dividing interest expenses on deposits over average

deposits. The spreads between lending and deposit rates were computed as the difference between these two.

The vector *x* contains country-level variables intended to control for changes in loan demand. Here the specification includes the natural logarithm of GDP, also measured in 1995 local currency. The vector *z* contains bank-level characteristics intended to proxy for financial constraints. Following the standard practice, three indicators were used: a measure of bank size, an indicator of asset liquidity, and an indicator of bank capitalization. Regarding bank size, the presumption is that bigger banks face lower external finance premia and are thus better prepared to substitute away a shock to deposits with other forms of financing. The chapter uses a relative measure of SIZE, computed as the difference between the log of assets of a bank in a given year (in 1995 local currency), and the average computed over all banks in the same country and year. This treatment removes trends in bank and has been implemented in previous studies (for example, Hernando and Martínez-Pagés (2001); Loupias, Savigna, and Sevestre (2001)).

$$Size_{i,c,t} = \ln(Assets_{i,c,t}) - \frac{\sum_{i \in c} \ln(Assets_{i,c,t})}{N_{c,t}} \text{ , for } c=1,...,C$$

Where N_{ct} stands for the number of banks in country *c* in year *t*. Therefore, the resulting measure is a normalized variable with zero mean for each country and year. The second variable, asset LIQUIDITY, was computed as the proportion of liquid assets

in total assets.[15] The argument is that banks with more liquid assets are in better position to isolate loans from unexpected shocks to deposits. The third variable, CAPITALIZATION, was defined as equity capital over total assets. The presumption is that better-capitalized banks tend to pay lower risk premia on non-insured debt financing, and therefore face lower liquidity restrictions. These two variables were normalized with respect to the sample averages of each country. For example, the transformation applied to liquidity was:

$$Liquidity_{i,c,t} = Liquidity_{i,c,t} - \frac{\sum_t \sum_i Liquidity_{i,c,t}}{N_c}$$

Where N_c is the number of observations in country c over the whole period. A similar treatment was applied to capitalization. Potential endogeneity problems and sources of bias associated with these variables are discussed below.

Going back to the specification, the vector m contains several measures of monetary conditions. First, the evolution of liquidity in the banking system was captured with the rates on short term lending between financial institutions, MONEY MARKET RATES, (series 60b of the *IFS*).[16] Second, the evolution of required reserves was tracked with RESERVE REQUIREMENTS, an indicator variable constructed on the basis of central bank reports (see Appendix 1 to 3 for details). This indicator was

---

[15] Liquid assets include cash and reserves, government bonds, and other marketable securities.

[16] For countries with incomplete or not available information on money market rates, an alternative indicator was used. Deposit rates (series 60L) were used for Bolivia, Chile, Colombia, Panamá, Paraguay, and Venezuela; the call money rate (series 60) was used for India; the 1-month average interbank offer rate for Hong Kong; and the interbank rate for Taiwan.

allowed to vary on a scale from 1 to 5, with a larger number indicating higher reserve requirements.[17] Third, monetary conditions include the yearly percent change of the average market exchange rate, DEPRECIATION, (series rf of the *IFS*), and the three-month US Treasury bill rate, T-BILL (series 11160c of the *IFS*). The inclusion of these two variables follows from the fact that all countries included in the sample are small open economies. Thus, developments in the foreign exchange market tend to affect the stability of banks' deposits. Potential multicollinearity problems among these monetary indicators were avoided by running two specifications. The first includes domestic interest rates and reserve requirements. The second exploits the uncovered interest parity condition replacing domestic interest rates with both international interest rates and the change in the nominal exchange rate.

Separate regressions were estimated for Asia and Latin America, under the presumption that differences in macroeconomic performance as well as in banking regulations and practices between these two regions render the population parameters different. It is well known, for example, that foreign bank entry in emerging markets has led to the emergence of "regional evolvers", that is, banks that use their relative advantages (for example: historic and cultural links with host countries) to focus their international expansion into a particular region. This is the case for Spanish banks in Latin America, and Japanese banks in East Asia.

---

[17] Actual reserve requirements (in percent) are not used because in some cases these are defined on marginal deposits, while in other cases they are based on average deposits. In many cases, judgment was required to map reserve requirements into the indicator variable.

Turning now to a brief discussion of the tests performed, the lending channel hypothesis has clear implications for cross-sectional differences in the response of the selected endogenous variables to changes in monetary conditions, across banks with different levels of financial constraints. Under the null that foreign banks are less financially constrained than domestic, a basic test could be conducted by comparing the coefficients associated with the monetary conditions (the δ's) between domestic and foreign banks. Following this, a test of coefficient equality between these two groups was implemented with the help of dummy variables interacted with each right-hand side variable. An additional, more restrictive test was also implemented by further splitting the sample by bank characteristics. In particular, dummy variables were created to separate banks with lagged capitalization above the 75^{th} percentile with respect to the sample of banks operating in the same country. Similarly, another set of dummy variables was created to separate banks with lagged liquidity above the 75^{th} percentile with respect to the rest of banks in the same country.

We now turn to a brief discussion of the models that use quantity-related endogenous variables (i.e. loans and deposits). The first model provides a test for the sensitivity of loan growth to changes in monetary conditions which, under the lending channel hypothesis, is expected to be stronger for more financially constrained banks. Thus, under the null, the coefficients associated with domestic banks are expected to be higher in absolute value (i.e. more negative) than those for foreign banks. The second model further explores for differences in the sensitivity of the deposit base to monetary conditions across domestic and foreign banks. Here the main interest is

exploratory. In principle, if banks have the capacity to adjust their deposit rates to partially offset a negative shock to deposits, the lending channel hypothesis should imply a *lower* sensitivity of deposits to monetary conditions for more financially constrained banks—since they are less capable of replacing them with other sources of funds and are thus more likely to raise deposit rates in order to maintain their deposit base. The third model is closely related to the previous two. It checks for changes in the relative importance of deposits in the financing of loan portfolios, in response to changes in monetary conditions. The lending channel hypothesis implies that the associated coefficient should be insignificant for more financially constrained banks, and positive for less financially constrained banks, since a lower proportion of loans will be financed with customer deposits in periods of tighter monetary conditions.

Consider now the models with price-related endogenous variables (i.e. interest rates). The lending channel hypothesis implies a higher response of lending and deposit rates to tighter monetary conditions for financially constrained banks. Moreover, the lending minus deposit spread is expected to increase under tighter monetary conditions for financially constrained banks. This is because, in response to a negative shock to deposits, banks try to resort to alternative forms of financing, increasing the premium they pay on non-insured debt. By cost minimization, this implies that equilibrium deposit rates also increase (especially for financially constrained banks). Finally, because of the tax-like effect of reserve requirements on insured deposits, this increase is translated by more than one-to-one into the credit market, increasing the lending minus deposit spread.

As a by-product, the coefficients associated with GDP growth (the β's) also allow us to explore for systematic differences in the cyclical behavior of the selected endogenous variables across domestic and foreign banks, and test if loand demand shocks affect the two types of banks differently. A similar exercise is provided in Goldberg et al. (2000) using data for Mexico and Argentina.

There are potential endogeneity problems and bias associated with the use of bank characteristics (i.e. size, liquidity, and capitalization). Regarding size, a bank may actually become larger precisely because of large deposit (and loan) growth. Regarding capitalization, a bank may *choose* to be better capitalized because it faces a higher external finance premium in the first place. Therefore, it is unclear whether better-capitalized banks are in fact less financially constrained in equilibrium. Actually, balance sheet data show that capitalization decreases systematically with bank size, suggesting that it may be a poor indicator of the degree of liquidity constraints. A similar problem arises with the use of liquidity ratios. A bank may optimally *choose* to have a more liquid asset structure to compensate for higher financing restrictions. Again, it is unclear whether a less liquid asset structure is a clear-cut indicator of higher liquidity restrictions. To reduce these endogeneity problems, the regressions use lagged values of bank-level characteristics.

A related problem, spurious correlation, may arise from the use of liquidity ratios as defined. To see why, suppose that bank assets are composed only of liquid instruments and loans. In this simplified balance sheet, a bank with higher-than-average liquid assets in period *t-1* will mechanically have a higher-than-average loan

growth in year *t*. Thus interacting monetary conditions with a liquidity indicator will tend to produce results biased in favor of the lending channel hypothesis (i.e. banks with more liquid balance sheets having less sensitivity of loan growth to monetary disturbances). The problem of spurious correlation can be avoided by choosing a different scaling variable. For example, liquid assets could be scaled by total deposits, which in fact seems to be the relevant measure if deposits are the main source of shocks to bank's liabilities. For comparative purposes, this chapter computes liquidity in the usual way (scaling liquid assets by total assets), but an additional exercise was implemented using deposits as the scaling variable with similar qualitative results.

Data

Bank-level data (i.e. financial statements) come from the Bankscope database. Series are yearly, covering a sample of 1,565 banks in 20 countries during 1989-2001. The sample of countries includes major Latin American and Southeast Asian economies.[18] Comparing the behavior of domestic and foreign banks in this sample of countries during the nineties offers a rich experiment, since it covers pre- and post-entry years, as well as several banking and balance of payment crises. In total, the sample has 8,574 observations, distributed across time and countries as shown in Table 9. The decrease in the number of banks in Asia after 1997 reflects the consolidation process following the Asian crisis.

---

[18] For Latin America, the list of countries includes: Argentina, Bolivia, Brazil, Chile, Colombia, Mexico, Panama, Paraguay, Peru, Uruguay, and Venezuela. For East Asia: Hong Kong, India, Indonesia, South Korea, Malaysia, Philippines, Singapore, Thailand, and Taiwan.

Using the Bankscope database has two major advantages. First, the coverage is fairly comprehensive, with sampled banks accounting for about 90 percent of total assets in each country. Second, the accounting information at the bank level is presented in standardized formats, after making adjustments for differences in accounting and reporting standards. The accounting information is presented at two consolidation levels. In most cases, the reported figures are unconsolidated. Yet, for some mother banks, Bankscope integrates information from subsidiaries and reports both unconsolidated and consolidated statements.[19] To minimize changes in balance sheets arising from changes in ownership of subsidiaries, and to work with comparable accounting data, this chapter uses unconsolidated financial statements whenever possible. From the original source, unconsolidated figures were available in all but 73 cases. For the purposes of the exercises below, balance sheet figures were converted into constant 1995 local currency using consumer price indexes (series 64 of the *IFS*). Series in constant 1995 US$ were also computed using the average market exchange rate for each country (series rf of the *IFS*).

Outliers were identified through the application of several filters, including limits on the yearly change in total assets, on the yearly growth rate of loans and

[19] Yet a third consolidation level adds up accounting information of a group of affiliated banks with no financial links between them. These aggregates statements were removed from the sample (four cases in total) since they have no legal entity associated (only its components are legal entities).

deposits, and on the ratio of net loans to deposits. A few cases with data deficiencies probably due to measurement errors and with negative equity were also removed.[20]

The identification of foreign banks in each country was achieved in several complementary steps aimed to minimize misclassifications. A bank was classified as "foreign" in a given year, if it was a branch of a bank incorporated in a foreign country, or if had at least 51 percent of its capital in the hands of foreign shareholders. The ownership structure at the end of 2001, for each bank in the sample, was obtained from BankScope and from central banks. To obtain chronological information on the evolution of ownership throughout the period, the list of banks was crossed with a comprehensive list of mergers and acquisitions targeting financial institutions in the sampled countries (a detailed description is presented in Appendix 4).

Descriptive evidence on the structure of balance sheets across regions and bank sizes is presented in Table 10. The regularities that emerge here have been pointed out in previous studies of the United States (Kayshap (1994)). Larger banks tend to have a higher proportion of loans to assets, and they rely more on non-deposit financing, and less on equity. These patterns are robust across regions. For the United States, similar patterns have been interpreted as consistent with the presence of imperfect substitution between deposits and other sources of financing, especially for smaller banks. In

---

[20] Specifically, the following filters were used. First, 31 observations where yearly asset growth in constant US$ exceeded 200 percent in absolute terms were removed. Second, 57 cases where the yearly loan growth exceeded 300 percent in absolute terms, and 77 cases where the yearly deposit growth exceeded 300 percent in absolute terms, were also removed. Third, 27 cases where loans represented more than 100 times the value of deposits were removed. Finally, 66 cases with negative deposits, and 94 cases with negative equity capital were also removed. In total, 316 observations were removed.

particular, if small banks cannot completely offset shocks to deposits with other sources of financing, they will optimally hold a buffer stock of liquid assets to reduce the costs of early loan liquidation. In equilibrium, they will also tend to rely less on non-deposit financing and more on internal capital.

This presumption can be further checked by splitting the sample across domestic and foreign banks. Foreign banks could be more aggressive in lending if they have access to internal financial resources from their mother institutions. Also, they could have systematic differences in the liability structure of their balance sheets compared to domestic banks. Table 11 presents summary statistics on loan growth, deposit growth, and several indicators of the structure of balance sheets for domestic and foreign banks, and by regions. In general, there are not strong differences in the structure of balance sheets structure across domestic and foreign banks, so the data does not fit into the hypothesized pattern. Net loans are in the range of 50 and 60 percent of total assets, and other earning assets[21] account for an additional 30 to 40 percent. More variation across domestic and foreign banks is observed on loan growth and deposit growth. On average, foreign banks in Latin America have higher rates of deposit and loan growth than their domestic counterparts. In Asia, the opposite holds true.

[21] Other earning assets include: government securities, equity investments, bonds, deposits with banks, and due from central banks.

Baseline Results

The results of the baseline regressions for the Asian and Latin American sub-samples are presented in Tables 12 and 13. For each sub-sample, six regressions are computed. All regressions are identical, except for their dependent variables. The first three use measures of quantities (loan growth, deposit growth, and loan to deposit ratios), and the rest use measures of prices (lending rates, deposit rates, and lending minus deposit spreads). The explanatory variables are divided in two panels. The upper panel includes GDP growth, and the bank-level controls, while the lower panel groups the monetary conditions.

Going to the first two columns, the results show that loan and deposit growth tend to be procyclical (especially the former), with no statistically significant differences across domestic and foreign banks except for deposits in Asia. A similar result for loan growth was obtained in Goldberg et al. (2000) using data for Mexico and Argentina. In addition, banks with more liquid assets at the end of the previous accounting year tend to display larger loan growth and lower deposit growth, while banks with better capitalization also display higher loan and deposit growth. On the lower panel, the results indicate that loan growth decelerates with increases in money market rates and in reserve requirements, with no significant differences across domestic and foreign banks in the Latin American sub-sample. On the other hand, there is some evidence that loan growth of foreign banks tends to be more isolated from changes in money market rates but more sensitive to changes in reserve requirements in the Asian sub-sample. The results in the third column indicate that

loans and deposits tend to move one to one, independently of the economic cycle—at least at the one year frequency.

Going to the last three columns, the upper panel shows that deposit rates tend to be countercyclical, with some evidence suggesting that this is less intense in the case of foreign banks. Bank spreads show a procyclical behavior, driven by movements in deposit rates. At the same time, larger and banks with higher liquidity tend to have generally lower lending and deposit rates and also lower interest spreads, but again, the results show no evidence of systematic differences between domestic and foreign banks. As expected, periods of tight monetary conditions are associated with higher lending and deposit rates, with inconclusive results in terms of spreads (for example, spreads go up for the Latin American sub-sample, and decrease for the Asian sub-sample). In general, foreign banks tend to display a lower sensitivity of lending and deposit rates to changes in monetary conditions. A possible explanation is that they are perceived as more reliable than domestic banks and are therefore able to attract deposits with relative small changes in interest rates. If this is in fact the case, it strengthens the power of the test of the lending channel used in this chapter.

Summing up, there is no strong evidence of systematic differences in the response of loan and deposit growth to changes in monetary conditions across domestic and foreign banks, but the response of bank-specific lending and deposit rates to changes in monetary conditions systematically differs across domestic and foreign banks. All these results were qualitatively robust to the removal of 58 banks changing ownership during the period.

The model discussed so far assumes that the errors of the fixed-effect regressions are white noise. Nevertheless, given the nature of the data, which includes a time-series dimension, the error term could be autocorrelated within panels, probably following panel-specific processes. Also, although the dependent variables are expressed in growth rates, the error term could be heteroscedastic across panels. To take these into account, the equations were estimated again with Generalized Least Squares (GLS), allowing for panel-specific AR(1) processes. As the number of panels is much larger than the time series dimension, cross-sectional correlations between panels were not considered. The results obtained under this estimation (Tables 14 and 15) tend to provide better support to the lending channel hypothesis. In particular, loan growth of foreign banks is less sensitive to monetary conditions in both Asia and Latin America, and some evidence suggests that deposits of foreign banks are also less sensitive to monetary conditions, especially in Latin America. At the same time, the evidence on prices is now weaker and the results on reserve requirements in Asia still go in the wrong direction.

A Closer Look at Loan Growth

The exercise presented in this section focuses on the response of *loan growth* to monetary conditions. Compared with the previous exercise, it goes a step further by adding interaction terms between bank ownership (i.e. domestic and foreign) and bank characteristics. In particular, besides partitioning the sample across domestic and foreign banks, two additional partitions were performed, the first separating banks with capitalization above and below the 75th percentile with respect other banks

operating in the same country, and the second separating banks above and below the 75th liquidity percentile with respect to other banks operating in the same country. Arguably, banks with larger capitalization and more liquid assets will be less financially constrained, and therefore better equipped to isolate loan growth from changes in monetary conditions. Therefore, any differences between domestic and foreign banks are expected to be stronger in the sub-samples of banks with lower liquidity and/or capitalization.

The results are presented in Tables 16 to 19. All tables share the same format, with three sets of regressions each. The leftmost regressions cover the whole sample, while the other two are computed on sub-samples partitioned by bank characteristics (i.e. liquidity and capitalization). To facilitate the reading, each regression presents the coefficients of domestic banks alongside the matching coefficients for foreign banks, and the p-values for the null(s) of coefficient equality between square brackets.

Going to the results, the coefficients associated with the money market rate are statistically significant and have the expected (negative) sign for domestic banks, but are non significant in the case of foreign banks, which provides support to the lending channel hypothesis. The differences between domestic and foreign banks are noticeably stronger for the sub samples of less liquid and/or less capitalized banks than for the full sample. The coefficients associated to the reserve requirement ratio are also statistically significant and have the expected (negative) sign for both regions, but no statistically significant differences arise between domestic and foreign banks in

Latin America, while foreign banks display a higher sensitivity to reserve requirements in the Asian sub sample.

As a complementary exercise, the same regressions were computed with alternative measures of monetary conditions. The new measures include reserve requirements as before, but exploit the uncovered interest parity condition replacing money market rates with the nominal exchange rate depreciation and international interests proxied by the federal funds rate. To get a sense of the relationship between these indicators of monetary conditions, Table 20 presents the pair-wise correlations, by regions, together with the p-values for the nulls of zero correlation. In the case of Latin America, there is a positive and significant correlation between money market rates, depreciation, reserve requirements, and the federal funds rate. For the case of Asia, the money market rate is also highly correlated with the nominal exchange depreciation rate, but not with the federal funds rate of with reserve requirements, which explains the results previously reported.[22]

The results of the regressions using the alternative indicators of monetary conditions, presented in Tables 21 to 24, are comparable to those reported above. They provide weak evidence in support of the lending channel in the case of Latin America, and a less conclusive mix for the Asian sub-sample. For Latin America, loan growth decelerates with exchange rate depreciation, with foreign banks displaying a lower sensitivity. Moreover, the differences appear to be driven by less liquid and/or less

[22] Similar results were obtained using other indicators of foreign interest rates, including the U.S. treasury bill rate, and the Japanese and Australian money market rates for the case of Asia.

capitalized banks. For the Asian sub-sample, the results are mixed, but also seem to indicate that loan growth of domestic banks decreases with exchange rate depreciation (especially for banks with lower liquidity and capitalization). On the other hand, loan growth of foreign banks increases with exchange depreciation.

Going now to the coefficients associated with reserve requirements, the results for the Latin American sub-sample have the expected (negative) sign, and are mainly driven by less liquid and/or less capitalized banks, with no significant differences across domestic and foreign banks. For the Asian sub-sample, while the coefficients also have the expected (negative) sign, foreign banks display a larger sensitivity than domestic, which runs contrary to the lending channel hypothesis.

The coefficients associated with the Federal Funds rate have the expected (negative) sign for the Latin American sub-sample but the standard errors are too high to be conclusive, and there are not significant differences across domestic or foreign banks. For the Asian sub-sample, the coefficients of the Federal Funds rate are either not significant or have the wrong sign. Similar results were obtained using other indicators of international interest rates, which may reflect the lack of reliance on capital inflows by Asian countries.

Summing up, the regressions show that loan growth is procyclical and tends to slow down with tighter monetary conditions. The results also indicate that loan growth of well capitalized, or more liquid banks, is less sensitive to changes in monetary conditions, but no major differences arise between domestic and foreign banks. The few exceptions provide some support to the lending channel hypothesis. The

simultaneous finding of systematic differences in the sensitivity of loan growth to monetary conditions across banks with different degrees of liquidity and capitalization, but no differences between domestic and foreign banks, suggest that bank ownership may be a poor proxy for financial constraints, probably because institutional arrangements prevent subsidiaries from resorting to automatic financing from their mother companies.

The results obtained so far implicitly assume that the behavior of domestic and foreign banks is similar during tranquil times and during periods of financial distress. However, there is no reason to reject a priori the possibility of non linear patterns. For example, differences in the behavior of domestic and foreign banks (and their depositors) may be magnified during periods of financial distress. The next section provides a closer look into this.

Are Foreign Banks Different During Crises Periods?

This section provides an alternative comparison between domestic and foreign banks by discriminating between tranquil periods and episodes of financial distress. Arguably, the latter entail larger financial constraints for firms and banks, as well as changes in depositors' behavior that may induce relocations of deposits toward larger or sounder banks. Therefore, potential asymmetries in financial constraints across domestic and foreign banks will tend to increase during crisis periods, especially if foreign banks are perceived as safer than domestic. The sample of countries included in this study offers a rich information set to address this issue, since half of the countries included suffered some type of financial crisis during the nineties.

To implement this exercise, three types of (related) crisis are considered: currency, banking, and debt crises. The definitions of each type of crises, and the series, are borrowed from previous studies. A first exercise exploits the currency and banking crises defined in Kamisnsky and Reinhart (1999),[23] and the debt crises provided in Detriagache and Spilimbergo (2001).[24] Each crisis variable is a dummy that takes the value of one at the crisis year and zero otherwise.

A first pass at the evidence is provided with the help of a set of three-year crises windows, centered around years with a banking, currency, or debt crisis. The close relationship between these three types of crises—both within and between countries—tends to produce clustering, and therefore the size of the window exceeds the three-year period in many countries. For example, the Mexican currency crisis of 1994 was preceded by a banking crisis in 1992, and therefore the crisis window in this case spans five years (1991-1995). Similarly, the Venezuelan currency crisis of 1994-1995 was preceded by a banking crisis that started in 1993, and thus the crisis window

---

[23] In Kaminsky and Reinhart (1999), the dating of currency crises is based on an index of currency market turbulence, computed as a weighted average of exchange rate changes and reserve changes. A currency crisis occurs when the index reaches (or surpasses) three standard deviations above the mean. In turn, the onset of a banking crisis is defined by two types of events: (i) bank runs that lead to the closure, merging, or takeover by the public sector of one or more financial institutions; or (ii) if there are no runs, the closure, merging, takeover, or large-scale government assistance of an important financial institution (or group of institutions) that marks the start of a string of similar outcomes for other financial institutions.

[24] In Detriagache and Spilimbergo (2001), a debt crisis occurs when either (or both) of the following conditions occur: (i) there are arrears of principal or interest on external obligations towards commercial creditors (banks or bondholders) of more than 5 percent of total commercial debt outstanding; (2) there is a rescheduling or debt restructuring agreement with commercial creditors as listed in the Global Development Finance (World Bank Debt Tables).

also spans over years (1992-1996). In other cases, such as Malaysia and Philippines during the 1997 Asian Crisis, the currency and banking crises occurred simultaneously, and the crisis window only covers three years (1996-1998).

Figure 3 presents the behavior of loan growth across domestic and foreign banks for each country, both during crises and tranquil periods.[25] The graphs illustrate two results. First, as expected, loan growth decreases sharply at the beginning of the crisis window and tend to recover toward the end. Second, the behavior of loan growth for domestic and foreign banks is remarkably similar both during crisis and tranquil periods.

A more systematic test comparing the behavior of domestic and foreign banks across crisis and tranquil periods is performed by running panel regressions with bank-level fixed effects similar to those presented above (i.e. splitting the sample of banks between domestic and foreign with the use of a dummy variable). The results, presented in Tables 25 and 26, are qualitatively similar for the Asian and Latin American sub-samples. The first two columns indicate that both loan and deposit growth decrease during crisis periods, with mild differences in loan growth in Latin America and significant differences in deposit growth (in the wrong direction) for Asia. The third column, that uses the ratio of loans to deposits as dependent variable, indicates that the proportion of loans financed though deposits does not change during crisis periods. In other words, changes in loans are matched one by one by changes in deposits both during crises and tranquil periods, for both domestic and foreign banks.

---

[25] Loan growth was computed as the median taken over all banks operating in the same country in a given year.

The strongest differences across domestic and foreign banks during crisis periods are related to the behavior of interest rates, as indicated by the results shown in the last three columns. The regressions presented in the fifth and sixth columns indicate that bank-specific deposit and lending rates increase during crisis periods, and that the increase tends to be more moderate for foreign banks. The behavior of bank spreads during crisis periods is less conclusive (they increase for the sub-sample of Latin American countries but decrease for the sub-sample of Asian countries) but the results show no differences between domestic and foreign banks.

A potential drawback of the above results is that they are obtained from a crisis window that may be too large (differences in the behavior of domestic and foreign banks may tend to disappear as the size of the crisis window increases). To address this concern, the same regressions are computed using a slightly richer set of crisis variables. Specifically, three sets of dummy variables are created to isolate potentially different behaviors around crisis episodes. The first variable, CRISIS T-1, equals one for the year preceding the crisis and zero otherwise, the second, CRISIS T, equals one in the year of the crisis and zero elsewhere, and the third, CRISIS T+1, equals one for the year immediately after the crises and zero otherwise.

The results, displayed in the first two columns of Tables 27 and 28, indicate that both loan growth and deposit growth tend to be above average in the year preceding a crisis, and collapse at the onset of the crisis, There is evidence of stronger loan growth in T+1 for foreign banks in Latin America. For Asia, the differences between domestic and foreign banks are significant but in the wrong direction,

indicating a sharper contraction of both deposits and loans for foreign banks. Looking at the third column, the ratio of loans to deposits tends to decrease during and following crisis episodes, but the differences with tranquil periods are non significant. In other words, the data strongly indicate that loans and deposits move one for one for both domestic and foreign banks, at least at the yearly frequency. Going to the last three columns, the evidence indicates that lending rates increase one year before the crisis, and remain high thereafter (within the crisis window considered). Deposit rates, on the other hand, appear to react sluggishly, since they do not significantly increase during the year preceding the crises. Also, consistent with previous results, there is evidence that foreign banks show smaller increases in both lending and deposit rates, although the standard errors tend to be large due to the size of the crisis window.

At first sight, the fact that loan and deposit growth do not significantly drop during the crisis years appears to be odd. This may be a consequence of the operational definition of crises used by Kaminsky and Reinhart (1999), since they identify the onset of crisis events, which are typically followed by broader and deeper periods of distress. To check this assertion, the same set of regressions is computed exploiting two alternative definitions of crises: the currency crashes of Frankel and Rose (1996), and the banking crises of Caprio and Kinglebiel (1996).[26] Summary results of these regressions, provided in Tables 29 and 30, are roughly consistent with previous results, indicating higher loan growth before the crises and a significant drop

[26] In Frankel and Rose (1996), a currency crash is a yearly depreciation of the exchange rate larger of equal to 25 percent, provided that it exceeds the depreciation of the previous year by at least 10 percent.

either at their onset, or immediately afterwards. More importantly, the previous conclusions are robust in the sense that, in general, no systematic differences in loan and deposit growth arise between domestic and foreign banks regardless of the operational definition of crisis employed. On the other hand, the behavior of deposit and lending rates tends to differ across domestic and foreign banks around crises periods.

Concluding Remarks

This chapter adds to the literature on the lending channel of monetary transmission by looking at the evidence from emerging economies. It uses a bank-level dataset covering more than 1,500 banks operating in 20 emerging countries during the nineties, to look for systematic differences in the response of selected balance sheet components to monetary conditions between domestic and foreign banks. The targeted balance sheet variables include loan growth, deposit growth, loan to deposit ratios, and bank-specific interest rates. The chapter argues that comparing the behavior of these variables across domestic and foreign banks provides an alternative way to test the lending channel hypothesis, if foreign banks are less financially constrained than domestic and if the behavior of loan demand does not systematically differ across the two groups of banks.

Given the open-economy characteristics of the countries included in the sample, monetary conditions are measured by two sets of variables. The first group includes money market rates and reserve requirements, and the second includes international interest rates, exchange rate depreciation, and reserve requirements.

The results show a strong similarity in the response of loan growth to monetary conditions across domestic and foreign banks. In addition, the behavior of bank deposits and loan to deposit ratios is found to be markedly similar across these two groups of banks. These results can be interpreted in two ways. On the one hand, if one accepts that foreign banks are in fact less liquidity constrained than domestic banks, the results imply that supply-side effects in the credit market are nil. On the other, it may well be the case that supply-side effects exist without being properly captured by this test. This would be the case if foreign banks are not less financially constrained than domestic banks due, for example, to institutional arrangements that prevent them from freely getting upstream resources from their mother institutions. The latter interpretation appears to be plausible, since the results show systematic differences in the response of loan growth to monetary conditions across banks with different levels of liquidity and capitalization.

At a more general level, the results strongly suggest that foreign bank participation in emerging countries has not led to increased instability in credit markets. Their response to the level of economic activity and to monetary conditions closely resembles that of domestic banks. Differences across domestic and foreign banks, if any, appear to be more related to the behavior of bank spreads and deposit rates. In particular, the results show that both deposit rates and bank spreads of foreign banks are less sensitive to monetary conditions, which suggests that foreign banks are in a relative better position to attract and retain deposits. This result opens the door to further research on interest rate pass through in emerging economies.

Appendices

Appendix 1: Proofs of Propositions in Chapter 2

Proof to Result 2: Plugging equation (4') into (7) gives the equilibrium in the loan market:

$$z = z_0 - z_1 R^* - z_1[F(b) - \bar{c}]$$

Similarly, plugging equation (5') into (6) gives the equilibrium in the deposit market:

$$d = d_0 - d_1[\delta(I^* + \bar{c}) - (1-\delta)F(b)]$$

With $F(b)=\phi+\phi_b b$. These two equations, together with the balance sheet in equation (3) fully characterize the economy. Totally differentiating while keeping constant the bankruptcy costs, γ, and the bank's internal capital, k, gives:

$$\begin{vmatrix} 1 & 0 & Z_1F_b \\ 0 & 1 & -d_1-(1-\delta)F_b \\ 1 & -(1-\delta) & -1 \end{vmatrix} \begin{vmatrix} \mathrm{d}z \\ \mathrm{d}d \\ \mathrm{d}b \end{vmatrix} = \begin{vmatrix} 0 \\ -d_1\delta\mathrm{d}I^* - d_1[I^*+c+F(b)]\mathrm{d}\delta \\ -d\mathrm{d}\delta \end{vmatrix}$$

Applying Cramer's rule it can be checked that

$$\frac{db}{dI^*} = \frac{d_1\delta(1-\delta)}{1+z_1F_b+(1-\delta)^2 d_1F_b} > 0$$

$$\frac{dd}{dI^*} = -\frac{d_1\delta(1+z_1F_b)}{1+z_1F_b+(1-\delta)^2 d_1F_b} < 0$$

Accordingly, exchange rate depreciation and/or an increase in foreign real interests induce a substitution of deposit by bond financing. The response of interest spreads follows directly from these results and equations (4') and (5').

It can also be shown that, in the case of imperfect capital markets, the response of equilibrium loans to an increase in the foreign nominal rate expressed in local currency is negative:

$$\frac{dz}{dI^*} = -\frac{d_1\delta(1-\delta)z_1F_b}{1+z_1F_b+(1-\delta)^2 d_1F_b} < 0$$

A similar exercise with respect to reserve requirements shows that equilibrium bonds increase with reserve requirements and equilibrium loans go down, that is: db/dδ>0, and dz/dδ<0:

$$\frac{db}{d\delta} = \frac{d+d_1I^l(1-\delta)}{1+z_1F_b+(1-\delta)^2 d_1F_b} > 0$$

$$\frac{dz}{d\delta} = -\frac{z_1F_b[d+d_1I^l(1-\delta)]}{1+z_1F_b+(1-\delta)^2 d_1F_b} < 0$$

On the other hand, the effect of an increase in reserves on equilibrium deposits cannot be signed. There are two forces at work. On the one hand, higher reserve requirements increase the effective cost of deposits and induce a substitution of deposit by bond financing. On the other, the increase in the bond spread together with the fall in loanable deposits tends to generate the opposite. The net effect depends on specific parameter configurations. Q.E.D.

Proof to Result 3: Plugging equation (9) into (3) and taking equations (8) and (1) gives a system of three equations. Totally differentiating while keeping constant the reserve requirements, δ, exchange rate depreciation, ε, the international interest rate, R^*, gives:

$$\begin{vmatrix} Z_1F_b & 1 & 0 \\ -[1+d_1(1-\delta)^2F_b] & 1 & 0 \\ -\phi_b & 0 & 1 \end{vmatrix} \begin{vmatrix} db \\ dz \\ dI \end{vmatrix} = \begin{vmatrix} -Z_1F_\gamma d\gamma \\ d_1(1-\delta)^2F_\gamma d\gamma \\ \phi_\gamma d\gamma \end{vmatrix}$$

Applying Cramer's rule, it can be checked that:

$$\frac{dI}{d\gamma} = \frac{\phi_\gamma}{AF_b}\left\{1 + \frac{\gamma AI^* q'[1 + b(\frac{q''}{q'} - \frac{q'}{q})]}{[1-\gamma q]^2}\right\}$$

With $A=z_1+(1-\delta)^2d_1>0$. So the $dI/d\gamma>0$ for a low value of γ. Q.E.D.

Appendix 2: Construction of the Reserve Requirements Index

This appendix states the criteria used in the construction of the reserve requirement index used in Chapter 4, and presents the actual values.

Scale Used

I. SCALE

IF RESERVE REQUIREMENT (RR) IS:

BETWEEN 1% AND 15% : 1-2
BETWEEN 16% AND 30% : 2-3
BETWEEN 31% AND 70% : 3-4
BETWEEN 71% AND 100% : 4-5

SUB- CATEGORIES:

BETWEEN 1% AND 15%		BETWEEN 16% AND 30%		BETWEEN 31% AND 70%		BETWEEN 71% AND 100%	
1.00%	1.00	16.00%	2.00	31%	3.00	71%	4.00
3.00%	1.20	19.50%	2.25	40%	3.25	80%	4.30
4.50%	1.30	23.00%	2.50	50%	3.50	85%	4.50
6.00%	1.40	25.00%	2.60	60%	3.75	90%	4.60
7.50%	1.50	26.50%	2.75	70%	3.99	100%	4.99
9.00%	1.60	29.00%	2.95				
10.50%	1.70	30.00%	2.99				
12.00%	1.80						
13.50%	1.90						
15.00%	1.99						

EXAMPLES THAT CAN BE EXTENDED FOR OTHER CASES:

9.00%	1.60	10.50%	1.70
9.25%	1.62	10.75%	1.72
9.50%	1.64	11.00%	1.74
9.75%	1.65	11.25%	1.75
10.00%	1.67	11.50%	1.77
10.25%	1.69	11.75%	1.79
10.50%	1.70	12.00%	1.80

II. HOW DO WE ASSIGN THE FINAL SCALE?

1) In each country case, we specify the kind of RR that has been chosen in order to assign the scale. In most cases, it is the RR on demand deposits (first criterium).

2) If during the year, there were more than one change in the reserve requirement, we weigh the scales reflecting the different RR percentages by the amount of months that they last.

3) In the case where we do not have variation in the RR when look at the first criterium, we use a second criterium (specified in each country case) in order to assign the code. The number will be in red.

Criteria Used in the Construction of the Index

ARGENTINA

First Criterium:
Marginal reserve requirements until 1994
Minimum liquidity requirements since 1995

Second Criterium:
Reserve requirements for deposits in foreign currency.

BOLIVIA

First Criterium:
Reserve requirement on demand deposits (domestic currency).

BRAZIL

First Criterium:
Reserve requirement on demand deposits (domestic currency).

Second Criterium:
Reserve requirements for saving and time deposits in domestic currency, and daily balance to be held in banking reserves.

CHILE

First Criterium:
Reserve requirement on demand deposits (foreing currency).

COLOMBIA

First Criterium:
Reserve requirement on demand deposits (domestic currency).

Second Criterium:
Reserve requirements for saving and time deposits in domestic currency.

INDIA

First Criterium:
Cash reserve requirement on demand deposits (domestic currency).

Second Criterium:
Statutory liquidity ratio on demand and time liabilities.

INDONESIA

First Criterium:
Statutory reserve requirement on demand deposits (domestic currency).

Second Criterium:
Statutory reserve requirement on foreign currency deposits.

KOREA

First Criterium:
Reserve requirement on demand deposits (domestic currency).

Second Criterium:
Marginal reserve requirement in domestic and foreign currency.

MALAYSIA

First Criterium:
Statutory reserve requirement on demand deposits (domestic currency).

Second Criterium:
Liquidity requirement.

MEXICO

First Criterium:
Reserve requirement on demand deposits (domestic currency) until 1988.
liquidity coeffcient from 1989 to 1990

Second Criterium:
Liquidity coeffcient for deposits in foreign currency 1991 to 1994

PARAGUAY

First Criterium:
Reserve requirement on demand deposits (domestic currency).

PERU

First Criterium:
Exigible reserve requirement (domestic currency).

Second Criterium:
Exigible reserve requirements for deposits in foreign currency.

PHILIPPINES

First Criterium:
Reserve requirement on demand deposits (domestic currency).

SINGAPORE

First Criterium:
Minimum cash balance on demand deposits (domestic currency).

TAIWAN

First Criterium:
Reserve requirement ratio on demand deposits (domestic currency).

Second Criterium:
The required reserve ratio for passbook saving deposits, time saving deposits and time deposits.

THAILAND

First Criterium:
Liquidity requirement ratio on demand deposits (domestic currency).

Appendix 3: The Reserve Requirements Index

ARGENTINA

Year	Code	Reserve Requirements
1986	**4.580**	The monetary system continued with a high average reserve requirement (including assets at the Central Bank) of around 20% and with its entities underexpanded on an average nearly 40%.
1987	**4.580**	As in 1986, reserve requirements were kept high: 89,5% on demand deposits.
1988	**4.580**	The average reserve requirement of the system by end October was above 78% of total amount of deposits at interest, virtual nacionalization of deposits.
1989	**4.500**	The average reserve requirement of the system was 71% in June. There was a reduction of reserve requirements for deposits in foreign currency.
1990	**4.575**	As from July, reserve requirements were reduced 3% in cases of technical reserves for general demand deposits and by 1,5% additional for fixed period deposits. By September, the astringent monetary policy was further deepened, so the backing figures returned to their previous high levels.
1991	**4.555**	In December, the Central Bank reduced minimum cash requirements to 79% on demand deposits.
1992	**4.120**	There were not substancial variations in minimum cash requirements. As of October 1 the Central Bank reduced by 2% the minimun cash requirement on peso deposits in current accounts and other sight and fixed term operations, at 71% .
1993	**3.354**	The Central Bank homogenized the reserve requirements for current accounts and sight operations in both currencies, implying a substantial reduction in reserve requirements for current account in pesos from 71% to 40% . In August, the Central Bank set a 3% increase, to 43%, in cash requirements on current account and saving deposits.
1994	**3.300**	The Central Bank reduced temporarily required minimums covering dollars deposits from 43% for sight deposits dated 12-15-95, to 35% until 1-15-95. For fixed-term deposits the minimum cash requirement dropped from 3% to 1% as of 12-16-94 to be reestablished at 3% as of 2-1-95.
1995	**3.082**	As of November 1995, reserve requirements have been replaced by minimum liquidity requirements (Requisitos Minimos de Liquidez), which may include earning assets. All deposits were subject to a uniform 15% liquidity requirement.
1996	**2.100**	The Central Bank increased the minimum liquidity requirement by 2%.
1997	**2.200**	The Central Bank increased the minimum liquidity requirement by 2% .
1998	**2.300**	The Central Bank increased the minimum liquidity requirement by 1% .
2001	**2.188**	In April, the Central Bank reduced the minimum liquidity requirement by 2%. In June, the Central Bank established a new liquidity regime based on a minimum cash requirement over sight operations, whereas the rules realted to minimum liquidity requirements only involved fixed term deposits.

Source: Annual Report of the Argentine Economy- Economic Trends. Consejo Tecnico de Inversiones.

BOLIVIA

Year	Code	Reserve Requirements
1985	**3.500**	Central Bank reduced reserve requirements on demand deposits, saving deposits and time deposits, all in domestic currency. From 60% to 50% in the case of demand deposits.
1986	**3.250**	Central Bank reduced reserve requirements on demand deposits, saving deposits and time deposits, all in domestic currency. From 50% to 40% in the case of demand deposits.
1987	**2.765**	In July. Central Bank homogenized the reserve requirements to 20% for different types of deposits and currencies
1994	**1.975**	In July, the Central Bank eliminated the marginal reserve requirement for deposits in domestic currency. The marginal reserve requirement was 10% for demand and saving deposits, and 6% for time deposits (less than 365 days).
1998	**1.757**	In May, the Central Bank homogenized the reserve requirements to 12% for different types of deposits and currencies.

Source: Annual Reports of the Central Bank of Bolivia.

BRAZIL

Year	Code	Reserve Requirements
1984	**3.300**	Central Bank increased reserve requirements from 10% to 22% for time deposits. The average reserve requirement on demand deposits was 43%.
1985	**3.170**	The rate of reserve requirements on demand deposits in the commercial banks dropped from an average of 43% to 36%.
1988	**3.180**	Reserve requirements are rationalized, requirements differing according to bank size. As of December, the average, implicit, reserve requirement represented 37% of deposits.
1993	**3.458**	The percentage of the reserve requirement moved from 40%to 50% but had little impact on the banking system's capacity to grant credit, since demand deposits represent less than 1% of GDP.
1994	**4.337**	Under the Real Plan, the Central Bank raised the reserve requirement for demand deposits to 100% in June, which was reduced to 90% in December. The reserve requeriment for time deposits was raised from 20% to 30% in August and then reduced to 27% in December, and for the case of saving deposits the reserve requirement was raised from 20% to 30% in August.
1995	**4.500**	The reserve requirement for demand deposits was reduced from 90% to 83% in July, for time deposits the rate was reduced to 20% in August, and for saving deposits the rate was reduced to 15%.
1996	**4.200**	The criteria for reserve requirements and obligatory reserves on demand deposits were altered and a schedule was defined according to which the rate would gradually decline from 83% to 78% as of December.
1997	**4.150**	In January, the reserve requirement for demand deposits was reduced from 78% to 75% .
1999	**4.075**	In October, the reserve requirement for demand deposits was reduced from 75% to 65% .
2000	**3.538**	The reserve requirement for demand deposits was reduced twice during the year to 55% in March and to 45% in June.

Source: Annual Reports of the Central Bank of Brazil (Banco Central do Brasil).

CHILE

Year	Code	Reserve Requirements
	1.600	Reserve requirement (RR) for demand deposits was 9,0% in domestic currency.
1998	**2.100**	Reduction of reserve requirements to external credits from 30% to 10%. In December, there was a reduction of reserve requirements to deposits in foreign currency. From 30% to 19% for demand deposits, and from 30 to 13,6% for term deposits. 10% of reserve requirement in foreign currency were remunerated.

Source: Annual Reports of the Central Bank of Chile.

COLOMBIA

Year	Code	Reserve Requirements
1984	**3.300**	Monetary authority reduced the reserve requirement (RR) from 45% to 43% over demand deposits.
1987	**3.350**	The RR of demand deposits was raised to 44%.
1988	**3.250**	The RR of demand deposits was reduced from 44% to 40%, and also it was reduced the RR of demand deposits with entities of the public sector from 65% to 61%.
1989	**3.230**	The RR of demand deposits was reduced from 40% to 39%, and also it was reduced the RR of demand deposits with entities of the public sector from 61% to 53%.
1990	**3.100**	The RR of demand deposits was reduced from 39% to 33.5%, and also it was reduced the RR of demand deposits with entities of the public sector from 56% to 52.5%.
1991	**3.280**	In January, marginal reserve requirements of 100% are imposed on all new deposits. These reserves are held as interest-bearing central bank bonds. In September, the marginal reserve requirement is replaced by an increase in reserve requirement on most deposits. RR of demand deposits was raised from 33.5% to 41% , and from 53.5% to 70% (public sector).
1992	**3.260**	The RR for saving deposits was reduced from 31% to 10%, and from 23% to 10% in the case of term deposits.
1995	**3.250**	RR of demand deposits was reduced from 41% to 40% , and from 70% to 60% (public sector). It was established a marginal reserve requirement (MRR) of 21% for demand deposits, and 10% for saving deposits and term deposits.
1996	**2.350**	It was homogenized the RR for deposits to 21%. The RR for term deposits was reduced to 5% and the MRR was reduced to 7%.
1998	**2.292**	In November, The RR for demand deposits was reduced to 16% and the MRR was reduced to 16%.
1999	**1.870**	The RR for demand deposits was reduced to 13% and the MRR was reduced to 13%.

Source: Annual Reports of the Central Bank of Colombia (Banco de la Republica).

MEXICO

Year	Code	Reserve Requirements
1987	**3.550**	The Bank of Mexico (BOM) reduced the marginal reserve requirement (MRR) from 77.2% to 51%. The distribution was: 10% in cash, 35% in credits to the Federal Government, and 6% to development banks.
1988	**3.500**	The BOM determined liquidity coeffcients. 30% of liabilities (aceptaciones bancarias) had to be invested in remunerated demand deposits in the BOM and other securities (CETES, BONDES). The distribution of MRR required investment was: 10% in cash, 31% in credits to the Federal Government, and 10% to development banks.
1989	**2.990**	Liquidity coefficient applied also to liabilities coming from traditional bank instruments. Pagares en dolares required a liquidity coefficient of 30%.
1991	**1.600**	The BOM eliminated the existing liquidity coefficient on bank liabilities in domestic currency. In June, the BOM in order to descourage the growth of foreign currency liabilities of commercial banks established a compulsory liquidity coefficient of 50% to be constitued with liquid foreign assets. In August, the BOM determined an ascendent scale of the liquidity coefficient from 0% to 50% depending on the maturity of deposits.
1992	**1.200**	In April, the liquidity coefficient, which went from 0% up to 50% according to the maturity of the deposits, was replaced by a 15% requirement.
1995	**1.300**	In March, the BOM adopted a zero average legal reserve requirement: debtor balances posted at the close of each day in the current accounts of each credit institution with the BOM must be compensated, within 28-day periods, by posting, on other days, creditor balances of at least equal amounts in the same accounts.

Source: Annual Reports of the Central Bank of Mexico (Banco de Mexico).

PARAGUAY

Year	Code	Reserve Requirements
1991	**3.330**	Reserve Requirement (RR) on demand deposits in local currency was at 42%.
1992	**2.990**	The Central Bank reduced the RR for domestic currency deposits to 30%. In June, the Central Bank started to remunerate legal RR on local currency deposits.
1993	**2.600**	The CB reduced the RR on local currency deposits from 30% to 25%. RR on foreign currency deposits was 30%.
1994	**2.500**	In September, the CB reduced the RR on local currency deposits from 25% to 18%. In October, the CB started to remunerate legal RR on local currency deposits in excess of 10%.

Source: Annual Reports of the Central Bank of Paraguay.

PERU

Year	Code	Reserve Requirements
1985	**3.850**	In August, The marginal reserve requirement (MRR) was raised from 50% to 75% for liabilities in domestic currency.
1986	**3.760**	The Central Bank reduced the MRR twice. As of May the MRR was 70% for liabilities in domestic currency, and as October, the MRR was 64%.
1987	**3.580**	In March, the Central bank reduced the MRR from 64% to 50% for liabilities in domestic currency captured out of Lima in order to support credit descentralization.
1990	**3.350**	In June, the Central Bank homogenized and raised the MRR to 80%, but in August it came back to the initial scheme of 64% and 50%. In September, the Central Bank homogenized and reduced the MRR to 40% and then it was reduced to 30%.
1991	**2.600**	In October, the MRR was reduced to 15% and then reduced to 5% at the end of the year. The exigible reserve requirement was reduced from 45% to 25,4% at the end of the year. The Central Bank raised the MRR from 30% to 50% for liabilities in foreign currency.
1992	**1.625**	As of December, the exigible reserve requirement was at the level of 9,3%. There was a unification of the legal and exigible reserve requirement. In March, the MRR was reduced to 0% for domestic currency deposits.
1993	**1.620**	The Central Bank established a exigible reserve requirement of 9% for domestic currency, and reduced the MRR from 50% to 45% for foreign currency.
1997	**1.470**	The Central Bank reduced the exigible reserve requirement to 7%
1998	**1.470**	The Central Bank reduced the average reserve requirement by 4.5% between October and December for liabilities in foreign currency. In December, the MRR in foreign currency was reduced from 35% to 20%.
2000	**1.400**	In September, the minimum reserve requirement was reduced from 7% to 6%, an a 1% minimum reserve requirement in the form of demand deposits kept at the Central Bank was introduced.

Source: Annual Reports of the Central Reserve Bank of Peru.

URUGUAY

Year	Code	Reserve Requirements
1991	**1.870**	The remunerated reserve requirement (RR) on sight deposits in local currency was 13%
1992	**1.670**	The RR on sight deposits in local currency was reduced to 10%
1993-2000	**1.670**	No changes.

Source: IMF Staff Country Reports.

VENEZUELA

Year	Code	Reserve Requirements
1990	**1.927**	In January, the CB unified the RR for demand, time and saving deposits to 12%. In May, the CB raised the RR to 15%.
1991	**2.244**	In May, the CB established a special RR of 80% on public sector deposits in commercial banks. In August, the CB raised the RR on demand, savings and time deposits to 25% gradually.
1992	**2.397**	In September, the CB established that the RR for liabilities held until August 30 was 25%, and for liabilities after this date the RR was 15%. Also, the CB reduced the RR of public sector deposits in commercial banks from 80% to 25% gradually. In December, it was adjusted to 15%.
1993	**1.990**	In October, the CB unified the RR scheme. For commercial banks the RR was 15%.
1998	**2.100**	The RR was raised to 17%.

Source: Annual Reports of the Central Bank of Venezuela.

INDIA

Year	Code	Reserve Requirements
1987	**1.644**	In February, the cash reserve requirement (CRR) was raised from 9% to 9,5%. In May, the CRR on FCNR deposit liabilities was raised from 3% to 9,5%. In October, the CRR was raised from 9,5% to 10% of net demand and time liabilities.
1988	**1.705**	In July, the CRR was raised from 10% to 11% of net demand and time liabilities. In July, the CRR on FCNR was raised from 9,5% to 10% .
1989	**1.866**	In July, CRR was homogenized at the level of 15% of the entire net demand and time liabilities.
1990	**1.992**	In September, SLR was raised from 38% to 38,5% of net demand and time liabilities.
1992	**1.980**	In April, SLR was reduced from 38,5% to 37,75% of net demand and time liabilities. In April, banks were exempted from the mantainance of the 10% incremental CRR for any increase in net demand and time liabilities.
1993	**1.973**	In September, CRR was reduced from 15% to 14%.
1994	**1.990**	CRR was raised from 14% to 15% in three phases. In October, it was stablished a CRR of 7,5% in respect of deposit liabilities under Foreign Currency (NR) Accounts (Banks).
1995	**1.982**	In January, CRR of deposit liabilities under Foreign Currency (NR) was raised to 15%. In November and December, the CRR was reduced from 15% to 14%.
1996	**1.848**	In May, the CRR was reduced from 14% to 13%. In July, the CRR was reduced from13% to 12%. In November, the CRR was reduced from12% to 11%.
1997	**1.665**	In January, the CRR was reduced from11% to 10%. In April, liabilities to the banking system of all commercial banks were exempted from maintenance of CRR. In October, the CRR was reduced from 10% to 9,75%.
1998	**1.683**	In March, the CRR was raised from 9,75% to 10,25%.
1999	**1.675**	In November, the CRR was reduced from 10,25% to 9%.

Source: Annual Reports of the Central Bank of India.

INDONESIA

Year	Code	Reserve Requirements
1988	**1.100**	Reserve requirements were reduced from 15% to 2% of current liabilities.
1995	**1.100**	In December, the Bank of Indonesia (BOI) amended the regulation on the reserve requirement to statutory reserve requirement. With this newregulation, the reserve components changed from demand deposits with BOI and cash originally, to only demand deposit with BOI.
1996	**1.192**	In February, the new regulation requiries commercial banks to maintain 3% of their funds in the form of demand deposit with the BOI.
1997	**1.192**	The statutory reserve requirement for foreign currencies deposits was reduced from 5% to 3%.

Source: Annual Reports of the Bank of Indonesia.

KOREA

Year	Code	Reserve Requirements
1985	**1.300**	Reserve requirement (RR) for demand, time and saving deposits was 4,5% in domestic currency and 1% in foreign currency.
1987	**1.328**	In November, RR for demand, time and saving deposits was raised to 7,0% in domestic currency. In February, the marginal reserve ratio for resident account in foreign currency was reduced to 4.5% .
1988	**1.486**	In December, RR for demand, time and saving deposits was raised to 10,0% in domestic currency.
1989	**1.680**	In May, a marginal reserve requirement (MRR) was introduced for deposits in domestic currency. It was 30%.
1990	**1.762**	In February, RR for demand, time and saving deposits was raised to 11,5% in domestic currency. In March, the marginal reserve ratio for resident account in foreign currency was raised to 11.5% .
1996	**1.621**	In April, RR for demand, time and saving deposits was reduced to 9 % in domestic currency In April, the marginal reserve ratio for resident account in foreign currency was reduced to 9% . In November, RR for demand, time and saving deposits was reduced to 7 % in domestic currency. In November, the marginal reserve ratio for resident account in foreign currency was reduced to 7% .
1997	**1.351**	In February, RR for demand deposits was reduced to 5 % in domestic currency. The RR for time ans saving deposits was reduced to 2 % in domestic currency. The BOK imposed a RR on negotiable certificates of deposits at 2%.
2000	**1.340**	In April, the MRR for resident account in foreign currency (demand deposits) was reduced to 5%. The MRR for resident account in foreign currency (time and saving deposits) was reduced to 2% .

Source: Annual Reports of the Bank of Korea.

MALAYSIA

Year	Code	Reserve Requirements
1985	**1.288**	In April, the statutory reserve requeriment (SRR) of commercial banks (CB) was reduced from 5% to 4% of total eligible liabilities. For merchant banks (MB), the ratio was raised from 1.5% to 2.5%. The SRR for finance companies (FC) remain unchanged at 2.5%.
1986	**1.263**	In February, the SRR of FC and MB were increased from 2.5% to 3% . In October, the SRR for CB was reduced from 4% to 3,5%.
1987	**1.238**	The Central Bank reduced the liquidity ratio of CB from 10% to 8%, with the LR remaining unchanged at 17% for MB and FC.
1988	**1.233**	The Central Bank reduced the liquidity ratio of CB from 8% to 5%, and abolished the liquidity ratio for FC.
1989	**1.298**	In May, the Central Bank raised the SRR of CB, MB and FC to a uniform 4,5%. In October, the Central Bank raised the SRR of CB, MB and FC to 5,5%.
1990	**1.440**	In January, the Central Bank raised the SRR of CB, MB and FC to 6,5%.
1991	**1.465**	In August, the Central Bank raised the SRR of CB, MB and FC to 7,5%.
1992	**1.547**	In May, the Central Bank raised the SRR of CB, MB and FC to 8,5%.
1994	**1.715**	In January, the Central Bank raised the SRR of CB, MB and FC to 9,5%. In May, the Central Bank raised the SRR of CB, MB and FC to 10,5%. In July, the Central Bank raised the SRR of CB, MB and FC to 11,5%.
1996	**1.873**	In February, the Central Bank raised the SRR of CB, MB and FC to 12,5%. In June, the Central Bank raised the SRR of CB, MB and FC to 13,5%.
1998	**1.521**	In February, the Central Bank reduced the SRR of CB, MB and FC from 13,5% to 10%. In July, the Central Bank reduced the SRR of CB, MB and FC from 10% to 8%. In September, the Central Bank reduced the SRR of CB, MB and FC from 8% to 4%.

Source: Annual Reports of the Central Bank of Malaysia.

PHILIPPINES

Year	Code	Reserve Requirements
1985	**2.540**	In September, the reserve requirement (RR) against short-term deposit liabilities of commerical banks (CB) and thrift banks (TB) was reduced from 24% to 23%.
1986	**2.438**	The RR on long-term deposit instruments of banks was reduced by a total of 2 percentage points from 23% to 21% in May and August.
1989	**2.333**	In September, the RR on deposits and deposit substitutes was homogenized to 20%.
1990	**2.600**	A series of upward adjustments in the RR on bank deposits were made during the year with a cummulative increase of 5 percentage points from 20% in 1989 to 25% at the end of 1990 as a contractionary measure.
1993	**2.300**	A series of downward adjustments in the RR on bank deposits were made during the year with a cummulative reduction of 5 percentage points from 25% in 1992 to 20% at the end of 1993.
1994	**2.100**	The RR was reduced to 17%
1995	**2.027**	In May, the RR was reduced to 15%
1996	**2.100**	The RR was raised to 17%
1999	**1.800**	The RR was reduced during the year by a total of 5 percentage points from 17% in January to reach 12% by July.

Source: Annual Reports of the Central Bank of Philippines, and IMF Staff Country Reports (No. 97/28 and No. 95/113).

SINGAPORE

Year	Code	Reserve Requirements
1987	**1.400**	In May, the Monetary Authority of Singapore (MAS) reduced the minimum liquid asset ratio from 20% to 18%.
1997	**1.300**	In July, the MAS reduced the minimum cash balance (MCB) from 6% to 3%. The MCB was last changed in 1975.
1998	**1.330**	The minimum liquid assets (MLA) requirement of finance companies was raised from 10% to 13%.

Source: Annual Reports of the Monetary Authority of Singapore.

TAIWAN

Year	Code	Reserve Requirements
1978	**2.990**	The required reserve ratio (RRR) for checking accounts (CA) was 30%
1979	**2.730**	In May, the RRR for CA was reduced to 25%.
1982	**2.542**	In June, the RRR for CA was reduced to 23%.
1988	**2.508**	In December, the RRR for CA was raised to 25%.
1989	**2.863**	In April, the RRR for CA was raised to 29%.
1990	**2.929**	In August, the RRR for CA was reduced to 28.5%.
1991	**2.867**	In September, the RRR for CA was reduced to 27,75%.
1993	**2.773**	In September, the RRR for CA was reduced to 26,25%.
1995	**2.692**	In November, the RRR for CA was reduced to 23,75%.
1996	**2.508**	In August, the RRR for CA was reduced to 22%.
1997	**2.408**	In October, the RRR for CA was reduced to 19,75%.
1998	**2.247**	In September, the RRR for CA was reduced to 18,75%.
1999	**2.006**	In February, the RRR for CA was reduced to 15%.
2000	**1.975**	In October, the RRR for CA was reduced to 13,5%.
2001	**1.855**	In October, the RRR for CA was reduced to 10,75%.

Source: Annual Reports of the Central Bank of the Republic of China.

THAILAND

Year	Code	Reserve Requirements
1990	**1.470**	To stabilize the money markets and reduce fluctuations of short-term interest rates, the BOT modified commercial bank's reserve requirement computation procedure.
1995	**1.480**	In August, non-resident bath deposits with maturity of less than 1 year are subject to a 7% minimum reserve requirement in the form of deposits (with no interest) with the BOT. While reserve requirements on domestic deposits are also 7%, they can be held in the form of interest-beraring public bonds.
1997	**1.447**	In September, the BOT reduced the liquidity requirement ratio from 7 % to 6% of total deposits. For finance companies the liquidity requirement was reduced from 7% to 6% of total domestic and foreign borrowing. Also, it was the case for non-resident deposits or foreign borrowing with maturity of less than one year.
1999	**1.440**	The BOT announced new rules on liquidity reserve requirement composition and procedure, but not changes in rates.

Source: Annual Reports of the Bank of Thailand.

Appendix 4: Algorithm to Track the Evolution of Bank Ownership

Ideally, the objective is to identify foreign institutions involved in retail banking and with access to upstream financing from their mother banks.[27] This is the case of branches of foreign banks, which can obtain resources from their mother institutions on a needed basis. This may also be the case of subsidiaries of foreign banks, although the availability of upstream resources in this case is not guaranteed. In this paper a bank is considered "foreign" if it is a branch of a bank incorporated in a foreign country, or if it has shareholders settled in a foreign country, holding together at least 51 percent of the bank capital.

The above operational definition was applied in four steps. First, the Bankscope search engine was used to identify subsidiaries of banks from OECD countries. Those with more than 51 percent of ownership in the hands of foreign banks were selected. This search identified 304 banks at least partially owned by banks from OECD countries. Of those, 189 had more than 51 percent in the hands of banks headquartered in OECD countries. Second, to verify the above list, the search engine of Bankscope was used to identify the shareholders of the sampled banks. Specifically, banks with shareholders settled in OECD countries, holding together at least 51 percent of the bank capital were filtered. In cases with no available information on percentage ownership, banks with one or more shareholders from OECD countries,

---

[27] In practice, both the nature of the services provided by foreign banks, and their access to upstream resources, depend on the institutional modality of entry. The most commonly used are representative offices, branches, subsidiaries, and joint ventures (for a description, see for example: IMF International Capital Markets: September 2000, p. 159-160).

and with local shareholders holding together less than 50 percent of the bank's capital, were also selected. These filtering criteria produced 313 cases. Of those, 171 were common to the 189 mentioned above, and taken as foreign banks without further check. The remaining 18 were checked individually by looking at their web pages. All of them were included in the final list of foreign banks.

Third, as the information on ownership is not available for all the banks included in the Bankscope database, a list of banks with unknown dependence was produced. The search matched 801 banks. This information was crossed out with a list of transnational banks headquartered in OECD countries or the Cayman Islands, gathered from the web site www.transnationale.org. In addition, the list of banks in the sample was intersected with the lists of foreign banks available from the Central Banks' web pages of Hong Kong, Brazil, Singapore, and Thailand. On a case-by-case basis, 168 additional branches of foreign banks were also identified.

The list produced by the above criteria provides information on current ownership. In the fourth step, to obtain chronological information on changes in ownership throughout the period, the sample of banks was intersected with a comprehensive list of mergers and acquisitions targeting financial institutions in the sampled countries taken from the SDC Platinum database. Specifically, the list includes all transactions announced between January 1, 1985 and December 31, 2000, targeting institutions classified under industrial (SIC) codes 6000, 6081, 6029, 6021, and 6712 (to be on the safe side, these codes include a broad category of target financial institutions). The search produced 1,227 transactions involving 804 target

institutions. Of those, 404 were matched with the sample of banks. In order to track acquisitions by financial institutions exclusively, the list ignored operations were the acquirers and their nationalities were unknown. Using the description of each operation, nine categories were created, indicating the nationality of the buyer (foreign OECD, foreign non-OECD, government, domestic resident), and the resulting ownership position after the transaction (public, domestic, foreign OECD, and foreign non-OECD).[28] With the help of this code, it was possible to replicate the evolution of bank ownership throughout the period. In total, the algorithm identified 58 institutions changing ownership.

[28] In cases where the acquirer is a public company (there are several cases involving government-owned companies based in China), we classify the acquirer as government.

Table 1. Sample Description

		Balance Sheet		Flow of Funds	
Country	Number of Banks	Number of Observations	Coverage	Number of Observations	Coverage
Brazil	9	71	1988-1997	61	1988-1997
Canada	13	100	1986-1998	103	1987-1998
Chile	6	21	1988-1997	5	1995-1997
Colombia	9	64	1987-1997	62	1988-1997
Denmark	38	328	1987-1998	99	1989-1998
Finland	8	59	1988-1997	41	1988-1996
France	52	466	1986-1997	29	1987-1997
Germany	42	361	1988-1998	4	1995-1998
Hong Kong	16	95	1988-1998	34	1986-1996
India	4	-	-	9	1996-1998
Indonesia	12	72	1990-1997	66	1991-1997
Ireland	4	28	1988-1998	30	1988-1998
Italy	42	380	1986-1997	92	1987-1997
Japan	121	1028	1988-1998	96	1989-1998
Korea	20	119	1988-1997	46	1992-1997
Malaysia	19	120	1988-1997	100	1988-1998
Mexico	3	6	1992-1997	10	1992-1997
Norway	14	103	1988-1998	75	1988-1998
Peru	7	31	1988-1997	32	1988-1997
Philippines	12	75	1990-1997	61	1990-1997
Portugal	15	106	1986-1997	66	1988-1997
Spain	24	195	1986-1997	179	1987-1998
Taiwan	9	-	1993-1997	35	1993-1997
Thailand	30	204	1988-1997	108	1988-1997
United Kingdom	23	200	1986-1998	16	1988-1997
United States	266	2391	1986-1998	2263	1986-1998
Venezuela	4	25	1988-1997	26	1988-1997
Total	832	6648		3748	

This table describes the sample of banks included in the WorldScope database. Available information includes balance sheets, income statements, and flows of funds. The sample covers only the largest publicly traded banks in each country. WorldScope reports both original figures, as published by banks, as well as figures that are adjusted to account for cross-country variations in accounting practices. The panel is unbalanced, covering 1986-1998.

Table 2. Sample Distribution

Bank size (percentiles)	Median assets (Million 1995 US$)	Number of observations	Percentage of sample
20 th percentile			
Developed countries	574	1124	16.9
Developing countries	431	206	3.1
40 th percentile			
Developed countries	1,814	1066	16.0
Developing countries	1,943	264	4.0
60 th percentile			
Developed countries	5,751	1126	16.9
Developing countries	5,124	203	3.1
80 th percentile			
Developed countries	18,300	1203	18.1
Developing countries	20,000	127	1.9
100 th percentile			
Developed countries	84,900	1226	18.4
Developing countries	49,200	103	1.5
Total sample		6648	100.0

This table presents the sample distribution by quintiles of bank size and by developed and developing countries. Bank size is measured by total assets in constant 1995 US$. Quintiles are computed based on the entire sample distribution. The data comes from the WorldScope database.

Table 3. Structure of Balance Sheets for Developed and Developing Countries

	Total sample					Developed countries					Developing countries				
Percentile (by total assets)	20%	40%	60%	80%	100%	20%	40%	60%	80%	100%	20%	40%	60%	80%	100%
Cash and equivalents	0.053	0.061	0.053	0.053	0.068	0.043	0.049	0.049	0.048	0.068	0.133	0.121	0.080	0.104	0.070
Total Investments	0.259	0.239	0.213	0.190	0.190	0.272	0.263	0.225	0.191	0.189	0.157	0.123	0.137	0.175	0.205
Total loans	0.631	0.651	0.662	0.687	0.656	0.636	0.649	0.662	0.698	0.660	0.594	0.660	0.662	0.568	0.587
Net Loans	0.622	0.639	0.657	0.681	0.649	0.626	0.638	0.658	0.694	0.653	0.590	0.645	0.644	0.550	0.575
Other assets	0.066	0.061	0.077	0.076	0.093	0.059	0.050	0.068	0.067	0.089	0.120	0.111	0.139	0.172	0.150
Total Assets	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Demand deposits	0.167	0.155	0.140	0.111	0.099	0.167	0.156	0.140	0.105	0.094	0.171	0.154	0.140	0.175	0.194
Time deposits	0.524	0.537	0.477	0.501	0.319	0.542	0.562	0.480	0.517	0.325	0.385	0.417	0.454	0.327	0.197
Total deposits	0.725	0.730	0.675	0.674	0.553	0.739	0.741	0.675	0.681	0.554	0.614	0.678	0.675	0.599	0.525
Short-term debt	0.094	0.112	0.140	0.129	0.199	0.094	0.120	0.150	0.130	0.202	0.093	0.077	0.077	0.117	0.154
Long-term debt	0.050	0.044	0.066	0.075	0.106	0.045	0.039	0.066	0.075	0.107	0.091	0.069	0.064	0.071	0.087
Total liabilities	0.904	0.920	0.928	0.946	0.946	0.908	0.924	0.931	0.948	0.947	0.871	0.898	0.911	0.928	0.926
Shareholders equity	0.094	0.083	0.065	0.049	0.039	0.090	0.079	0.062	0.047	0.038	0.125	0.102	0.085	0.069	0.059
Total liabilities and equity	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Other ratios															
Flows from Operation/Loans	0.025	0.024	0.024	0.021	0.018	0.024	0.023	0.024	0.021	0.018	0.047	0.035	0.029	0.027	0.032
Total Deposits/Loans	1.260	1.216	1.108	1.128	0.865	1.265	1.242	1.135	1.140	0.882	1.108	1.001	0.968	1.199	1.244
Liquid Assets/Total Assets	0.284	0.281	0.246	0.227	0.218	0.294	0.306	0.262	0.230	0.210	0.265	0.208	0.181	0.213	0.313
Median Assets (Million 1995 US$)	561	1833	5698	18300	78700	574	1810	5763	18300	84100	448	1925	5125	19400	49000
Number of Obs.	1281	1299	1304	1300	1286	1095	1048	1107	1186	1192	186	251	197	114	94

This table presents the median structure of banks' balance sheets by quintiles of bank sizes across developed and developing countries. Bank sizes are based on total assets. Funds from operations (or cash flows) are the sum of net profit before preferred dividends plus depreciation, reserves changes and provision for loan losses. Cash and equivalents is the sum of cash and short-term investments (including U.S. treasury bills, municipal securities, stocks, bonds and other corporate securities, commercial paper, and other short-term financial instruments).

Table 4. Pair-wise Correlations between Selected Variables

	Developed countries					Developing countries				
	Lending minus LIBOR	Lending minus Deposit	Loan Growth	Deposit Growth	Deposit Rate	Lending minus LIBOR	Lending minus Deposit	Loan Growth	Deposit Growth	Deposit Rate
Depreciation	0.0444	-0.0373	0.1057	0.0226	-0.0983	0.8617	0.8106	-0.3486	-0.3258	0.7416
Significance level	0.6135	0.6712	0.2527	0.8074	0.2621	0	0	0.0007	0.0017	0
No. Obs.	132	132	119	119	132	112	111	91	90	128
Deposit Rate	0.7711	0.0215	0.1487	0.2632	1	0.9872	0.9444	-0.2211	-0.2168	1
Significance level	0	0.7985	0.1066	0.0038		0	0	0.0352	0.0401	
No. Obs.	144	144	119	119	144	119	119	91	90	138
Lending Rate	0.9041	0.5023	0.2191	0.3575	0.8753	1	0.9846	-0.6336	-0.6209	0.9873
Significance level	0	0	0.0167	0.0001	0	0	0	0	0	0
No. Obs.	144	144	119	119	144	121	119	82	81	119
Lending minus Deposit	0.4902	1	0.1976	0.2867	0.0215	0.9847	1	-0.5844	-0.5669	0.9444
Significance level	0		0.0312	0.0016	0.7985	0		0	0	0
No. Obs.	144	144	119	119	144	119	119	82	81	119

This table presents pair-wise correlations are based on yearly information for the period 1996-1998. All variables at the macro level are yearly averages. Correlations for bank-level variables i.e. loan growth, deposit growth) are based on the mean computed for each country-year. Growth rates are computed as the difference of the log of the corresponding variable, expressed in constant 1995 local currency. The sample excludes US observations and depreciation rates exceeding 25% per year. Significance levels are based on the null of zero correlation.

Table 5. Statistics on Loan Growth and Deposit Growth by Country Groups and Cost of Non-Insured Debt

	Loan Growth						Deposit Growth					
	Average	Median	St. Dev.	Minimum	Maximum	No. Obs.	Average	Median	St. Dev.	Minimum	Maximum	No. Obs.
A) All Sample												
Developed countries												
Low-Cost Debt	0.063	0.057	0.182	-1.398	2.638	1762	0.045	0.041	0.245	-2.645	5.014	1772
High-Cost Debt	0.042	0.047	0.321	-10.761	2.004	1650	0.043	0.041	0.332	-4.722	6.544	1656
Developing countries												
Low-Cost Debt	0.144	0.152	0.314	-0.895	2.888	175	0.120	0.138	0.249	-1.179	0.990	173
High-Cost Debt	0.138	0.141	0.512	-1.858	4.846	148	0.141	0.136	0.234	-0.920	1.224	146
B) Periods of Deposit Contraction												
Developed countries												
Low-Cost Debt	-0.051	-0.040	0.135	-1.398	0.603	580	-0.119	-0.073	0.199	-2.645	-0.001	594
High-Cost Debt	-0.069	-0.056	0.146	-1.398	0.287	590	-0.139	-0.069	0.314	-4.722	0.000	601
Developing countries												
Low-Cost Debt	-0.116	-0.091	0.249	-0.698	0.270	30	-0.249	-0.120	0.285	-1.179	-0.001	30
High-Cost Debt	-0.157	-0.116	0.414	-1.768	0.414	23	-0.197	-0.139	0.230	-0.920	-0.001	23
C) Periods of Deposit Expansion												
Developed countries												
Low-Cost Debt	0.119	0.089	0.176	-0.283	2.638	1182	0.127	0.078	0.223	0.000	5.014	1178
High-Cost Debt	0.104	0.086	0.372	-10.761	2.004	1060	0.146	0.087	0.295	0.001	6.544	1055
Developing countries												
Low-Cost Debt	0.198	0.182	0.299	-0.895	2.888	145	0.198	0.168	0.154	0.000	0.990	143
High-Cost Debt	0.193	0.168	0.511	-1.858	4.846	125	0.204	0.161	0.174	0.006	1.224	123

This table presents summary statistics for loan growth and deposit growth. The sample is split between developed and developing countries, and among periods of deposit contraction and expansion. In addition, banks are classified into two groups depending on their cost of non-insured debt financing. Banks facing interest rates on non-insured debt above the average when compared with their country peers in a given year are labeled "High Cost". Otherwise, banks are labeled "Low Cost".

Table 6. Loan Growth and Exchange Rate Depreciation

	[1]	[2]	[3]	[4]	[5]	[6]
	All sample	Depreciation< 25%	Depreciation< 25% and non-US banks	All sample	Depreciation< 25%	Depreciation< 25% and non-US banks
GDP Growth	1.028 ***	0.766 ***	0.504 ***	1.105 ***	0.93 ***	0.767 ***
	(0.117)	(0.109)	(0.131)	(0.112)	(0.106)	(0.146)
Lagged Liquidity	0.469 ***	0.474 ***	0.313 ***	0.373 ***	0.377 ***	0.2 ***
	(0.035)	(0.032)	(0.036)	(0.033)	(0.031)	(0.037)
Lagged Liquidity * Developing	0.492 ***	0.276 ***	0.434 ***	1.446 ***	0.583 ***	0.756 ***
	(0.104)	(0.105)	(0.096)	(0.134)	(0.149)	(0.141)
Ln Assets	0.051 ***	0.055 ***	0.011	0.058 ***	0.061 ***	0.012
	(0.008)	(0.007)	(0.01)	(0.008)	(0.007)	(0.013)
Ln Assets * Developing	-0.001	-0.011	0.033 *	0.028	-0.005	0.043 *
	(0.019)	(0.019)	(0.018)	(0.022)	(0.022)	(0.023)
Depreciation	-0.838 ***	-0.866 ***	-0.989 ***	-0.999 ***	-1.028 ***	-1.168 ***
	(0.277)	(0.25)	(0.223)	(0.341)	(0.318)	(0.298)
Depreciation * Developing	-0.285 **	-2.475 **	-2.298 **	0.078	-2.76 **	-2.581 **
	(0.15)	(1.014)	(0.905)	(0.383)	(1.298)	(1.21)
Ln Assets * Depreciation	-0.005	-0.004	0.004	0.004	0.005	0.013
	(0.017)	(0.015)	(0.014)	(0.02)	(0.019)	(0.018)
Ln Assets * Depreciation * Developing	0.082 ***	0.15 **	0.136 **	0.065 ***	0.186 **	0.174 **
	(0.02)	(0.065)	(0.058)	(0.023)	(0.084)	(0.079)
Depreciation * Dummy Cost of Debt				-0.0879	-0.0853	-0.0808
				(0.081)	(0.076)	(0.071)
Depreciation * Dummy Cost Debt * Developing				-1.0918 ***	-0.8135 **	-0.8184 ***
				(0.098)	(0.335)	(0.312)
R-Sq	4904	4862	2908	3871	3858	2020
No. Obs.	0.247	0.288	0.414	0.372	0.326	0.463

This table reports the results of fixed-effects regressions of loan growth (in 1995 constant local currency) on exchange rate depreciation. Explanatory variables include GDP growth to control for the business cycle, lagged liquidity (cash and liquid financial instruments over total assets at the beginning of the year), the log of bank's assets, exchange rate depreciation, and a dummy that equals one when the cost of non-insured debt for a bank is above the 75th percentile compared with their country peers in a given year, and zero otherwise. All variables are interacted with a developing dummy, which equals one for developing countries and zero elsewhere. Columns 1 and 4 report the results based on the whole sample; columns 2 and 5 exclude years with depreciation higher than 25 percent per year; columns 3 and 6 are based on non-US banks and exclude years with depreciation higher than 25 percent. The 25 percent threshold follows from the highest yearly rate of depreciation of developed countries included in the sample.

Table 7. Loan Growth, Reserve Requirements and Money Market Rates

	All sample	Excluding US banks
Control Variables		
GDP Growth	0.464 ***	0.589 ***
	(0.117)	(0.17)
Lag. liquidity	0.443 ***	0.196 ***
	(0.034)	(0.044)
Developing*Lag. liquidity	0.599 ***	0.848 ***
	(0.176)	(0.178)
Log assets	0.107 ***	0.204 ***
	(0.012)	(0.021)
Developing*Log assets	-0.133 ***	-0.228 ***
	(0.049)	(0.051)
Panel A: Reserve requirements		
Reserve Requirements	-0.199 *	-0.263 **
	(0.115)	(0.124)
Developing*Reserve Requirements	0.273	0.34
	(0.274)	(0.278)
Log assets*Reserve Requirements	0.012 *	0.015 **
	(0.007)	(0.008)
Developing*Log assets*Reserve Requirements	-0.012	-0.015
	(0.018)	(0.018)
Dummy Cost Debt*Reserve Requirements	0.001	-0.006
	(0.008)	(0.009)
Developing*Dummy Cost Debt*Reserve Requirements	0.013	0.019
	(0.029)	(0.029)
Panel B: Money Market Rates		
Money Market Rate	-0.024 ***	0.032 **
	(0.009)	(0.013)
Developing*Money Market Rate	-0.074 **	-0.129 ***
	(0.029)	(0.031)
Log assets*Money Market Rate	0.002 ***	-0.0003
	(0.001)	(0.001)
Developing*Log assets*Money Market Rate	0.003	0.006 ***
	(0.002)	(0.002)
Dummy Cost Debt*Money Market Rate	-0.004 **	-0.003
	(0.002)	(0.002)
Developing*Dummy Cost Debt*Money Market Rate	-0.018 ***	-0.017 ***
	(0.005)	(0.005)
No. Obs.	3838	2010
R-Sq.	0.188	0.2546

This table presents the results of fixed effect regressions of loan growth on money market rates and an indicator of reserve requirements. Loan growth is the yearly change in loans measured in constant (1995) local currency. Reserve requirements are an indicator variable ranging from 1 to 3, where a higher value means higher levels of required reserves. Dummy cost of debt is a dummy variable that equals one for bank-years whose interest rates on non-insured debt are above the 75th percentile relative to their country-year peers. Column [1] reports the results based on the whole sample of countries; column [2] excludes US banks. The data used in the regressions comes from the WorldScope database.

Table 8. Loan Growth, Reserve Requirements, Treasury Bill Rates, and Depreciation

	All sample	Excluding US banks
Panel A: Reserve Requirements		
Reserve Requirements	-0.140 **	-0.167 *
	(0.072)	(0.100)
Reserve Requirements * Developing	-0.037	-0.011
	(0.232)	(0.225)
Ln Assets * Reserve Requirements	0.011 *	0.012 **
	(0.006)	(0.006)
Ln Assets * Reserve Requirements * Developing	0.003	0.002
	(0.015)	(0.015)
Reserve Requirements * Dummy Cost of Debt	-0.006	-0.004
	(0.009)	(0.011)
Reserve Requirements * Dummy Cost Debt * Developing	-0.080 ***	-0.082 ***
	(0.030)	(0.030)
Panel B: Treasury Bill Rate		
Treasury Bill Rate	-0.005	0.002
	(0.011)	(0.018)
Treasury Bill Rate * Developing	0.000	-0.005
	(0.083)	(0.081)
Ln Assets * Treasury Bill Rate	0.001	0.000
	(0.001)	(0.001)
Ln Assets * Treasury Bill Rate * Developing	0.000	0.000
	(0.005)	(0.005)
Treasury Bill Rate * Dummy Cost of Debt	0.007	0.004
	(0.005)	(0.004)
Treasury Bill Rate * Dummy Cost Debt * Developing	-0.020	-0.023 *
	(0.013)	(0.013)
Panel C: Exchange Rate Depreciation		
Depreciation	-0.199	-0.283
	(0.291)	(0.284)
Depreciation * Developing	-5.938 ***	-5.870 ***
	(1.238)	(1.191)
Ln Assets * Depreciation	0.017	0.021
	(0.017)	(0.017)
Ln Assets * Depreciation * Developing	0.382 ***	0.377 ***
	(0.081)	(0.078)
Depreciation * Dummy Cost of Debt	-0.186 **	-0.186 ***
	(0.073)	(0.070)
Depreciation * Dummy Cost Debt * Developing	-1.259 ***	-1.264 ***
	(0.304)	(0.292)
R-Sq	0.158	0.150
No. Obs.	4145.000	2224.000

This table presents the results of fixed effect regressions of loan growth on an indicator of reserve requirements, the rate of the 3 month US treasury bills, and exchange rate depreciation. Control variables include GDP growth and lagged bank liquidity (cash and liquid assets over total assets). Loan growth is the yearly change in loans measured in constant (1995). Reserve requirements are an indicator variable that goes from 1 to 3, where a higher value means higher levels of required reserves. Dummy Cost of Debt is a dummy variable that equals one for bank-years whose interest rates are above the 75th percentile relative to their country-year peers. Column [1] reports the results based on the whole sample of countries; column [2] excludes US banks. The data come from the WorldScope database.

Table 9. Dynamic Panel Regressions of Loans in Levels on Deposits

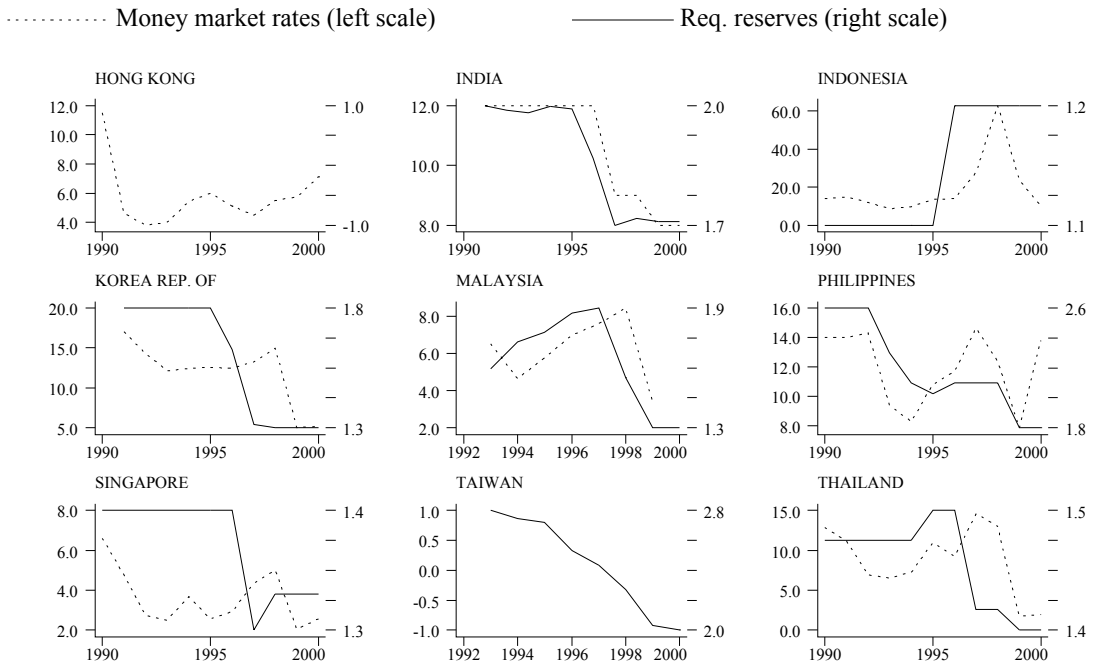
	Depreciation < 25 percent			Depreciation < 25 percent and non-US banks		
	[1]	[2]	[3]	[4]	[5]	[6]
Lagged Ln Loans	0.603	0.588	0.648	0.534	0.501	0.575
	[0.040]***	[0.046]***	[0.039]***	[0.034]***	[0.044]***	[0.039]***
D. GDP growth	0.705	0.852	0.824	0.018	0.018	-0.131
	[0.143]***	[0.152]***	[0.152]***	[0.187]	[0.186]	[0.195]
D. Developing*GDP growth	1.478	1.491	1.759	1.88	1.939	2.378
	[0.381]***	[0.389]***	[0.409]***	[0.372]***	[0.399]***	[0.413]***
D. Ln Deposits	0.268	0.272	0.564	0.226	0.23	0.485
	[0.054]***	[0.054]***	[0.130]***	[0.049]***	[0.045]***	[0.108]***
D. Developing*Ln Deposits	0.135	0.193	-0.201	0.267	0.325	-0.098
	[0.041]***	[0.049]***	[0.264]	[0.048]***	[0.064]***	[0.226]
D. Lagged capitalization		0.216	5.228		0.476	5.037
		[0.348]	[2.325]**		[0.247]*	[1.753]***
D. Developing*Lagged capitalization		-0.86	-7.255		-0.914	-7.988
		[0.721]	[4.767]		[0.645]	[3.901]**
D. Lagged liquidity		-0.043	6.449		0.015	4.908
		[0.095]	[2.888]**		[0.054]	[2.580]*
D. Developing*Lagged Liquidity		-0.468	-9.836		-0.493	-9.368
		[0.537]	[5.149]*		[0.528]	[4.794]*
D. Deposits*Lagged Capitalization			-0.368			-0.348
			[0.143]**			[0.107]***
D. Developing*Deposits*Lagged Capitalization			0.419			0.461
			[0.306]			[0.253]*
D. Deposits*Lagged Liquidity			-0.392			-0.298
			[0.177]**			[0.157]*
D. Developing*Deposits*Lagged Liquidity			0.585			0.555
			[0.328]*			[0.306]*
Estimation	one-step	one-step	one-step	one-step	one-step	one-step
Observations	4726	4678	4678	2889	2852	2852
Autocorr. order 1; (p-value)	-4.73; (0.000)	-8.87; (0.000)	-8.88; (0.000)	-5.88; (0.000)	-6.98; (0.000)	-6.58; (0.000)
Autocorr. order 2; (p-value)	-1.54; (0.122)	-1.59; (0.110)	-1.62; (0.105)	-1.65; (0.099)	-1.35; (0.179)	-2.29; (0.022)

Robust standard errors in brackets. D. stands for first differences

* significant at 10%; ** significant at 5%; *** significant at 1%

This table presents the results of dynamis panel regressions of (the log of) loans on their lagged values, (the log of) deposits, instrumented by monetary conditions (money market rates, exchange rate depreciation, an indicator of reserve requirements, and the three month US treasury bill rate). Control variables include GDP growth, and lagged bank-level characteristics (treated as predetermined variables). All variables were interacted with a Developing dummy which equals one for developing countries and zero elsewere. The equations were estimated in first differences, using the one-step GMM Arellano-Bond estimator. Columns [1] to [3] are computed on the whole sample, after exclusing periods with exchange rate depreciation above 25 percent. Columns [4] to [6] further exclude the subsample of US banks.

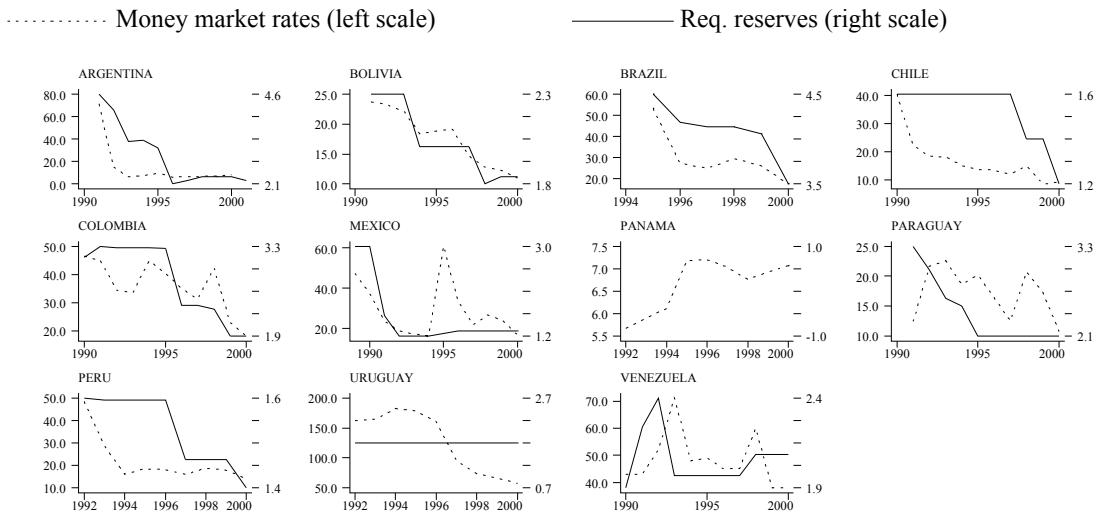
Figure 1. Money Market Rates and Reserve Requirements, Asian Countries, 1990-2000



Source: Central Bank reports and International Financial Statistics.

For countries with incomplete or not available information on money market rates, an alternative indicator was used. The call money rate (series 60) was used for India; the 1-month average interbank offer rate for Hong Kong; and the interbank rate for Taiwan

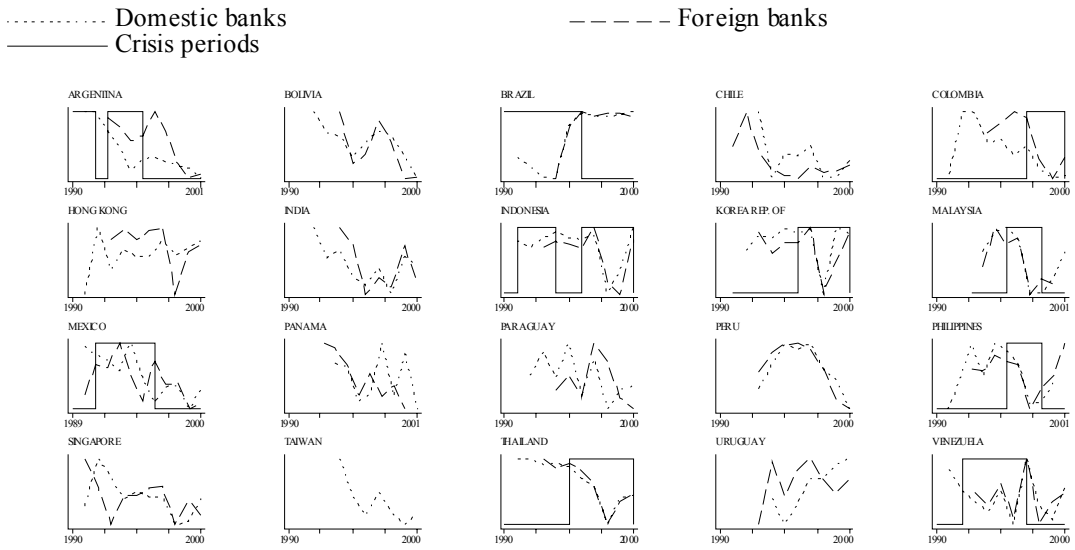
Figure 2. Money Market Rates and Reserve Requirements, Latin America, 1990-2000



Source: Central Bank reports and International Financial Statistics.

For countries with incomplete or not available information on money market rates, an alternative indicator was used. Deposit rates (series 60L) were used for Bolivia, Chile, Colombia, Panamá, Paraguay, and Venezuela.

Figure 3. Loan Growth of Domestic and Foreign Banks, 1990-2000



Source: BankScope.

This Figure presents the evolution of loan growth in constant local currency units for domestic and foreign banks. For each country, loan growth is computed as the median across sampled banks. A crisis window, covering a three-year period around either a currency, banking or debt crisis, is also plotted.

Table 10. Sample Coverage by Regions and Bank Ownership

	Asia			Latin America			Total Observations		
	Domestic	Foreign	Total	Domestic	Foreign	Total	Freq.	Percent	Cum.
1989	.	.	0	2	1	3	3	0.03	0.03
1990	9	2	11	9	3	12	23	0.27	0.30
1991	28	5	33	20	3	23	56	0.65	0.96
1992	84	31	115	42	13	55	170	1.98	2.94
1993	280	101	381	159	96	255	636	7.42	10.36
1994	366	132	498	294	157	451	949	11.07	21.43
1995	424	164	588	321	195	516	1104	12.88	34.30
1996	452	182	634	346	212	558	1192	13.90	48.20
1997	411	189	600	329	220	549	1149	13.40	61.60
1998	399	190	589	336	241	577	1166	13.60	75.20
1999	365	172	537	335	235	570	1107	12.91	88.12
2000	281	142	423	319	250	569	992	11.57	99.69
2001	5	1	6	14	7	21	27	0.31	100.00
Total	3104	1311	4415	2526	1633	4159	8574	100	

This table shows the temporal distribution of the bank-level data. The sample comes from the BankScope database, and covers 20 emerging economies in Asia and Latin America.

Table 11. Balance Sheet Structure by Regions and Quintiles of Bank Size

	Asian					Latin America				
Quintiles of bank size	0-20	20-40	40-60	60-80	80-100	0-20	20-40	40-60	60-80	80-100
Total loans	50.8	51.5	52.2	57.8	60.4	51.5	54.7	53.2	47.9	50.0
Problem loans	3.0	3.8	2.0	2.7	3.8	3.1	2.4	2.1	2.4	4.7
Loan loss reserves	4.9	2.6	1.6	1.7	1.6	4.5	3.1	2.6	2.2	3.0
Net Loans	45.9	49.1	50.7	56.4	59.2	48.1	52.9	51.7	47.1	49.8
Deposits with banks	16.6	13.2	11.9	9.2	11.4	10.4	9.0	8.6	7.0	4.8
Securities	14.8	12.4	14.5	13.8	10.4	15.9	15.2	18.0	21.6	18.7
Equity investment	5.0	7.4	6.1	2.6	1.9	2.8	2.4	1.8	2.5	3.4
Total other earning assets	44.2	43.0	41.5	34.8	30.7	33.1	31.4	33.6	36.9	34.6
Total non-earning assets	7.2	6.2	5.8	6.6	7.9	13.9	12.2	11.5	13.3	12.9
Fixed assets	2.7	1.7	2.0	2.2	2.2	4.9	3.5	3.2	2.7	2.6
Total assets	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Total deposits	53.8	59.1	61.2	72.6	76.8	58.9	66.7	65.8	59.3	56.1
Money Market Funding	9.6	8.2	8.4	4.7	3.6	8.0	9.3	12.0	14.8	16.4
Other Funding	3.5	4.9	8.5	4.7	6.1	2.0	2.8	4.0	6.5	9.7
Other liabilities	5.5	5.4	5.3	6.5	6.8	6.0	5.9	6.5	8.6	9.0
Total liabilities	72.4	77.6	83.4	88.6	93.2	75.0	84.8	88.2	89.2	91.2
Equity	27.6	22.5	16.6	11.4	6.7	25.0	15.2	11.8	10.8	8.8
Total liabilities and equity	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
No. Observations	578	761	888	972	1204	1131	948	821	737	504
Median Assets (million 1995 US$)	58	210	489	1,591	6,351	50	199	486	1,443	6,392
Mean Assets (million 1995 US$)	58	212	517	1,685	12,615	54	203	512	1,561	11,498

Other earning assets include due from Central Banks, deposits with banks, bonds, securities, and equity investments. Total deposits include demand deposits, saving deposits, certificates of deposits, and banks deposits. Equity includes equity reserves and share capital.

Table 12. Summary Statistics by Regions and Bank Ownership

	Domestic Banks					Foreign Banks				
	Mean	Median	Max.	Min.	Obs.	Mean	Median	Max.	Min.	Obs.
A) Asia										
Loan Growth	11.2	10.5	240.4	-128.6	1016	5.1	8.3	218.2	-206.9	238
Deposit Growth	11.0	9.3	215.7	-183.8	1003	8.3	8.4	216.2	-108.1	238
Net Loans/Total Deposits	81.8	75.9	484.0	21.1	1217	88.8	80.7	465.0	22.0	289
Net Loans/Total Assets	56.1	57.4	87.1	11.8	1232	54.5	58.0	87.0	10.0	291
Other Earning Assets/Total Assets	31.4	28.5	78.4	5.2	1231	32.7	30.0	75.9	6.1	292
Non Earning Assets/Total Assets	9.9	8.0	74.4	5.0	1234	11.2	8.3	71.2	5.0	293
Total Deposits/Total Assets	75.2	79.5	94.9	5.2	1219	68.9	74.8	94.9	7.2	291
Money Market Funding/Total Assets	4.1	0.9	77.2	0.0	1180	4.4	0.0	73.3	0.0	275
Total Liabilities/Total Assets	90.1	92.3	99.7	40.9	1234	86.1	89.9	99.8	40.3	293
Net Worth/Total Assets	9.9	7.7	59.1	0.3	1234	13.9	10.1	59.7	0.2	293
Efective Bank Spread	3.8	3.8	19.0	-14.9	979	5.1	3.7	135.3	-4.4	215
B) Latin America										
Loan Growth	3.4	5.0	202.4	-237.0	1224	8.0	7.0	247.9	-209.2	681
Deposit Growth	3.6	5.3	229.8	-236.6	1227	5.4	5.8	196.2	-181.8	682
Net Loans/Total Deposits	89.0	80.4	494.1	20.1	1562	89.1	81.2	478.3	20.6	809
Net Loans/Total Assets	52.5	54.6	86.3	10.2	1568	50.4	53.0	87.8	10.1	812
Other Earning Assets/Total Assets	28.4	25.7	79.5	5.0	1576	31.1	26.8	78.8	5.0	822
Non Earning Assets/Total Assets	14.7	12.4	75.0	5.0	1576	16.0	13.1	77.4	5.0	822
Total Deposits/Total Assets	65.2	69.7	93.7	5.4	1568	62.7	69.8	94.9	5.5	818
Money Market Funding/Total Assets	9.0	2.2	64.3	0.0	1351	12.5	3.3	74.1	0.0	745
Total Liabilities/Total Assets	85.1	87.8	99.9	40.0	1576	86.5	89.4	99.9	40.2	822
Net Worth/Total Assets	14.9	12.2	60.0	0.1	1576	13.5	10.6	59.8	0.1	822
Efective Bank Spread	8.9	7.0	82.2	-19.6	1205	7.8	6.0	101.4	-31.0	670
B) Whole Sample										
Loan Growth	6.9	8.0	240.4	-237.0	2240	7.2	7.5	247.9	-209.2	919
Deposit Growth	6.9	7.7	229.8	-236.6	2230	6.1	6.3	216.2	-181.8	920
Net Loans/Total Deposits	85.8	78.7	494.1	20.1	2779	89.0	81.1	478.3	20.6	1098
Net Loans/Total Assets	54.1	55.6	87.1	10.2	2800	51.5	54.4	87.8	10.0	1103
Other Earning Assets/Total Assets	29.7	26.7	79.5	5.0	2807	31.5	27.7	78.8	5.0	1114
Non Earning Assets/Total Assets	12.6	9.7	75.0	5.0	2810	14.8	11.5	77.4	5.0	1115
Total Deposits/Total Assets	69.6	74.6	94.9	5.2	2787	64.3	71.0	94.9	5.5	1109
Money Market Funding/Total Assets	6.7	1.1	77.2	0.0	2531	10.3	1.2	74.1	0.0	1020
Total Liabilities/Total Assets	87.3	89.6	99.9	40.0	2810	86.4	89.5	99.9	40.2	1115
Net Worth/Total Assets	12.7	10.4	60.0	0.1	2810	13.6	10.5	59.8	0.1	1115
Efective Bank Spread	6.6	4.7	82.2	-19.6	2184	7.1	5.2	135.3	-31.0	885

This table presents summary statistics of selected variables for domestic and foreign banks, and by regions.

Table 13. Fixed Effects Regressions of Selected Variables on Monetary Conditions, Latin-American Sub-Sample

	[1] Loan Growth	[2] Deposit Growth	[3] Loans/Deposits	[4] Bank Spread	[5] Deposit Rate	[6] Lending Rate
Controls						
GDP Growth	1.647	1.097	-0.041	0.112	-0.293	-0.054
	[0.302]***	[0.301]***	[0.996]	[0.049]**	[0.101]***	[0.060]
Foreign*GDP Growth	0.276	-0.224	-1.805	-0.022	-0.022	-0.149
	[0.458]	[0.473]	[1.559]	[0.081]	[0.108]	[0.106]
Size	0.256	0.299	-0.292	-0.016	0.003	-0.009
	[0.033]***	[0.032]***	[0.181]	[0.005]***	[0.005]	[0.006]
Foreign*Size	0.006	0.044	0.109	0.003	-0.009	-0.009
	[0.041]	[0.039]	[0.155]	[0.006]	[0.005]*	[0.008]
Liquidity (t-1)	0.694	-0.045	-1.457	-0.064	-0.090	-0.098
	[0.148]***	[0.128]	[0.669]**	[0.018]***	[0.041]**	[0.027]***
Foreign*Liquidity (t-1)	0.383	0.074	1.325	0.110	0.045	0.104
	[0.216]*	[0.206]	[0.734]*	[0.035]***	[0.045]	[0.048]**
Capitalization (t-1)	1.205	2.194	-1.950	-0.021	0.082	0.091
	[0.309]***	[0.308]***	[1.693]	[0.034]	[0.046]*	[0.055]*
Foreign*Capitalization (t-1)	1.056	1.002	2.361	0.065	-0.036	-0.005
	[0.477]**	[0.465]**	[1.791]	[0.065]	[0.055]	[0.086]
Monetary Conditions						
Reserve Requirements	-0.127	-0.080	-0.063	0.000	0.023	0.004
	[0.038]***	[0.038]**	[0.139]	[0.005]	[0.016]	[0.007]
Foreign*Reserve Requirements	-0.029	-0.071	0.319	-0.023	-0.007	-0.013
	[0.070]	[0.093]	[0.285]	[0.009]**	[0.017]	[0.012]
Money Market Rate	-0.051	-0.058	-0.001	0.273	0.203	0.494
	[0.004]***	[0.003]***	[0.004]	[0.026]***	[0.037]***	[0.042]***
Foreign*Money Market Rate	-0.001	0.001	-0.005	-0.003	-0.102	-0.111
	[0.007]	[0.008]	[0.007]	[0.044]	[0.043]**	[0.065]*
Observations	3019	3055	3020	2881	2938	2889
R-squared	0.49	0.46	0.55	0.87	0.61	0.74

This table presents the results of panel regressions with bank-level fixed effects. The sample comes from the Bankscope database and covers banks operating in selected Latin American countries from 1989-2001. Robust standard errors are reported between square brackets. Statistical significance at one, five, and ten percent level, are indicated by ***, **, *, respectively. Six models are considered, each one presented in a separate column. Each model uses a different dependent variable, specified in the first row of the table. All models share the same set of explanatory variables, including country-level controls (GDP growth), bank-level controls (bank size, bank liquidity, and bank capitalization), and two indicators of monetary conditions (an index that tracks the evolution of reserve requirements, and the money market rate). The sample is split across domestic and foreign banks with the use of a dummy ("Foreign") which equals one for foreign banks and zero otherwise.

Table 14. Fixed Effects Regressions of Selected Variables on Monetary Conditions, Asian Sub-Sample

	[1] Loan Growth	[2] Deposit Growth	[3] Loans/Deposits	[4] Bank Spread	[5] Deposit Rate	[6] Lending Rate
Controls						
GDP Growth	2.283	1.512	0.644	0.140	-0.117	0.017
	[0.210]***	[0.268]***	[0.725]	[0.023]***	[0.018]***	[0.024]
Foreign*GDP Growth	-0.038	0.912	-0.414	-0.073	0.082	0.020
	[0.370]	[0.386]**	[1.618]	[0.044]*	[0.027]***	[0.053]
Size	0.172	0.240	0.114	-0.006	-0.002	-0.008
	[0.036]***	[0.036]***	[0.118]	[0.003]**	[0.002]	[0.003]**
Foreign*Size	0.115	0.211	0.430	0.005	0.000	0.005
	[0.054]**	[0.055]***	[0.316]	[0.006]	[0.003]	[0.007]
Liquidity (t-1)	0.638	-0.138	-1.830	-0.031	-0.023	-0.061
	[0.137]***	[0.094]	[0.628]***	[0.011]***	[0.007]***	[0.013]***
Foreign*Liquidity (t-1)	0.294	0.470	-0.664	0.025	0.006	0.035
	[0.225]	[0.206]**	[1.874]	[0.061]	[0.017]	[0.074]
Capitalization (t-1)	0.934	1.230	0.421	0.029	-0.011	0.020
	[0.198]***	[0.213]***	[0.668]	[0.031]	[0.008]	[0.030]
Foreign*Capitalization (t-1)	0.109	0.269	0.326	0.014	0.039	0.052
	[0.392]	[0.444]	[0.853]	[0.040]	[0.017]**	[0.044]
Monetary Conditions						
Reserve Requirements	0.073	0.139	-0.066	-0.001	0.012	0.011
	[0.063]	[0.086]	[0.273]	[0.009]	[0.006]**	[0.010]
Foreign*Reserve Requirements	-0.297	-0.384	-0.086	-0.001	-0.013	-0.013
	[0.146]**	[0.151]**	[0.430]	[0.014]	[0.012]	[0.018]
Money Market Rate	-0.701	0.040	-0.597	-0.045	0.256	0.206
	[0.162]***	[0.164]	[0.393]	[0.020]**	[0.019]***	[0.020]***
Foreign*Money Market Rate	0.529	-0.112	-1.356	0.092	-0.150	-0.053
	[0.225]**	[0.237]	[1.025]	[0.036]***	[0.024]***	[0.041]
Observations	3339	3322	3267	2953	3047	2962
R-squared	0.51	0.40	0.71	0.92	0.95	0.90

This table presents the results of panel regressions with bank-level fixed effects. The sample comes from the Bankscope database and covers banks operating in selected Latin American countries from 1989-2001. Robust standard errors are reported between square brackets. Statistical significance at one, five, and ten percent level, are indicated by ***, **, *, respectively. Six models are considered, each one presented in a separate column. Each model uses a different dependent variable, specified in the first row of the table. All models share the same set of explanatory variables, including country-level controls (GDP growth), bank-level controls (bank size, bank liquidity, and bank capitalization), and two indicators of monetary conditions (an index that tracks the evolution of reserve requirements, and the money market rate). The sample is split across domestic and foreign banks with the use of a dummy ("Foreign") which equals one for foreign banks and zero otherwise.

Table 15. GLS Estimates of Selected Variables on Monetary Conditions, Latin-American Sub-Sample

	[1] Loan Growth	[2] Deposit Growth	[3] Loans/Deposits	[4] Bank Spread	[5] Deposit Rate	[6] Lending Rate
Controls						
GDP Growth	2.016	1.695	0.938	0.011	-0.129	-0.107
	[0.369]***	[0.391]***	[1.838]	[0.047]	[0.065]**	[0.075]
Foreign*GDP Growth	-0.329	-0.063	-2.619	-0.039	-0.111	-0.108
	[0.582]	[0.614]	[2.906]	[0.072]	[0.100]	[0.115]
Size	0.316	0.377	-0.242	-0.005	0.002	-0.008
	[0.032]***	[0.032]***	[0.185]	[0.004]	[0.005]	[0.007]
Foreign*Size	0.008	0.011	0.068	0.000	-0.007	-0.006
	[0.040]	[0.040]	[0.239]	[0.006]	[0.007]	[0.009]
Liquidity (t-1)	0.837	-0.043	-1.052	-0.036	-0.048	-0.068
	[0.127]***	[0.129]	[0.686]	[0.016]**	[0.022]**	[0.025]***
Foreign*Liquidity (t-1)	0.046	-0.210	1.796	0.005	-0.002	-0.010
	[0.188]	[0.190]	[1.022]*	[0.025]	[0.032]	[0.039]
Capitalization (t-1)	1.109	2.178	-1.351	-0.065	0.050	0.026
	[0.212]***	[0.215]***	[1.058]	[0.025]**	[0.035]	[0.040]
Foreign*Capitalization (t-1)	0.704	1.337	0.386	0.039	-0.017	-0.015
	[0.376]*	[0.378]***	[1.950]	[0.047]	[0.063]	[0.075]
Monetary Conditions						
Reserve Requirements	-0.088	-0.028	0.048	-0.001	-0.002	-0.004
	[0.043]**	[0.047]	[0.204]	[0.005]	[0.007]	[0.008]
Foreign*Reserve Requirements	0.007	-0.046	0.227	-0.017	0.029	0.014
	[0.082]	[0.088]	[0.394]	[0.010]*	[0.014]**	[0.015]
Money Market Rate	-0.042	-0.055	0.000	0.106	0.233	0.388
	[0.006]***	[0.007]***	[0.029]	[0.028]***	[0.039]***	[0.045]***
Foreign*Money Market Rate	0.056	0.399	-0.013	0.070	0.026	0.107
	[0.034]*	[0.102]***	[0.065]	[0.039]*	[0.050]	[0.061]*
Observations	2317	2350	2324	2194	2235	2197
Groups	591	599	593	582	595	584
R. Sq.	0.17	0.22	0.00	0.04	0.07	0.13
Rho AR(1)	0.18	0.06	0.55	0.42	0.09	0.31

This table presents the results of GLS panel regressions with bank-level fixed effects, and allowing for panel-specific AR(1) errors. The sample comes from the Bankscope database and covers banks operating in selected Latin American countries from 1989-2001. Robust standard errors are reported between square brackets. Statistical significance at one, five, and ten percent level, are indicated by ***, **, *, respectively. Six models are considered, each one presented in a separate column. Each model uses a different dependent variable, specified in the first row of the table. All models share the same set of explanatory variables, including country-level controls (GDP growth), bank-level controls (bank size, bank liquidity, and bank capitalization), and two indicators of monetary conditions (an index that tracks the evolution of reserve requirements, and the money market rate). The sample is split across domestic and foreign banks with the use of a dummy ("Foreign") which equals one for foreign banks and zero otherwise.

Table 16. GLS Regressions of Selected Variables on Monetary Conditions, Asian Sub-Sample

	[1] Loan Growth	[2] Deposit Growth	[3] Loans/Deposits	[4] Bank Spread	[5] Deposit Rate	[6] Lending Rate
Controls						
GDP Growth	1.906	1.364	-0.101	0.073	-0.099	-0.027
	[0.238]***	[0.268]***	[1.260]	[0.026]***	[0.018]***	[0.031]
Foreign*GDP Growth	0.389	1.202	-0.944	0.004	0.071	0.063
	[0.351]	[0.393]***	[1.887]	[0.040]	[0.028]**	[0.048]
Size	0.281	0.315	0.126	0.001	-0.002	0.000
	[0.032]***	[0.035]***	[0.193]	[0.004]	[0.002]	[0.005]
Foreign*Size	0.127	0.209	0.303	0.009	-0.001	0.005
	[0.044]***	[0.047]***	[0.264]	[0.005]	[0.003]	[0.006]
Liquidity (t-1)	0.856	-0.224	-1.537	-0.025	-0.036	-0.066
	[0.107]***	[0.119]*	[0.646]**	[0.013]*	[0.008]***	[0.015]***
Foreign*Liquidity (t-1)	0.309	0.595	0.602	-0.010	0.011	0.016
	[0.171]*	[0.189]***	[1.005]	[0.021]	[0.013]	[0.025]
Capitalization (t-1)	0.870	0.924	0.365	0.047	-0.013	0.033
	[0.138]***	[0.156]***	[0.806]	[0.015]***	[0.010]	[0.018]*
Foreign*Capitalization (t-1)	0.045	0.544	-0.221	-0.032	0.046	-0.002
	[0.216]	[0.238]**	[1.257]	[0.024]	[0.015]***	[0.029]
Monetary Conditions						
Reserve Requirements	-0.033	0.111	-0.091	0.001	0.023	0.011
	[0.089]	[0.099]	[0.473]	[0.009]	[0.006]***	[0.011]
Foreign*Reserve Requirements	-0.352	-0.329	-0.064	-0.011	-0.026	-0.025
	[0.196]*	[0.219]	[1.039]	[0.021]	[0.014]*	[0.025]
Money Market Rate	-0.793	-0.005	-1.245	-0.063	0.254	0.200
	[0.177]***	[0.195]	[0.998]	[0.019]***	[0.013]***	[0.023]***
Foreign*Money Market Rate	0.569	-0.169	0.052	0.094	-0.158	-0.052
	[0.260]**	[0.288]	[1.435]	[0.029]***	[0.019]***	[0.034]
Observations	2631	2623	2582	2308	2380	2314
Groups	627	628	613	571	593	573
R. Sq.	0.26	0.17	0.01	0.04	0.40	0.15
Rho AR(1)	0.15	0.02	0.45	0.40	-0.01	0.42

This table presents the results of GLS panel regressions with bank-level fixed effects, and allowing for panel-specific AR(1) errors. The sample comes from the Bankscope database and covers banks operating in selected Latin American countries from 1989-2001. Robust standard errors are reported between square brackets. Statistical significance at one, five, and ten percent level, are indicated by ***, **, *, respectively. Six models are considered, each one presented in a separate column. Each model uses a different dependent variable, specified in the first row of the table. All models share the same set of explanatory variables, including country-level controls (GDP growth), bank-level controls (bank size, bank liquidity, and bank capitalization), and two indicators of monetary conditions (an index that tracks the evolution of reserve requirements, and the money market rate). The sample is split across domestic and foreign banks with the use of a dummy ("Foreign") which equals one for foreign banks and zero otherwise.

Table 17. GLS Regressions of Loan Growth on Monetary Conditions I by Capitalization, Latin American Sub-Sample

	Whole Sample			Capitalization Below 75 percentile			Capitalization Above 75 percentile		
	Domestic Banks	Foreign Banks	H0: Domestic= Foreign	Domestic Banks	Foreign Banks	H0: Domestic= Foreign	Domestic Banks	Foreign Banks	H0: Domestic= Foreign
GDP Growth	2.016 ***	1.687 ***	[0.57]	1.734 ***	1.791 ***	[0.93]	1.787 *	0.444	[0.40]
	(0.3692)	(0.4639)		(0.3974)	(0.4845)		(0.9302)	(1.2661)	
Size	0.316 ***	0.324 ***	[0.85]	0.283 ***	0.320 ***	[0.38]	0.668 ***	0.116	[0.00]
	(0.0322)	(0.0339)		(0.0340)	(0.0361)		(0.1095)	(0.1278)	
Liquidity (t-1)	0.837 ***	0.883 ***	[0.81]	0.902 ***	1.042 ***	[0.51]	1.411 ***	-0.130	[0.00]
	(0.1272)	(0.1420)		(0.1396)	(0.1625)		(0.3228)	(0.3686)	
Capitalization (t-1)	1.109 ***	1.813 ***	[0.06]	0.882 ***	2.071 ***	[0.06]	2.030 ***	1.321 **	[0.32]
	(0.2123)	(0.3177)		(0.2900)	(0.5914)		(0.4771)	(0.5336)	
Money Market Rate	-0.0425 ***	0.0133	[0.10]	-0.0416 ***	-0.0185	[0.46]	0.0285	1.2317	[0.29]
	(0.0064)	(0.0332)		(0.0060)	(0.0304)		(0.0336)	(1.1285)	
Reserve Requirements	-0.088 **	-0.081	[0.93]	-0.094 *	-0.057	[0.68]	0.014	0.188	[0.38]
	(0.0431)	(0.0697)		(0.0482)	(0.0748)		(0.0895)	(0.1743)	
Obs.	2317			1759			401		
Groups	591			483			165		
R-Squared	0.17			0.18			0.27		
Rho AR(1)	0.18			0.21			0.36		

This table presents the results of panel regressions of loan growth on monetary conditions. The estimation is based on GLS, allowing for panel-specific AR(1) processes. Monetary conditions are measured by money market rates and an indicator of reserve requirements. Control variables include GDP growth, bank size, liquidity, and capitalization. Three sets of regressions are presented. The first covers the whole sample of banks in Latin America. The other two split the sample by capitalization levels using a 75 percent threshold. For each regression, the sample was further split between domestic and foreign banks with the use of dummy variables, to compare the coefficients between these two groups of banks. The p-values for the null of coefficient equality are presented between squared brackets.

Table 18. GLS Regressions of Loan Growth on Monetary Conditions I by Capitalization, Asian Sub-Sample

	Whole Sample			Capitalization Below 75 percentile			Capitalization Above 75 percentile		
	Domestic Banks	Foreign Banks	H0: Domestic= Foreign	Domestic Banks	Foreign Banks	H0: Domestic= Foreign	Domestic Banks	Foreign Banks	H0: Domestic= Foreign
GDP Growth	1.906 ***	2.295 ***	[0.27]	1.812 ***	2.107 ***	[0.41]	2.766 ***	2.929 ***	[0.90]
	(0.2381)	(0.2779)		(0.2385)	(0.2870)		(0.9666)	(0.9670)	
Size	0.281 ***	0.408 ***	[0.00]	0.279 ***	0.427 ***	[0.00]	0.587 ***	0.752 ***	[0.43]
	(0.0322)	(0.0383)		(0.0343)	(0.0400)		(0.1251)	(0.1722)	
Liquidity (t-1)	0.856 ***	1.165 ***	[0.07]	0.784 ***	1.201 ***	[0.04]	1.043 ***	2.120 ***	[0.04]
	(0.1066)	(0.1342)		(0.1247)	(0.1569)		(0.3379)	(0.3946)	
Capitalization (t-1)	0.870 ***	0.915 ***	[0.84]	0.965 ***	0.949 ***	[0.95]	0.208	-0.509	[0.38]
	(0.1384)	(0.1669)		(0.1553)	(0.1924)		(0.5217)	(0.6414)	
Money Market Rate	-0.7932 ***	-0.2244	[0.03]	-0.6470 ***	-0.3824	[0.42]	-0.8248	-0.0586	[0.29]
	(0.1770)	(0.2034)		(0.2000)	(0.2724)		(0.5376)	(0.5424)	
Reserve Requirements	-0.033	-0.384 **	[0.07]	-0.022	-0.254	[0.22]	0.031	-0.541	[0.58]
	(0.0893)	(0.1760)		(0.0882)	(0.1670)		(0.3771)	(0.9635)	
Obs.	2631			2032			442		
Groups	627			511			181		
R-Squared	0.26			0.25			0.37		
Rho AR(1)	0.15			0.16			0.21		

This table presents the results of panel regressions of loan growth on monetary conditions. The estimation is based on GLS, allowing for panel-specific AR(1) processes. Monetary conditions are measured by money market rates and an indicator of reserve requirements. Control variables include GDP growth, bank size, liquidity, and capitalization. Three sets of regressions are presented. The first covers the whole sample of banks in Asia. The other two split the sample by capitalization levels using a 75 percent threshold. For each regression, the sample was further split between domestic and foreign banks with the use of dummy variables, to compare the coefficients between these two groups of banks. The p-values for the null of coefficient equality are presented between squared brackets.

Table 19. GLS Regressions of Loan Growth on Monetary Conditions I by Liquidity, Latin American Sub-Sample

	Whole Sample			Liquidity Below 75 percentile			Liquidity Above 75 percentile		
	Domestic Banks	Foreign Banks	H0: Domestic= Foreign	Domestic Banks	Foreign Banks	H0: Domestic= Foreign	Domestic Banks	Foreign Banks	H0: Domestic= Foreign
GDP Growth	2.016 ***	1.687 ***	[0.57]	1.893 ***	1.743 ***	[0.79]	5.547 **	0.706	[0.15]
	(0.3692)	(0.4639)		(0.3406)	(0.4707)		(2.6100)	(2.1112)	
Size	0.316 ***	0.324 ***	[0.85]	0.365 ***	0.413 ***	[0.24]	0.322 **	0.074	[0.22]
	(0.0322)	(0.0339)		(0.0329)	(0.0358)		(0.1433)	(0.1438)	
Liquidity (t-1)	0.837 ***	0.883 ***	[0.81]	1.040 ***	1.327 ***	[0.32]	0.374	2.301 ***	[0.06]
	(0.1272)	(0.1420)		(0.1738)	(0.2329)		(0.8351)	(0.7619)	
Capitalization (t-1)	1.109 ***	1.813 ***	[0.06]	1.701 ***	2.608 ***	[0.02]	-0.889	0.483	[0.39]
	(0.2123)	(0.3177)		(0.2066)	(0.3550)		(0.9099)	(1.2859)	
Money Market Rate	-0.0425 ***	0.0133	[0.10]	-0.0418 ***	-0.0029	[0.04]	0.9838	0.7777	[0.91]
	(0.0064)	(0.0332)		(0.0053)	(0.0184)		(1.2471)	(1.2656)	
Reserve Requirements	-0.088 **	-0.081	[0.93]	-0.028	-0.040	[0.88]	-0.603 **	-0.206	[0.34]
	(0.0431)	(0.0697)		(0.0392)	(0.0663)		(0.3016)	(0.2861)	
Obs.	2317			1718			377		
Groups	591			501			171		
R-Squared	0.17			0.27			0.10		
Rho AR(1)	0.18			0.26			0.20		

This table presents the results of panel regressions of loan growth on monetary conditions. The estimation is based on GLS, allowing for panel-specific AR(1) processes. Monetary conditions are measured by money market rates and an indicator of reserve requirements. Control variables include GDP growth, bank size, liquidity, and capitalization. Three sets of regressions are presented. The first covers the whole sample of banks in Latin America. The other two split the sample by capitalization levels using a 75 percent threshold. For each regression, the sample was further split between domestic and foreign banks with the use of dummy variables, to compare the coefficients between these two groups of banks. The p-values for the null of coefficient equality are presented between squared brackets.

Table 20. GLS Regressions of Loan Growth on Monetary Conditions I by Liquidity, Asian Sub-Sample

	Whole Sample			Liquidity Below 75 percentile			Liquidity Above 75 percentile		
	Domestic Banks	Foreign Banks	H0: Domestic= Foreign	Domestic Banks	Foreign Banks	H0: Domestic= Foreign	Domestic Banks	Foreign Banks	H0: Domestic= Foreign
GDP Growth	1.906 ***	2.295 ***	[0.27]	1.822 ***	2.204 ***	[0.20]	0.166	1.835	[0.37]
	(0.2381)	(0.2779)		(0.1991)	(0.2364)		(1.3256)	(1.3495)	
Size	0.281 ***	0.408 ***	[0.00]	0.242 ***	0.583 ***	[0.00]	0.191	0.060	[0.56]
	(0.0322)	(0.0383)		(0.0311)	(0.0359)		(0.1497)	(0.1955)	
Liquidity (t-1)	0.856 ***	1.165 ***	[0.07]	0.239	1.325 ***	[0.00]	3.708 ***	4.759 ***	[0.38]
	(0.1066)	(0.1342)		(0.1531)	(0.1583)		(0.9236)	(0.7712)	
Capitalization (t-1)	0.870 ***	0.915 ***	[0.84]	0.763 ***	0.739 ***	[0.90]	0.511	3.535 ***	[0.02]
	(0.1384)	(0.1669)		(0.1313)	(0.1431)		(0.5861)	(1.1621)	
Money Market Rate	-0.7932 ***	-0.2244	[0.03]	-1.0298 ***	-0.5181 ***	[0.02]	-0.6231	0.7673	[0.45]
	(0.1770)	(0.2034)		(0.1560)	(0.1778)		(1.4300)	(1.1636)	
Reserve Requirements	-0.033	-0.384 **	[0.07]	-0.040	-0.447 ***	[0.01]	-0.225	-1.232	[0.47]
	(0.0893)	(0.1760)		(0.0730)	(0.1435)		(0.5974)	(1.2425)	
Obs.	2631			2105			358		
Groups	627			527			161		
R-Squared	0.26			0.34			0.27		
Rho AR(1)	0.15			0.29			0.24		

This table presents the results of panel regressions of loan growth on monetary conditions. The estimation is based on GLS, allowing for panel-specific AR(1) processes. Monetary conditions are measured by money market rates and an indicator of reserve requirements. Control variables include GDP growth, bank size, liquidity, and capitalization. Three sets of regressions are presented. The first covers the whole sample of banks in Asia. The other two split the sample by liquidity levels using a 75 percent threshold. For each regression, the sample was further split between domestic and foreign banks with the use of dummy variables, to compare the coefficients between these two groups of banks. The p-values for the null of coefficient equality are presented between squared brackets.

Table 21. Pair-wise Correlations between Selected Monetary Indicators, By Regions, 1999-2001

	Money Market Rate	Real Interest Rate	Inflation	Depreciation	Reserve Requirements	US Federal funds rate
Money Market Rate		*0.58*	*0.99*	*0.35*	*0.25*	*0.24*
		(0.000)	*(0.000)*	*(0.000)*	*(0.013)*	*(0.011)*
		[103]	*[103]*	*[113]*	*[96]*	*[114]*
Real Interest rate	0.37		*0.52*	*0.51*	*0.27*	*-0.06*
	(0.001)		*(0.000)*	*(0.000)*	*(0.011)*	*(0.516)*
	[74]		*[103]*	*[103]*	*[87]*	*[103]*
Inflation	0.85	-0.18		*0.93*	*0.33*	*-0.20*
	(0.000)	(0.125)		*(0.000)*	*(0.001)*	*(0.044)*
	[74]	[74]		*[104]*	*[88]*	*[105]*
Depreciation	0.75	0.18	0.69		*0.40*	*0.08*
	(0.000)	(0.118)	(0.000)		*(0.000)*	*(0.374)*
	[82]	[74]	[82]		*[95]*	*[114]*
Reserve Requirements	0.01	-0.10	-0.07	-0.04		*0.07*
	(0.950)	(0.412)	(0.550)	(0.756)		*(0.513)*
	[71]	[64]	[72]	[79]		*[97]*
US Federal funds rate	0.10	0.13	-0.05	0.01	-0.08	
	(0.376)	(0.286)	(0.668)	(0.910)	(0.454)	
	[82]	[74]	[85]	[90]	[80]	

The upper triangle shows the pairwise correlations for the Latin American countries in the sample, and the lower triangle corresponds to Asian countries. The significance level of rejecting the null of no correlation is in parenthesis, and the number of observetions is in square brakets.

Table 22. GLS Regressions of Loan Growth on Monetary Conditions II by Capitalization, Latin American Sub-Sample

	Whole Sample			Capitalization Below 75 percentile			Capitalization Above 75 percentile		
	Domestic Banks	Foreign Banks	H0: Domestic= Foreign	Domestic Banks	Foreign Banks	H0: Domestic= Foreign	Domestic Banks	Foreign Banks	H0: Domestic= Foreign
GDP Growth	1.578 ***	1.869 ***	[0.65]	1.219 ***	2.058 ***	[0.23]	1.685 *	1.814 ***	[0.37]
	(0.3939)	(0.5164)		(0.4266)	(0.5484)		(0.9538)	(0.5224)	
Size	0.307 ***	0.327 ***	[0.65]	0.277 ***	0.326 ***	[0.31]	0.670 ***	0.409 ***	[0.00]
	(0.0336)	(0.0357)		(0.0363)	(0.0386)		(0.1121)	(0.0376)	
Liquidity (t-1)	0.845 ***	0.884 ***	[0.84]	0.959 ***	1.054 ***	[0.66]	1.471 ***	1.322 ***	[0.00]
	(0.1306)	(0.1445)		(0.1445)	(0.1663)		(0.3283)	(0.2394)	
Capitalization (t-1)	1.037 ***	1.811 ***	[0.04]	0.750 **	2.343 ***	[0.02]	2.153 ***	2.659 ***	[0.21]
	(0.2155)	(0.3226)		(0.2979)	(0.6308)		(0.4851)	(0.3609)	
Exchange Rate Depreciation	-0.4138 ***	0.0482	[0.00]	-0.4398 ***	0.0914	[0.00]	-0.0729	0.0362	[0.78]
	(0.0751)	(0.1345)		(0.0750)	(0.1314)		(0.2306)	(0.1450)	
Reserve Requirements	-0.080 *	-0.081	[0.98]	-0.094 *	-0.056	[0.68]	0.022	-0.039	[0.32]
	(0.0438)	(0.0707)		(0.0488)	(0.0762)		(0.0922)	(0.0676)	
US Federal Funds Rate	-0.035	-0.049 *	[0.45]	-0.048 *	-0.057 **	[0.68]	-0.011	-0.004	[0.28]
	(0.0248)	(0.0263)		(0.0263)	(0.0272)		(0.0663)	(0.0250)	
Obs.	2299			1744			398		
Groups	589			483			162		
R-Squared	0.16			0.17			0.27		
Rho AR(1)	0.19			0.22			0.39		

This table presents the results of panel regressions of loan growth on monetary conditions. The estimation is based on GLS, allowing for panel-specific AR(1) processes. Monetary conditions are measured by the annual rate of exchange rate depreciation, the US Federal Funds rate, and an indicator of reserve requirements. Control variables include GDP growth, bank size, liquidity, and capitalization. Three sets of regressions are presented. The first covers the whole sample of banks in Latin America. The other two split the sample by capitalization levels using a 75 percent threshold. For each regression, the sample was further split between domestic and foreign banks with the use of dummy variables, to compare the coefficients between these two groups of banks. The p-values for the null of coefficient equality are presented between squared brackets.

Table 23. GLS Regressions of Loan Growth on Monetary Conditions II by Capitalization, Asian Sub-Sample

	Whole Sample			Capitalization Below 75 percentile			Capitalization Above 75 percentile		
	Domestic Banks	Foreign Banks	H0: Domestic= Foreign	Domestic Banks	Foreign Banks	H0: Domestic= Foreign	Domestic Banks	Foreign Banks	H0: Domestic= Foreign
GDP Growth	2.130 ***	3.159 ***	[0.01]	1.609 ***	2.912 ***	[0.00]	5.104 ***	2.918 ***	[0.32]
	(0.2846)	(0.2974)		(0.2994)	(0.3098)		(1.0105)	(0.2603)	
Size	0.242 ***	0.439 ***	[0.00]	0.230 ***	0.466 ***	[0.00]	0.619 ***	0.606 ***	[0.53]
	(0.0329)	(0.0396)		(0.0350)	(0.0408)		(0.1272)	(0.0364)	
Liquidity (t-1)	0.952 ***	1.155 ***	[0.23]	0.845 ***	1.142 ***	[0.13]	1.411 ***	1.226 ***	[0.18]
	(0.1060)	(0.1323)		(0.1218)	(0.1554)		(0.3561)	(0.1588)	
Capitalization (t-1)	0.839 ***	0.764 ***	[0.73]	1.038 ***	0.717 ***	[0.21]	0.232	0.614 ***	[0.33]
	(0.1458)	(0.1687)		(0.1727)	(0.1936)		(0.5256)	(0.1443)	
Exchange Rate Depreciation	-0.1188 *	0.2317 ***	[0.00]	-0.2040 **	0.2345 ***	[0.00]	0.3491 *	0.0683	[0.62]
	(0.0691)	(0.0722)		(0.0802)	(0.0905)		(0.1861)	(0.0623)	
Reserve Requirements	-0.075	-0.461 ***	[0.05]	-0.032	-0.328 **	[0.12]	-0.253	-0.515 ***	[0.81]
	(0.0922)	(0.1759)		(0.0915)	(0.1658)		(0.3863)	(0.1440)	
US Federal Funds Rate	0.039 **	-0.013	[0.00]	0.054 ***	-0.018	[0.00]	-0.052	-0.028 *	[0.59]
	(0.0165)	(0.0197)		(0.0171)	(0.0202)		(0.0555)	(0.0162)	
Obs.	2631			2032			442		
Groups	627			511			181		
R-Squared	0.26			0.26			0.38		
Rho AR(1)	0.14			0.15			0.21		

This table presents the results of panel regressions of loan growth on monetary conditions. The estimation is based on GLS, allowing for panel-specific AR(1) processes. Monetary conditions are measured by the annual rate of exchange rate depreciation, the US Federal Funds rate, and an indicator of reserve requirements. Control variables include GDP growth, bank size, liquidity, and capitalization. Three sets of regressions are presented. The first covers the whole sample of banks in Latin America. The other two split the sample by capitalization levels using a 75 percent threshold. For each regression, the sample was further split between domestic and foreign banks with the use of dummy variables, to compare the coefficients between these two groups of banks. The p-values for the null of coefficient equality are presented between squared brackets.

Table 24. GLS Regressions of Loan Growth on Monetary Conditions II by Liquidity, Latin American Sub-Sample

	Whole Sample			Liquidity Below 75 percentile			Liquidity Above 75 percentile		
	Domestic Banks	Foreign Banks	H0: Domestic= Foreign	Domestic Banks	Foreign Banks	H0: Domestic= Foreign	Domestic Banks	Foreign Banks	H0: Domestic= Foreign
GDP Growth	1.578 ***	1.869 ***	[0.65]	1.451 ***	0.220	[0.57]	3.601	0.220	[0.31]
	(0.3939)	(0.5164)		(0.3606)	(1.3126)		(2.5082)	(1.3126)	
Size	0.307 ***	0.327 ***	[0.65]	0.350 ***	0.097	[0.18]	0.305 **	0.097	[0.47]
	(0.0336)	(0.0357)		(0.0343)	(0.1334)		(0.1543)	(0.1334)	
Liquidity (t-1)	0.845 ***	0.884 ***	[0.84]	0.982 ***	-0.070	[0.25]	-0.359	-0.070	[0.03]
	(0.1306)	(0.1445)		(0.1776)	(0.3698)		(0.9575)	(0.3698)	
Capitalization (t-1)	1.037 ***	1.811 ***	[0.04]	1.612 ***	1.232 **	[0.01]	-0.839	1.232 **	[0.43]
	(0.2155)	(0.3226)		(0.2110)	(0.5427)		(0.9200)	(0.5427)	
Exchange Rate Depreciation	-0.4138 ***	0.0482	[0.00]	-0.4186 ***	0.0966	[0.00]	-0.1468	0.0966	[0.90]
	(0.0751)	(0.1345)		(0.0727)	(0.5544)		(0.3556)	(0.5544)	
Reserve Requirements	-0.080 *	-0.081	[0.98]	-0.029	0.217	[0.90]	-0.425	0.217	[0.78]
	(0.0438)	(0.0707)		(0.0404)	(0.1743)		(0.2939)	(0.1743)	
US Federal Funds Rate	-0.035	-0.049 *	[0.45]	0.005	0.060	[0.60]	-0.012	0.060	[0.08]
	(0.0248)	(0.0263)		(0.0221)	(0.0671)		(0.1363)	(0.0671)	
Obs.	2299			1707			373		
Groups	589			497			169		
R-Squared	0.16			0.26			0.13		
Rho AR(1)	0.19			0.25			0.20		

This table presents the results of panel regressions of loan growth on monetary conditions. The estimation is based on GLS, allowing for panel-specific AR(1) processes. Monetary conditions are measured by the annual rate of exchange rate depreciation, the US Federal Funds rate, and an indicator of reserve requirements. Control variables include GDP growth, bank size, liquidity, and capitalization. Three sets of regressions are presented. The first covers the whole sample of banks in Latin America. The other two split the sample by liquidity levels using a 75 percent threshold. For each regression, the sample was further split between domestic and foreign banks with the use of dummy variables, to compare the coefficients between these two groups of banks. The p-values for the null of coefficient equality are presented between squared brackets.

Table 25. GLS Regressions of Loan Growth on Monetary Conditions II by Liquidity, Asian Sub-Sample

	Whole Sample			Liquidity Below 75 percentile			Liquidity Above 75 percentile		
	Domestic Banks	Foreign Banks	H0: Domestic= Foreign	Domestic Banks	Foreign Banks	H0: Domestic= Foreign	Domestic Banks	Foreign Banks	H0: Domestic= Foreign
GDP Growth	2.130 ***	3.159 ***	[0.01]	1.538 ***	3.686 ***	[0.00]	0.311	3.686 ***	[0.40]
	(0.2846)	(0.2974)		(0.2567)	(0.9872)		(1.3703)	(0.9872)	
Size	0.242 ***	0.439 ***	[0.00]	0.192 ***	0.750 ***	[0.00]	0.229	0.750 ***	[0.36]
	(0.0329)	(0.0396)		(0.0317)	(0.1712)		(0.1542)	(0.1712)	
Liquidity (t-1)	0.952 ***	1.155 ***	[0.23]	0.392 **	2.129 ***	[0.00]	3.804 ***	2.129 ***	[0.44]
	(0.1060)	(0.1323)		(0.1541)	(0.3911)		(0.9278)	(0.3911)	
Capitalization (t-1)	0.839 ***	0.764 ***	[0.73]	0.848 ***	-0.572	[0.24]	0.531	-0.572	[0.02]
	(0.1458)	(0.1687)		(0.1411)	(0.6408)		(0.5858)	(0.6408)	
Exchange Rate Depreciation	-0.1188 *	0.2317 ***	[0.00]	-0.3327 ***	0.2154	[0.00]	-0.0347	0.2154	[0.36]
	(0.0691)	(0.0722)		(0.0647)	(0.1917)		(0.3986)	(0.1917)	
Reserve Requirements	-0.075	-0.461 ***	[0.05]	-0.025	-0.496	[0.00]	-0.238	-0.496	[0.51]
	(0.0922)	(0.1759)		(0.0770)	(0.9463)		(0.6127)	(0.9463)	
US Federal Funds Rate	0.039 **	-0.013	[0.00]	0.040 ***	-0.019	[0.00]	-0.061	-0.019	[0.18]
	(0.0165)	(0.0197)		(0.0134)	(0.0627)		(0.0899)	(0.0627)	
Obs.	2631			2105			358		
Groups	627			527			161		
R-Squared	0.26			0.34			0.29		
Rho AR(1)	0.14			0.28			0.25		

This table presents the results of panel regressions of loan growth on monetary conditions. The estimation is based on GLS, allowing for panel-specific AR(1) processes. Monetary conditions are measured by the annual rate of exchange rate depreciation, the US Federal Funds rate, and an indicator of reserve requirements. Control variables include GDP growth, bank size, liquidity, and capitalization. Three sets of regressions are presented. The first covers the whole sample of banks in Latin America. The other two split the sample by liquidity levels using a 75 percent threshold. For each regression, the sample was further split between domestic and foreign banks with the use of dummy variables, to compare the coefficients between these two groups of banks. The p-values for the null of coefficient equality are presented between squared brackets.

Table 26. Latin America, Regressions Using a Crisis Window

	[1] Loan Growth	[2] Deposit Growth	[3] Loans to Deposits	[4] Bank Spread	[5] Deposit Rate	[6] Lending Rate
Bank-level controls						
Size	0.2270	0.2710	-0.3110	-0.0130	0.0120	0.0010
	[0.039]***	[0.038]***	[0.190]	[0.004]***	[0.005]**	[0.007]
Foreign*Size	0.0220	0.0570	0.1010	0.0000	-0.0100	-0.0130
	[0.053]	[0.052]	[0.154]	[0.006]	[0.006]*	[0.009]
Liquidity (t-1)	0.6740	-0.0860	-1.6310	-0.0550	-0.0770	-0.0830
	[0.155]***	[0.139]	[0.778]**	[0.019]***	[0.036]**	[0.029]***
Foreign*Liquidity (t-1)	0.4110	0.1140	1.5120	0.1090	0.0400	0.1050
	[0.223]*	[0.217]	[0.836]*	[0.036]***	[0.042]	[0.050]**
Capitalization (t-1)	1.2380	2.2150	-1.9040	-0.0030	0.0800	0.1170
	[0.325]***	[0.320]***	[1.677]	[0.035]	[0.048]*	[0.060]*
Foreign*Capitalization (t-1)	0.8360	0.7930	2.3640	0.0550	-0.0410	-0.0240
	[0.527]	[0.520]	[1.791]	[0.065]	[0.056]	[0.089]
Target variables						
Dummy Crises	-0.0980	-0.1380	-0.2770	0.0300	0.0370	0.0580
	[0.038]***	[0.038]***	[0.209]	[0.005]***	[0.011]***	[0.008]***
Foreign*Dummy Crises	0.1340	0.0710	0.0700	-0.0040	-0.0290	-0.0270
	[0.070]*	[0.081]	[0.259]	[0.011]	[0.014]**	[0.015]*
Constant	0.0220	0.0260	1.1860	0.0710	0.1210	0.1930
	[0.014]	[0.012]**	[0.055]***	[0.002]***	[0.003]***	[0.002]***
Observations	3019	3055	3020	2898	2955	2906
R-squared	0.41	0.37	0.55	0.86	0.60	0.71

This table compares the response of selected bank-level variables to GDP growth and crisis/non-crisis periods for domestic and foreign banks. The regressions were computed with bank-level fixed effects and robust standard errors. The sample covers the Latin American countries.

* significant at 10%; ** significant at 5%; *** significant at 1%

Table 27. Asia, Regressions Using a Crisis Window

	[1] Loan Growth	[2] Deposit Growth	[3] Loans to Deposits	[4] Bank Spread	[5] Deposit Rate	[6] Lending Rate
Bank-level controls						
Size	0.1270	0.2060	0.0780	-0.0080	0.0030	-0.0050
	[0.035]***	[0.035]***	[0.118]	[0.003]***	[0.002]	[0.003]
Foreign*Size	0.1120	0.2010	0.4140	0.0080	-0.0020	0.0050
	[0.051]**	[0.052]***	[0.303]	[0.005]	[0.003]	[0.007]
Liquidity (t-1)	0.7570	-0.0910	-1.7290	-0.0220	-0.0510	-0.0790
	[0.145]***	[0.092]	[0.609]***	[0.011]*	[0.010]***	[0.013]***
Foreign*Liquidity (t-1)	0.2920	0.4940	-0.6090	0.0100	0.0230	0.0360
	[0.233]	[0.208]**	[1.856]	[0.059]	[0.019]	[0.073]
Capitalization (t-1)	0.8860	1.2560	0.3880	0.0270	0.0140	0.0430
	[0.206]***	[0.211]***	[0.643]	[0.031]	[0.011]	[0.030]
Foreign*Capitalization (t-1)	0.1720	0.2740	0.2290	0.0210	0.0220	0.0420
	[0.402]	[0.449]	[0.831]	[0.039]	[0.021]	[0.043]
Target variables						
Dummy Crises	-0.0920	-0.0440	0.0090	-0.0040	0.0230	0.0190
	[0.019]***	[0.019]**	[0.049]	[0.001]**	[0.002]***	[0.002]***
Foreign*Dummy Crises	-0.0300	-0.1100	-0.3190	0.0020	-0.0050	-0.0030
	[0.040]	[0.039]***	[0.154]**	[0.005]	[0.003]*	[0.006]
Constant	0.1250	0.1260	1.2440	0.0490	0.0680	0.1150
	[0.008]***	[0.010]***	[0.040]***	[0.001]***	[0.001]***	[0.001]***
Observations	3343	3327	3271	2956	3050	2965
R-squared	0.43	0.37	0.71	0.92	0.94	0.90

This table compares the response of selected bank-level variables to GDP growth and crises/non-crises period across domestic and foreign banks. The regressions were computed with bank-level fixed effects and robust standard errors. The sample covers the Asian countries.
Robust standard errors in brackets
* significant at 10%; ** significant at 5%; *** significant at 1%

Table 28. Latin America, Regressions Specifying Pre- and Post- Crisis Years

	[1]	[2]	[3]	[4]	[5]	[6]
	Loan Growth	Deposit Growth	Loans to Deposits	Bank Spread	Deposit Rate	Lending Rate
Bank-level controls						
Size	0.2330	0.2790	-0.3100	-0.0130	0.0100	0.0000
	[0.040]***	[0.039]***	[0.187]*	[0.004]***	[0.005]**	[0.007]
Foreign*Size	0.0190	0.0560	0.1010	0.0000	-0.0090	-0.0130
	[0.054]	[0.053]	[0.152]	[0.006]	[0.006]	[0.009]
Liquidity (t-1)	0.6790	-0.0790	-1.6320	-0.0550	-0.0780	-0.0840
	[0.154]***	[0.138]	[0.781]**	[0.019]***	[0.036]**	[0.029]***
Foreign*Liquidity (t-1)	0.4030	0.0910	1.5070	0.1110	0.0410	0.1080
	[0.223]*	[0.217]	[0.839]*	[0.036]***	[0.042]	[0.050]**
Capitalization (t-1)	1.2350	2.2250	-1.9140	-0.0010	0.0750	0.1150
	[0.326]***	[0.322]***	[1.670]	[0.035]	[0.047]	[0.059]*
Foreign*Capitalization (t-1)	0.8360	0.7750	2.3690	0.0530	-0.0350	-0.0220
	[0.529]	[0.523]	[1.784]	[0.066]	[0.055]	[0.089]
Target variables						
Crises (T-1)	0.0690	0.0620	-0.1570	0.0240	-0.0060	0.0180
	[0.066]	[0.070]	[0.110]	[0.007]***	[0.006]	[0.010]*
Foreign*Crises (T-1)	0.0850	0.1840	0.1480	-0.0080	-0.0100	-0.0180
	[0.105]	[0.108]*	[0.133]	[0.014]	[0.011]	[0.018]
Crises (T)	-0.0730	-0.0730	-0.2820	0.0310	0.0150	0.0450
	[0.069]	[0.076]	[0.138]**	[0.007]***	[0.007]**	[0.010]***
Foreign*Crises (T)	0.1120	0.0780	0.0990	-0.0220	-0.0050	-0.0270
	[0.134]	[0.150]	[0.141]	[0.015]	[0.014]	[0.019]
Crises (T+1)	-0.1370	-0.2030	-0.3030	0.0290	0.0560	0.0720
	[0.040]***	[0.039]***	[0.281]	[0.007]***	[0.016]***	[0.011]***
Foreign*Crises (T+1)	0.1690	0.0680	0.0570	0.0070	-0.0480	-0.0320
	[0.070]**	[0.085]	[0.371]	[0.014]	[0.019]**	[0.021]
Constant	0.0190	0.0220	1.1850	0.0710	0.1220	0.1940
	[0.014]	[0.012]*	[0.054]***	[0.002]***	[0.003]***	[0.002]***
Observations	3019	3055	3020	2898	2955	2906
R-squared	0.41	0.38	0.55	0.86	0.60	0.71

This table compares the response of selected bank-level variables to GDP growth and crises/non-crises period across domestic and foreign banks. The regressions were computed with bank-level fixed effects and robust standard errors. The sample covers the Latin American countries.

Robust standard errors in brackets
* significant at 10%; ** significant at 5%; *** significant at 1%

Table 29. Asia, Regressions Specifying Pre- and Post- Crisis Years

	[1] Loan Growth	[2] Deposit Growth	[3] Loans to Deposits	[4] Bank Spread	[5] Deposit Rate	[6] Lending Rate
Bank-level controls						
Size	0.1240	0.2030	0.0830	-0.0090	0.0030	-0.0050
	[0.035]***	[0.035]***	[0.118]	[0.003]***	[0.002]	[0.003]
Foreign*Size	0.1030	0.1940	0.4040	0.0080	-0.0040	0.0040
	[0.050]**	[0.052]***	[0.305]	[0.005]	[0.003]	[0.007]
Liquidity (t-1)	0.8030	-0.0650	-1.7330	-0.0200	-0.0500	-0.0770
	[0.146]***	[0.092]	[0.612]***	[0.011]*	[0.011]***	[0.013]***
Foreign*Liquidity (t-1)	0.3410	0.5500	-0.5260	0.0090	0.0210	0.0330
	[0.231]	[0.207]***	[1.838]	[0.059]	[0.019]	[0.072]
Capitalization (t-1)	0.8020	1.2090	0.3610	0.0260	0.0080	0.0390
	[0.204]***	[0.214]***	[0.648]	[0.031]	[0.012]	[0.031]
Foreign*Capitalization (t-1)	0.1330	0.2240	0.2730	0.0190	0.0230	0.0380
	[0.391]	[0.446]	[0.837]	[0.039]	[0.020]	[0.044]
Target variables						
Crises (T-1)	0.0380	0.0160	0.0470	0.0020	0.0010	0.0040
	[0.011]***	[0.014]	[0.034]	[0.001]**	[0.002]	[0.001]***
Foreign*Crises (T-1)	0.0170	-0.0160	-0.1570	0.0000	0.0060	0.0040
	[0.024]	[0.029]	[0.086]*	[0.003]	[0.002]**	[0.004]
Crises (T)	-0.0330	-0.0100	-0.0170	-0.0010	0.0180	0.0150
	[0.013]**	[0.015]	[0.034]	[0.001]	[0.002]***	[0.001]***
Foreign*Crises (T)	0.0450	-0.0170	-0.1730	0.0010	-0.0030	0.0000
	[0.032]	[0.032]	[0.103]*	[0.004]	[0.003]	[0.005]
Crises (T+1)	-0.1360	-0.0640	-0.0310	-0.0020	0.0110	0.0090
	[0.016]***	[0.019]***	[0.032]	[0.001]	[0.002]***	[0.002]***
Foreign*Crises (T+1)	-0.0540	-0.1270	-0.1100	-0.0020	-0.0030	-0.0060
	[0.030]*	[0.031]***	[0.074]	[0.003]	[0.002]	[0.004]
Constant	0.1140	0.1180	1.2390	0.0480	0.0700	0.1160
	[0.008]***	[0.009]***	[0.040]***	[0.001]***	[0.001]***	[0.001]***
Observations	3343	3327	3271	2956	3050	2965
R-squared	0.45	0.38	0.71	0.92	0.94	0.90

This table compares the response of selected bank-level variables to GDP growth and crises/non-crises period across domestic and foreign banks. The regressions were computed with bank-level fixed effects and robust standard errors. The sample covers the Asian countries.
Robust standard errors in brackets
* significant at 10%; ** significant at 5%; *** significant at 1%

Table 30. Latin America, Results with Alternative Definitions of Crises

	[1] Loan Growth	[2] Deposit Growth	[3] Loans to Deposits	[4] Bank Spread	[5] Deposit Rate	[6] Lending Rate
Caprio-Kinglebiel						
Crises C-K (T-1)	0.006	-0.075	-0.267	0.025	0.000	0.026
	[0.047]	[0.045]*	[0.127]**	[0.006]***	[0.006]	[0.009]***
Foreign*Crises C-K (T-1)	-0.142	0.005	0.032	-0.024	-0.008	-0.033
	[0.082]*	[0.079]	[0.135]	[0.010]**	[0.010]	[0.012]***
Crises C-K (T)	-0.101	-0.171	-0.350	0.045	0.045	0.081
	[0.046]**	[0.047]***	[0.282]	[0.007]***	[0.012]***	[0.011]***
Foreign*Crises C-K (T)	0.136	0.123	0.019	0.000	-0.057	-0.051
	[0.075]*	[0.087]	[0.326]	[0.011]	[0.015]***	[0.017]***
Crises C-K (T+1)	0.066	-0.005	-0.316	0.009	-0.008	0.013
	[0.039]*	[0.041]	[0.275]	[0.005]*	[0.014]	[0.009]
Foreign*Crises C-K (T+1)	0.123	0.042	-0.108	0.023	-0.014	-0.003
	[0.077]	[0.087]	[0.410]	[0.012]*	[0.016]	[0.017]
Frankel-Rose						
Crises F-R (T-1)	-0.029	0.157	0.141	0.002	-0.012	-0.006
	[0.042]	[0.051]***	[0.195]	[0.006]	[0.009]	[0.011]
Foreign*Crises F-R (T-1)	0.034	0.006	0.254	-0.006	-0.005	-0.012
	[0.101]	[0.107]	[0.465]	[0.010]	[0.013]	[0.015]
Crises F-R (T)	-0.226	-0.026	-0.205	0.011	0.036	0.046
	[0.055]***	[0.060]	[0.140]	[0.006]*	[0.009]***	[0.011]***
Foreign*Crises F-R (T)	0.184	0.073	0.738	0.009	-0.007	0.003
	[0.100]*	[0.111]	[0.561]	[0.012]	[0.015]	[0.020]
Crises F-R (T+1)	-0.150	-0.110	0.126	0.009	0.043	0.056
	[0.043]***	[0.042]***	[0.292]	[0.007]	[0.011]***	[0.013]***
Foreign*Crises F-R (T+1)	0.123	0.091	-0.028	0.005	0.035	0.038
	[0.079]	[0.083]	[0.436]	[0.015]	[0.020]*	[0.022]*
Kaminsky-Reinhart						
Crises K-R (T-1)	0.016	0.010	-0.149	0.024	0.004	0.027
	[0.057]	[0.061]	[0.103]	[0.006]***	[0.005]	[0.008]***
Foreign*Crises K-R (T-1)	-0.033	0.091	0.046	-0.017	-0.009	-0.025
	[0.089]	[0.084]	[0.121]	[0.012]	[0.007]	[0.013]*
Crises K-R (T)	-0.069	-0.069	-0.287	0.034	0.025	0.059
	[0.069]	[0.076]	[0.141]**	[0.007]***	[0.006]***	[0.010]***
Foreign*Crises K-R (T)	0.116	0.088	0.101	-0.023	-0.008	-0.031
	[0.133]	[0.149]	[0.142]	[0.016]	[0.013]	[0.017]*
Crises K-R (T+1)	-0.147	-0.213	-0.302	0.029	0.059	0.074
	[0.040]***	[0.039]***	[0.282]	[0.007]***	[0.016]***	[0.011]***
Foreign*Crises K-R (T+1)	0.162	0.059	0.049	0.007	-0.049	-0.032
	[0.071]**	[0.086]	[0.376]	[0.015]	[0.020]**	[0.021]

This table reports selected coefficients from a set of 18 panel regressions that compare the behavior of bank loans, deposits, and interest rates, across domestic and foreign banks, around periods of financial crises. The sample covers 11 Latin American countries during 1989-2001. Each column covers 3 separate regressions that share the same dependent variable, described in the first row, and the same set of (unreported) bank-level controls: size, liquidity, and capitalization. Bank-level controls were lagged one period to reduce potential endogeneity problems. The reported coefficients correspond to a set of dummy variables, generically labeled as "T-1", "T", and "T+1". Those labeled with "T" equal one during banking crises and zero elsewhere. Correspondingly, "T-1" equal one a year before financial crises and zero elsewhere, and "T+1" equal one a year after banking crises, and zero elsewhere. To provide sensitivity analysis, three alternative definitions of banking crises were used: Caprio-Kinglebiel, Frankel-Rose, and Kaminsky-Reinhart. These are reported in the upper-, middle-, and lower-panel, respectively.

In order to compare the behavior of domestic and foreign banks, each explanatory variable was interacted with a "foreign bank" dummy. All regressions were computed with bank-level fixed effects and robust standard errors, reportes between square brackets. *, **, ***, indicate significance at the 10, 5, and 1 percent level, respectively.

Table 31. Asia, Results with Alternative Definitions of Crises

	[1] Loan Growth	[2] Deposit Growth	[3] Loans to Deposits	[4] Bank Spread	[5] Deposit Rate	[6] Lending Rate
Caprio-Kinglebiel						
Crises C-K (T-1)	0.008	-0.021	0.005	0.004	0.003	0.008
	[0.017]	[0.021]	[0.062]	[0.002]**	[0.002]*	[0.002]***
Foreign*Crises C-K (T-1)	-0.017	-0.065	-0.208	-0.004	0.011	0.006
	[0.037]	[0.050]	[0.187]	[0.006]	[0.004]**	[0.008]
Crises C-K (T)	-0.095	-0.086	-0.083	0.004	0.018	0.021
	[0.018]***	[0.016]***	[0.061]	[0.002]	[0.002]***	[0.002]***
Foreign*Crises C-K (T)	-0.015	-0.071	-0.217	-0.007	0.005	-0.001
	[0.048]	[0.044]	[0.177]	[0.006]	[0.004]	[0.008]
Crises C-K (T+1)	-0.15	-0.055	0.017	-0.008	0.005	-0.003
	[0.024]***	[0.020]***	[0.101]	[0.004]**	[0.001]***	[0.004]
Foreign*Crises C-K (T+1)	-0.159	-0.102	-0.391	-0.004	-0.005	-0.009
	[0.057]***	[0.059]*	[0.169]**	[0.005]	[0.003]	[0.006]
Frankel-Rose						
Crises F-R (T-1)	0.0230	-0.0260	0.0630	-0.0020	0.0050	0.0050
	[0.023]	[0.026]	[0.096]	[0.002]	[0.002]***	[0.002]**
Foreign*Crises F-R (T-1)	0.0040	-0.0270	-0.7470	-0.0050	0.0030	-0.0040
	[0.043]	[0.065]	[0.210]***	[0.006]	[0.003]	[0.008]
Crises F-R (T)	-0.1950	-0.1580	-0.0080	-0.0160	0.0310	0.0140
	[0.025]***	[0.028]***	[0.081]	[0.002]***	[0.003]***	[0.003]***
Foreign*Crises F-R (T)	-0.0460	-0.1180	-0.8810	0.0070	-0.0150	-0.0070
	[0.048]	[0.048]**	[0.231]***	[0.005]	[0.003]***	[0.006]
Crises F-R (T+1)	-0.1840	-0.0990	-0.0950	-0.0130	0.0050	-0.0080
	[0.038]***	[0.033]***	[0.060]	[0.002]***	[0.002]***	[0.003]***
Foreign*Crises F-R (T+1)	0.0820	-0.0120	-0.7050	0.0180	-0.0030	0.0150
	[0.054]	[0.063]	[0.454]	[0.015]	[0.004]	[0.018]
Kaminsky-Reinhart						
Crises K-R (T-1)	0.038	0.005	0.06	0.002	0.009	0.012
	[0.020]*	[0.024]	[0.075]	[0.001]	[0.002]***	[0.002]***
Foreign*Crises K-R (T-1)	0.007	-0.033	-0.279	0.001	0.006	0.006
	[0.041]	[0.052]	[0.189]	[0.005]	[0.004]	[0.007]
Crises K-R (T)	-0.122	-0.048	-0.049	-0.004	0.039	0.032
	[0.027]***	[0.024]**	[0.054]	[0.002]*	[0.004]***	[0.002]***
Foreign*Crises K-R (T)	0.066	-0.057	-0.315	0.004	-0.012	-0.005
	[0.055]	[0.050]	[0.190]*	[0.007]	[0.005]**	[0.008]
Crises K-R (T+1)	-0.225	-0.106	0.028	-0.011	0.02	0.01
	[0.035]***	[0.032]***	[0.058]	[0.003]***	[0.003]***	[0.003]***
Foreign*Crises K-R (T+1)	-0.115	-0.209	-0.339	0.003	-0.01	-0.008
	[0.056]**	[0.058]***	[0.155]**	[0.005]	[0.004]***	[0.006]

This table reports selected coefficients from a set of 18 panel regressions that compare the behavior of bank loans, deposits, and interest rates, across domestic and foreign banks, around periods of financial crises. The sample covers 9 Asian countries during 1989-2001. Each column covers 3 separate regressions that share the same dependent variable, described in the first row, and the same set of (unreported) bank-level controls: size, liquidity, and capitalization. Bank-level controls were lagged one period to reduce potential endogeneity problems. The reported coefficients correspond to a set of dummy variables, generically labeled as "T-1", "T", and "T+1". Those labeled with "T" equal one during banking crises and zero elsewhere. Correspondingly, "T-1" equal one a year before financial crises and zero elsewhere, and "T+1" equal one a year after banking crises, and zero elsewhere. To provide sensitivity analysis, three alternative definitions of banking crises were used: Caprio-Kinglebiel, Frankel-Rose, and Kaminsky-Reinhart. These are reported in the upper-, middle-, and lower-panel, respectively.

In order to compare the behavior of domestic and foreign banks, each explanatory variable was interacted with a "foreign bank" dummy. All regressions were computed with bank-level fixed effects and robust standard errors, reportes between square brackets. *, **, ***, indicate significance at the 10, 5, and 1 percent level, respectively.

Bibliography

Agung, J. (1998), "Financial Deregulation and the Bank Lending Channel in Developing Countries: the Case of Indonesia,"Asian Economic Journal, Vol. 12, No. 3, pp. 273-294.

Arellano, M, and S. Bond (1991), "Some tests of specification for panel data: Monte Carlo evidence and an application to employment equations", *Review of Economic Studies* 58, pp. 277-297.

Ashcraft, A. (2000), "New Evidence on the Lending Channel," Working Paper, MIT Department of Economics.

Barajas, A., R. Steiner, and N. Salazar (2000), "Foreign Investment in Colombia's Financial Sector." Journal of Development Economics, Vol 63, pp. 157-196.

Bernanke, B. and A. Blinder (1988), "Credit, Money and Aggregate Demand," The Amercian Economic Review, Vol. 78, 2, pp. 435-439.

Bernanke, B. and A. Blinder (1992), "The Federal Funds Rate and the Channels of Monetary Transmission," American Economic Review, Vol. 82, 4, pp. 901-921.

Bernanke B. and M. Gertler (1987), "Banking and Macroeconomic Equilibrium," In: Barnett, W., and Singletion, K. (Eds.) New Approaches to Monetary Economics, Cambridge University Press, Cambridge, pp. 89-111.

Bernanke B. and M. Gertler (1995), "Inside the Black Box: The Credit Channel of Monetary Policy Transmission," The Journal of Economic Perspectives, Vol. 9, 4, pp. 27-48.

Bank of International Settlements (1998), "The Transmission of Monetary Policy in Emerging Market Economies", Bank of International Settlements Policy Papers 3, January.

Blinder, A. and J. Stiglitz (1983), "Money, Credit Constraints and Economic Activity," American Economic Review, Vol. 73, pp. 297-302.

Brainard, W. and J. Tobin (1963), "Financial Intermediaries and the Effectiveness of Monetary Control, American Economic Review, 53, pp. 461-472.

Calvo, G. (1998), "Balance of Payments Crisis in Emerging Markets: Large Capital Inflows and Sovereign Governments," Working Paper, Department of Economics, University of Maryland, College Park.

Caprio, G., and D. Klingebiel, (1996), “Bank Insolvencies, Cross-Country Experiences.” World Bank Policy Research Paper 1620.

Claessens, S., and T. Glaessner (1999), “Internationalization of Financial services in Asia.” World Bank WP 1911.

Claessens, S., A. Demirgüç-Kunt, and H. Huizinga (2001). “How Does Foreign Presence Affect Domestic Banking Markets?” Journal of Banking and Finance, Vol. 25, 5, pp. 891-911.

Crystal, J., G. Dages, and L. Goldberg (2001), “Does Foreign Ownership contribute to Sounder Banks in Emerging Markets? The Latin American Experience.” Federal Reserve Bank of New York.

Dages, B., L. Goldberg, and D. Kinney (2000), “Foreign and Domestic Bank Participation in Emerging Markets: Lessons from Mexico and Argentina.” Economic Policy Review, Federal Reserve Bank of New York, Vol. 6, 3, pp. 17-36.

Detriagache, E., and A. Spilimbergo, (2001), “Short-term Debt and Crises.” International Monetary Fund Seminar Series (International), No. 2002-21:1-28, October 2001.

De Bondt (1999), "Credit Channels in Europe: A Cross-Country Investigation," Banca Nazionale del Lavoro Quaterly Review, Vol. 52, No. 210, pp. 295-326.

Edwards, S. and C. Végh (1997), "Banks and Macroeconomic Disturbances Under Predetermined Exchange Rates," Journal of Monetary Economics, Vol. 40, pp. 239-278.

Frankel, J., and A. Rose, (1996), “Exchange Rate Crises in Emerging Markets.” Journal of International Economics, Vol. 41, 3-4, pp. 351-368.

Fuerst, T. (1992), "Liquidity, Loanable Funds, and real Activity," Journal of Monetary Economics, 29, pp. 3-24.

Fuerst, T. (1993), "The Availability Doctrine," Journal of Monetary Economics, 34, pp. 429-443.

Gale, D. and M. Hellwig (1985), "Incentive-Compatible Debt Contracts: The One-Period Problem," Review of Economic Studies, 70, pp. 647-663.

Goldberg, L., G. Dages and D. Kinney (2000), "Foreign and Domestic Participation in Emerging Markets: Lessons from Mexico and Argentina," NBER Working Paper No. 7714.

Goldberg, L. (2001), “When I U.S. Bank Lending to Emerging Markets Volatile?” National Bureau of Economic Research WP 8209, April.

Hernando, I., and J. Martínez-Pagés (2001), “Is There a bank Lending Channel of Monetary Policy in Spain?”, Working Paper No. 99, European central Bank.

Holmstrom, B. and J. Tirole (1997), "Financial Intermediation, Loanable Funds, and the Real Sector," Quarterly Journal of Economics, 112, pp. 663-691.

Houston, J., C. James, and D. Marcus (1997), “Capital Market Frictions and the Role of Internal Capital Markets in Banking.” Journal of Financial Economics, Vol. 46, pp. 135-164, November.

International Monetary Fund (2000), International Capital Markets. Developments, Prospects, and Key Policy Issues. IMF, September.

Jayaratne, J. and D. Morgan (2000), "Capital Market Frictions and Deposit Constraints at Banks," Journal of Money, Credit, and Banking, Vol. 32, 1, pp. 74-92

Kaminsky, G., and C. Reinhart, (1999), “The Twin Crises: The Causes of Banking and Balance-of-Payments Problems.” The American Economic Review, Vol. 89, 3, pp. 473-500.

Kaminsky, G. and C. Reinhart (2000), “Bank Lending and Contagion: Evidence From the Asian Crisis,” in T. Ito and A. Krueger, eds. *Regional and Global Capital Flows: Macroeconomic Causes and Consequences*, Chicago: University of Chicago Press for the NBER, (forthcoming).

Kaminsky, G. and S. Schmukler (2001), "On Booms and Crashes: Financial Liberalization and Stock Market Cycles," mimeo, World Bank.

Kashyap A., J. Stein, and D. Wilcox, (1993), "Monetary Policy and Credit Conditions: Evidence from the Composition of External Finance," American Economic Review, Vol. 83, pp. 78-98.

Kashyap A. and J. Stein (1994), "Monetary Policy and Bank Lending," in: Monetary Policy, Mankiw, G. (Ed.), NBER Studies in Business Cycles, Vol. 29, University of Chicago Press.

Kashyap A. and J. Stein (1995), "The Impact of Monetary Policy on Bank Balance Sheets," Carnegie-Rochester Conference Series in Public Policy, Vol. 42, pp. 151-195.

Kashyap, A. and J. Stein (2000), ”What Do One Million Observations on Banks have to say about Monetary Policy?” American Economic Review, Vol. 90, 3, pp. 407-428.

Kishan, R. and T. Opiela (2000), "Bank Size, Bank Capital and the Bank Lending Channel," Journal of Money, Credit and Banking, Vol. 32, 1, pp. 121-141.
Loupias, C., F. Savigna, and P. Sevestre (2001), "Monetary Policy and Bank Lending in France: Are There Assymmetries?", Working Paper No. 101, European Central Bank.

Peek, J. and E. Rosengren (1997), "The International Transmission of Financial Shocks: The Case of Japan." American Economic Review, Vol. 87 (4): 495-505.

Peek, J. and E. Rosengren (2000), "Implications of the Globalization of the Banking sector: The Latin American Experience." Federal Reserve Bank of Boston, New England Economic Review, September/October.

Reinhart, C. and V. Reinhart (1999), "On the Use of Reserve Requirements in Dealing with Capital Flow Problems," International Journal of Finance and Economics, Vol. 4, 1, pp. 27-54.

Repullo, R. and J. Suarez (1999), "Entrepreneurial Moral Hazard and Bank Monitoring: A Model of the Credit Channel," European Economic Review, 44, 1931-1950.

Rojas-Suarez, L. and S. Weisbrod (1995), "Financial Fragilities in Latin America: The 1980s and 1990s," Occasional Paper 132, International Monetary Fund.

Romer, C. and D. Romer (1990), "New Evidence on the Monetary Transmission Mechanism," Brookings Papers on Economic Activity, Vol. 1, pp. 149-213.

Steigum, E. (1983), "A Financial Theory of Investment Behavior," Econometrica, Vol. 51, 3, pp. 637-645.

Stein, J. (1995), "An Adverse Selection Model of Bank Assets and Liability Management with Implications for the Transmission Mechanism of Monetary Policy," NBER Working Paper No. 5217.

Stiglitz, J. and A. Weiss (1981), Credit Rationing in Markets with Imperfect Information," The American Economic Review, Vol. 71, 3, pp. 393-410.

Townsend, R. (1978), "Optimal Contracts and Competitive Markets with Costly State Verification, "Journal of Economic Theory, 21, pp. 417-425.

Williamson, S. (1987), "Costly Monitoring, Loan Contracts, and Equilibrium Credit Rationing," Quarterly Journal of Economics, Vol. 102, 1, pp. 135-146.