

# Loyal Lending or Fickle Financing: Foreign Banks in Latin America

Arturo Galindo  
IDB

Alejandro Micco  
IDB

Andrew Powell  
Universidad Trocuato Di Tella

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## Abstract

We suggest that foreign banks may represent a trade-off for their developing country hosts. A portfolio model is used to show that a more diversified international bank may be one of lower overall risk, and hence less subject to funding or liquidity shocks, but that these institutions may react more to host country shocks that affect expected returns. Foreign banks have become particularly important in Latin America where we find support for the theoretical predictions using a dataset of individual Latin American banks in eight countries. In a final section we discuss the role of foreign banks in Argentina. We suggest that, on balance, foreign banks played a positive role but that the experience raises a set of unresolved issues for the role of foreign banks in the region.

## 1 Introduction

Foreign banks play an extremely important role in developing economies. Referring to BIS data, foreign banks through direct lending and their local affiliates had lent some US\$1.3 trillion by the end of 2000<sup>1</sup>. To put this in context, Martinez Peria, Powell and Vladkova calculate that this is some 31% of total domestic credit in the developing world. And foreign banks account for more than 50% of private domestic credit in Latin America and Eastern Europe. Crystal, Dages and Goldberg (2002) highlight the dramatic increase in the foreign ownership of local banks. As pointed out by these authors, foreign banks now control majority shares in nearly all of the larger Latin American financial markets - with the exceptions being Brazil and Colombia<sup>2</sup>. In this paper, we

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<sup>1</sup>See Bank of International Settlements (2003)

<sup>2</sup>The BIS data captures cross border lending and local lending in foreign currency. More recently, local lending in local currency has been made available but not by economic sector. To date this complicates an analysis of lending to the private sector.

use data from the local affiliates of foreign banks and their national competitors in Latin America<sup>3</sup>. This data suggests that some 42% of domestic credit from private banks to the private sector is accounted for by the affiliates<sup>4</sup> of foreign banks in the region ranging from a low of 6% in El Salvador to 65% in Mexico<sup>5</sup>.

Given the rise in importance of foreign banks, a lively debate has developed focusing on whether foreign banks imply greater stability in credit intermediation. In favor of greater stability is the idea that internationally active banks from G10 countries, through their global reach, diversification and potential G10 central bank, lender-of-last-resorts may have lower default risks, lower funding costs and be less prone to depositor runs. However, there is also a view that foreign banks may import shocks from their home or other countries and that they may be more fickle than domestic lenders. What is generally meant by fickle is that they may be more sensitive to shocks that affect the host countries in which they operate, and in the extreme may simply pack up and leave<sup>6</sup>.

In this paper, we develop a portfolio model of banking. This approach has been used by Pyle (1971), Hart and Jaffee (1974), Kim and Santomero (1988) and Rochet (1992) among others. See Freixas and Rochet (1999) for a review. It is clear from this literature that, an unregulated bank that does not take into account its own limited liability, with a wider universe of potential assets will have a lower probability of default for a given required rate of return on capital or a greater expected return for the same probability of default.

In the case of a regulated bank, where Basel I type risk weights bind, a bank with a wider universe of potential assets may or may not be a less risky bank (Kim and Santomero 1988). The potential perverse result comes from the Basel I constant risk weights across assets of different risks and hence there is an incentive to invest in riskier, higher expected-return assets and divest those assets where the capital requirement does not bind. While in some circumstances, depending on the universe of assets available, international banks may be more risky under Basel I rules, we will generally work with the non-perverse case.

Where the bank takes its own limited liability specifically into account, Rochet (1992) shows that a bank with higher capital levels will also in general be a safer bank - and indeed higher levels of capital rather than just risk related capital may be required to reduce default probabilities efficiently. With limited liability, the option like nature of the returns implies a decrease in the incentives to take risk as bank capital rises (the theta of a call option falls as the option is further out of the money). This result may then go in the direction of larger international banks being "safer". In what follows we will generally assume that banks are subject to Basel I capital type rules. What limited liability implies,

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<sup>3</sup>We therefore capture all local lending in foreign and local currency and attempt to define credit to the non-financial private sector. We do not consider direct lending from the foreign parent to local companies.

<sup>4</sup>In this paper we use the word affiliate to mean branch or subsidiary with foreign ownership greater than 50%.

<sup>5</sup>In pre crisis Argentina, the figure was higher at some 72%.

<sup>6</sup>On these issues see, for example, Crystal et al (2002), Dages et al. (2000), Goldberg (2001), Martinez Peria, Powell and Vladkova (2003). Peek and Rosengren (2000a, 2000b) and van Rijckeghem and Weder (2000).

in this context, is that it is reasonable to suppose that the capital constraint binds.

In general, international banks must comply with local capital regulations as well as the capital regulations of their main or lead supervisors on their consolidated balance sheets. This rarely represents a constraint as capital may be transferred between affiliates<sup>7</sup>. Potentially more important are restrictions on the use of local deposit funding. Several countries attempt to restrict the use of banks' local funding. Argentina provides a case in point where, by law, local deposits may only be used to fund local assets. The only foreign assets banks may purchase, funded by local deposits, are those authorized by the central bank and consistent with liquidity regulations. This may then represent a set of extra restrictions on the asset allocation of international banks.

On the one hand, internationally diversified banks may then be safer banks. But, we also use the portfolio model to show that when banks are more diversified across countries, and suffer a shock to local (host) expected returns, they may cut back on local operations more rapidly than a less diversified (national) bank. This result mirrors that of Calvo (1996) where his interest was the globalization of mutual funds. Calvo (1996) considers only assets and not liabilities and independent asset returns. Here we extend that approach to a model where returns are correlated across countries and where the funding costs that a bank must pay are also correlated across countries.

The theory broadly suggests that the presence of international banks represents a trade-off. On the one hand, diversification of risk is likely to lead to safer banks and hence lower funding costs and hence a lower cost of credit assuming the banking sector is competitive. The theoretical model we develop in section 2 of the paper suggests various nuances to this tradeoff depending on the structure of the variances and covariances between country expected returns and funding costs and whether banks are constrained in terms of their use of local deposits.

In the third section of the paper we then turn to the empirical evidence. We first consider some descriptive statistics to illustrate the role of foreign banks in the region. We then turn to a more formal statistical and econometric analysis. We employ a dataset on individual banks across eight countries in Latin America. We develop a methodology that side-steps the deep problems of variable endogeneity in standard regression analyses. In general, we find support for the hypotheses as suggested by the theory.

In a fourth section, we consider particular aspects of the role of foreign banks in the Argentine crisis to date. We argue that on balance Argentina is better off given that it had foreign banks but that there are a set of issues that are unresolved regarding the role of foreign banks in the region. Section five concludes.

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<sup>7</sup>Things may be more complex when requirements are different in different countries or when a distinction between tier 1 and tier 2 capital is introduced. For example, what may be considered as tier 2 capital by a subsidiary may not be considered as qualifying by the home supervisor.

## 2 A simple model of an international bank

Consider a bank that operates in  $J$  different countries. Let us assume that it chooses a loan portfolio in each country that is represented simply by an expected return and a variance. For simplicity we will consider assets with normal distributions only, however the main results would also stem from other distributional assumptions. Given this loan portfolio, we assume that the bank must seek funding through own capital and deposits. We assume the bank must pay the market deposit rate of the country concerned. We assume that the loan portfolio is of a longer maturity than deposits, that must then be rolled over at market rates, or equivalently in our case, that the bank contracts deposits at a variable interest rate. Deposit contracts are then also summarized by an expected cost and a variance.

We normalize the capital of the bank to 1 and we assume risk aversion with mean-variance type preferences. The model is formally similar to that of Pyle (1971) and others but we extend to  $J$  countries with deposits and assets in those  $J$  countries.

First consider a symmetric case. Suppose that the bank raises a total of  $D$  deposits, the expected return on all country loans is equal to  $\rho_r$  the expected deposit rate in all countries is  $\rho_d$ , the standard deviation of all loan returns and deposit rates to be paid is equal to  $\sigma$  and all covariances between country loan returns and between country deposit rates are equal to  $COV$  and the covariance between the loan rate and the deposit rate within a country is  $COVLD$ , then the bank would raise  $D/J$  deposits in each country and invest  $(1+D)/J$  in each country. The expected return,  $\mu$ , and the variance,  $VAR$ , of the bank's return may then be written as:

$$\mu = (1 + D)\rho_r - D\rho_d \quad (1)$$

$$VAR = \frac{(1 + D)^2}{J}\sigma^2 - \frac{D^2}{J}\sigma + \frac{J}{J-1}COV - 2COVLD\frac{D(1 + D)}{J} \quad (2)$$

It is easy to check that as  $J$  increases this variance decreases and in fact as  $J$  tends to infinity, the variance of the portfolio tends to  $COV$ , the covariance of returns on assets and of deposit rates across the  $J$  different countries. This, of course, mirrors the standard result in portfolio theory that the risk of a well-diversified portfolio is the systemic risk represented by the covariance of asset returns. Note that in this symmetric case, the same result follows if we add a Basel I capital constraint that might be written as:

$$\sum_{j=1}^J \alpha_j L \leq K \quad (3)$$

where  $L$  are loans,  $\alpha_j$  the Basel 1 risk weight,  $K$  capital and the  $j$  subscripts are for country  $j$ . In this simple symmetric case, where the  $\alpha$  is the same for each country's asset, capital is normalized to unity, and a bank invests  $(1+D)/J$  in each country this reduces to:

$$\alpha(1+D) \leq 1 \quad (4)$$

Maximizing mean-variance utility subject to this constraint with the symmetric assumptions on expected returns and variances above, also results in a portfolio of equal shares across countries and hence the same result: that risk will decline with greater diversification across countries.

However, as noted in Calvo (1996) globalization may also make investors more fickle. This result is also relevant for global banks. To make things simple, analytically, we follow Calvo (1996) and call the first country the "host". All countries will be symmetric in terms of variances and covariances, but we will allow the host country to suffer an "expected return shock".

As before let the international bank invest  $(1+D)$  in risky assets around the globe in  $J$  different countries and fund these assets by raising  $D$  deposits and capital normalized to unity. Let the bank invest  $\theta$  in the  $J-1$  countries excluding the "host" and  $(1-\theta)$  in the host country. Let the bank raise  $(1-\eta)$  deposits in the host country and  $\eta$  in the other  $J-1$  countries. Let the expected return on loans in the host country be  $s_L$  and the expected cost of deposits in the host country be  $s_D$ .

The expected return and the variance of the return of the bank can then be written as:

$$\mu = (1+D)(\theta\rho_r + (1-\theta)s_r) - D(\eta\rho_d + (1-\eta)s_D) \quad (5)$$

$$VAR = (1+D)^2 \left\{ \frac{\theta^2\sigma^2}{J-1} + (1-\theta)^2\sigma^2 + \frac{(J-2)\theta^2COV}{J-1} \right\} + \quad (6)$$

$$D^2 \left\{ \frac{\eta^2\sigma^2}{J-1} + (1-\eta)^2\sigma^2 + \frac{(J-2)\eta^2COV}{J-1} \right\} - \quad (7)$$

$$2D(1+D) \left\{ \frac{(J-2)\theta\eta COV}{J-1} + \frac{\theta\eta COVLD}{J-1} + \theta(1-\eta)COV + \right. \quad (8)$$

$$\left. \eta(1-\theta)COV + (1-\eta)(1-\theta)COVLD \right\}$$

Assuming a Basel 1 type capital requirement the maximization problem faced by the bank can then be represented as:

$$P1 : Max \left\{ \mu - \frac{1}{2} \gamma VAR \right\} \text{ Subject to } \alpha(1 + D) \leq 1 \quad (9)$$

If the constraint is satisfied at equality this yields a solution for  $\theta$  as follows:

$$\theta = \frac{(J-1)(\sigma_D^2(\alpha(\rho_L - s_L) + \gamma\sigma^2) - COV(\alpha(\rho_L - s_L) - (\rho_D - s_D)) - COVLD\gamma^2 - \alpha(\rho_D - s_D)COVLD)}{\gamma J(\sigma^2\sigma_D^2 - COV(\sigma^2 + \sigma_D^2 - 2COVLD) - COVLD^2)} \quad (10)$$

If  $\rho_L = s_L$  and  $\rho_D = s_D$ , then as  $J$  goes to infinity it follows that  $\theta$  tends to unity such that the investment in the home country tends to zero. However if we take the derivative with respect to  $s_L$  to investigate how the optimal portfolio changes given a shock to host country expected returns we find:

$$\frac{d\theta}{ds_L} = \frac{(J-1)\alpha(\sigma_D^2 - COV)}{\gamma J(\sigma^2\sigma_D^2 - COV(\sigma^2 + \sigma_D^2 - 2COVLD) - COVLD^2)} \quad (11)$$

And taking the limit of this derivative as  $J$  goes to infinity yields:

$$\lim_{J \rightarrow \infty} \frac{d\theta}{ds_L} = \frac{\alpha(\sigma_D^2 - COV)}{\gamma(\sigma^2\sigma_D^2 - COV(\sigma^2 + \sigma_D^2 - 2COVLD) - COVLD^2)} \quad (12)$$

It is clear that this limit does not equal zero (even if expected returns and deposit rates on the host country are the same in the other  $J - 1$  countries) and hence we find the same result as Calvo (1996) namely that globalization leads to a greater relative effect (given by the ratio of  $(d\theta/ds)(s_L/(1-\theta))$  of a host expected return shock). Our results above are, however, more general than those of Calvo (1996) as it is clear that the limits also depend on the covariances. To illustrate this more clearly, we turn to a set of simulations. We first fix a set of base parameter values noted in Appendix 1. Graph 1 plots the elasticity of loans in the home country to the expected return in the home country {henceforth the "elasticity" and defined as the ratio:  $(d\theta/ds)(s_L/(1-\theta))$ } on the z axis for these base parameters but varying the number of countries,  $J$ , and the covariance of expected returns (and funding costs) across countries,  $COV$ . As can be seen

there is an interesting interaction between the two. As the covariance between the countries increases then the problem of “globalization” highlighted by Calvo is worse. Calvo’s case of independent asset returns was, in fact, only a mild version of the problem.

Figure 1 Here

In the base case we set the  $\rho_L = s_L$ . But it is also interesting to consider what happens as  $s_L < \rho_L$ , or in other words, with successive expected return shocks. In Graph 2, we plot  $(d\theta/ds)(s_L/(1-\theta))$  on the z axis and the number of countries,  $J$ , and the initial host country expected return,  $s_L$ , on the x and y axes. As can be seen the potential deleterious effect of globalization also interacts with the initial level of  $s_L$ . This implies that as the situation in the host country deteriorates the effect of is highly non-linear. A more diversified bank pulls out faster and faster as expected returns decline.

Figure 2 Here

In the above simulations, we also set the covariance between expected loan and deposit returns to zero. In fact it is debatable whether this covariance should be positive or negative. One view might be that there should be a positive correlation between loan and deposit rates reflecting the overall tightness of the credit market and the general level of interest rates. The opposing view is that there should be a negative correlation. In particular, a significant increase in country risk, would normally be accompanied by a downswing in the real economy and a fall in expected rates of return including loan losses, but deposit interest rates that banks may need to pay to maintain funding would rise. In Graph 3, we then allow the covariance of expected rates of return on loans and deposit rates to vary. We note that the relationship is not monotonic and that the base case of a zero correlation in fact is close to the optimum value from the standpoint of reducing the ratio  $(d\theta/ds)(s_L/(1-\theta))$  in numerical terms. If this correlation is either more positive or more negative, then globalization increases the “flightiness” of investors more quickly.

Figure 3 Here

The above results were obtained from the portfolio model subject to a Basel I type capital restriction that limits bank leverage. In practice many countries also place limits on the use of local deposits. For example, in Argentina local deposits may in general only be used to fund local assets and other countries

have similar restrictions. In the following program we then include a second restriction, namely that an international bank affiliate in the host country must have local assets at least as large as local deposits:

$$P2 : Max \left\{ \mu - \frac{1}{2} \gamma VAR \right\}, Subject\_to : \alpha(1+D) \leq 1, (1+D)(1-\theta) \geq D(1-\eta) \quad (13)$$

The following equation gives the solution for  $\theta$  in this case when both restrictions are assumed to be binding<sup>8</sup>:

$$\theta = \frac{\alpha(J-1)}{J} \left[ 1 + \frac{(\rho_L - s_L - (\rho_D - s_D))}{\gamma(\sigma^2 + \sigma_D^2 - COVLD)} \right] \quad (14)$$

Note that  $\theta$  does not, in this case, depend on the covariance between country asset expected returns,  $COV$ , if the restriction on the use of local deposits binds. The share invested in the host country depends on the covariance between deposits and loan returns within countries but not the covariance across countries. Hence, while we still find a Calvo type effect - that the ratio of  $(d\theta/ds)(s_L/(1-\theta))$  tends to infinity as  $J$  tend to infinity - we do not now find that this is aggravated by a higher covariance between countries.

In this case we also now find a monotonic relation between the ratio  $(d\theta/ds)(s_L/(1-\theta))$  and the covariance between asset expected returns and expected deposit rates within countries,  $COVLD$ . In particular the more negative is this correlation then the lower numerically is the ratio. This is easy to prove analytically as the derivative  $d((d\theta/ds)(s_L/(1-\theta)))/d(COVLD)$  takes the same sign as  $\alpha\gamma(\alpha-2)(J-1)$  which is clearly negative for  $\alpha < 1$  (typically we have  $\alpha = 0.08$  - the Basel I capital requirement). Hence as  $COVLD$  becomes more positive, the ratio  $(d\theta/ds)(s_L/(1-\theta))$  becomes more negative.

In this section we have then found a set of interesting results. We find that for a standard model of banking as a portfolio operation, globalization may imply safer banks from the point of view of aggregate default risk but also banks that may react more aggressively to bad (or good) news regarding expected returns in a particular country. We also find that this potential instability of globalization of banking is aggravated across countries if the correlation between country expected returns and deposit rates is higher. Finally, we consider the impact of a restriction on the use of local deposits. We find that this kind of restriction does not protect countries against the potential deleterious effects of globalization, but it may protect countries from the extra impact of highly correlated expected returns on investments and deposit returns across countries. Testing the relative stability of domestic versus foreign bank credit intermediation

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<sup>8</sup>While we do not go into details here, we would expect the restriction on deposits to be binding when expected returns in the host country fall below those of other countries - assuming expected deposit rates remain equal across countries.

## 3 Testing the relative stability of foreign vs. domestic banks

### 3.1 The data

Over the 1990's foreign bank affiliates have become increasingly more important as lenders to the private sector within domestic financial systems in Latin America. The data we work with comes from the balance sheets of domestic banks in 8 countries in the region: Argentina, Brazil, Chile, Colombia, Costa Rica, Mexico, Peru and El Salvador and runs from 1993 to 2002 depending on the country. To give readers an idea of the broad trends, we present four sets of graphs in the two appendices to this paper. In the first appendix, Graphs A1.1-A1.8 show the loans outstanding of different types of banks to the private sector in real local currency and the A1.9-1.16 show the same but as a percentage of the total in each country<sup>9</sup>. Graphs A2.1-2.8 show the real deposits outstanding by type of bank and A2.9-2.16 show deposits outstanding by type of bank as a percentage of total deposits<sup>10</sup>. In each graph we also plot the real level of GDP so that the reader can compare loan/deposit growth and loan/deposit shares against the strength of the real economy. For the purposes of these graphs, we define foreign as loans/deposits on the balance sheet of a bank with ownership of more than 50% from a G10 country. We define regional loans/deposits as those on the balance sheet of a bank with ownership of more than 50% from the Latin American region. We do not include public banks at all in these graphs nor in our regressions<sup>11</sup>. We stress that these graphs simply illustrate the data. They include all institutions that report to the appropriate regulatory agency and there is no control for mergers and acquisitions, aspects that we do control for in the regressions in the next sub-section.

The graphs illustrate the varied importance of foreign banks across the region. At the end of 2001, "foreign loans" in Argentina accounted for 72% of total loans to the private sector whereas the number for the other countries (in 2002) were Brazil: 42%, Chile: 50%, Colombia: 21%, Costa Rica: 12%, Mexico: 65%, Peru: 52%, and El Salvador 6%. The graphs show in virtually all cases a significant increase in loans to the private sector, deposits and the share of foreign banks during the 1990's. As many countries' economies stagnated during the latter half of the decade loan growth subsided and in many cases the share of foreign banks stabilized. In the case of Argentina, Brazil and Mexico, we see decreases in loans to the private sector towards the end of the sample.

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<sup>9</sup>The data comes with various health warnings attached. First the definition of credit to the private sector depends on the country and is not exact in some countries. In all cases we exclude Government bond holdings but the data may not exclude all lending to public sector enterprises. Second we attempted to net out lending within the financial sector but once again this netting is more or less accurate depending on the country.

<sup>10</sup>Deposits are defined as deposits of the private sector in all countries.

<sup>11</sup>We feel that as we do not have a good model of public bank behaviour, it is best to consider private foreign versus private domestic so as to obtain a cleaner comparison.

The case of Argentina is of course a particularly interesting one where the share of foreign banks rose very strongly over the 1990's with the significant entry of new foreign banks purchasing existing large Argentine banks. The interesting feature of the graphs on Argentina is that as the recession kicks in, in late 1998 through 2000, domestic private banks appear to reduce credit more than foreign banks such that the latter's share of lending continues to rise. Considering the deposit graph, foreign banks clearly increased their share of deposits over this period. In late 2001, lending to the private sector falls dramatically for both foreign and domestic banks but foreign banks maintain their share and there is a further rise in the deposit share of foreign banks.

In the case of Brazil, the graphs show the considerable increase in the importance of foreign banks especially over 2000-2002 with again the purchase of several domestic institutions by large international players. The last few observations show a very rapid decline in loans of both foreign and domestic banks and, in contrast to Argentina, with foreign banks marginally losing market share of deposits and loans. The lumpy increases in foreign bank presence of Mexico and Peru show the importance of controlling for mergers and acquisitions in any regression analysis. Mexico also experiences a reduction in the share of foreign loans and deposits at the end of the sample.

While these graphs give a broad picture of loan and deposit growth and shares by different types of banks, they are only of limited interest regarding the underlying question of the stability of credit intermediation. Here we need to turn to a more sophisticated analysis. In particular, the above graphs do not control for the entry or exit of particular foreign banks. While exit is an extreme form of cutting ties with a host country (and entry an extreme form of increasing exposure), the debate regarding stability is normally couched in terms of the stability of credit intermediation while a bank continues to operate. In the more formal empirical analysis we then attempt to control for mergers and acquisitions and exits. We discuss this further below.

### **3.2 Statistical and econometric tests**

In this section we present a set of statistical and econometric tests to attempt to investigate more precisely whether foreign banks are more or less stable credit intermediaries, relative to domestic institutions, and in particular whether they respond to the types of shocks as suggested by the theory. The data we work with comes from the individual balance sheets that regulated institutions in each of the eight countries (Argentina, Brazil, Chile, Colombia, Costa Rica, El Salvador, Mexico and Peru) supply to their respective regulators. In most countries these presentations are on a monthly basis. However, we find that on a monthly basis there is tremendous volatility across the board and suspect that the signal to noise ratio on monthly data is low and hence we work with quarterly and annual information. In general, the information covers all regulated institutions that report to the relevant regulator however we restrict our analysis to banks that constitute 80% of our definition of credit and where each bank included

accounts for at least 1% of credit. We limit the sample in this way, as again given the volatility in the figures, we suspect that the data quality of the smaller institutions in some countries is low. Also, our interest is really a comparison between the larger domestic and the larger foreign banks within host countries. The credit from smaller institutions that constitute a small share of credit may vary greatly for other reasons that may simply reduce the power of our tests or even bias the results. We attempt to define credit to the non-financial private sector although we note that in some countries this is difficult and our definition is not exact. In all cases we exclude bonds from the public sector and in most cases we exclude credit to other financial institutions but in some cases loans to the public sector and some credit to financial institutions creeps in.

We also control as far as possible for mergers and acquisitions. In each country we investigated the major mergers and acquisitions and the merged or acquired bank is then considered as a new bank in our data. In all of the statistics and tests reported we drop the observations where a new institution appears. Hence we drop from the sample, observations of entry, exit and major mergers and acquisitions. Our statistics and tests are in general conducted on changes in credit and hence the change is calculated only where the institution existed in both periods to calculate the relevant first difference and where the institution is the “same institution”. This we feel gives the fairest picture of actual changes in credit intermediation.

Table 1 Here

In each period, we define foreign banks as those banks that have majority shareholders (more than 50%) from a G10 country. We also define regional banks as those banks that, in each period, have a majority shareholder from another country in the region. To illustrate the sample, in Table 1, we give the statistics on the shares of the level of credit of the different types of banks and the number of observations (quarterly data) for each country. The sample only included regional banks from three countries (Argentina, Costa Rica and El Salvador) and so we do not present always a full set of results for this type of bank. However, we have foreign banks in each country that range from 3.3% of credit in El Salvador to 52.5% of credit in Argentina on average across the sample. The average share of foreign banks in the whole sample is about 24%.

Table 2 Here

In Table 2, we present the unconditional volatility of credit growth in each country on both a quarterly and on an annual basis (note that the samples are different as on an annual basis we need that the institution exists in two observations separated by twelve rather than three months). We find that, credit from foreign banks is marginally more volatile than that of domestic institutions in virtually all cases – the exception being Mexico on a quarterly basis. In the cases of Chile, Costa Rica and El Salvador the differences are more pronounced than in the other countries where the figures are similar.

However these unconditional standard deviations tell us only a limited amount. For example, it may be that foreign banks increase credit more strongly than domestic ones. Moreover, here we do not test statistical significance; nor do we control for bank specific factors nor country common time effects that may affect these statistics. We turn to more formal econometric tests below. Also, the theory tells us that foreign banks may respond more to some types of shocks but less to others. In particular, the theory suggests that foreign banks may respond less to shocks that affect deposits (as foreign banks are perceived as safer and can also shift from traditional domestic to other sources of funding more easily than domestic institutions), but may respond more to shocks that affect expected returns in host countries.

One way to consider these differential impacts of different shocks is to analyze the behaviour of the different types of institutions in different scenarios corresponding to positive and negative shocks to “opportunities” and positive and negative shocks to deposits or the supply of domestic funds. In the following figure, corresponding to a 2\*2 matrix, we then depict four scenarios depending on whether total credit in a particular country is growing or contracting and whether deposits are growing faster or slower than credit. In the first quadrant (NE), credit is contracting and is contracting faster than deposits. This we refer to as a Negative Opportunity Shock and our hypothesis, following the theory outlined in the first section, is that foreign banks would contract credit faster than their domestic counterparts. The second (SE) quadrant credit corresponds to a Positive Funding Shock. Here credit is growing but not as fast as domestic deposits. Here again we would expect foreign bank credit to expand less fast than the credit of their domestic counterparts. The third quadrant (NW) represents the classic Deposit Crunch where credit is falling, but deposits are falling faster. Here we would expect foreign banks’ credit to be falling less quickly than that of domestic banks. Finally, in quadrant four (SW), we have credit rising and rising faster than deposits. We refer to this as the Positive Deposit Shock and again we would expect foreign banks’ credit to be rising faster than that of domestic banks during this scenario.

Figure 4: Matrix of Opportunity versus Funding Shocks

Using quarterly data, we then divide our sample data (as constructed above) into these four quadrants and then track the share of credit of each type of bank at the start and at the end of the period. We then aggregate across all banks and countries and present the results in Table 3 in terms of the share of each type of bank at the start and at the end of each quarter, with the quarters classified into the four quadrants as indicated. The results tend to follow the theoretical predictions with the foreign bank share falling in quadrant 2 (Positive Funding Shock) and rising in quadrants 3 and 4 (Deposit Crunch and Positive Opportunity Shock). Quadrant 1 (Negative Opportunity Shock) however goes the wrong way with the foreign bank share rising rather than falling as predicted. Moreover, the changes in the shares are small. Perhaps

of interest is that the largest change in share occurs with the Deposit Crunch where foreign banks increase their market share by some 0.8% on average when credit falls and deposits fall faster than credit. It is not obvious whether the quadrants should be defined with credit falling or growing or growing faster or slower than the average growth rate of credit in the country concerned. Hence we also recalculated the Table defining each quadrant with respect to the mean growth rate for credit across the sample in each country. The Table is in the appendix of the paper (Table A3). In this case the result for the first quadrant (Negative Opportunity Shock) goes in the direction as predicted by the theory. The other signs remain as before, so the results are all as expected by the theory, but again the magnitude of the differences appear to be small.

Table 3 Here

We now turn to some more formal econometric tests. Following the idea that foreign banks may respond differently to domestic banks depending on the nature of the shocks, we conduct a series of regressions that attempt to test whether foreign banks behave differently under the different scenarios as described above. We note that this technique side-steps the usual problems of endogeneity and identification that tend to plague this type of analysis. For example, a regression of credit on the underlying economic variables such as GDP, economic activity, country risk, interest rates, country rating together with bank deposits is subject to the standard criticism that these variables may not be exogenous to bank credit or to bank deposits. Moreover, they may not be endogenous to the presence of foreign banks. Thus using such regressions to test whether foreign banks bring stability or not is problematic.

In what follows we conduct a set of regressions that essentially tell us what is happening to the market shares of foreign and domestic banks in the four scenarios as identified above. This approach then uses the overall movement of credit and deposits to identify the type of shock and side-steps the endogeneity issues discussed above. Apart from telling us about statistical significance levels, the results may also differ from the tables above due to the set of further controls that we introduce. First, as we have data on an individual bank basis we can control for individual bank fixed effects. Secondly, as we have several countries, we control for country time effects. Third, we conduct unweighted and weighted regressions where the regression weights depend on the size of the individual banks.

Table 4

In Table 4 we present the results. Column 1 is a regression of the change in credit of bank  $i$  against dummies for whether the bank is a foreign G10 or a regional bank (a domestic bank is the benchmark) and interaction dummies. The first interaction dummy takes the value of one when the bank is foreign

G10 and when credit is growing faster than deposits and the second interaction dummy takes the value of one when the bank is regional and credit is growing faster than deposits. These interaction dummies then refer to the third (NW) and the fourth (SW) quadrants of the 2\*2 matrix above - in other words they test whether foreign (regional) banks behave differently under the scenario of either a deposit crunch or a positive opportunity shock respectively. In both of these cases we would expect that foreign banks increase their share of credit relative to domestic banks and this is what we find. In this first column we include country time effects only. We have 2073 observations and find the interaction dummies to be significant, but only at the 10% level only. In this regression the dummies on foreign banks and regional banks (without the interaction terms) then test whether foreign banks behave differently in the other two quadrants corresponding to a negative opportunity shock or a positive funding shock. Here the hypothesis from the theory is that foreign banks credit growth may be less positive than that of domestic banks. We do indeed find negative signs but the G10 foreign bank dummy is not significant although the regional bank dummy is significant at the 5% level.

In columns 2-4 we perform the same regression but weighting the regression (column 2), including bank fixed effects (column 3) and both weighting the regression and with bank fixed effects (column 4). As we add these controls we find that the significance level of the foreign bank interaction dummy improves but that the significance level of the regional bank interaction effect and the dummies without interaction terms for both foreign and regional banks are weaker. Column 4 represents the most robust version where the regression (a) is weighted, (b) includes bank fixed effects and (c) includes country quarterly time effects. We find that the foreign (G10) bank interaction effect is significant at the 1% level. The coefficient is 0.043, such that the regression suggests that, whenever credit is growing faster than deposits (either due to a deposit crunch or a positive opportunity shock), on average foreign bank credit grew 4.3% more (shrunk 4.3% less) than domestic bank credit per annum<sup>12</sup>. With this specification, no other coefficients are significant. Hence while we find evidence that foreign (G10) banks increase credit more strongly when there is a deposit crunch or positive opportunity shock we find no evidence that they reduce credit more rapidly when there is a negative opportunity shock or that credit grows less strongly when there is a positive funding shock.

In columns 5 and 6, we report the results for the same regression but with the data de-meaned. This implies that the definition of the four quadrants is with respect to average credit growth (for each country) and not with respect to zero credit growth. As can be seen this makes little difference to the results. In columns 7-10, we change the definition of the interaction terms. Previously they were dummies equal to unity or zero but in columns 7-10 we multiply the zero/one dummy by the percentage difference of credit versus deposit growth. As can be seen this results in the interaction terms becoming not significantly

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<sup>12</sup>The regression is on quarterly data but the first difference is the difference between one quarter and the same quarter one year before. We also conducted the tests on simple quarterly differences and found similar results.

different from zero. We can therefore conclude that our quadrants appear to be quite distinct regimes rather than a continuum where the different behaviour of foreign banks is a continuous function of the nature of the opportunity versus liquidity shocks.

In these regressions we consider positive or negative funding shocks but we do not distinguish between the opportunity shocks. In other words, while we distinguish between whether deposits are either growing faster or slower than credit, we did not distinguish between positive and negative credit growth. In the following regression results, presented in Table 5, we distinguish both types of shocks. In this case we define an "opportunity shock" dummy variable which takes on the value of 1 if credit is growing and -1 if credit is shrinking. We also define a "deposit shock" dummy which takes on the value of +1 if deposits are growing faster than credit and -1 if deposits are growing less than (shrinking more than) credit.

Table 5

The first column then reports a regression (unweighted and without bank fixed effects but with a country- quarterly time effect) of the percentage change in credit of bank  $i$  on the foreign (G10) and regional bank dummies and interaction terms between these dummies and the Opportunity Shock dummy and the Liquidity Shock dummy as described. Regarding foreign (G10) banks we find that the Deposit Shock dummy interaction term is significant, but only at the 10% level, with a negative sign. This sign indicates that when the deposit shock is negative (positive), foreign bank credit grows more (less) relative to national banks so the sign is as suggested by the theory. In columns 2 and 3 we weight the regression and add individual bank fixed effects respectively and column 4 provides the results of including both procedures. Column 4 then represents the most robust estimates and here we do find support for a significant "opportunity shock" effect (at the 5% level) and a deposit shock effect (at the 10% level). Again both signs are as suggested by the theory. In columns 5 and 6 we further disaggregate and include a dummy interaction specifically for the case of a positive opportunity shock which takes the value of unity if credit is growing and credit is growing faster than deposits. In column 5 we do not weight the regression and in column 6 we do weight (both have bank individual and country quarter time effects). Introducing this dummy implies that we are now disaggregating all four quadrants in the matrix above. However, we find that this interaction is not significant for developed (G10) banks and in these cases the first interaction on the aggregated dummy is also not significant for developed banks (in the first row) - although it remains positive as indicated by the theory. It appears that the differential impact of foreign banks cannot be distinguished between the case of a positive opportunity shock where credit is growing faster than deposits and one where credit is growing but less than deposits<sup>13</sup>.

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<sup>13</sup>We also performed the same set of regressions reported in Table 5 on the de-measured data ie: defining the quadrants using the average growth rates in credit and deposits in each

To summarise the methodology and results of the empirical tests, in an attempt to control for the very serious problems of endogeneity that plague standard regressions in this area, we define four scenarios using total credit and deposit changes in each country. We then analyze the relative behaviour of foreign versus domestic banks in these different scenarios. Considering unconditional changes in market share (controlling for entry, mergers and acquisitions and exit), we find that the changes in market share follow those as expected by the theory but arguably the quantitative effects are small. In particular we find that foreign banks tend to increase market share when there is a deposit crunch or a positive opportunity shock and decrease market share when there is a negative opportunity shock or positive funding shock. When we use more formal econometric techniques and control for bank specific effects and country time effects, we find that there is evidence that foreign banks tend to increase market shares when there is a deposit crunch or a positive opportunity shock. We find little evidence that they decrease market share when there is a positive funding shock or a negative opportunity shock.

## 4 Foreign Banks and Systemic Host Crises, What can we learn from Argentina and outstanding policy issues

### 4.1 An introduction to the crisis

The Argentine crisis raises as many issues as answers regarding the role of foreign banks in emerging economies. In this section, we review specific aspects of the experience and discuss the issues that the crisis, to date, raises regarding the role of foreign banks in the region<sup>14</sup>. As noted above, foreign banks in Argentina became increasingly important over the 1990's. While there had been a strong foreign bank presence for many decades with "traditional foreign banks" such as Citibank, Banco Boston and Lloyds<sup>15</sup> there was perhaps a surprising lack of interest in new entry for the first four years of the currency board despite the stabilization and strong growth of the economy and given the entry of foreign firms in telecoms, electricity, gas, water, mining, retail and other sectors. In terms of the legal and regulatory hurdles, these had been simplified dramatically with the passing of the general investment law in 1991 that stated that, regarding the authorization of investment projects, there should be no discrimination with

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country. The results are reported in the appendix in Table A5. As can be seen once again this does not substantially change the results.

<sup>14</sup>There is no attempt to provide an exhaustive account here. See Powell (2002) and Cline (2003) for overviews. Rather, aspects are introduced here that are useful for the discussion of the issues pertaining to foreign banks that follows.

<sup>15</sup>Here the focus is on retail banks that tend to be larger in terms of deposits. However there were other foreign wholesale banks in Argentina including JP Morgan, ING-Barings and Deutsche Bank (that sold its retail operation to Banco Boston in an early example of foreign retail bank exit). and Banco General de Negocios - owned by a consortium of foreign banks including Credit Suisse First Boston.

respect to the origin of the capital (domestic versus foreign) and the new law of financial institutions and the charter of the Central Bank in September 1992 that re-affirmed the Central Bank's powers in terms of the licensing of new financial institutions. The Central Bank, from that date, essentially took the view that the market should determine which banks should enter (either through start-ups or acquisitions) subject to a Central Bank determination that the relevant institution and officers were competent and, in accordance with the investment law, without discrimination with respect to the origin of the capital. Some authors have suggested that foreign banks remained suspicious of the monetary regime and only became more convinced after the currency board survived the Tequila shock as an explanation as to why new foreign banks did not enter in those early years. Another view is that foreign bank entry had more to do with push factors than Argentina's particular situation<sup>16</sup>. A new set of foreign institutions entered in 1997 and 1998 - well after the Tequila crisis was resolved<sup>17</sup>. Three particular acquisitions changed the face of the private banking sector with Banco Santander's purchase of Banco Rio, Banco Bilbao Vizcaye's purchase of Banco Frances (which had previously merged with local bank, Banco Credito) and HSBC's purchase of Banco Roberts. These major acquisitions helped the foreign bank share of deposits rise from some 39%, at the end of 1996, to 67% at the start of 1999.

In terms of the legal and regulatory mechanisms governing foreign bank entry, foreign banks were allowed to operate as either branches or subsidiaries. However, branches were required to have capital in Argentina and indeed were essentially governed by exactly the same regulations as subsidiaries. Argentine law provides for what is sometimes referred to as separate entity resolution which implies that if an international bank fails that has a branch (or a subsidiary) in Argentina, the Argentine authorities would expect the assets of that branch to be placed at the disposal of the creditors of the branch within Argentina. In this case, the general view from the Argentine authorities was that a branch gave greater comfort to local depositors (as the branch might be supported under more states of the world than a subsidiary) with little disadvantage in the unlikely event that the international bank failed<sup>18</sup>. Asking for capital for a branch then appeared as an even greater way of giving comfort to local depositors. In practice, the "traditional foreign banks" appeared to favour branches (Citibank and Banco Boston in particular), whereas the later European entrants (Santander, BBV and HSBC) all entered by purchasing a domestic bank that became a subsidiary.

It is interesting to note that one common view, especially among foreign observers, was that the Argentine authorities encouraged foreign bank entry, as it was argued that the currency board implied no "lender of last resort" and that in some way foreign banks would then assume this role. If the Argen-

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<sup>16</sup>See the discussion in, for example, Calomiris and Powell (2002).

<sup>17</sup>It should also be pointed out though that the "traditional foreign banks" participated in several resolutions of failed banks, precipitated by the Tequila crisis and after.

<sup>18</sup>This theory is expounded in the Latin American Shadow Financial Regulatory Committee statement regarding foreign banks made in Peru, November 2002, Shadow Committee (2002).

tine authorities ever shared this view, this was surely quickly dispelled by the experience of Tequila in 1995. It is certainly true that foreign bank entry was encouraged in the sense that a level playing field was established regarding entry, however, arguably this was because it was thought that these institutions would add stability by making deposit runs less likely and because it was believed that foreign banks would enhance competition and the efficiency of the sector. In any event, the new foreign entry only occurred late in the day - ie: in year 6 out of the 10 year total of the currency board. Moreover, while foreign banks did on average support their affiliates in Argentina during the Tequila crisis - Central Bank estimates claim that about US\$2bn of the (January to May 1995) US\$8bn outflow (about 18% of total deposits at that time) was financed by increased foreign bank lines largely to local affiliates - this was by no means universal nor without problems. Indeed, after Tequila the Central Bank's view made explicit by then Governor Pedro Pou on several occasions at the time was that foreign banks should be thought of as "losers of first resort" rather than "lenders of last resort". What he meant by this was that if an affiliate of a foreign bank made a set of bad lending (or other) decisions locally and became capital deficient, then the foreign parent would indeed be expected to recapitalize. However, if through no fault of the affiliate of a foreign bank, Argentina suffered a systemic liquidity problem, it would be dangerous to expect the parent of local foreign banks to help-out with significant injections of cash.

The substantially revised liquidity policy of the Central Bank post Tequila closely followed this doctrine and hence foreign banks as per their domestic colleagues were required to have very substantial liquidity in foreign assets on their balance sheets (around 20% of their deposits), either held in the Central Bank or elsewhere. Only very marginal relaxations of this requirement were made to foreign institutions<sup>19</sup>. If foreign banks were expected to have been "lenders of last resort", then presumably the required liquidity ratios of those banks could have been much lower.

As is well known, the banking system (foreign and domestic institutions) extended more and more credit to the Government through 1998-2001<sup>20</sup>. In part this was natural because, as the real economy stagnated, credit to the private sector started to shrink and banks naturally looked to other assets including Government assets. Moreover, in 1998 credit to the public sector was not high by international standards and as deposits continued to grow through that year banks were highly liquid. However, at the end of 2000 and especially through 2001, as the Government's funding position became more and more precarious, some of the liquidity cushion that the Central Bank had requested banks' build (as a preventative defensive measure against another liquidity shock in the financial sector like Tequila), was directed towards financing the Government. In large part, the objections to this policy from the Central Bank heralded the

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<sup>19</sup>Through a fairly complex arrangement banks could satisfy a portion of their liquidity requirement through a stand-by letter of credit from a foreign bank of a particular rating registered and deposited in an authorized custodian. This system was said to favour foreign banks.

<sup>20</sup>See for example Perry and Servin (2002)

ousting of the Governor in of the Central Bank in April 2001<sup>21</sup>. Four separately identifiable banking runs occurred as the crisis developed; (1) November 2000 with the resignation of the Vice President, (2) April 2001 with the political uncertainty of the resignation of 2 economy ministers in 20 or so days (3) July 2001 with concern regarding potential IMF withdrawal given the implementation of a system of import/export tax/subsidies that ran the risk of being classified as a type of dual exchange rate and (4) November 2001 after it became clear that the IMF would finally depart after revised end of year IMF targets would be missed. The final run was stopped by a set of banking controls known as the "corralito". The corralito attempted to preserve the possibility of effecting inter-bank transfers and tried to restrict only withdrawals from the banking system as a whole. An interesting question, worthy of deeper research, but not strictly related to foreign banks is whether this set of controls was more or less costly to the real economy than the Uruguayan strategy of immediately freezing time deposits but ensuring that the sight deposits in the "good banks" remained liquid<sup>22</sup>. Moving into 2002, the corralito (or "little corral"), was transformed into the so-called "corralon" (or "large corral") under which most deposits (except smaller deposits in pesos) were frozen.

In early 2002, Argentina defaulted (under President Rodriguez Saa) and devalued (under President Duhalde). The devaluation was accompanied by "asymmetric pessification" whereby local bank assets were pessified at the exchange rate of 1 to 1 and local bank liabilities (largely deposits) were pessified at 1.4 to 1. Naturally such an action reduced bank capital dramatically. Moreover, in the following months banks were ordered to pay out significant amounts of deposits (originally in dollars) in dollars cash as a result of court injunctions<sup>23</sup>. Also, assets and deposits were indexed but to different price indices creating a third source of losses to the banks<sup>24</sup>. Given the build-up of public

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<sup>21</sup>The Charter of the Central Bank allows the President to remove the Central Bank Governor on the recommendation of a congressional committee. While the relevant clause may suggest to some that the Governor should have been previously found guilty of an offence by a court of law this is not stated. In the event, Governor Pou was removed essentially on the grounds of a letter that he wrote to the Minister that was leaked to the press and illustrated his objection to much of the current economic strategy of the Government.

<sup>22</sup>In fact there is a relation with foreign banks to the extent that foreign banks may be the higher quality banks. If this is the case, then political pressures may stop the "Uruguayan solution". If there is not enough reserves to ensure the liquidity of sight deposits across the board, it is likely that the weaker banks that may need to be suspended are national (and possibly public) banks.

<sup>23</sup>As argued elsewhere by one of the authors, the resolution of the crisis was aimed specifically at bailing out borrowers at minimum costs to depositors. It is then not the case that if banks had had more capital then devaluation could have occurred without pessification. Rather, pessification would have been more asymmetric (eg: 1.6 to 1 and not 1.4 to 1). Moreover, if (transaction) banks had had more liquidity as proposed by the "narrow banking school", then this would most likely have been used earlier to have tried to keep the Government current on payments. There seems little reason to suppose that it would have escaped the use of the very high existing levels of liquidity and used to protect the payments' system!

<sup>24</sup>Roughly speaking assets were indexed to wage inflation whereas deposits were indexed to an index closer to the CPI.

sector assets on banks balance sheets, the default, the asymmetric pessification, the court injunctions and the asymmetric indexation bank capital was reduced dramatically<sup>25</sup>.

The liquidity assistance to the financial system from the Central Bank during the crisis (particularly January - June 2002) was also explicitly asymmetric. Assistance was offered to local banks and to foreign banks, but the assistance offered to foreign banks was only on the condition that for each dollar of assistance provided, those banks (through their foreign parents) also had to contribute one dollar. Interestingly, the largest foreign banks went along with this. Three significant foreign banks departed.

The first to explicitly depart was Scotiabank of Canada that had bought a small to medium sized retail bank, Banco Quilmes (renamed Scotiabank Quilmes). Scotiabank Quilmes was suspended in late 2001 due to liquidity problems and subsequently Scotia explicitly stated that it would not continue to support its subsidiary and came to an "agreement" with the Central Bank regarding its departure. Its liabilities and assets were split and taken over by Banco Comafi bank and Banco Bansud. Scotiabank honoured the severance pay owed to employees who lost their jobs and some assets that the local bank held on its parent were not pursued and were written off. The parent bank also paid a reported 20 cents on the dollar to the holders of (uninsured) Quilmes' bonds. Credit Agricole departed in 2002 but did not appear to come to an agreement as such with the Central Bank, it simply did not send the required co-assistance. The three subsidiaries that Credit Agricole maintained in Argentina (Banco Bisel, Banco del Suquia and Banco de Entre Rios) were taken over by Banco Nacion. Finally, in 2003 Intesa sold a majority share of Banco Sudameris Argentina to Banco Patagonia a local, regional bank. Intesa will maintain 20% of the new entity<sup>26</sup>.

Returning to the current state of the financial system, to date, banks have been awarded compensation in the form of Government bonds for some A\$28bn face value. Indeed, valuing public assets at their face values the financial system as of June 2003 has been calculated as having a new worth of some A\$23bn or a capital to total assets ratio of 12.8%. However, valuing Government bonds at market values (excepting the Lebac's issued by the Central Bank) the net worth turns negative. However, the financial system also owes a substantial amount to the Central Bank for assistance rendered and a negotiated settlement has been reached that "matches" payments by the banks to the Central Bank and payments from the Government to the banks. Taking this into account a rough estimate of the solvency of the financial system today, is about -A\$6m or somewhat less than (more negative than) -US\$2bn. Banks in Argentina also continue to lose money according to their stated accounts and despite a 15% reduction in personnel and an 8% or so reduction in the number of bank branches. Losses between January and June 2003 amount to some A\$3.3bn

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<sup>25</sup>Pou (2003) estimates the losses are A\$23bn for the asymmetric pessification, A\$3.5-4.5m for the asymmetric indexation and A\$6.2-8bn for the court injunctions respectively where A\$=Argentine peso.

<sup>26</sup>This paragraph draws on Tschoegl (2003).

for the system as a whole. It is perhaps surprising that given the solvency and the income situation, deposits in the financial system have been growing quite strongly and this has clearly helped the banks to finance the losses to date<sup>27</sup>. Suffice to say that the current situation does not appear to be sustainable and further thinking and effort is required to ensure that the sector has a viable future. It does not appear likely that credit to the private sector will grow (except from public banks) until that work has been completed.

## **4.2 Issues raised by the Argentine crisis for foreign banks in emerging countries**

In this subsection, we discuss a set of issues regarding the role of foreign banks raised by the Argentine crisis. We do not discuss here the role of foreign banks in promoting competition or enhancing efficiency in the sector, rather our focus is on the stability issues.

### **4.2.1 On depositor confidence**

The theory suggests that one advantage of foreign banks is that they may be safer and hence less subject to depositor runs. We tested this in the empirical section by considering how the credit of banks react under different scenarios depending on the movement of credit versus deposits. Another type of test is whether depositor runs that actually occur tend to be less for foreign owned relative to national banks. Given the different periods of banking stress in Argentina, this country gives plenty of evidence on these issues. During a first phase of Tequila (January and February 1995), foreign banks actually gained deposits but during the first two weeks of March 1995, (when 50% of the total US\$8bn deposit loss occurred), all banks lost deposits. This experience was repeated in 2001/2002, and in particular in the later run, all banks lost deposits<sup>28</sup>. It appears that when the fear is more one of an across the board regulatory intervention, the suspension of convertibility or expropriation of one sort or another, foreign banks were clearly not expected to provide a safe haven. The Argentine crisis does then bear out the hypothesis that foreign banks may suffer less from depositor or liquidity shocks, but subject to the qualification that this advantage is severely curtailed when the crisis is so chronic that the over-riding fear is blanket intervention by the authorities rather than bank failure per se.

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<sup>27</sup>This paragraph is based on Pou (2003). See also Cline (2003) and Guidotti and Dujovne (2002) for estimates of the losses experienced by the Argentine financial system.

<sup>28</sup>See D'Amato, Grubisic and Powell (1997), on Tequila and particularly McCandless et al (2003) on the 2000/2001 runs. In the latter paper, Tables 3 and 5 on dollar deposit runs (dollars were the vast majority of time deposits and the majority of deposits) show clearly the positive effect of foreign ownership when the situation was not "critical" in the words of the authors but the dummy for foreign ownership is not significant during the final "critical" period.

#### 4.2.2 On lender of last resort issues

The evidence on whether foreign banks act as a lender of last resort (ie: after the liquidity shock has actually occurred), from the recent Argentine crisis is mixed. Given the scepticism of the view expounded by the Argentine Central Bank in 1997/8 regarding this issue, it is probably fair to say that to date foreign banks have indeed acted more as a lender of last resort than expected. In particular all the large foreign bank players put in extra capital during the first half of 2002 given the Central Bank's asymmetric assistance policy. In this sense, a good case can be made that Argentina is better off today given that much of the system was in private hands versus the counterfactual of no foreign banks. On the other hand, it is also the case that the foreign banks did not act as complete lenders of last resort and they did not honour the original currency of their deposits. During the first phase of the corralon they were actually prevented from doing this legally within Argentina by the Argentine authorities. A subtle change in the corralon occurred however in June 2002 (check date) when this essentially became voluntary, leading to some fear on the part of foreign banks that this change may leave them open to further legal cases in international courts. However, the pessification of the assets of the banks allows banks to argue that the Argentine authorities intervened to such an extent in their balance sheet that this became impossible<sup>29</sup>.

This discussion raises the interesting question as to whether the foreign banks, in some sense, went along with the forced pessification. To answer this requires considering a counterfactual. Suppose that the counterfactual was a default of the Argentine Government, a devaluation but no pessification. Arguably, devaluation and sovereign default were commercial risks that foreign banks knew entering into Argentina and hence they may still have been expected to honour their deposits in the original currency - largely dollars<sup>30</sup>. The losses that banks faced under this scenario would then have been the cost of the Government default on their public sector asset holdings and the significant losses on their assets to the private sector that presumably would have become largely non-performing<sup>31</sup>. One way of thinking about this is then a comparison of the cost of the asymmetric pessification (including court injunctions and asymmetric indexation) net of the expected compensation from the Government, relative

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<sup>29</sup>See Del Negro and Kay (2002) for an excellent discussion, especially of the position of US banks, in this regard. While the cases in international courts do not appear to have prospered, the court injunctions in Argentina during 2002 showed the vulnerability of the banks in general to depositors' claims. Injunctions were levelled, however, against all banks, not only foreign owned ones.

<sup>30</sup>Banks may have tried to argue otherwise noting that the currency board was not simply a pegged exchange rate but was enshrined in the laws of the land. Interestingly, some contracts in Argentina (typically governing house purchases) typically included a clause that if dollars could not be paid within Argentina, then the seller had the right to demand payment elsewhere (normally in Montevideo and typically in the form of Government dollar dominated Bonex bonds valued at market prices - and hence this clause is typically referred to as the Bonex clause). We note that deposit contracts in Argentina did not include such a clause.

<sup>31</sup>Although having said that the performance of the private assets have been very weak even given pessification at 1 to 1.

to a poorer performance on private sector assets, the cost of honouring deposits according to the original terms and no compensation from the Government. The answer hinges on the valuation of the Government's compensation. Given "full compensation" of the losses of the asymmetric pessification, this route was surely a less costly one for the banks. However, if it turns out that compensation is very low, this seems unlikely. To date, the compensation payments are not final with continued haggling between the Government and the banks over the final figures.

But this ignores the potential damage done to the banks' franchises going forward. While deposits have risen surprisingly quickly, it seems reasonable to assume that some damage has been done that will take time to repair and the financial system will remain smaller than it would have been due to the asymmetric pessification. Unless banks thought that they would leave the country and not honour their deposits according to the original terms, if Argentina had not pessified, it seems unlikely taking the cost to the franchise that asymmetric pessification was the least cost route. This discussion is important as to the extent that (foreign) banks were party to the pessification, the less they acted as lenders of last resort to local depositors.

As we have noted, the banks continue to lose money including the foreign banks and presumably it is the promised compensation (even the compensation that has been agreed and is typically now presented in banks' balance sheets is not bankable in the sense that these assets are not really under the control of banks and cannot be sold), plus the option value of maintaining a presence in Argentina as things improve that stops further exit. If the final compensation figure is lower than the expectations of the foreign banks and this option value is perceived as lower than previously thought due to, say, an early stagnation of the economic recovery, then there must be the possibility of some of the remaining foreign banks deciding to leave. On the other hand, if the compensation is perceived as "reasonable" and the recovery appears sustainable, then it is not totally beyond credulity to suggest that the foreign banks may put in further capital to assist in the recovery of credit.

We also note that during the crisis there was a notable lack of international coordination regarding lender of last resort issues. Argentina did not by itself constitute a significant concern for the liquidity (or solvency) of the majority of international banks operating within its territory and hence the issue of whether a G10 central bank would have extended liquidity to the parent to assist its affiliate in Argentina did not really arise. However, if the crisis had spread to several countries in the region then this could indeed have become an issue. Curiously, the Central Bank in Argentina not only refused to assist Argentine banks such that they could assist their subsidiaries abroad, but (in the context of exchange controls), actually forbade the banks to provide liquidity support themselves heralding the suspension of Argentine banks in Uruguay. It does appear that some thought is required regarding whether it is feasible to attempt to coordinate lender of last resort activities internationally.

To sum up, as foreign banks have indeed put in further capital in Argentina they have indeed played the role of lender of last resort to some extent. They

were prevented by Argentina's own regulations from being a total lender of last resort although it is not clear what would have happened if this had not been the case. The crisis is not yet resolved so how many foreign banks will be left and whether those that stay put in further capital remain highly dependent on how the Argentine authorities negotiate with the banks going forward and how the economy recovers. On balance Argentina was better off having had foreign banks.

### 4.2.3 Subsidiaries versus Branches

In the above discussion, we have not drawn a distinction between subsidiaries and branches. As discussed above, Argentina by requiring branches to have capital and subjecting them to essentially the same regulations as subsidiaries minimized the differences between these two legal entities. As discussed also by Del Negro and Kay (2001), it is arguable whether in practice a subsidiary of an international bank is really an autonomous unit that treats its parent as a majority shareholder and no more. The alternative view is that international banks are more akin to a wholly integrated global organization and hence while the legal entity may be called a subsidiary, a court of law may not necessarily accept restrictions on liability. Certainly the matrix structure of some international banking organizations, furthered by home country consolidated supervision that now tends to insist on separate reporting lines for risk management, appears to go in the direction of less autonomy. In a survey conducted by the Central Bank of Argentina in the late 1990s regarding the degree of autonomy of the local units of foreign banks, the lending limits for single loans were surprisingly low implying, for some foreign subsidiaries, any major credit had to be authorized by a credit committee outside of the country<sup>32</sup>. However, while these arguments suggest that international courts, if tested may find that there is little difference in practice between a branch and a subsidiary, there is a lack of test cases on these issues<sup>33</sup>. A more general point is that from the standpoint of the depositor, the protection that is afforded in the subsidiary or branch of a foreign bank is far from clear. While international banking organizations tend to portray themselves as large, solid and integrated institutions in terms of service provision, the parent may also claim that legally they are not liable for claims against a subsidiary. As a general rule, it seems reasonable to suggest that the less autonomy a foreign affiliate has in a host country, then the greater is the support that a depositor would expect from the parent and vice

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<sup>32</sup>Curiously, these controls may lead to a comparative advantage, for foreign banks in host countries, lending to SME's and not to large corporates as is often proposed.

<sup>33</sup>We also note that there is a lack of evidence regarding the theory that a country should accept branches if it has separate entity bankruptcy resolution and only subsidiaries if it has separate entity resolution. And moreover if an international bank operates in different jurisdictions that have different bankruptcy procedures in this regard, then there is the potential for a significant set of legal problems to emerge. These issues came to prominence thanks to the case of BCCI but have not been satisfactorily resolved.

versa. However, in any case greater transparency appears to be required such that depositors can judge risks effectively.

## 5 Conclusions

In this paper we have suggested that playing host to foreign banks may imply a trade-off. The theory developed in the second section, suggests that foreign banks may be safer but that they may be more sensitive to shocks to host country expected returns. We found that this may be especially the case where asset returns are correlated although imposing a regulation that local deposits must be used to fund local assets may protect countries from this particular feature.

In order to test this empirically and taking into account the very serious problems of endogeneity in standard regression analyses, we used the change in total credit and total deposits in each of eight countries to define periods corresponding to positive and negative "opportunity" and "funding" shocks. The hypothesis from the theory is then that foreign banks will be more volatile than domestic banks in cases of "opportunity shocks" and less sensitive when it comes to "funding shocks". On balance, we did indeed find evidence in favour of this hypothesis.

In a final section the lessons to be learned from the Argentine crisis to date regarding the role of foreign banks. As in the previous Tequila period, foreign banks did appear to be more resistant to depositor runs except when the run became "chronic" and the fear was confiscation or expropriation of one sort or another. Taking the somewhat negative attitude of the Central Bank (in 1997/8) regarding whether foreign banks are expected to be lenders of last resorts as a starting point, foreign banks did act more as a lender of last resort than might have been expected. Foreign banks have largely remained in Argentina and they have indeed put in more capital. While local laws prevented them from paying local depositors in full according to the original currency of their claims, we also note that foreign banks did not choose to repay in full either outside of the country or when this became essentially voluntary locally<sup>34</sup>. The banks had the argument that as they had had the asset side of their balance sheets pessified aswell, they could not perform on their original contractual terms for deposits. Foreign bank parents did not then act as a full lender of last resort. Having said that, we suggest that Argentina was better off having had foreign banks than not.

The Argentine crisis also raises a set of unresolved issues regarding the role of foreign banks. There was a clear lack of coordination of international central bank lender of last resort activities and whether it is possible to coordinate such activities deserves further thought. The distinction between subsidiaries and branches did not appear crucial in the Argentine story. And in general it is not clear that many subsidiaries are really autonomous units. However, the

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<sup>34</sup>We use the words "laws" to include decrees and Central Bank regulations.

distinction was not put to the (legal) test<sup>35</sup>. There should however be greater transparency regarding a) the autonomy of local banks with foreign shareholders and b) what protection local depositors have in international banking organizations. All in all, the Argentine crisis does not contradict the empirical results suggested above that foreign banks are helpful in crises that tend to be characterized by deposit crunches.

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<sup>35</sup>The Argentine crisis did not cause the failure of any major international bank, but there are also a set of unresolved legal issues between countries with different and inconsistent bankruptcy codes that deserves urgent attention.

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Figure 1: The Effect of the Number of Countries (J) and Return Correlation (COV) on the Sensitivity to an Expected Return Shock (Elasticity)

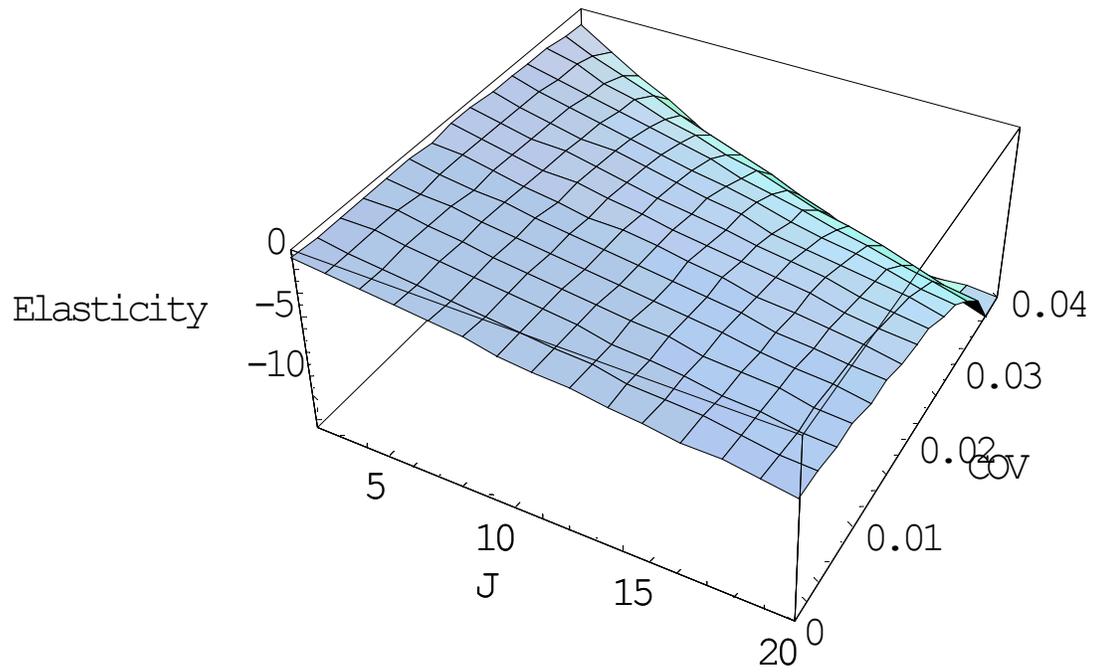


Figure 2: The Effect of the Number of Countries ( $J$ ) and The Expected Return in the Host Country ( $S_L$ ) on the Sensitivity to an Expected Return Shock (Elasticity)

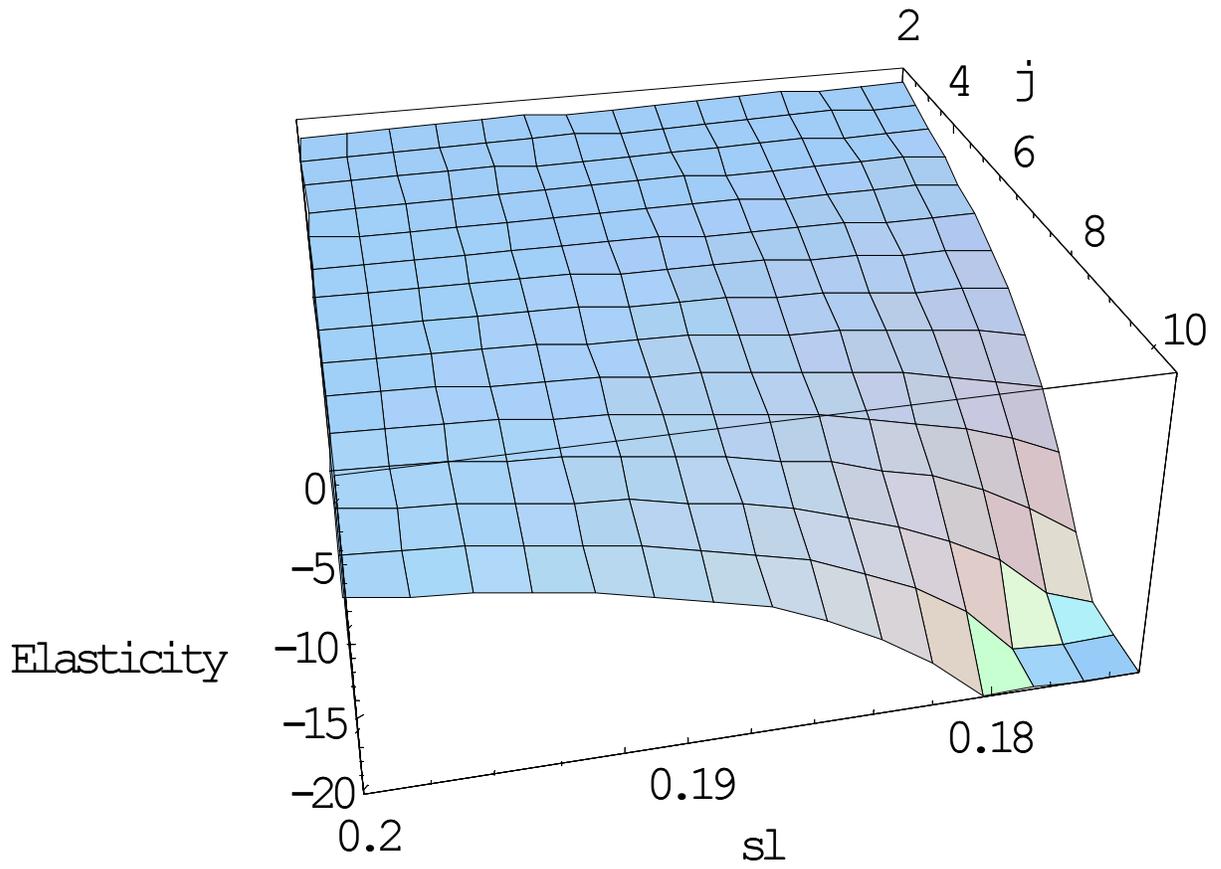
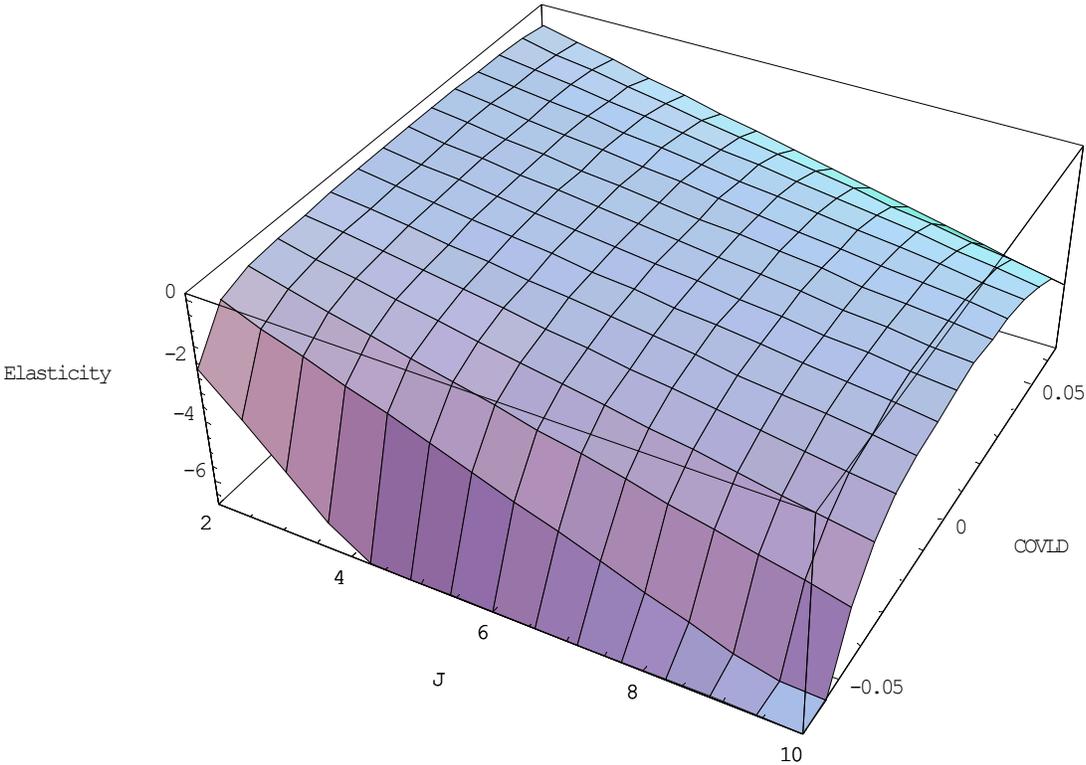


Figure 3: The Effect of the Number of Countries (J) and Correlation between Assets and Deposits Within Countries (COVLD) on the Sensitivity to an Expected Return Shock (Elasticity)



**Figure 4: 2\*2 Matrix of Opportunity and Liquidity Shocks**

	<p>Credit Growth &lt; Deposit Growth</p>	<p>Credit Growth &gt; Deposit Growth</p>
<p>Credit Growth &lt;0</p>	<p>Negative Opportunity Shock</p>	<p>Deposit Crunch</p>
<p>Credit Growth &gt;0</p>	<p>Positive Funding (Liquidity) Shock</p>	<p>Negative Opportunity Shock</p>

**Table 1: Foreign and Regional Bank Shares**

		Domestic	Regional	Foreign
Argentina	Share	43.3%	4.2%	52.5%
	Obs	222	19	219
Brazil	Share	72.1%		27.9%
	Obs	343		301
Chile	Share	64.7%		35.3%
	Obs	204		76
Colombia	Share	82.9%		17.1%
	Obs	307		65
Costa Rica	Share	71.0%	22.5%	6.4%
	Obs	237	68	33
Mexico	Share	80.3%		19.7%
	Obs	155		47
Peru	Share	72.6%		27.4%
	Obs	157		100
El Salvador	Share	72.3%	24.4%	3.3%
	Obs	132	26	12
Average Share		69.9%	6.4%	23.7%
Total Observations		1757	113	853
Grand Total Number of Observations				2723

**Table 2 Standard Deviation of Credit Growth**

	Annual		Quarterly	
	Domestic	Foreign	Domestic	Foreign
Argentina	14.6%	15.0%	7.5%	7.7%
Brazil	11.6%	13.1%	3.9%	4.9%
Chile	4.6%	7.0%	1.7%	1.8%
Colombia	8.2%	9.9%	3.2%	4.3%
Costa Rica	11.4%	21.2%	5.5%	7.5%
Mexico	4.7%	4.9%	2.4%	2.3%
Peru	12.2%	12.3%	4.5%	5.2%
El Salvador	3.8%	12.2%	2.3%	4.3%

**Table 3: Identifying Foreign Bank Behaviour Across Four Scenarios**

		Credit Growth < Deposits			Credit Growth > Deposits		
		National	Regional	Foreign	National	Regional	Foreign
Credit Contraction	Initial Share	67.3%	4.9%	27.8%	78.9%	6.6%	14.5%
	Final Share	67.3%	4.9%	27.8%	77.8%	6.9%	15.3%
	Change	-0.1%	0.0%	0.1%	-1.1%	0.3%	0.8%
Credit Growth	Initial Share	59.8%	9.2%	31.0%	74.9%	8.0%	17.1%
	Final Share	60.3%	9.0%	30.7%	74.6%	8.1%	17.3%
	Change	0.6%	-0.2%	-0.3%	-0.3%	0.1%	0.1%

**Table 4: Foreign versus Domestic Bank Behaviour under Liquidity Shocks**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
					DeMean *					
Cred-Dep>0 x Dev. Foreign	0.035 (0.019)c	0.038 (0.014)a	0.041 (0.019)b	0.043 (0.013)a	0.036 (0.016)b	0.041 (0.012)a				
Cred-Dep>0 x Reg. Foreign	0.053 (0.031)c	0.039 (0.020)c	0.003 (0.027)	0.018 (0.020)	-0.019 (0.030)	0.005 (0.020)				
Cred-Dep>0 x (CD) x Dev.Foreign							0.167 (0.189)	0.188 (0.147)	0.176 (0.215)	0.203 (0.151)
Cred-Dep>0 x (CD) x Reg.Foreign							0.671 (0.520)	0.317 (0.309)	-0.029 (0.472)	0.024 (0.294)
Dev.Foreign	-0.006 (0.010)	-0.018 (0.008)b	0.013 (0.017)	0.008 (0.017)	0.010 (0.017)	0.005 (0.017)	0.002 (0.010)	-0.010 (0.007)	0.021 (0.017)	0.015 (0.017)
Reg.Foreign	-0.060 (0.025)b	-0.038 (0.016)b	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	-0.051 (0.021)b	-0.027 (0.014)b	0.000 (0.000)	0.000 (0.000)
Observations	2073	2073	2073	2073	2073	2073	2073	2073	2073	2073
R-squared	0.41	0.54	0.65	0.77	0.65	0.77	0.41	0.54	0.65	0.77
Weight	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
Bank FE	0.00	0.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	1.00
Cty-Q FE	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Robust standard errors in parentheses. \* The variable Cred-Dep>0 is computed using demean rate of growth for both Credit and Deposits.

c significant at 10%; b significant at 5%; a significant at 1%

**Table 5: Foreign versus Domestic Bank Behaviour under Opportunity and Liquidity Shocks**

	(1)	(2)	(3)	(4)	(5)	(6)
Op Sh x Dev. Foreign	0.008 (0.011)	0.014 (0.008)c	0.016 (0.013)	0.020 (0.009)b	0.046 (0.036)	0.009 (0.028)
Dp Sh x Dev. Foreign	-0.036 (0.019)c	-0.031 (0.014)b	-0.029 (0.019)	-0.025 (0.014)c	-0.046 (0.032)	-0.015 (0.025)
Op Sh x Dev.Regional	0.071 (0.035)b	0.015 (0.018)	0.036 (0.025)	0.012 (0.017)	0.140 (0.061)b	0.059 (0.036)
Dp Sh x Dev.Regional	0.029 (0.036)	-0.028 (0.020)	0.041 (0.032)	-0.004 (0.021)	-0.015 (0.030)	-0.029 (0.019)
Op Sh x Dev. Foreign (Credit Line)					-0.056 (0.067)	0.022 (0.053)
Op Sh x Dev.Regional (Credit Line)					-0.177 (0.085)b	-0.084 (0.049)c
Dev.Foreign	0.019 (0.012)	0.005 (0.008)	0.036 (0.018)b	0.031 (0.017)c	0.058 (0.035)c	0.020 (0.029)
Reg.Foreign	-0.072 (0.032)b	-0.015 (0.015)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)
Observations	2073	2073	2073	2073	2073	2073
R-squared	0.42	0.54	0.65	0.77	0.65	0.77
Weight	0.00	1.00	0.00	1.00	0.00	1.00
Bank FE	0.00	0.00	1.00	1.00	1.00	1.00
Cty-Q FE	1.00	1.00	1.00	1.00	1.00	1.00

Robust standard errors in parentheses

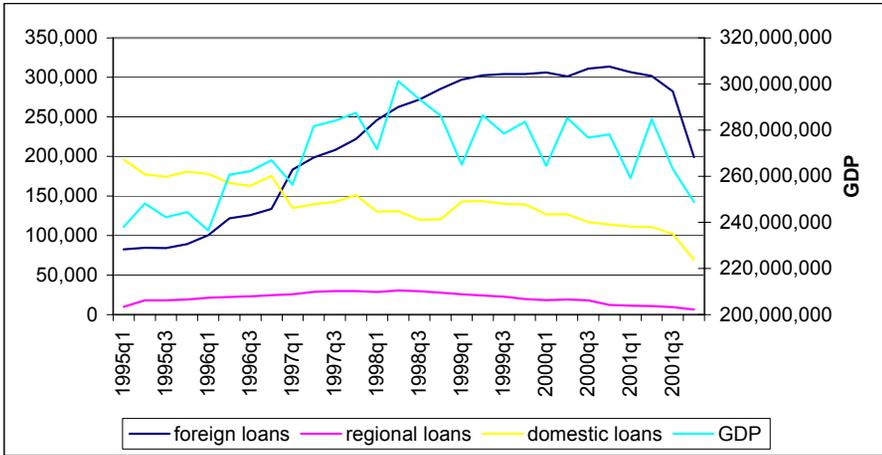
c significant at 10%; b significant at 5%; a significant at 1%

**Table A3: Identifying Foreign Bank Behaviour Across Four Scenarios**

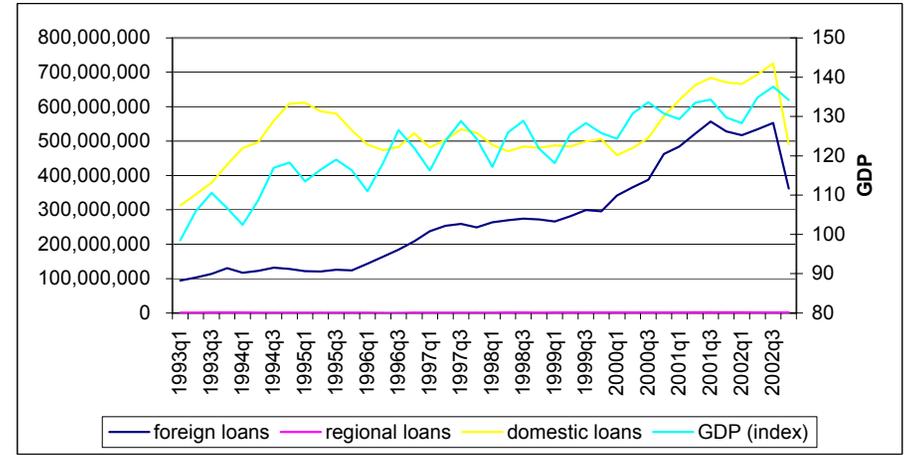
		Data de-meaned					
		Credit Growth < Deposits			Credit Growth > Deposits		
		National	Regional	Foreign	National	Regional	Foreign
Credit Contraction	Initial Share	63.6%	6.7%	29.8%	68.7%	7.1%	24.3%
	Final Share	63.9%	6.5%	29.6%	68.1%	7.2%	24.7%
	Change	0.4%	-0.2%	-0.2%	-0.6%	0.1%	0.4%
Credit Growth	Initial Share	64.7%	11.2%	24.1%	74.0%	7.0%	18.9%
	Final Share	65.3%	11.3%	23.5%	73.8%	7.0%	19.2%
	Change	0.6%	0.1%	-0.7%	-0.3%	0.0%	0.3%

## Real Loans and GDP (in domestic currency)

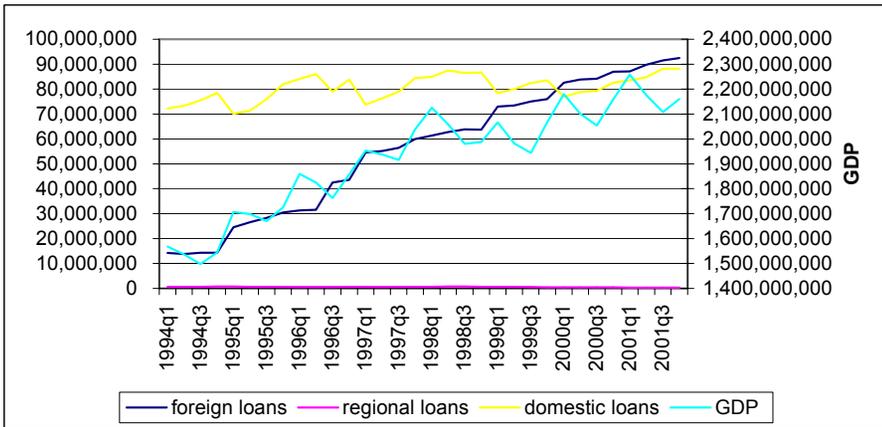
Graph 1.1 Argentina (thousands)



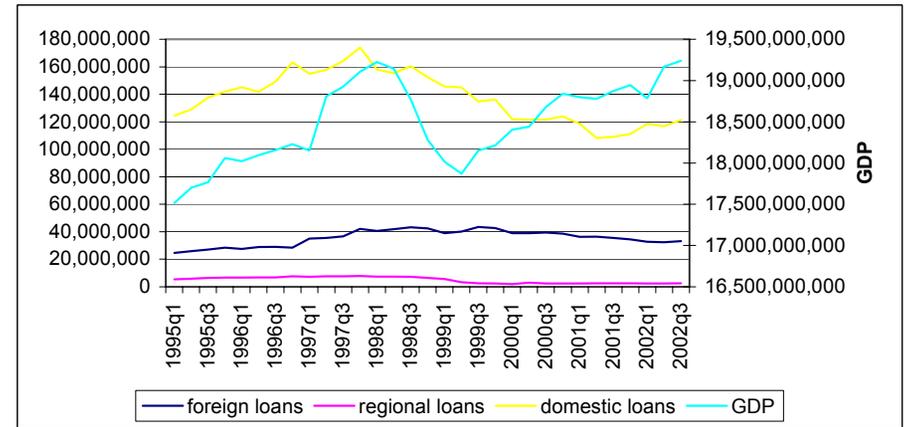
Graph 1.2 Brazil (units)



Graph 1.3 Chile (thousands)

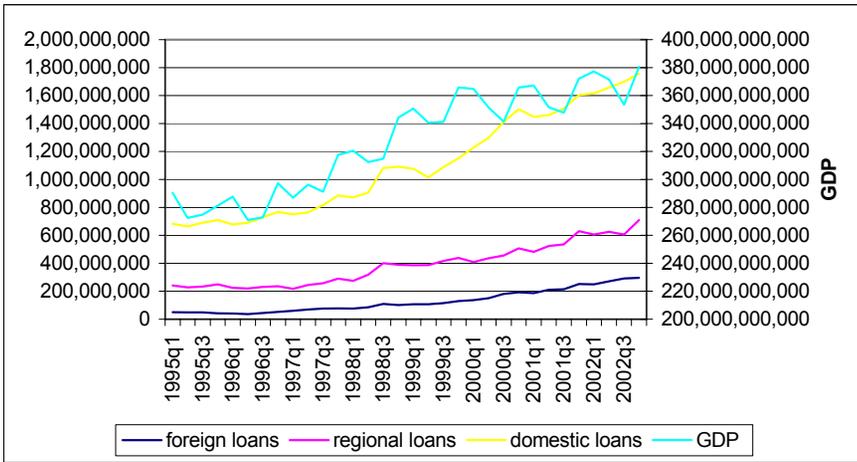


Graph 1.4 Colombia (thousands)

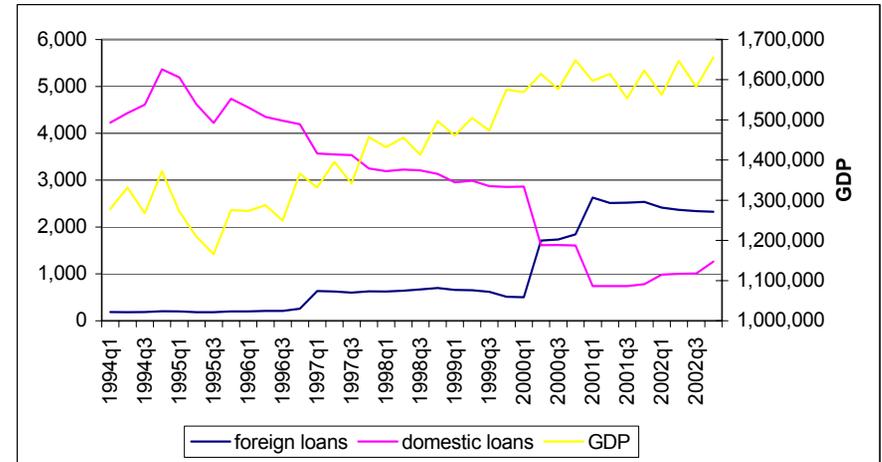


## Real Loans and GDP (in domestic currency)

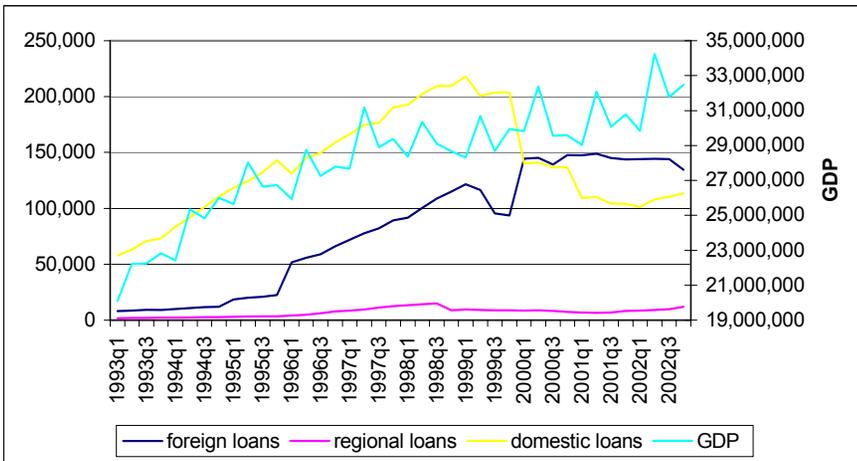
Graph 1.5 Costa Rica (units)



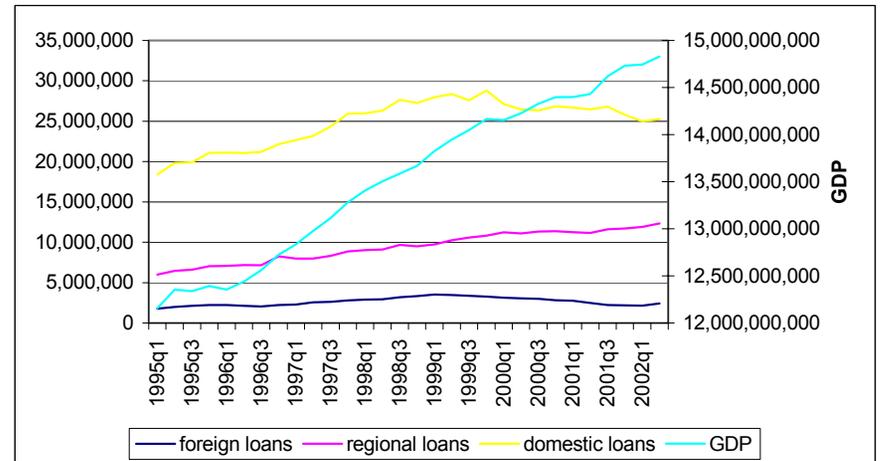
Graph 1.6 Mexico (millions)



Graph 1.7 Peru (thousands)

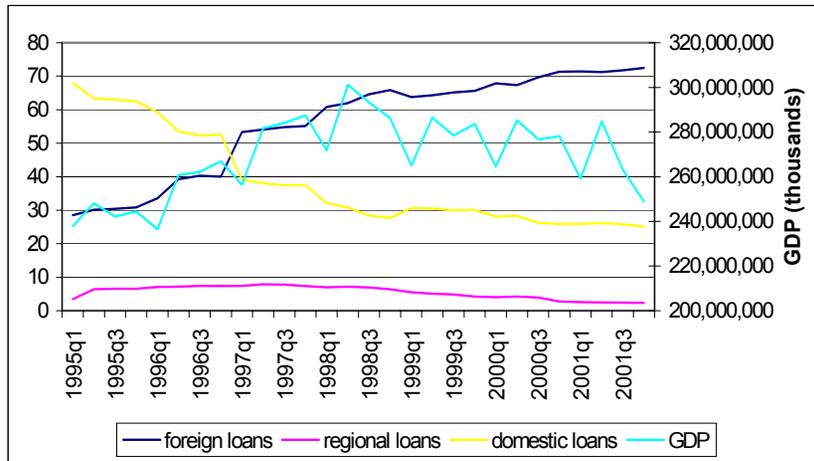


Graph 1.8 El Salvador (units)

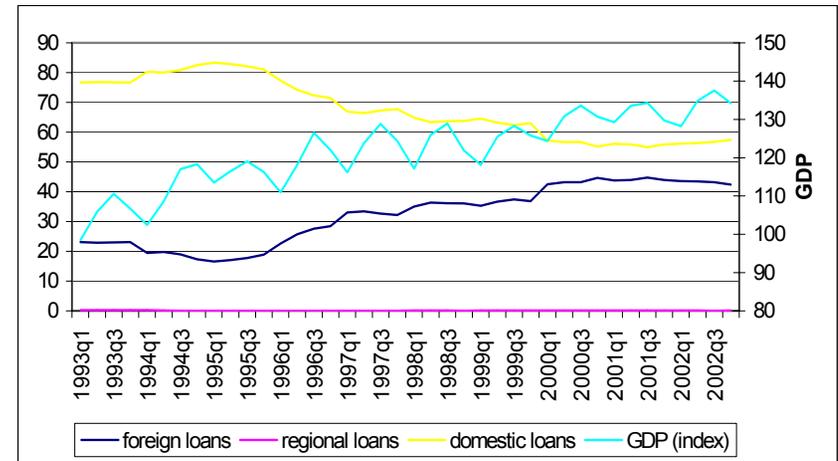


## Real Loans and GDP (as percentage of total)

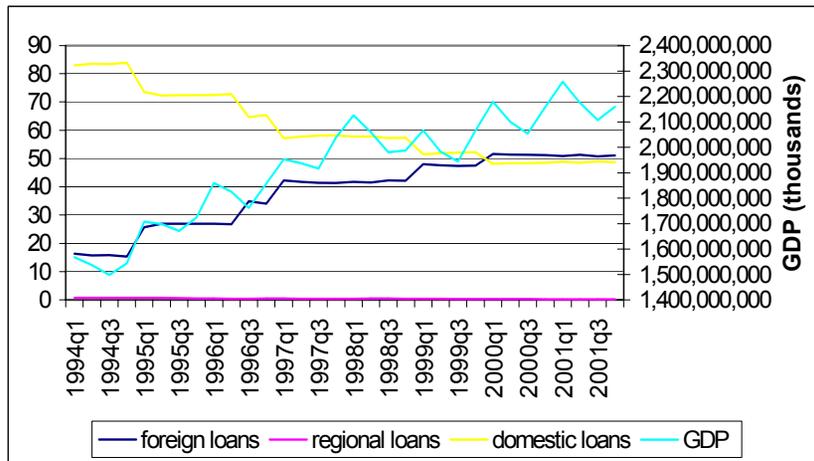
Graph 1.9 Argentina



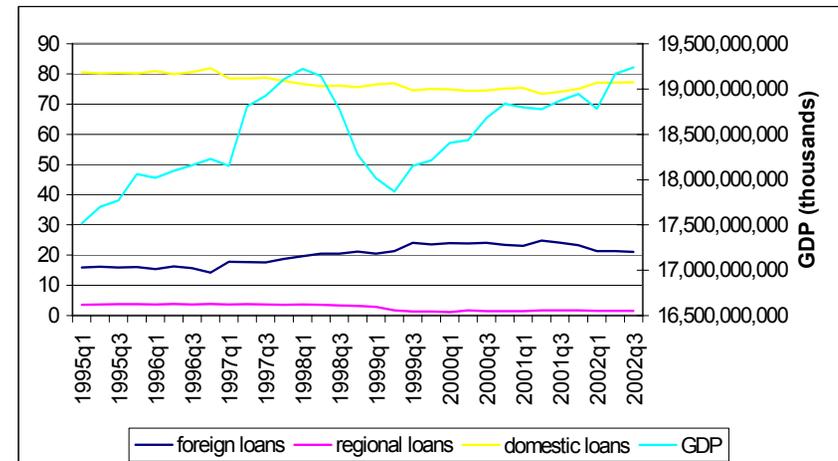
Graph 1.10 Brazil



Graph 1.11 Chile

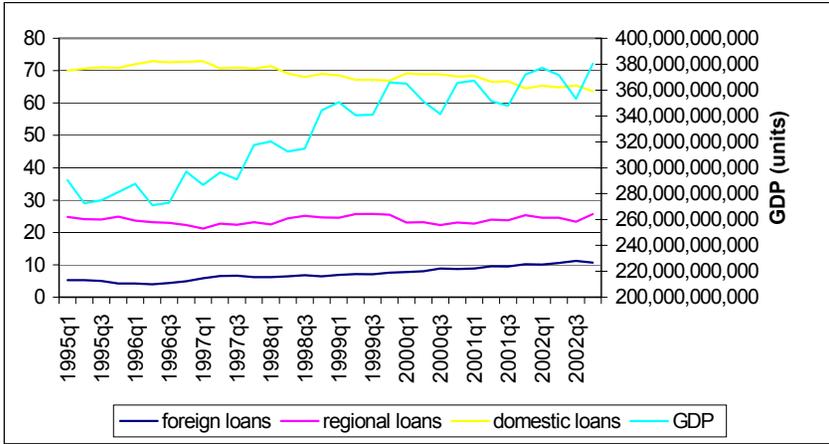


Graph 1.12 Colombia

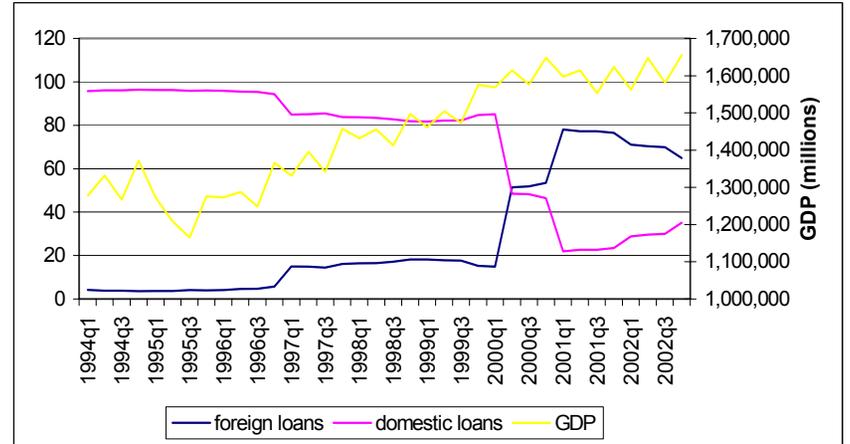


## Real Loans and GDP (as percentage of total)

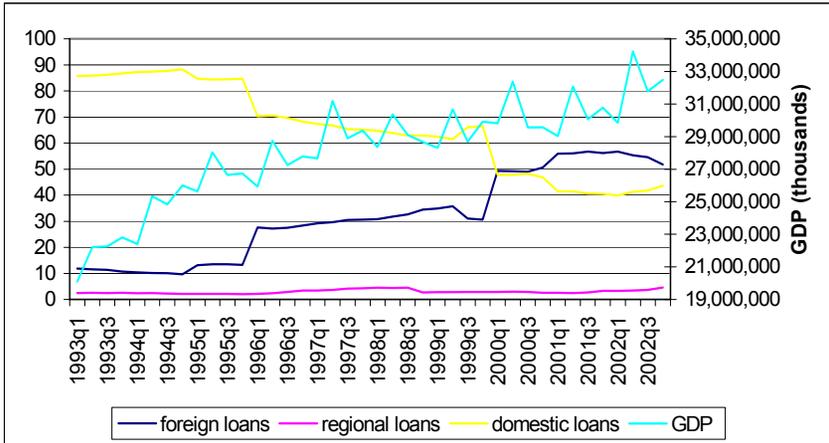
Graph 1.13 Costa Rica



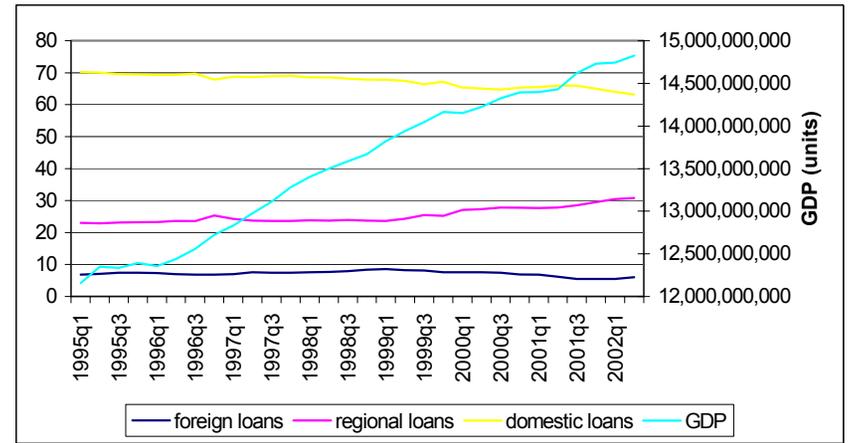
Graph 1.14 Mexico



Graph 1.15 Peru

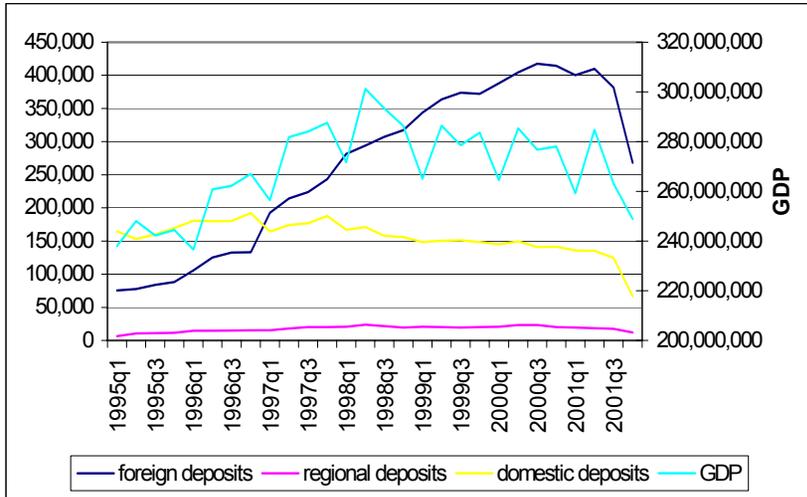


Graph 1.16 El Salvador

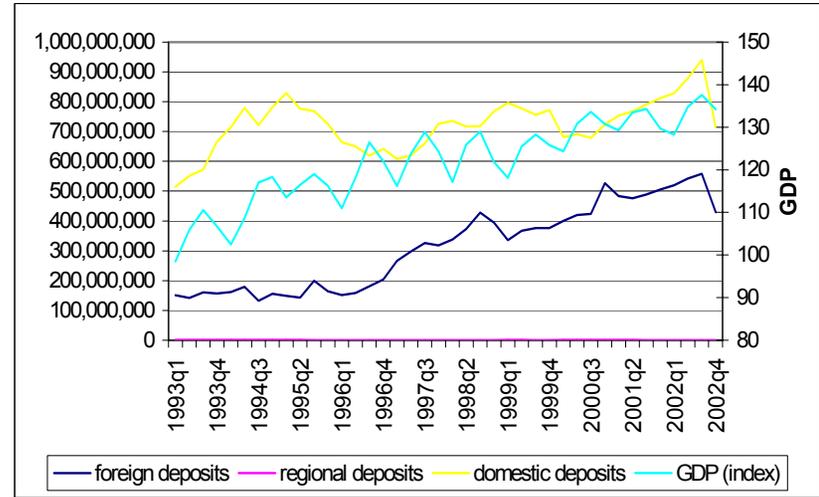


## Real Deposits and GDP (in domestic currency)

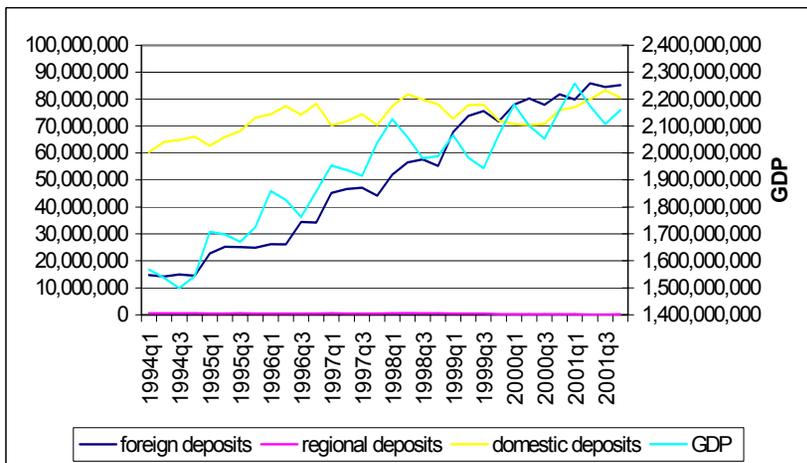
Graph 2.1 Argentina (thousands)



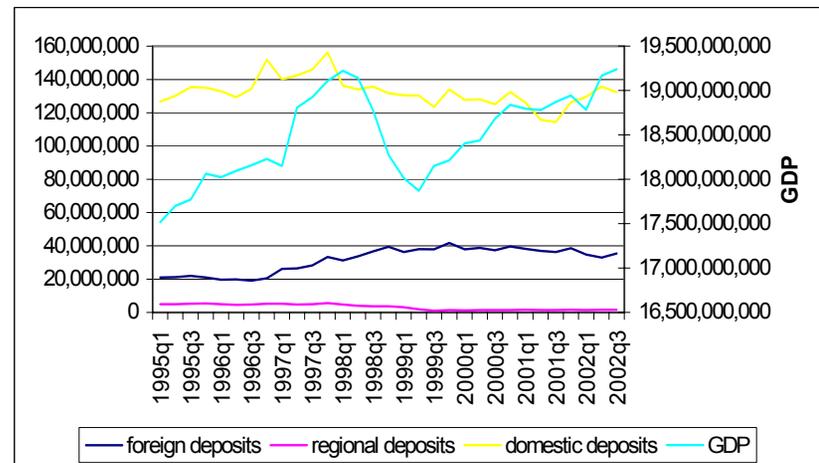
Graph 2.2 Brazil (units)



Graph 2.3 Chile (thousands)

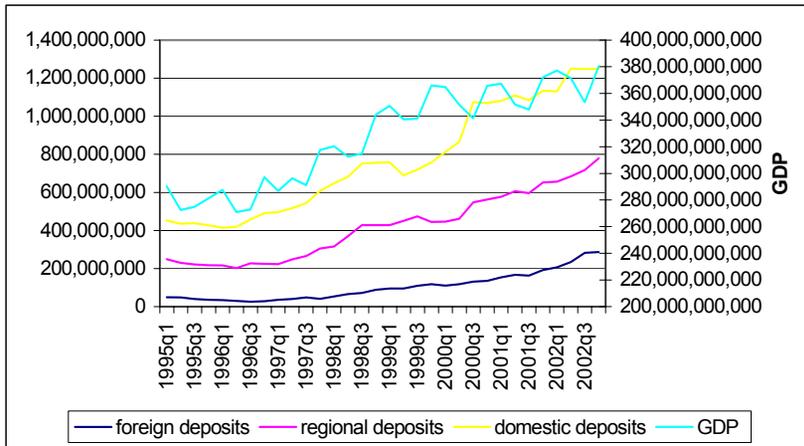


Graph 2.4 Colombia (thousands)

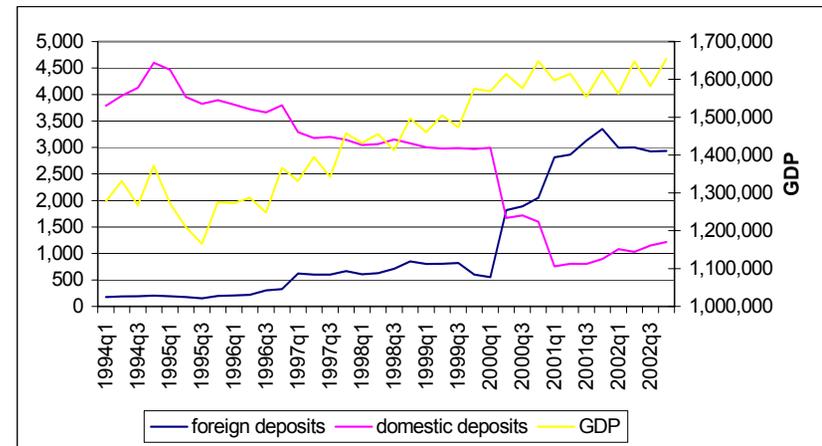


## Real Deposits and GDP (in domestic currency)

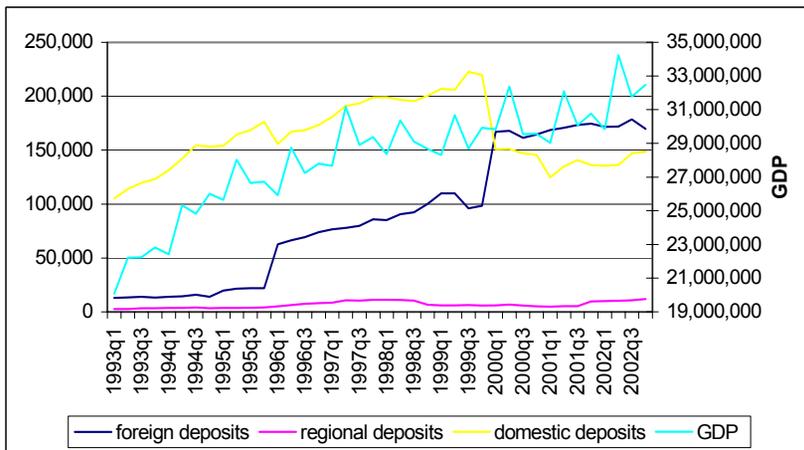
Graph 2.5 Costa Rica (units)



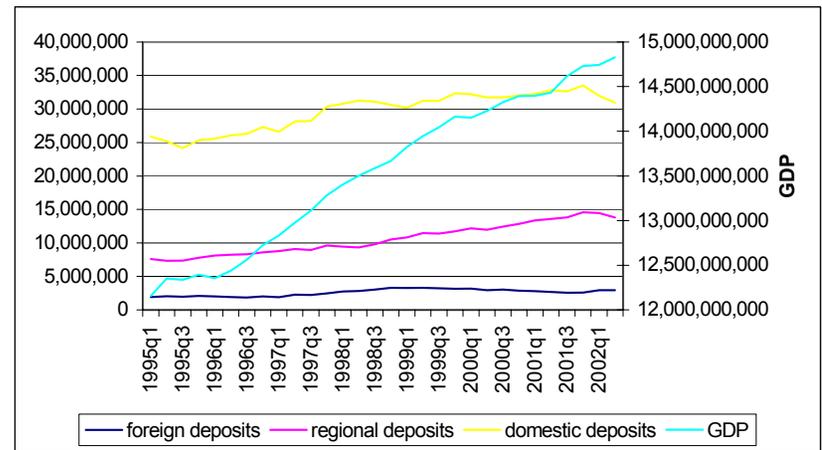
Graph 2.6 Mexico (millions)



Graph 2.7 Peru (thousands)

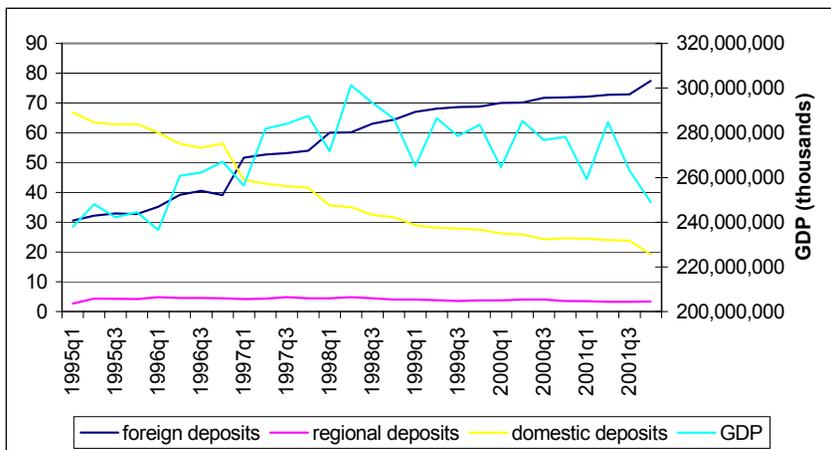


Graph 2.8 El Salvador (units)

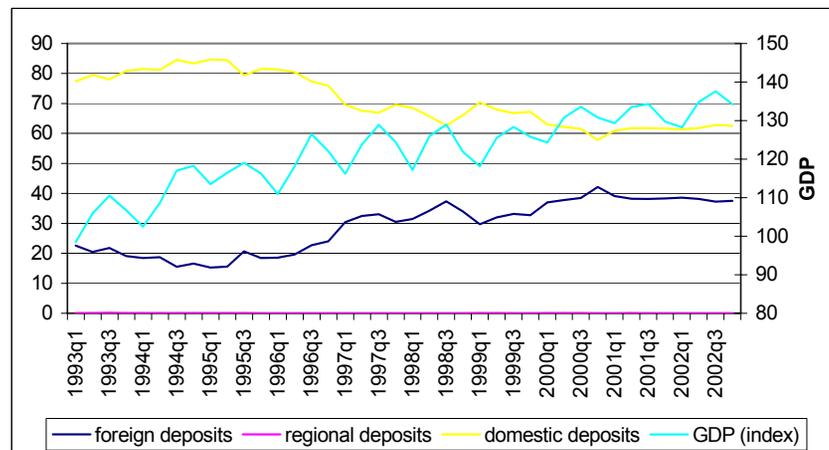


## Real Deposits and GDP (as percentage of total)

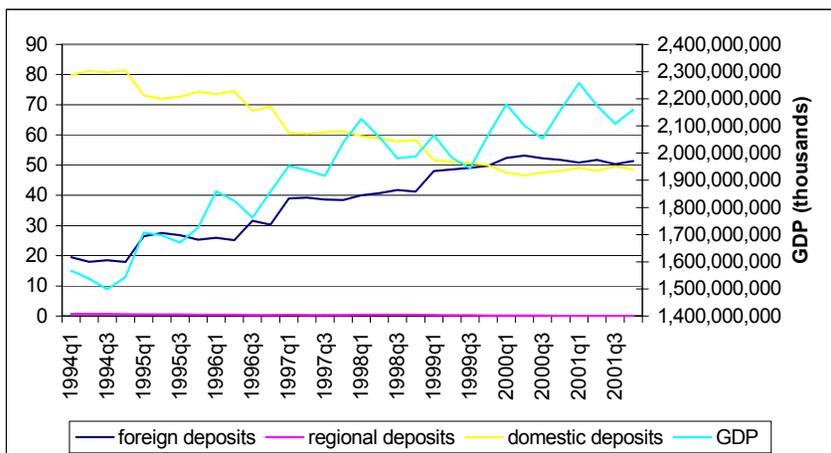
Graph 2.9 Argentina



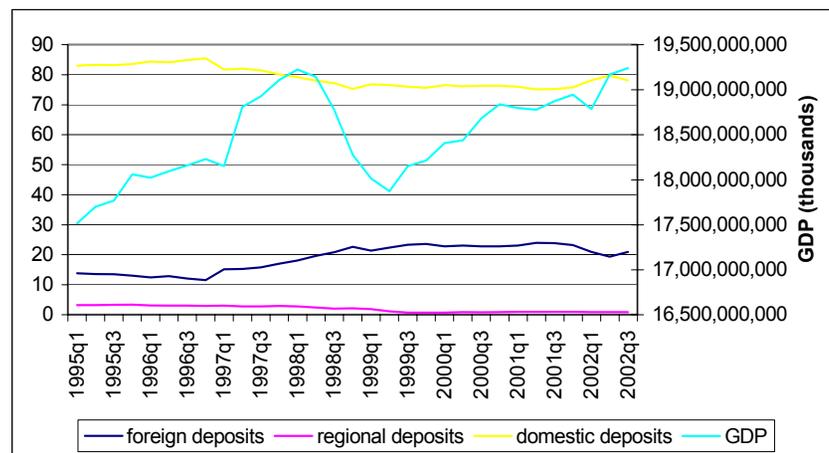
Graph 2.10 Brazil



Graph 2.11 Chile

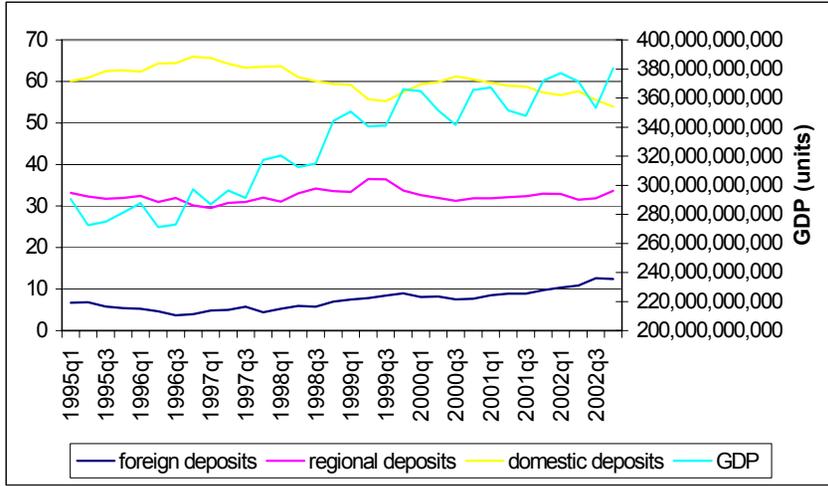


Graph 2.12 Colombia

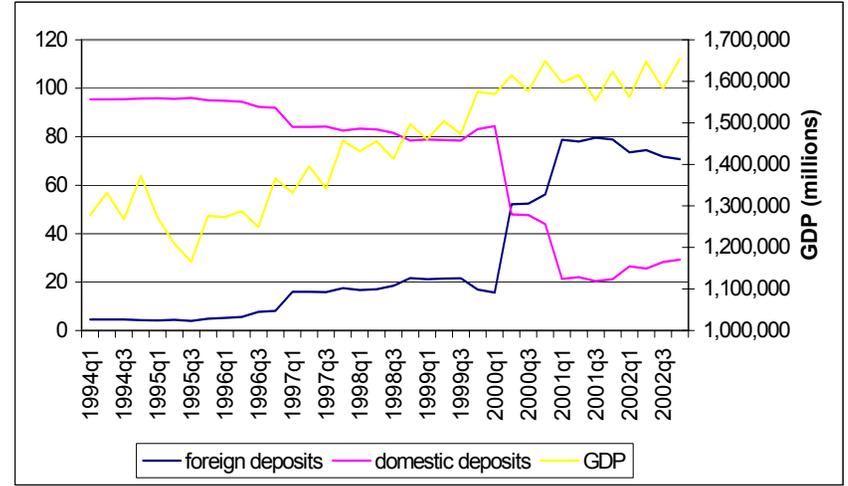


## Real Deposits and GDP (as percentage of total)

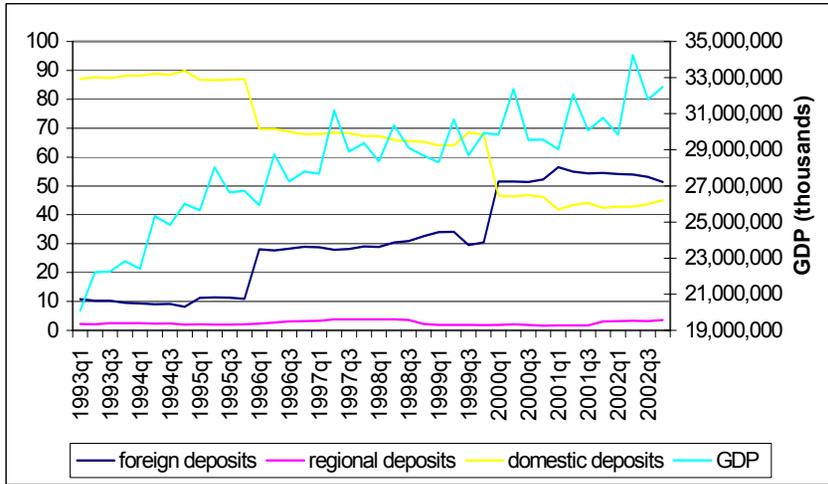
Graph 2.13 Costa Rica



Graph 2.14 Mexico



Graph 2.15 Peru



Graph 2.16 El Salvador

