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María Soledad Martínez Sergio Schmukler

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DO DEPOSITORS PUNISH BANKS FOR "BAD" BEHAVIOR?: EXAMINING MARKET DISCIPLINE IN ARGENTINA, CHILE, AND MEXICO

María Soledad Martínez
World Bank

Sergio Schmukler
World Bank

Resumen

Este trabajo estudia la existencia de disciplina de mercado en la industria bancaria de Argentina, Chile y México durante la década de los 80's y la década de los 90's. Se testea la disciplina bancaria analizando si los depositantes castigan a los bancos riesgosos retirando sus depósitos. Usando una base de batos de panel bancario se encuentra que existe disciplina de mercado a través de los distintos países y esquemas de seguro de depósito. Esta conclusión se mantiene incluso entre los pequeños depositantes y con esquemas de seguro de depósito. Los coeficientes encontrados y la varianza de descomposición indican que los fundamentales de los bancos son al menos tan importantes como otros factores que afectan los depósitos. Estimaciones basadas en la técnica MMG confirman la robustez de los resultados ante la posible endogeneidad de los fundamentales de los bancos.

Abstract

This paper examines the existence of market discipline in the banking industries of Argentina, Chile, and Mexico during the 1980s and 1990s. Using a bank panel data set, we test for the presence of market discipline by studying whether depositors punish risky banks by withdrawing their deposits. We find that across countries and across deposit insurance schemes, market discipline exists even among small, insured depositors. Standardized coefficients and variance decomposition of deposits indicate that bank fundamentals are at least as important as other factors affecting deposits. GMM estimations confirm that the results are robust to the potential endogeneity of bank fundamentals.

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I - Introduction

Over the last two decades, both developed and developing countries have endured severe banking crises. The U.S. savings and loans (S&Ls) debacle, the Chilean banking crisis in the 1980s, the Argentine and Mexican crises in the mid-1980s and 1990s, as well as the current financial stress in a number of Asian economies and in Russia are only a few examples. At all times and, particularly, in order to avoid banking crises, regulators need to find ways to promote prudent behavior by banks. Typically countries coming out of banking crises, or trying to prevent them, tighten supervision and prudential regulations. Alternatively, rather than depending exclusively on regulatory action, banking authorities can also increase their reliance on market discipline to oversee banks.

Market discipline in the banking sector can be described as a situation in which private sector agents (stockholders, depositors, or creditors at large) face costs that are increasing in the risks undertaken by banks and take action on the basis of these costs (Berger, 1991). For example, uninsured depositors, who are exposed to bank risk-taking, may penalize riskier banks by requiring higher interest rates or by withdrawing their deposits.

There are a number of potential social benefits from enhancing market discipline in a country's banking sector. First, by punishing bank risk-taking, increased market discipline may reduce the moral hazard incentives, which government guarantees create for banks to undertake excessive risks. Second, market discipline may improve the efficiency of banks by pressuring some of the relatively inefficient banks to become more efficient or to exit the industry (Berger, 1991). Finally, the social cost of supervising banks may be lowered if regulators ceded greater control to market forces that can tell "good" from "bad" banks. In particular, the market is an anonymous and constant overseer, which is hard to lobby for forbearance, and may react more quickly than regulators to increases in bank risk-taking.

The potential benefits of market discipline could be particularly important in developing countries, where banks intermediate the majority of funds. However, little is known regarding the existence of market discipline in developing countries. This is the subject of this paper. Specifically, this study tests the existence of market discipline in the Argentine, Chilean, and Mexican banking industries in the 1980s and 1990s. Using a bank panel data set, this paper examines whether depositors punish banks for "bad" behavior, by withdrawing their deposits from risky banks. In particular, we estimate reduced form equations of individual bank deposits as functions of bank fundamentals, bank systemic and macroeconomic variables. We conduct estimations for the period before, during, and after banking crises. Whenever possible, we estimate separate equations according to the size of deposits, their currency denomination, and the type of guarantee that protects them. We obtain *between* and *within* estimators of the parameters, and we test the joint significance of bank fundamentals. Additionally, we calculate standardized coefficients and we measure the variance of deposits explained by bank fundamentals. These two approaches enable us to determine the relative importance of bank risk characteristics vis-à-vis other factors that explain deposits. Finally, we test the robustness of our results and control for the potential endogeneity of bank fundamentals by conducting Generalized Method of Moments (GMM) estimations, as proposed by Arellano and Bover (1995).

A number of factors make the banking sectors of Argentina, Chile, and Mexico very interesting to study market discipline. First, in the last two decades, these countries have endured severe banking crises. All three countries underwent banking crises in the 1980s, while Argentina and Mexico experienced a recent crisis in 1994-95. Second, the banking sectors in the three countries have suffered important transformations, mainly as a result of the banking crises and due to subsequent changes in their regulatory frameworks. Third, these countries exhibit different deposit insurance systems, which have changed over the last two decades. Fourth, these countries have adopted different exchange rate regimes over time, implying different monetary policies and

different capabilities of central banks to act as lenders of last resort. Finally, it seems appropriate to conduct a study of market discipline for Argentina, Chile, and Mexico, since these countries have made significant efforts to promote the role of market forces in regulating banks. In the last two decades, bank supervisors in these countries have taken steps towards improving the quality and availability of information on banks. Recently, policymakers have been searching for new ways of summarizing information to improve market discipline --like requiring the issuance of subordinated debt and the regular rating of banks by external agencies.

Not only are the Argentine, Chilean, and Mexican banking sectors interesting to study in their own right, but also the cross-country comparison allows us to analyze important questions. For example, we examine whether the extent of market discipline is related to different regulatory and macroeconomic environments. In particular, we attempt to address the issue of whether certain types of deposit insurance schemes undermine market discipline.

The remainder of this paper is organized as follows. Section II presents an overview of the literature on market discipline. Section III describes the empirical methodology used in this study. Section IV provides a description of the data. Section V presents the empirical results. Section VI studies the relative importance of market discipline vis-à-vis systemic and macroeconomic factors. Section VII tests whether the results are robust to endogeneity. Section VIII concludes.

II - Literature on Market Discipline

Most of the existing academic studies on market discipline focus on the experience of the U.S. commercial banking industry over the last two decades. Flannery (1998) provides an excellent survey of this literature. Several of the papers that examine market discipline in the U.S., analyze whether banks pay a risk premium on their uninsured bank liabilities. Baer and Brewer (1986), Hannan and Hanweck (1988), and Ellis and Flannery (1992), among others, analyze how yields on uninsured deposits respond to bank risk-taking as captured by balance sheet and by market

measures of risk.[1] Overall, these papers support the hypothesis that yields on uninsured deposits contain risk premia. This evidence means that uninsured depositors charge higher interest rates to riskier banks. Furthermore, Cook and Spellman (1994) provide evidence of risk pricing even among insured depositors.

While the studies mentioned above analyze the degree of market discipline by focusing only on the interest rates paid by commercial banks, other studies have examined this question by concentrating on the level or change of uninsured deposits. Goldberg and Hudgins (1996), for example, analyze the behavior of uninsured deposits at S&Ls associations during 1984-89. The authors' goal is to uncover whether depositors adjust their holdings of uninsured deposits in response to indications of impending institutional failure. The results show that depositors reduce uninsured holdings at institutions that are failing, that is, healthy S&Ls attract more uninsured deposits than failing S&Ls.

Park (1995) and Park and Peristiani (1998) combine both approaches mentioned above. These papers study market discipline by looking at the effect of depository's institution risk on both the pricing and growth of uninsured deposits. Both studies find that riskier banks pay higher interest rates, but at the same time they attract smaller amounts of uninsured deposits.

The evidence on the existence of risk premia on subordinated notes and debentures, rather than deposits, is more mixed. Avery, Belton, and Golberg (1988) and Gorton and Santomero (1990) fail to identify risk premia in the spreads of subordinated notes and debentures. However, Flannery and Sorescu (1996) point out that both of these studies use data from the 1983-84 period, during which subordinated note and debenture investors may have felt protected by a conjectural government guarantee on such securities. On the other hand, Flannery and Sorescu (1996) examine subordinated note and debenture spreads over varying windows between 1983 and 1991. They document a significant relationship between several balance sheet and income statement risk proxies and yield spreads for the overall period and, in particular, for the 1989-91 window.

Whereas the literature on market discipline is quite vast for the U.S., significantly fewer papers have been written on this subject for the case of developing countries.[2] The main contributors to this market discipline literature are Valdes and Lomakin (1988), Schumacher (1996), and D'Amato, Grubisic, and Powell (1997).

Valdes and Lomakin (1988) examine whether, during 1987, depositors in the Chilean financial system continued to act as if all claims were insured by the government, despite the fact that a law was passed in 1986 providing insurance only to small depositors. Throughout 1981-1986, the government guaranteed the deposits of practically all banks that failed during that period. However, in 1986, a new law was passed that limited the insurance coverage to deposits under around 2,000 dollars. Using panel data on implicit interest rates paid on deposits during 1987-1988, Valdes and Lomakin fail to reject the null that depositors did not require riskier banks to pay higher interest rates. Consequently, the authors conclude that depositors behaved as if they continued to enjoy the pre-1986 full deposit insurance guarantee, even though the 1986 law limited deposit insurance coverage.

Schumacher (1996) studies the 1994-95 Argentine banking crisis. Using a bank-level data set, she first estimates probabilities of bank failure. Then, she examines whether these probabilities have an impact on deposit behavior over the course of the 1995 Argentine banking crisis. Overall, Schumacher finds that the probability of failure is explained by the ratio of non-performing loans, the return on assets, and a number of variables measuring liquidity. In the second step of her estimation, Schumacher finds that the probability of bank failure negatively affects the behavior of deposits, in particular, during the peak of the crisis in March 1995. For the pre-panic period (i.e., during 1994, excluding December), she finds that riskier banks paid higher interest rates on deposits.[3]

D'Amato, Grubisic, and Powell (1997) estimate a two-way random effects model using daily deposit data for a sample of 120 Argentine banks, over a four month period surrounding the 1995 banking crisis. The main objective of this paper is to test the presence of contagion in depositors' behavior. First, the authors estimate a random effects model of daily changes in deposits

as a function of a number of macro variables (which vary over time but not across banks) and bank fundamentals (which take values for November 1994). For this initial panel estimation, the authors find that a Breusch-Pagan Lagrange Multiplier test indicates that even after accounting for the role of macro and bank specific variables, there remain significant random time effects. However, once they model contagion explicitly by including lagged movements of deposits in various groups of banks (cooperative, foreign, and public), they cannot reject the hypothesis that there is no random time effect remaining. The authors interpret their results as evidence of contagion in depositor behavior in Argentina during the 1995-banking crisis.

The existing empirical literature related to market discipline in Latin America can be summarized as follows. Valdes and Lomakin (1988) focus on interest rate changes associated with bank riskiness. Schumacher (1996) analyzes how deposits across banks are affected by their probability of failure. D'Amato et al. study contagion effects in depositors' behavior, controlling for macroeconomic factors and for the level of bank fundamentals at the beginning of their sample. While extremely informative, these studies have a number of limitations as far as the objectives of this paper are concerned.

First, Schumacher's two-step approach to analyze deposit growth (i.e., first estimate a probability of failure and then study how this probability affects deposit growth) makes it impossible to determine specifically which bank risk variables (if any) affect depositors' behavior. Second, both Valdes and Lomakin and Schumacher fail to allow in their analysis for the potential role that macroeconomic and bank systemic factors can play in affecting interest rates or deposit behavior, respectively. Given that three of the four periods we study coincide with macroeconomic crises, recognizing the potential role of these factors in affecting deposits is very important. Third, while D'Amato et al. control for the role of bank fundamentals, macroeconomic, and contagion effects, given that fundamentals are fixed in their paper, the authors cannot adequately study the response of deposits to changes in bank risk indicators over time. Fourth, D'Amato et al. as well as Schumacher

do not discriminate between insured and uninsured deposits. This may be problematic because these two types of depositors may have different incentives to monitor and, consequently, to discipline bank risk-taking. Given that uninsured depositors' claims are unprotected in the event of bank failures, we expect them to have greater incentives to monitor bank activities. By studying the behavior of total deposits (even after the introduction of deposit insurance), both studies mentioned above are implicitly constraining their models of deposits to be the same for insured and uninsured depositors. Fifth, none of the studies mentioned above analyze the relative importance of bank fundamentals vis-à-vis other factors affecting deposits, nor do they control for the potential endogeneity of bank fundamentals in their estimations. Finally, the previous papers are unable to make cross-country comparisons.

The analysis in the remainder of this paper studies market discipline in Argentina, Chile, and Mexico by concentrating on the response of deposits to changes in bank specific fundamentals. At the same time, we control for factors affecting the macroeconomic environment in which banks operate and for the behavior of deposits in the overall banking system. In particular, using panel data for banks in Argentina, Chile, and Mexico, we focus on how changes in bank fundamentals, over time and across banks, affect individual bank deposits. Also, to determine whether the responsiveness of depositors to bank risk is affected by the type of guarantees that depositors enjoy, we discriminate between insured and uninsured deposits. Finally, we explore the hypothesis that large depositors tend to discipline banks more than small depositors do.

III - Empirical Methodology

This section is devoted to a discussion of the empirical methodology we use to study market discipline. We estimate the following reduced form equation for bank deposits in each country separately.

$$DEP_{i,t} = \mu_i + \delta' SYS_t + \gamma' MACRO_t + \beta' BANK_{i,t-1} + \nu_{i,t}$$
$$\nu_{i,t} \sim N(0, \sigma^2_{i,t}) \qquad (1)$$

such that $i = 1,...,N$ and $t = 1,...,T$.

$DEP_{i,t}$ represents individual bank deposits of bank *i* at time *t*. *N* is the number of banks in each country. The panel is unbalanced, so *T* --the number of observations per bank-- varies across banks. SYS_t stands for the systemic variable, while $MACRO_t$ is a vector of macroeconomic variables. Both the systemic and the macroeconomic variables change over time but not across individuals. $BANK_{i,t-1}$ is a vector of bank fundamentals. This vector is included with a lag, to account for the fact that balance sheet information is available to the public with a certain delay. μ_i stands for each bank's specific or fixed effect. Thus, according to equation (1), bank deposits are determined by three main factors: the behavior of deposits in the overall banking system, the developments in the macro economy, and the evolution of the bank risk characteristics (or bank fundamentals).

We report *between* and *within* estimators of equation (1). *Between* estimators are obtained by regressing the mean of deposits of each bank on mean values of the explanatory variables. In other words, for each individual we compute the mean of each variable over time. Then, we calculate a cross-section ordinary least square (OLS) on the means. The results allow us to compare deposit behavior across banks. For instance, the *between* estimators enable us to study whether banks with stronger fundamentals attract more deposits. Given that the systemic and macroeconomic regressors only vary over time but not across individuals, we only include bank specific variables in the *between* estimations. The equations for Argentina encompass between 82 to 162 banks, while 33 to 40 banks are contained in the estimations for Chile. On the other hand, the equations for Mexico include 12 to 38 banks. We conduct *between* estimations only for Argentina, since we need enough degrees of freedom to obtain reliable estimates.

While *between* estimators exploit differences across banks, *within* estimators highlight the variation of deposits over time. *Within* estimators study deviations from each bank's mean. For instance, *within* estimators indicate how deviations from the average bank fundamentals affect deviations of deposits from their mean. *Within* estimates are obtained by including a dummy variable for each bank, which controls for bank mean deposits.

The results from the *between* and *within* estimates have two different interpretations. The *between* estimates tell us how *bank j*'s deposits would change if *bank j* became *bank h*. On the other hand, the *within* estimates tell us how *bank j*'s deposits would react if bank *j*'s fundamentals (or other variables in the equation) changed over time, given its mean deposits. Heteroskedastic-consistent standard errors are calculated, both in the *between* and *within* regressions.

To test the joint significance of the macroeconomic variables, we compute and report the corresponding F-test statistics from the *within* estimations. Given that the macroeconomic variables may be correlated with each other, we may fail to find that any of these variables are individually significant. The F-test for the joint significance of macroeconomic variables should allow us to determine if these variables have a joint significant impact on deposits, even when some of them might not be individually significant. We also compute and report similar F-tests for the joint significance of bank fundamentals, excluding the logarithm of bank assets. The latter is included to control for possible scale effects, since typically larger banks attract more deposits. In reporting the joint significance of bank fundamentals, we omit the logarithm of bank assets, since this variable is not a measure of bank risk per se.

The *within* estimates control for individual fixed effects. We conduct two tests associated with these parameters. First, we test the joint significance of the individual fixed effects and we report the corresponding F-statistic. Second, we conduct a Hausman (1978) test to evaluate the validity of including individual fixed effects rather than estimating a random-effects model. The corresponding test statistic is distributed as a chi-square, which we label "Chi-Hausman." In most

cases, the tests show that we cannot reject the hypothesis that the fixed effects are jointly significant. Therefore, we report only the fixed-effects models, because the random-effects specification would yield biased coefficients.

Whenever possible, we estimate various specifications of equation (1) for each country, dividing the estimates by size of deposits, time periods, and currency denomination. First, we distinguish between insured and uninsured deposits. This distinction is important in a study of market discipline, since a-priori we would expect to find differences in the degree of market discipline across these two types of depositors. Assuming the deposit insurance scheme is credible, one can expect insured depositors to have fewer incentives to monitor bank risk-taking. However, if the deposit guarantee is not credible or if there are costs associated with the recovery of deposits following a bank failure, we may find evidence that insured depositors enforce market discipline. On the other hand, uninsured depositors' claims are not protected by the deposit guarantee, so in theory we expect these depositors to withdraw their funds from risky banks.

Two other sets of specifications are estimated. Among uninsured deposits --which are larger than insured deposits-- we distinguish between medium and large deposits. Our goal is to study whether there are differences across these groups. Furthermore, we divide the sample period to test for the presence of market discipline before, during, and after banking crises. In the case of Argentina and Chile, we compute separate regressions for local currency (peso) and U.S. dollar deposits. For the regressions in local currency, deposits and assets are expressed in real terms (adjusted by the consumer price index) in order to control for the potential growth in nominal figures that can be due to inflation.

To compare the relative importance of the bank fundamentals vis-à-vis the macro and systemic variables, we compute standardized coefficients. These coefficients are obtained by transforming all variables (using each bank's mean and standard deviation) and by estimating equation (1) without bank dummies. Standardized coefficients are unit free coefficients and,

therefore, can be compared across regressors. We also calculate the variance of deposits explained by bank fundamentals as an alternative measure of their relative impact.

Our methodology assumes that bank risk, systemic, and macroeconomic variables are exogenous. However, under certain circumstances, bank fundamentals may be endogenously determined. If so, the estimated coefficients will be biased and inconsistent. The specification in equation (1) captures the fact that bank risk characteristics are only known to depositors with a certain delay. This lag structure mitigates the potential problem of endogeneity. In this scenario, endogeneity can only take place if bankers anticipate depositors' reaction. To address this issue and to check for the robustness of the results we conduct GMM estimations, as proposed by Arellano and Bover (1995). The GMM estimations are explained and reported in Section VII.

As mentioned above, depositors can exercise market discipline on banks through two channels: by requiring higher interest rates and/or by withdrawing their deposits from risky banks. Even though most papers on market discipline focus either on interest rates or on the quantity of deposits, in order to measure the full extent of market discipline, it is necessary to examine the behavior of both variables.[4] Only when one of these variables is completely inelastic, is it adequate to focus exclusively on the behavior of the other variable.

The approach pursued by this paper focuses on quantity responses due to the lack of adequate data on interests rates paid by each bank on deposits. For the countries we examine, the only readily available bank level information on interest rates is an implicit rate rather than a market rate. This implicit rate is calculated as the share of interest rate expenses over the total amount of deposits. This proxy for the true market rate paid on deposits does not allow us to discriminate across currency denomination, maturity, or size of deposits. Moreover, the interest rate data do not enable us to distinguish between insured and uninsured deposits.

Under certain circumstances, focusing only on changes in the quantity of deposits to measure the extent of market discipline might be the appropriate approach. For example, in situations

of asymmetric information and adverse selection, depositors may prefer to adjust to changes in the perception of banks' risk via changes in quantity rather than by accepting higher interest rates (a la Stiglitz and Weiss, 1981). In this context, if banks are unable to raise interest rates sufficiently to compensate depositors for the perceived risk, or if banks decide not to increase interest rates to hide their risky situations, interest rates paid by banks on deposits will be imperfect indicators of market discipline.

In the cases where interest rates cease to be useful indicators of market discipline, examining whether riskier banks attract fewer deposits is a complete test of the existence and the degree of market discipline. However, in general, such a test would require that we study the behavior of both interest rates and deposits. Even though our focus on the quantity of deposits does not allow us to measure the full extent of depositors' response to bank risk, our study does provide a test of the existence of market discipline. If we find that indeed riskier banks attract fewer deposits, we can interpret this finding as evidence of market discipline.

IV - The Data

Three types of data are used in this study, namely: bank specific, systemic, and macroeconomic variables. The bank-specific data used in this study come from the Central Bank of Argentina, the Superintendencia de Entidades Financieras (Argentina), the Superintendencia de Bancos e Instituciones Financieras (Chile), the Comision Nacional Bancaria y de Valores (Mexico).[5] These agencies oversee banks. Banking sector data were also obtained from these sources. Macroeconomic and systemic data come both from the Argentine Central Bank and the Ministry of Finance, as well as from the International Financial Statistics of the International Monetary Fund. Bank specific data are usually quarterly, although some variables appear on a monthly basis. We estimate the models with quarterly data, except for Chile during the 1980s,

when monthly data is available. All the bank specific balance sheet information is collected regularly, but published and available to the public with a lag of around 2 months.

IV.A - Bank Level Variables

The vector $BANK_{i,t-1}$ contains several bank-specific fundamentals which are intended to measure banks' risk exposure. The variables included are akin to those used in the CAMEL rating system of banks (where CAMEL stands for capital adequacy, asset quality, management, earnings, and liquidity). Capital adequacy is measured by the capital to assets ratio. We expect the capital adequacy variable to have a positive effect on bank deposits. A number of indicators are used as measures of asset quality. A clear signal of asset quality is the ratio of non-performing to total loans. This ratio measures the percentage of loans a bank might have to write off as losses. We expect this variable to have a negative impact on deposits.

The concentration of bank's loan portfolio also captures the quality of the assets held by banks. In general a large exposure to a vulnerable sector, like real estate, raises banks' risks. On the other hand, because most real estate sector loans are mortgage loans (i.e., loans where the assets in question serve as collateral), it is possible that these loans can be considered safer than others. Thus, it is a priori unclear what impact we expect the ratio of real estate loans to total loans to have on deposit behavior. We face a similar uncertainty when analyzing personal or consumption loans. These loans are typically granted without collateral. However, they may be easier to recall than other loans (like mortgage loans), given that consumption loans are usually smaller and have a shorter maturity. Consequently, one might expect a rise in this type of lending to indicate either an increase or a decrease in the risk exposure of banks. Ex-ante, then, consumption loans might have either a positive or a negative impact on deposits.

We measure banks' profitability by the return on assets ratio. In general, assuming we are adequately controlling for risk, we expect this variable to have a positive effect on deposits. The

efficiency of banks is measured by the ratio of non-interest expenditures to total assets. Less efficient banks are expected to have higher expenditures. However, it is also the case that banks that offer a better service to customers might have higher expenditures to total assets. If we could control for the quality of service, we would expect an increase in non-interest expenditures to have a negative effect on deposits. In our case, given that we cannot control for the quality of bank services, the effect of this variable is undetermined.

The cash to assets ratio is included as an indicator of banks' liquidity. In general, banks with a large volume of liquid assets are perceived to be safer, since these assets would allow a bank to meet unexpected withdrawals. In this sense, controlling for other factors, we expect more liquid banks to suffer fewer deposit withdrawals. To the extent that one can consider the bonds to assets ratio as a measure of liquidity, we would expect this variable to have a positive effect on bank deposits. Finally, in order to control for the size of banks, the logarithm of bank assets is included in the regressions. If larger banks are perceived as being more solid, we expect this variable to positively affect bank deposits. As mentioned above, we include the logarithm of bank assets as a control variable and not as a measure of bank risk.

IV.B – Systemic and Macroeconomic Variables

In order to control for the behavior of the overall banking sector, our estimations include the ratio of cash outside banks to system deposits. We believe this variable provides a preliminary way of testing for "contagion" effects. Contagion refers to a situation in which individual depositors at a given bank act according to what the rest of the banking system appears to be doing, after controlling for bank specific and macroeconomic factors. Cash outside banks over system deposits reflects individuals' preference for holding currency relative to bank deposits. If depositors perceive an increase in systemic risks, they might decide to withdraw their deposit from banks regardless of their fundamentals. The value of cash outside banks over system

deposits will increase and individual bank deposits will fall. Therefore, a negative correlation between individual bank deposits and cash outside banks can be interpreted as evidence of systemic or contagion effects.

Deposits at individual banks can also be influenced by the state of the overall economy. Thus, we control for the impact of macroeconomic variables. In particular, we evaluate the effect of central bank reserves (as a share of M2) and the stock market index on the quantity of bank deposits. We also include the interest rate differential to control for exchange rate expectations of devaluation.

V - Empirical Results

Argentina:

Table I (A and B) and Table II (A and B) display the estimates of equation (1), denominated in local currency and U.S. dollars, respectively. Tables I.A and II.A present the *between* estimates, while Table I.B and Table II.B display the *within* estimates. The tables show the estimates over different sample periods, using various measures of deposits. We conduct estimations over the following periods: June 1993-September 1994, June 1993-March 1995, and June 1995-March 1997. Our data set begins in June 1993, when bank level data was made available systematically to the public on a quarterly basis. The Mexican crisis, which triggered a banking crisis in Argentina, started in December 1994. Therefore, our first estimation covers the pre-crisis period, June 1993-September 1994. Our second estimation, for the period June 1993-March 1995, includes the so-called "tequila crisis". Until then, all deposits were uninsured. Therefore, during this period, looking at banks' total term deposits is equivalent to studying the behavior of uninsured deposits. For each of the sub-categories discussed above, we perform the estimations for dollar and peso deposits.

For the period after April 1995, we analyze the behavior of deposits by size.[6] In particular, we estimate equation (1) separately for insured and uninsured deposits. According to the deposit insurance law introduced in April 1995, deposits are protected up to 20,000 pesos or dollars, depending on their maturity.[7] Deposits with a maturity of more than 90 days are protected up to 20,000 dollars or pesos. For deposits with a shorter maturity, the guarantee covers deposits of up to 10,000 pesos or dollars. Since we do not have data on the maturity of deposits, there is no clear way to separate insured from uninsured deposits with full certainty. In order to reduce the probability of including uninsured deposits in the insured group, we work with the relatively conservative cut off point of 10,000 pesos or dollars. Finally, to analyze the degree of market discipline exercised by "medium" size and "large" depositors, we distinguish between deposits in the 20,000-100,000 peso/dollar range and those more than 100,000 pesos/dollars.

[Tables I.A, I.B, II.A, II.B here]

Table I.A presents the results for the *between* estimates for peso deposits. We do not distinguish here between the pre-crisis and crisis periods, since results do not vary significantly across these periods. The *between* estimates for peso deposits indicate that banks with a higher ratio of non-performing loans to total loans capture fewer deposits. On the other hand, banks with a larger proportion of personal loans in their portfolio attract more deposits. In the aftermath of the tequila crisis, cash over assets significantly and positively explains bank deposits after June 1995, implying that more liquid banks attract more deposits. Table I.A also shows that the variable return on assets negatively affects peso deposits. The *between* estimates show that larger banks (as measured by the logarithm of assets) attract more local currency deposits.

The *between* estimates for dollar deposits, displayed in Table II.A, are similar to the ones obtained for peso deposits. One difference is that, in the pre-deposit insurance period, the variable bonds over assets is negative. During the tequila crisis, the value of Latin American government bonds declined substantially, and the banks that were heavily invested in these bonds suffered

considerable losses. Although a priori we expected the ratio of bonds over assets to have a positive effect on deposits, with the benefit of hindsight, the estimated negative sign on this variable becomes easier to interpret.

The *within* estimates for the pre-deposit insurance sample --June 1993 through March 1995-- indicate that bonds over assets is negative and significant in the equations for peso deposits. Bank size is significant and positive in the equations for both peso and dollar deposits (see Tables I.B and 2.B). Cash over assets is statistically significant and positive in the equations for dollar deposits. Thus, liquid banks attract more deposits. On the other hand, we find that banks with higher capitalization rates and a smaller fraction of non-performing loans capture fewer dollar deposits throughout the period June 1993-March 1995.

These two last results are the opposite of what we would have expected. However, we can offer an intuitive explanation for these unintuitive results. Between December 1994 and March 1995, many banks in trouble were merged or acquired.[8] Because the acquiring bank absorbs the deposits, the bad loans, the capital, and the assets of the bank in trouble, we observe an increase in deposits for the acquiring bank, together with an increase in its ratio of non-performing loans and a fall in its capitalization ratio. This fact accounts for the positive coefficient on the ratio of non-performing loans and the negative estimate for the capital assets ratio during the period June 1993-March 1995. In both cases, if we take from the sample the acquiring banks, these odd results disappear.[9] Finally, note that if we exclude the crisis period (when most mergers and acquisitions took place), the results for June 1993–September 1994, show that the variable non-performing loans has the expected negative sign, while the capital assets ratio is negative but insignificant.

With respect to the macroeconomic variables, stock market prices and central bank reserves have a positive and significant effect on both pesos and dollar deposits. The interest rate differential is statistically significant in the equations for dollar deposits before June 1995. This

variable captures the expectations of a devaluation. Our results indicate that dollar deposits increase, as the expectations of a devaluation grow. The macroeconomic variables are jointly significant during the crisis period in the equations for peso and dollar deposits.

The systemic variable is statistically significant and has the expected sign in the equation that includes the crisis period. As mentioned before, there are two possible interpretations to this result. One potential explanation is that individual bank deposits exhibit a trend that is not captured by the macroeconomic variables included in the estimations. Cash to system deposits may be significant because it is capturing this trend. The other possible interpretation is that (to the extent that the macroeconomic variables control for trend developments in the economy) the negative impact of the systemic variable may be due to contagion. This refers to a situation where the decisions of individual depositors of a given bank are affected by the behavior of depositors in other banks. The fact that the variable turns significant when we include the crisis period is consistent with the results obtained by D'Amato et al. (1997), who find evidence of contagion during the tequila crisis.

The *within* estimates for the deposit insurance period --the period after April 1995-- indicate that, among the bank fundamentals, the ratio of non-performing loans to total loans almost always has a negative impact on both dollar and peso deposits (see Tables I.B and II.B). The ratio of capital over assets is also significant in some specifications. Its effect on deposits is always positive. The variable bonds over assets is statistically significant and positive (as opposed to its negative effect during the crisis period) in particular for small and medium deposits. Bank size has a positive significant impact on all peso and dollar deposits, except for large deposits.

Regarding the macroeconomic variables, the last four columns of Table I.B and Table II.B show that the ratio of central bank reserves to M2 is positive and significant only among dollar deposits. The peso-dollar interest rate differential is statistically significant and negative in the equations for peso deposits. This variable is also significant, but positive, in the equations for

dollar deposits. Under uncover interest parity, the peso-dollar interest rate differential measures the expected devaluation. The results show that a higher expected devaluation decreases peso deposits and, at the same time, it raises dollar deposits. Regarding the systemic variable, the tables show that cash outside banks over system deposits is statistically significant in the *within* equation for dollar deposits, except in the equation for large deposits.

The overall results for Argentina show that we are able to reject the null hypothesis that bank risk characteristics are jointly insignificant. The F-tests for bank fundamentals are significant in all equations for peso and dollar deposits. To test the joint significance of the macroeconomic variables, we compute and report the corresponding F-test statistics. We are able to reject the hypothesis that macroeconomic variables are jointly insignificant across the different specifications. We can also reject the hypothesis that the fixed effects are jointly insignificant in all specifications. In general, we can reject the null hypothesis that we should estimate a random effects model.

In summary, for Argentina, we find that bank fundamentals significantly explain peso and dollar deposits. In fact, bank fundamentals are jointly significant in all equations. Therefore, one can conclude that there exists market discipline in the Argentine banking system. Given the individual significance of the variables and the sign of the coefficients, the evidence suggests that market discipline is more present in the aftermath of the crisis. As expected, there is evidence of market discipline among uninsured depositors. However, more surprisingly, we also find that market discipline operates among insured depositors. This finding insinuates that depositors do not fully rely or believe in the insurance scheme.

The *within* estimates also show that the systemic variable is statistically significant in the pre-deposit insurance system period and, to some degree, among small and medium dollar deposits in general. This result may signal the presence of contagion. That is, these depositors

appear to react not only to the observed risk-taking of their individual banks, but also to the generalized behavior of deposits in other banks in the industry.

Chile:

The results for Chile are shown in Table III and Table IV. Table III reports the estimates for total deposits (expressed in pesos) in the1980s and for peso deposits during the 1990s. Table IV exhibits the estimates for dollar deposits during the 1990s. For the 1980s, we conducted only one estimation, because there is no separate information on peso and dollar deposits. Moreover, there is no data on different deposit sizes. Even if we had more information, the distinction between insured and uninsured deposits was not very clear during the 1980s. In principle, prior to November 1986 (when our 1980s sample ends), Chile had a limited deposit insurance scheme.[10] However, throughout this period, several banks were intervened, and in practice most deposits were de facto fully insured.

Tables III and IV display different estimations in local and foreign currency for the 1990s. Given that we have information on the size of deposits, we divide the estimation in "small," "medium," and "large" deposits. Small deposits are the ones smaller than 120 UFs, which are also insured.[11] Medium deposits are defined as those between 120 UFs and 1,500 UFs. Large deposits are those above 1,500 UFs. We also estimate an equation for uninsured deposits, namely all deposits above 120 UFs. For deposits in U.S. dollars we divide the sample in "small" (less than 2,000 dollars), "medium" (between 2,000 and 30,000 dollars), and "large" (more than 30,000 dollars).

[Table III here]

The estimates for the 1980s, displayed in the second column of Table III, show that bank fundamentals are significant in explaining the behavior of total deposits throughout this period. The proportion of liquid assets over total assets, the ratio of financial investments to total assets,

and bank assets positively affect bank deposits at 1 percent. Administrative expenditures negatively affect bank deposits.

The macroeconomic variables are also statistically significant in the 1980s estimation. The stock market index positively affects bank deposits, while central bank reserves have a negative impact. The latter result is hard to interpret since we expect higher reserves to be associated with a lower probability of devaluation, which in turn should have a positive effect on deposits. However, after the peso was devalued in 1982, Chilean reserves as a proportion of M2 recovered. The banking sector, in the meantime, continued to lose deposits, which only bounced back up after the end of 1984. As a result, following the 1982 devaluation, deposits and reserves seem to have been negatively correlated. Thus, the negative sign on reserves in the estimation for the 1980s could be driven by events in Chile following the 1982 devaluation.

During the 1990s, the *within* estimates across all peso equations suggest that bank risk characteristics are always relevant in explaining Chilean peso deposits. Table III shows that the capital assets ratio, the cash to assets ratio, and bank assets have a positive effect on bank peso deposits. The variable return on assets is positively associated with deposits, particularly small and medium deposits. The F-tests for the joint insignificance of bank fundamentals can always be rejected at 1 percent significance level.

With respect to the systemic variable, the proportion of cash outside banks over system deposits has a negative impact on peso deposits during the 1990s. In other words, when there is a generalized shift of deposits towards currency outside of the banking sector, the average bank is negatively affected even after controlling for fundamentals. This variable is statistically significant at 1 or at 10 percent level in all specifications for peso deposits. On the other hand, macroeconomic variables do not appear to be very relevant in the equations for peso deposits. Only international reserves in the central bank are statistically significant for small and medium deposits. For uninsured and large deposits, the macroeconomic variables are jointly insignificant.

Summarizing, small, medium, and large peso deposits in Chile do not behave very differently from each other during the 1990s. Even the results for the 1980s do not vary radically. When comparing insured with uninsured deposits in the 1990s, many of the same variables appear to be significant in the regressions. This evidence suggests that even small, insured depositors impose some degree of market discipline on the banking sector. Assuming that the models are well specified, the behavior of small deposits suggests that the deposit insurance scheme does not undermine market discipline. As in the case of Argentina, the evidence suggests that depositors either do not fully trust the deposit insurance scheme or perceive that recovering insured deposits would be a costly process. In addition, as in the case of Argentina, our results show that peso deposits in Chile respond to the systemic variable, after controlling for bank fundamentals. In other words, once again, the results are consistent with the presence of contagion.

Dollar deposits in Chile behave differently than peso deposits. Dollar deposits represent a small proportion of total deposit in Chile. For instance, in 1995, dollar deposits accounted for only 5 percent of total deposits. Furthermore, dollar deposits are typically used for different purposes than peso deposits, generally associated with transactions in foreign currency. Table IV displays the *within* estimates for small, medium, and large dollar deposits. Among the bank fundamentals, the results show that, at 5 percent significance level, the variable investment over assets is significant in all dollar regressions. A higher proportion of expenditures to assets negatively affects small and medium dollar deposits. In the equation for medium deposits, returns on assets significantly and positively explain dollar deposits. Among large deposits, an increase in cash over assets has a negative effect on dollar deposits. A possible explanation for this sign is that illiquid banks might seek funds from large depositors, who are able to finance them. In all equations, bank assets significantly and positively explain dollar deposits. The F-tests show that bank fundamentals are jointly significant in all regressions for dollar deposits.

[Table IV here]

In the equations for small and medium deposits, the variable cash over system deposits is statistically significant and positive. This seems to suggest that depositors allocate their portfolio between peso deposits, on the one hand, and cash and dollar deposits, on the other hand. Thus, the ratio of cash outside banks to system deposits increases along with an increase in dollar deposits. Among the macroeconomic variables, the interest rate differential is significant and positive for all deposit sizes. A higher probability of depreciation increases dollar deposits, as we found in the case of Argentina. In the equation for large deposits, central bank reserves have a positive effect on dollar deposits.[12]

Mexico:

We conduct four sets of estimations of equation (1). The results are displayed in Table V. For the period March 1991 through September 1995, we only have information for the largest 12 Mexican banks, which hold 80 to 90 percent of total deposits. Approximately 20 banks were in business at the beginning of the sample. First, we study the behavior of deposits in the 12 banks during the pre-crisis period, March 1991 through September 1994. Second, to test the constancy of parameters during the Mexican crisis, we estimate the equation throughout the period March 1991-September 1995, using the same banks.[13] For the post-crisis period, December 1995-March 1998, we estimate two equations. One estimation includes all available banks in the sample (38 banks). However, since the number of banks increases drastically in 1995 --due to the deregulation of the Mexican banking sector and the lifting of restrictions for foreign entry-- we estimate a second equation. The latter includes only the 12 banks for which we have data for the whole sample. The purpose of this regression is to compare how deposits in the 12 banks included in our pre-crisis estimations behave during the post-crisis period.

The data set for Mexico does not provide information regarding different size or different currency denomination of deposits. This lack of information is not very problematic in our study

of market discipline for Mexico, since due to legal restrictions almost 100% of deposits are held in pesos, the local currency. Also, the legislation on deposit insurance does not distinguish between small and large deposits. In principle, 100% of deposits are implicitly guaranteed in Mexico.

The Credit Institutions Law passed in 1990 created FOBAPROA, a trust administered by the Banco de Mexico. According to this legislation, this trust was created to serve as a mechanism for preventive support to commercial banks and to protect savings. The Credit Institutions Law does not obligate FOBAPROA to explicitly guarantee or insure any obligations of commercial banks. However, Article 122 does provide that each year, in December, FOBAPROA must announce the maximum amount of the obligations it intends to protect. In general, FOBAPROA has expressed an intention to protect all deposits. However, it is important to note that given that FOBAPROA is not an explicit deposit insurance scheme, depositors of a Mexican bank are not entitled to make a claim against FOBAPROA in the event of an uncovered default by any such bank.

[Table V here]

For the pre-crisis period, the second column of Table V shows that bank fundamentals are significant in explaining bank deposits. Capital over assets, consumption loans over total loans, cash over assets, and bank assets positively affect bank deposits. On the other hand, the ratio of non-performing loans to total loans has a negative effect on bank deposits. All these variables are statistically significant at 1 percent. The stock market index and the peso-dollar interest rate differential are statistically significant only at 10 percent significance level.

The equation that extends the sample to include the crisis period also shows that bank fundamentals significantly explain bank deposits. Among them, consumption loans over total loans, cash over assets, and bank assets positively affect bank deposits. In this equation, central bank reserves are significant and negative.[14] As in the case of Chile during its crisis, the

government lost reserves but system deposits did not fall. This fact seems to be explaining the sign of the variable.

The fourth column in Table V shows the estimates for the same 12 banks during the aftermath of the Mexican crisis. Only the bank fundamentals significantly explain bank deposits. The proportion of consumption loans over total loans and the size of bank assets positively affect bank deposits. On the other hand, return on assets and expenditures over assets negatively affect deposits.

When we include all banks --38 in total-- the results are slightly modified. Among the bank fundamentals, the proportion of non-performing loans to total loans is statistically significant and negative at 1 percent. On the other hand, the proportion of housing loans over total loans and the ratio of bank expenditures over assets are statistically significant and positive. As discussed earlier, we can expect both a negative or positive sign for the ratio of housing loans over total loans. On the one hand, housing loans typically have collateral, which guarantees the loan. On the other hand, these loans might be risky since during a financial crisis, the value of the collateral tends to fall. The variable expenditure over assets is positive and significant. Higher expenditures might reflect higher advertisement and better service to customers, which may attract more deposits.

The systemic variable is statistically significant and positive at 10 percent, during the post crisis period --when both deposits and cash over system deposits grew. Even though we expect a negative sign for this variable, a positive coefficient suggests that deposits in the entire banking sector grew at a slower rate than cash outside banks. Thus, we find a positive correlation between these two variables. The rapid growth in cash outside banks might be a consequence of increases in liquidity in the aftermath of the financial crisis. Among the macroeconomic variables, the interest rate differential is statistically significant and negative. In other words, a higher probability of devaluation corresponds to lower bank deposits.

The F-tests show that bank fundamental are jointly significant at 1 percent in all specifications. Thus, the results provide evidence of market discipline in Mexico for all the specifications studied. The presence of market discipline in Mexico, despite the 100% implicit guarantee of deposits, could be due to the murkiness in the Credit Institutions Law. In other words, though FOBAPROA was created with the intention of protecting savings, the fact that it is not legally responsible for paying out depositors in cases of bank closures might create an incentive for them to monitor banks.

Finally, the F-tests show that systemic and macroeconomic variables are jointly significant at a 5 or 10 percent significance level. The systemic variable only appears to be individually significant in the last equation and it enters with an unexpected sign. Therefore, the evidence is not consistent with contagion in the case of Mexico.

VI – What Is the Relative Importance of Market Discipline?

In the previous section, we showed that bank fundamentals significantly explain deposits in Argentina, Chile, and Mexico. Several variables are statistically significant in various specifications. Furthermore, when taken jointly, we are always able to reject the hypothesis that bank fundamentals are statistically insignificant at 1 percent significance level. The joint tests exclude the variable bank assets, so our results are not driven by a bank size effect. Nevertheless, the previous section did not explore the relative importance of bank fundamentals vis-à-vis the systemic and macroeconomic factors. Bank risk-taking can significantly explain deposits at reasonable statistical standards, but its effects may be negligible. In this section, we analyze the relative impact of market discipline in all specifications. We estimate standardized coefficients and we calculate the variance explained by each group of variables (bank, macro, and systemic) in order to answer this question.

Standardized coefficients are presented in Table I through Table V, next to the columns that report the coefficients obtained in the *within* estimations.[15] Standardized coefficients are unit free coefficients that we can therefore compare across regressors. To estimate these coefficients, we subtract each bank's mean from each variable. Then, we divide each demeaned variable by each bank's standard deviation. Since the fixed effects are removed, we obtain the standardized coefficients by estimating pooled regressions. Standardized coefficients express by how many standard deviations the dependent variable increases, when the independent variable increases by one standard deviation.

The results from the standardized coefficients are quite revealing. The coefficients of the bank fundamentals increase substantially. Particularly, when bank fundamentals are statistically significant, the standardized coefficients are always larger in absolute value, except for the variable bank assets. For instance, the coefficient on non-performing loans for large peso deposits in Argentina increase from –0.016 to –0.252. The coefficient on cash over assets increases from 0.015 to 0.599 during the 1980s in Chile. The coefficient on consumption loans to total loans increases from 0.086 to 0.517 in Mexico, in the equation for 12 banks during December 1995-March 1998. Not only do these coefficients increase in size, but also they become comparable in magnitude to the coefficients on the systemic and macroeconomic variables. This proves that the relative effect of bank risk-taking is not negligible.

To measure the relative importance of bank fundamentals, we also compute the proportion of the variance explained by these variables (excluding bank assets).[16] Any variance decomposition is problematic since the different groups of variables included in a regression are, typically, not orthogonal to each other. Therefore, the part of the variance explained by two groups of variables would be attributed to the first group included in the regression.[17] In our exercise, we first run the regressions with the systemic and macroeconomic variables, as well as with the variable bank assets. Then, we re-run the regression, including the bank fundamentals.

For each regression, we compute the increase in the adjusted R-squared, as a proportion of the total variance explained by all variables (except the fixed effects). In other words, Table VI displays the fraction explained by the bank fundamentals as a share of the variance explained by: bank risk, macroeconomic, and systemic variables. If the different groups of variables are correlated, these estimations bias downward the variance attributed to bank fundamentals since we include them last.

[Table VI here]

The results displayed in Table VI indicate that bank fundamentals explain a significant proportion of the total variance of deposits, particularly in the late periods. For Argentina, the proportion explained by bank fundamentals varies from 3 percent to a maximum of 75 percent. In the case of Chile, the proportion jumps from 11 percent in the 1980s to values between 19 percent and 38 percent for peso deposits in the 1990s. In Mexico, bank fundamentals explain between 7 and 87 percent of the total variance. The results show that there are no systematic differences across deposit sizes. It is not the case that bank fundamentals explain a higher proportion of the variance in the equations for large deposits vis-à-vis the equations for medium and small deposits.

Interestingly, the main difference across specifications is the sharp increase in the variance explained by bank fundamentals after crisis periods. In the case of Chile, the steep increase in the variance takes place when comparing the 1980s (when there was a banking crisis) with the 1990s. Market discipline also seems to be more important in Argentina and Mexico after the crises than before and during them. For instance, in the case of Mexico, the proportion of the variance explained by bank fundamentals in the 12 banks largest banks is 21 percent and 7 percent, before and during the crisis respectively. However, after the crisis this variance increases to 86 percent for the same group of banks.

The increase in the variance explained by bank fundamentals in Argentina, occurs even after the deposit insurance scheme was established in the aftermath of the crisis. This evidence

further supports the notion that the deposit insurance does not appear to be credible. We can also interpret this result as indicating that the introduction of the deposit insurance did not undermine market discipline.

Our results that the variance explained by fundamentals increases after crises should be interpreted with caution. It is not completely valid from this result to conclude that there was less market discipline before crises. When comparing the pre and post crises periods, we are only looking at the variance of deposits explained by fundamentals. However, as mentioned at the beginning of this paper, depositors can impose market discipline by either withdrawing deposits or by requiring higher interest. It is feasible that before crises, discipline occurred only through increases in interest rates. If this is the case, the fact that we are only examining changes in deposits will bias our conclusions.

Finally, to the extent that we can make a cross-country comparison after the banking crises, the degree of market discipline via changes in deposit quantities seems to be more important in Argentina and Mexico than in Chile. Perhaps, the longer history of macroeconomic stability in Chile has made investors less concerned about their deposits.

VII – Are the Findings of Market Discipline Robust?

The results presented above depend on the assumption that bank fundamentals, systemic variables, and macroeconomic variables are exogenously determined. Although most previous studies of market discipline do not address this issue, under certain circumstances, the explanatory variables could be potentially endogenous.

Endogeneity arises when changes in deposits have an effect on bank fundamentals. Changes in deposits at time *t* probably affect bank fundamentals from time *t* onwards. Then, if we had contemporaneous bank fundamentals, our estimates would most likely be biased. In our specification, bank fundamentals are lagged one quarter, to account for the fact that information

becomes available with a delay. This fact solves part of the problem. Nevertheless, endogeneity might still be present. If bankers are forward looking, they will anticipate that bank fundamentals at time *t-1* affect deposits at time *t*. Therefore, banks might try to adjust their risk characteristics, to prevent future deposit withdrawals.

In other to account for endogeneity, we adopt GMM methods.[18] This methodology first-differences equation (1), so bank-specific effects are eliminated. First-differencing equation (1) yields equation (2):

$$\left(DEP_{i,t} - DEP_{i,t-1}\right) = \delta'\left(SYS_t - SYS_{t-1}\right) + \gamma'\left(MACRO_t - MACRO_{t-1}\right) + \beta'\left(BANK_{i,t-1} - BANK_{i,t-2}\right) + \left(v_{i,t} - v_{i,t-1}\right).$$

We relax the assumption that bank fundamentals are strictly exogenous --that they are uncorrelated with the error term at all leads and lags. Instead, we assume that bank fundamentals are weakly exogenous --that they are uncorrelated with realizations of the error term from time *t+1* onwards. We believe that it is safe to assume that systemic and macroeconomic variables are exogenously determined, namely they do not react to bank individual deposits.

We use the *system* estimator proposed by Arellano and Bover (1995) to obtain estimates of δ, γ, and β. This estimator combines the regression in first differences in equation (2) and the regression in levels in equation (1). Blundell and Bond (1997) show that the *system* estimator reduces the potential biases and imprecision of using only the equation in first differences as in Anderson and Hsiao (1982) and Arellano and Bond (1991).

Under the assumption of weak exogeneity of bank fundamentals, we need to use instruments to account for the fact that some of the variables in $BANK_{i,t-1}$ may be jointly determined with $DEP_{i,t}$. The instruments for the regression in differences are lagged levels of the corresponding variable. The instruments for the regression in levels are lagged differences of the corresponding variable.

Assuming that the error term $n_{i,t}$ is not serially correlated and that $BANK_{i,t-1}$ is weakly exogenous, we obtain the following moment conditions for the regression in differences:

$$\begin{aligned} &E\left[SYS_{i,t} \times \left(n_{i,t} - n_{i,t-1}\right)\right] = 0, \\ &E\left[MACRO_{i,t} \times \left(n_{i,t} - n_{i,t-1}\right)\right] = 0, \qquad for\ s \geq 3; t = 4,\ldots,T\ . \quad (3) \\ &E\left[BANK_{i,t-s} \times \left(n_{i,t} - n_{i,t-1}\right)\right] = 0, \end{aligned}$$

Under the assumption that any correlation between the bank specific effects and the levels of the explanatory variables is constant over time, the differences of the right-hand side variables and the bank specific effects would be uncorrelated. When this is the case, lagged differences are valid instruments for the equation in levels. Then, the moment conditions for the regression in levels are:

$$\begin{aligned} &E\left[\left(SYS_{i,t} - SYS_{i,t-1}\right) \times \left(m_i + n_{i,t}\right)\right] = 0, \\ &E\left[\left(MACRO_{i,t} - MACRO_{i,t-1}\right) \times \left(m_i + n_{i,t}\right)\right] = 0, \qquad (4) \\ &E\left[\left(BANK_{i,t-1} - BANK_{i,t-2}\right) \times \left(m_i + n_{i,t}\right)\right] = 0. \end{aligned}$$

The *system* estimated in the Arellano and Bover (1995) technique consists of the stacked regressions in differences and levels. The moment conditions in (3) are used for the first part of the *system*, that is, the regressions in differences. The moment conditions in (4) are used for the second part of the system, that is, the regressions in levels. The model is estimated in two steps. The first step assumes that $n_{i,t}$ are independent and homoskedastic across individuals and over time. The residuals obtained in the first step are used to construct a consistent estimate of the variance-covariance matrix of the moment conditions in the second step. Efficiency is gained in the second step estimates.

In general, panels used in econometric estimations have a large number of cross-sectional units and a small number of time periods. Our data set contains a limited number of individuals. Then, in order to work with a manageable number of moment restrictions, the moment conditions are applied such that each of them corresponds to all available periods. In other words, the number of moment restrictions is constant across observations.

We compute two specification tests to check whether the assumptions made to calculate the GMM estimators are valid. First, we calculate the Sargan test of over-identifying restrictions. The null hypothesis of the Sargan test is that lagged values of the explanatory variables are valid instruments. The model is well specified whenever we fail to reject the test. The second test estimates whether the error term is not serially correlated. We use the error term from the equation in first differences. The error term has first-order serial correlation by construction. Therefore, we test whether the first-differenced error term has second-order serial correlation. Once again, failure to reject confirms that the model's assumption of no serial correlation (in levels) is valid.

Table VII reports the GMM estimates for Argentina.[19] Table VIII displays the results for Chile and Mexico. Given that the number of instruments is greater than the number of individuals, GMM estimates cannot be computed for the specifications that involve 12 Mexican banks. The results show that we are not able to reject the Sargan test in any of the specifications. Moreover, we are not able to reject the null hypothesis of no second-order serial correlation of the residuals. In other words, the Sargan test and the autocorrelation test indicate that the GMM models are well specified.

[Tables VII and VIII here]

The GMM estimations suggest that bank fundamentals are still statistically significant, once we account for their potential endogeneity. Most of the variables that appeared statistically significant in the OLS estimations remain significant when we apply GMM, although some specific differences appear in the point estimates. Regarding the joint tests for bank fundamentals, we find again that there is evidence of market discipline across equations. We cannot reject the tests that bank fundamentals are jointly significant even when we exclude the logarithm of assets. Given that we consistently find that bank fundamentals continue to be significant, the GMM estimations suggest that our previous results are robust to potential endogeneity problems.

VIII –Conclusions

This paper conducted a study of depositor market discipline in the Argentine, Chilean, and Mexican banking sectors during the 1980s and 1990s. The purpose of this study was to examine whether depositors punish risky banks by withdrawing their deposits. In order to analyze this question, we used bank level data to estimate reduced form equations, in which bank deposits were modeled as a function of bank specific, systemic, and macroeconomic variables.

The data set used in this paper enabled us to study market discipline under different circumstances and among different groups of depositors. First, the data available allowed us to test in detail the presence of market discipline during the Chilean financial crisis of the 1980s, as well as during the Argentine and Mexican financial crises of 1994-95. These episodes are attractive because they permitted us to study whether the extent of market discipline changed after the financial crises. We were also able to test whether banking crises were preceded by a lack of market discipline, and if so, whether banking crises were learning experiences for depositors.

Second, we were also able to study market discipline in situations where regulations on the countries' banking sectors changed. For example, in the case of Argentina, we were able to compare the results for the pre-deposit insurance period with those for the period after deposit insurance was introduced. For the latter period, we distinguished between insured and uninsured depositors. Also, we compared the results for medium size depositors with those for large depositors. In the case of Chile, deposits were implicitly guaranteed during the 1980s, while a limited deposit insurance scheme was in place during the 1990s. For the latter period, we were able to compare the behavior of insured versus uninsured deposits, as well as the behavior of medium and large peso and dollar deposits. In the case of Mexico, since the available data is

aggregate and the deposit insurance regulation (covering 100% of deposits) did not change, we were not capable of making similar distinctions.

Our results helped us to conclude that depositors in Argentina, Chile, and Mexico punish banks for risky behavior. The tests for the joint insignificance of bank fundamentals were consistently rejected across equations. In other words, we were unable to accept the null hypothesis that the bank risk variables are not relevant in explaining the behavior of bank deposits. This finding was consistently verified in the *between*, *within*, and GMM estimations.

We found evidence of market discipline whether we examined deposits in local or foreign currency. Also, we could not reject the null hypothesis that insured, uninsured, medium, and large deposits respond to bank risk-taking. Even though large depositors have a larger amount of funds at risk, their deposits probably represent a smaller proportion of their wealth.[20] Therefore, we are not surprised by the result that small and large depositors discipline banks.

The finding that even insured depositors exercise market discipline can be due to a number of reasons. One possible explanation is a lack of credibility in the insurance schemes. If depositors believe that in the event of a crisis their deposits will not be covered, then they have large incentives to closely monitor banks to avoid losing their funds. Alternatively, it is possible that we observe discipline by insured depositors because, even if the insurance is credible, depositors want to avoid any costs they might face (typically in the form of delays) when banks fail. Repayments through the insurance fund usually take time. Moreover, when a bank fails, there are efforts to sell the failing bank to other institutions, in order to minimize the cost for the insurance fund. One of the major incentives for a healthy bank to buy a failing bank is to acquire the failed bank's deposits. Therefore, if deposits are returned through the deposit insurance, the value of the failing bank decreases. As a consequence, both insured and uninsured deposits are only returned once the acquisition process is complete. Recent experiences with failing banks in

the countries we analyze have validated depositors' concerns about insufficient funds in the deposit insurance schemes and about long delays in repayments.

The standardized coefficients and the analysis of variance showed that bank fundamentals are not only jointly and individually significant, but also they seem to be important vis-à-vis systemic and macroeconomic factors. The analysis of variance suggested that banking crises seem to be "wake-up" calls for depositors. The degree of market discipline becomes more important after banking crises. On the other hand, before and during crises, the extent of market discipline is much more limited.

Prima facie, the results obtained in this paper provide evidence in favor of regulatory efforts to increase the reliance on market discipline to control bank risk-taking. However, there are a number of caveats and extensions to the results in this paper. First, our conclusions on the degree of market discipline should be considered as partial. As mentioned at the beginning of the paper, depositors can impose market discipline on banks by requiring higher interest rates and/or withdrawing their deposits. In this paper, we have focused on the response of the quantity of deposits to changes in bank risk characteristics. The fact that we find that riskier banks attract fewer deposits provides evidence of market discipline. Nevertheless, a complete assessment of the full extent of market discipline would require an analysis of the behavior of both prices and quantities, which cannot be performed given the lack of adequate data on interest rates

Second, to strongly support market vis-à-vis regulatory discipline, it is not enough to show that depositors respond to bank risk-taking. It is also important to determine, in turn, that bankers respond to depositors' behavior by reducing the amount of risk they take. This question is beyond the scope of this paper.

Third, the finding that even once we control for bank risk-taking there appears to be evidence of contagion, indicates that it would be a mistake to rely exclusively on market discipline to constrain bank's exposures to risk. In this circumstance, adequate prudential

regulation and supervision remain extremely important. The evidence on contagion indicates that some depositors' decision to withdraw their funds is affected not only by the risk taken by their own banks, but also it is a function of other depositors' actions. In the presence of contagion, market discipline may be inefficient, since depositors, influenced by the evolution of deposits in the banking system, may withdraw deposits from healthy banks. Increasing disclosure of information and transparency in the banking sector might help to avoid this type of herding behavior. Also, enhancing the credibility of the existing deposit safety net may reduce contagion among insured depositors, and therefore avoid runs on good banks.

Finally, in this paper we have not identified the specific channels through which depositors obtain information regarding banks fundamentals. Depositors may be getting the information directly from balance sheets, from financial advisors, newspaper articles, or from rumors. Future research on this subject could shed light on how the banking sector operates and on what mechanisms may promote efficient market discipline, i.e. the kind where depositors can always distinguish "good" from "bad" banks.

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Endnotes

[1] Some measures of risk frequently used include: proportion of non-performing loans to total loans, loan loss provisions, capital assets ratio, ratio of real estate loans to total loans, return on assets, and variance of stock returns.

[2] A related literature exists on the causes of bank failures in developing countries and on how to resolve banking crises. See, among others, Gonzalez-Hermosillo, Pazarbasioglu, and Billings (1996), Demirguc-Kunt and Detragiache (1997), Caprio and Klingebiel (1996), Rojas-Suarez (1997), and Rojas-Suarez and Weisbrod (1996).

[3] Interest rates in her study are implicit rates (i.e. interest rate expenditure over total deposits) and not explicit market rates paid by banks.

[4] Park (1995) and Park and Peristiani (1998) are among the only studies that examine the effect of bank risk taking on both interest rates and deposits.

[5] We are grateful to Alejandra Anastasi, Laura D'Amato, Angel del Canto, Gina Casar, Claudio Chamorro, Leonardo Hernandez, Victor Manuel Lopez, Andrea Molinari, and Agustin Villar for comments and help in understanding the data.

[6] Data on deposits by size is not available before early 1995.

[7] In September 1998, the insurance coverage was extended to deposits of all maturities up to 30,000 pesos or dollars. However, since our data ends in March 1997, this recent change does not affect our analysis.

[8] In our estimations, anytime a bank acquires another bank (whose assets are considerably large relative to those of the acquiring bank) we treat the acquiring bank as a new bank in the sample.

[9] The results from this exercise are not reported here, but are available upon request.

[10] This deposit insurance scheme first introduced in January 1977 and expanded in December 1981 protected deposits up to 3,500 dollars.

[11] UFs are "unidades de fomento" or units of account, equal to around 4,000 dollars in 1997.

[12] For dollar deposits we only compute equations for small, medium, and large deposits. We do not compare "insured" versus "uninsured" deposits because the threshold for insured deposits (120 UFs) changes over time whenever the peso dollar exchange rate moves.

[13] Given the restricted number of observations, we do not estimate a separate equation for the crisis period.

[14] This is similar to what we found in Chile during its banking crisis.

[15] T-statistics for standardized coefficients are not reported to make the tables more readable. However, standardized coefficients are statistically significant whenever the regular coefficients are also significant.

[16] Another alternative to study the relative importance of each group of variables would be to use the first principal component of each group. Then, one could compare the size of the coefficients for each principal component. Unfortunately, the first principal component of bank fundamentals comprises a low proportion of their total variance. Then, to capture bank fundamentals, we would need to use more than one principal component. This would make our comparison less straightforward.

[17] This problem still persists when a Cholesky decomposition is used.

[18] Arellano and Bond (1991) and Arellano and Bover (1995), among others have developed the GMM methodology for panel data. For empirical applications of the technique see Caselli, Esquivel, and Lefort (1996), Easterly, Loayza, and Montiel (1997), Loayza, Schmidt-Hebbel, and Serven (1998). We thank Thorsten Beck, Norman Loayza, and George Monokroussos for their help in implementing the DPD econometric software.

[19] Since we want to check whether the evidence of market discipline is robust to the assumption of endogeneity, we only report the results for those periods where the *within* estimators indicated the presence of market discipline. Consequently, for Argentina, we do not present results for the pre-crisis period since we found little evidence of discipline in the *within* estimations.

[20] Furthermore, large investors more likely diversify through holding bonds and equity.

Table I.A: Argentina - Panel Estimates for Real Peso Deposits

	Jun. 93 -Mar. 95	Jun. 1995 - Mar. 1997			
		< $10,000	> $20,000	>$20,000 & <$100,000	> $100,000
Variables	**Between**	**Between**	**Between**	**Between**	**Between**
Lag(Capital/Assets)	-0.019	0.004	0.012	0.001	0.008
	(-1.20)	*(0.20)*	*(0.93)*	*(0.04)*	*(0.84)*
Lag(Non-performing Loans/Total Loans)	-0.020 ***	0.013	-0.021 ***	-0.007	-0.024 ***
	(-3.45)	*(1.11)*	*(-2.57)*	*(-0.73)*	*(-3.95)*
Lag(Real Estate Loans/Total Loans)	-0.006	-0.008	-0.011	-0.006	-0.025 ***
	(-0.81)	*(-0.67)*	*(-1.43)*	*(-0.64)*	*(-3.44)*
Lag(Personal Loans/Total Loans)	0.008	0.014 ***	0.013 **	0.019 ***	0.004
	(1.36)	*(2.65)*	*(2.10)*	*(3.28)*	*(0.87)*
Lag(Return/Assets)	-0.080 *	-0.097 ***	-0.076 *	-0.100 **	-0.042 *
	(-1.81)	*(-3.03)*	*(-1.65)*	*(-2.44)*	*(-1.88)*
Lag(Cash/Assets)	0.013	0.134 ***	0.106 ***	0.150 ***	0.030
	(0.71)	*(2.56)*	*(2.69)*	*(4.13)*	*(1.17)*
Lag(Bonds/Assets)	-0.010	-0.016	0.007	0.003	0.003
	(-0.53)	*(-0.43)*	*(0.25)*	*(0.12)*	*(0.16)*
Lag(Expenditure/Assets)	0.366 ***	0.227 **	0.010	0.055	-0.005
	(3.25)	*(2.28)*	*(0.10)*	*(0.60)*	*(-0.10)*
Lag(Log of (Assets/CPI))	0.967 ***	1.083 ***	1.090 ***	0.873 ***	1.076 ***
	(11.01)	*(9.98)*	*(13.91)*	*(10.27)*	*(16.49)*
C	-2.763 ***	-7.177 ***	-4.373 ***	-5.199 ***	-3.422 ***
	(-2.92)	*(-5.85)*	*(-4.09)*	*(-4.68)*	*(-5.78)*
Adjusted R-squared	0.713	0.732	0.764	0.698	0.853
Number of banks	162	90	91	87	82

T-statistics are in parentheses. Robust standard errors—White correction for heteroskedasticity.
*, **, *** indicate 10, 5, 1 percent level of significance, respectively.

Table I.B: Argentina - Panel Estimates for Real Peso Deposits

Variables	Jun. 93 – Sept. 94		Jun. 93 – Mar. 95		Jun. 1995 – Mar. 1997							
					<$10,000		>$20,000		>$20,000 &<$100,000		>$100,000	
	Within	Standardized Coefficients	Within	Standardized Coefficients	Within	Standardized Coefficients	Within	Standardized Coefficients	Within	Standardized Coefficients	Within	Standardized Coefficients
Cash Outside Banks/System Deposits	0.007	0.045	-0.024 **	-0.094	-0.008	-0.038	-0.007	-0.025	-0.017	-0.081	0.007	0.026
	(0.42)		*(-2.44)*		*(-0.60)*		*(-0.40)*		*(-1.23)*		*(0.37)*	
Stock Market Index in Dollars	0.547 **	0.169	0.636 **	0.201	-0.240	-0.097	0.092	0.028	0.001	0.001	0.231	0.076
	(2.50)		*(2.55)*		*(-0.78)*		*(0.24)*		*(0.00)*		*(0.50)*	
Central Bank Reserves/M2	-0.023	-0.111	0.041 ***	0.278	0.003	0.013	-0.024	-0.084	-0.002	-0.009	-0.039	-0.141
	(-0.92)		*(3.22)*		*(0.13)*		*(-0.86)*		*(-0.09)*		*(-1.21)*	
Peso-Dollar Interest Rate Differential	-0.005	-0.013	-0.010	-0.046	-0.098 ***	-0.233	-0.105 ***	-0.184	-0.112 ***	-0.254	-0.096 ***	-0.173
	(-0.27)		*(-0.48)*		*(-5.14)*		*(-3.70)*		*(-5.45)*		*(-3.28)*	
Lag(Capital/Assets)	-0.005	-0.039	-0.010	-0.059	0.023 *	0.254	0.022	0.179	0.030 *	0.304	0.014	0.119
	(-0.71)		*(-1.19)*		*(1.68)*		*(1.09)*		*(1.89)*		*(0.81)*	
Lag(Non-performing Loans/Total Loans)	-0.002	-0.018	0.007	0.057	-0.009 *	-0.172	-0.017 ***	-0.248	-0.011 **	-0.207	-0.016 ***	-0.252
	(-0.38)		*(1.55)*		*(-1.93)*		*(-3.40)*		*(-2.37)*		*(-2.96)*	
Lag(Real Estate Loans/Total Loans)	-0.005	-0.038	-0.001	-0.005	-0.005	-0.057	-0.003	-0.024	-0.003	-0.038	-0.004	-0.043
	(-0.97)		*(-0.13)*		*(-1.55)*		*(-0.62)*		*(-0.69)*		*(-0.87)*	
Lag(Personal Loans/Total Loans)	0.001	0.012	-0.002	-0.018	-0.001	-0.013	-0.010	-0.079	-0.003	-0.031	-0.013 *	-0.118
	(0.41)		*(-0.62)*		*(-0.42)*		*(-1.44)*		*(-0.69)*		*(-1.70)*	
Lag(Return/Assets)	-0.003	-0.050	-0.008 **	-0.104	0.008	0.107	0.009	0.091	0.005	0.072	0.001	0.008
	(-1.12)		*(-2.54)*		*(0.72)*		*(0.78)*		*(0.52)*		*(0.17)*	
Lag(Cash/Assets)	-0.003	-0.027	-0.005	-0.034	0.005	0.039	0.005	0.026	0.012	0.082	-0.001	-0.005
	(-0.82)		*(-1.28)*		*(0.98)*		*(0.52)*		*(1.62)*		*(-0.08)*	
Lag(Bonds/Assets)	-0.016 *	-0.099	-0.002	-0.010	0.015 ***	0.168	0.005	0.04	0.004	0.040	0.012	0.111
	(-1.75)		*(-0.27)*		*(3.41)*		*(0.74)*		*(0.77)*		*(1.63)*	
Lag(Expenditure/ Assets)	0.041	0.049	0.035	0.046	0.008	0.034	0.004	0.011	0.001	0.003	0.020	0.056
	(1.02)		*(1.58)*		*(0.63)*		*(0.17)*		*(0.04)*		*(1.04)*	
Lag(Log of (Assets/CPI))	0.610 ***	0.262	0.554 ***	0.187	0.521 *	0.299	0.571 *	0.249	0.508 *	0.287	0.451	0.208
	(2.57)		*(2.64)*		*(1.66)*		*(1.78)*		*(1.84)*		*(1.51)*	
Adjusted R-squared	0.959		0.929		0.974		0.953		0.964		0.947	
F- Fixed Effects	34.439 ***		26.480 ***		56.056 ***		22.584 ***		39.179 ***		13.427 ***	
F- Macro Variables	5.727 ***		65.619 ***		6.706 ***		5.234 ***		9.802 ***		4.752 ***	
F-Bank Fundamentals	1.503		3.172 ***		6.473 ***		5.113 ***		5.852 ***		4.691 ***	
F-(Macro+System)	4.734 ***		50.976 ***		5.065 ***		4.422 ***		8.193 ***		3.768 ***	
Chi-Hausman	6.192		49.504 ***		3.290 *		78.781 ***		40.329 ***		54.064 ***	
Number of banks	158		162		90		91		87		82	
Number of observations	791		1120		507		511		491		465	

T-statistics are in parentheses. Robust standard errors—White correction for heteroskedasticity.
*, **, *** indicate 10, 5, 1 percent level of significance, respectively.

Table II.A: Argentina - Panel Estimates for Dollar Deposits

	Dec 93-Mar 95	Jun. 1995 – Mar. 1997			
		<US$10,000	> US$20,000	> US$20,000 & <US$100,000	> US$100,000
Variables	**Between**	**Between**	**Between**	**Between**	**Between**
Lag(Capital/Assets)	-0.014	0.011	0.009	0.024	0.005
	(-1.52)	*(0.58)*	*(0.75)*	*(1.61)*	*(0.47)*
Lag(Non-performing Loans/Total Loans)	-0.043 ***	-0.009	-0.027 ***	-0.018 **	-0.027 ***
	(-7.66)	*(-0.72)*	*(-3.56)*	*(-2.35)*	*(-4.70)*
Lag(Real Estate Loans/Total Loans)	0.002	-0.005	-0.003	-0.002	-0.005
	(0.45)	*(-0.51)*	*(-0.65)*	*(-0.26)*	*(-0.85)*
Lag(Personal Loans/Total Loans)	-0.004	0.009	0.002	0.006	0.001
	(-0.89)	*(1.40)*	*(0.37)*	*(0.87)*	*(0.31)*
Lag(Return/Assets)	-0.034	-0.191 ***	-0.118 ***	-0.168 ***	-0.069 **
	(-1.18)	*(-5.21)*	*(-3.79)*	*(-4.01)*	*(-2.23)*
Lag(Cash/Assets)	0.017	0.177 ***	0.142 ***	0.175 ***	0.102 ***
	(1.55)	*(3.35)*	*(3.78)*	*(3.82)*	*(3.36)*
Lag(Bonds/Assets)	-0.038 **	-0.010	0.011	0.005	-0.004
	(-2.33)	*(-0.29)*	*(0.56)*	*(0.18)*	*(-0.19)*
Lag(Expenditure/Assets)	0.112	0.240 **	-0.037	0.049	-0.099 *
	(1.56)	*(2.11)*	*(-0.47)*	*(0.49)*	*(-1.70)*
Lag(Log of Assets in Dollars)	0.964 ***	1.123 ***	0.948 ***	0.976 ***	0.949 ***
	(18.02)	*(11.31)*	*(15.31)*	*(12.04)*	*(16.31)*
C	-0.748	-6.978 ***	-2.343 **	-4.576 ***	-2.138 ***
	(-0.90)	*(-4.32)*	*(-2.22)*	*(-3.41)*	*(-2.33)*
Adjusted R-squared	0.866	0.752	0.795	0.755	0.842
Number of banks	162	90	91	87	82

T-statistics are in parentheses. Robust standard errors—White correction for heteroskedasticity.
*, **, *** indicate 10, 5, 1 percent level of significance, respectively.

Table II.B: Argentina - Panel Estimates for Dollar Deposits

Variables	Jun. 93 – Sept. 94		Jun. 93 – Mar. 95		Jun. 1995 – Mar. 1997							
					<US$10,000		> US$20,000		>US$20,000 &< US$100,000		> US$100,000	
	Within	Standardized Coefficients	Within	Standardized Coefficients	Within	Standardized Coefficients	Within	Standardized Coefficients	Within	Standardized Coefficients	Within	Standardized Coefficients
Cash Outside Banks/System Deposits	0.002	0.017	-0.012 **	-0.089	-0.035 ***	-0.175	-0.028 **	-0.14	-0.035 ***	-0.183	-0.022	-0.108
	(0.13)		*(-2.26)*		*(-3.15)*		*(-2.14)*		*(-2.94)*		*(-1.47)*	
Stock Market Index in Dollars	0.434 ***	0.223	0.560 ***	0.321	-0.381	-0.165	0.064	0.28	0.165	0.074	0.290	0.125
	(2.71)		*(3.30)*		*(-1.43)*		*(0.23)*		*(0.61)*		*(0.96)*	
Central Bank Reserves/M2	-0.028	-0.212	0.023 ***	0.295	0.053 ***	0.250	0.036 *	0.172	0.046 **	0.225	0.023	0.108
	(-1.34)		*(3.60)*		*(2.97)*		*(1.71)*		*(2.37)*		*(0.97)*	
Peso-Dollar Interest Rate Differential	0.030 **	0.115	0.035 ***	0.288	0.008	0.019	0.051 ***	0.124	0.041 **	0.102	0.038 *	0.089
	2.13		*(2.61)*		*(0.48)*		*(2.74)*		*(2.26)*		*(1.80)*	
Lag(Capital/Assets)	-0.011	-0.127	-0.011 *	-0.126	0.015	0.172	0.017	0.186	0.029 **	0.321	0.001	0.009
	(-1.05)		*(-1.66)*		*(1.24)*		*(1.33)*		*(2.14)*		*(0.08)*	
Lag(Non-performing Loans/Total Loans)	-0.003	-0.034	0.008 ***	0.117	-0.017 ***	-0.344	-0.010 **	-0.224	-0.010 ***	-0.218	-0.009 *	-0.184
	(-0.51)		*(2.73)*		*(-3.59)*		*(-2.55)*		*(-2.62)*		*(-1.78)*	
Lag(Real Estate Loans/Total Loans)	0.004	0.040	0.007 **	0.082	-0.005	-0.057	-0.003	-0.039	-0.007	-0.088	-0.003	-0.038
	(1.17)		*(2.41)*		*(-1.45)*		*(-0.65)*		*(-1.63)*		*(-0.52)*	
Lag(Personal Loans/Total Loans)	-0.001	-0.017	0.004 *	0.054	-0.002	-0.039	-0.006	-0.067	0.000	0.005	-0.008	-0.093
	(-0.48)		*(1.78)*		*(-0.54)*		*(-1.13)*		*(0.09)*		*(-1.18)*	
Lag(Return/Assets)	0.000	0.003	-0.003	-0.074	0.004	0.063	0.005	0.072	0.004	0.064	-0.003	-0.041
	(0.11)		*(-1.44)*		*(0.44)*		*(0.58)*		*(0.47)*		*(-0.86)*	
Lag(Cash/Assets)	0.008 **	0.102	0.000	0.001	0.007	0.056	0.002	0.015	0.006	0.047	0.001	0.006
	(2.21)		*(0.02)*		*(1.60)*		*(0.30)*		*(1.09)*		*(0.09)*	
Lag(Bonds/Assets)	-0.001	-0.007	0.004	0.037	0.012 ***	0.141	0.006	0.072	0.011 **	0.140	0.002	0.026
	(-0.10)		*(0.83)*		*(2.80)*		*(1.06)*		*(2.18)*		*(0.29)*	
Lag(Expenditure/ Assets)	0.018	0.034	0.072 ***	0.180	0.008	0.036	-0.020	-0.077	-0.018	-0.068	-0.004	-0.016
	(1.02)		*(3.75)*		*(0.59)*		*(-1.03)*		*(-0.77)*		*(-0.30)*	
Lag(Log of Assets in Dollars)	0.222	0.157	0.422 ***	0.289	0.517 *	0.311	0.439 *	0.265	0.499 **	0.307	0.137	0.082
	(1.54)		*(3.62)*		*(1.84)*		*(1.92)*		*(2.02)*		*(0.73)*	
Adjusted R-squared	0.985		0.980		0.981		0.974		0.978		0.968	
F- Fixed Effects	50.597 ***		47.139 ***		75.887 ***		39.276 ***		56.583 ***		24.929 ***	
F- Macro Variables	6.671 ***		29.091 ***		2.580 *		4.842 ***		8.893 ***		3.792 **	
F-Bank Fundamentals	2.559 ***		10.925 ***		10.421 ***		4.710 ***		8.982 ***		2.302 ***	
F-(Macro+System)	10.549 ***		23.261 ***		2.122 *		4.050 ***		7.556 ***		3.356 **	
Chi-Hausman	42.643 ***		57.897 ***		5.147		54.822 ***		12.117 *		35.557 ***	
Number of banks	158		162		90		91		87		82	
Number of observations	791		1120		507		511		491		465	

T-statistics are in parentheses. Robust standard errors—White correction for heteroskedasticity.
*, **, *** indicate 10, 5, 1 percent level of significance, respectively.

Table III: Chile - Panel Estimates for Real Peso Deposits

Variables	Jun. 81- Nov. 86		Feb. 91 - Nov. 96							
			< 120 UF		> 120 UF		> 120 UF & < 1,500 UF		> 1,500 UF	
	Within	Standardized Coefficients	Within	Standardized Coefficients	Within	Standardized Coefficients	Within	Standardized Coefficients	Within	Standardized Coefficients
Cash Outside Banks/System Deposits	.0056	0.011	-0.057 *	-0.119	-0.096 ***	-0.202	-0.092 ***	-0.212	-0.097 ***	-0.175
	(0.39)		*(-1.91)*		*(-4.67)*		*(-3.97)*		*(-4.15)*	
Stock Market Index/CPI	0.539 ***	0.209	-0.052	-0.031	-0.095	-0.057	-0.119	-0.077	-0.091	-0.046
	(6.31)		*(-0.39)*		*(-0.92)*		*(-1.11)*		*(-0.75)*	
Central Bank Reserves/M2	-0.006 **	-0.053	0.006 *	0.080	0.004	0.057	0.006 **	-0.097	0.005	0.057
	(-2.01)		*(1.72)*		*(1.61)*		*(2.08)*		*(1.61)*	
Peso-Dollar Interest Rate Differential	-0.000	-0.008	0.005 *	0.117	-0.002	-0.063	0.003	0.071	-0.003	-0.058
	(-0.19)		*(1.87)*		*(-1.19)*		*(1.09)*		*(-1.12)*	
Lag(Capital/Assets)	-0.00	-0.194	0.011 *	0.191	0.012 **	0.213	0.014 ***	0.275	0.016 **	0.241
	(-1.55)		*(1.70)*		*(2.12)*		*(2.89)*		*(2.27)*	
Lag(Non-performing Loans/Total Loans)	-0.007	-0.091	-0.004	-0.015	0.016	0.057	-0.027	-0.103	0.025	0.075
	(-1.38)		*(-0.22)*		*(1.18)*		*(-1.26)*		*(1.46)*	
Lag(Return/Assets)	-0.004	-0.029	0.106 ***	0.196	0.055 *	0.103	0.060 *	0.123	0.044	0.069
	(-1.40)		*(3.17)*		*(1.95)*		*(1.91)*		*(1.34)*	
Lag(Cash/Assets)	0.015 ***	0.599	0.005 **	0.112	0.007 **	0.154	0.005 *	0.117	0.007 **	0.141
	(3.45)		*(1.97)*		*(2.41)*		*(1.88)*		*(2.17)*	
Lag(Investment/Assets)	0.006 ***	0.192	-0.002	-0.066	0.001	0.050	-0.002	-0.093	0.001	0.042
	(3.24)		*(-0.78)*		*(0.76)*		*(-1.36)*		*(0.63)*	
Lag(Expenditure/Assets)	-0.003 **	-0.416	-0.010 *	-0.121	0.003	0.044	0.001	0.007	0.006	0.062
	(-2.10)		*(-1.75)*		*(0.75)*		*(0.10)*		*(1.09)*	
Lag(Log of (Assets/CPI))	0.566 ***	0.583	0.425 ***	0.323	1.023 ***	0.787	0.709 ***	0.592	1.210 ***	0.793
	(8.47)		*(3.75)*		*(10.14)*		*(6.49)*		*(10.04)*	
Adjusted R-squared	0.928		0.981		0.976		0.984		0.964	
F- Fixed Effects	48.770 ***		158.99 ***		60.954 ***		129.29 ***		53.509 ***	
F- Macro Variables	18.62 ***		3.104 **		1.396		3.836 ***		1.295	
F-Bank Fundamentals	19.08 ***		5.687 ***		16.024 ***		12.165 ***		15.385 ***	
F-(Macro+System)	20.11 ***		3.012 **		7.545 ***		6.569 ***		5.692 ***	
Chi-Hausman	10.765 **		41.703 ***		0.708		7.068		279.47 ***	
Number of banks	40		33		33		33		33	
Number of observations	1406		556		556		556		556	

T-statistics are in parentheses. Robust standard errors—White correction for heteroskedasticity.
*, **, *** indicate 10, 5, 1 percent level of significance, respectively.

Table IV: Chile - Panel Estimates for Dollar Deposits

Variables	Feb. 91 - Nov. 96					
	<US$2,000		> US$2,000 & <US$30,000		>US$30,000	
	Within	Standardized Coefficients	Within	Standardized Coefficients	Within	Standardized Coefficients
Cash Outside Banks/System Deposits	0.179 ***	0.330	0.10 ***	0.258	0.097	0.105
	(5.18)		*(4.09)*		*(1.54)*	
Stock Market Index in Dollars	-0.175 *	-0.138	-0.080	-0.086	-0.105	-0.049
	(-1.85)		*(-1.02)*		*(-0.48)*	
Central Bank Reserves/M2	0.002	0.021	0.002	0.036	0.019 ***	0.143
	(0.46)		*(0.73)*		*(2.88)*	
Peso-Dollar Interest Rate Differential	0.014 ***	0.303	0.008 ***	0.226	0.016 ***	0.209
	(4.50)		*(3.14)*		*(2.78)*	
Lag(Capital/Assets)	0.009	0.144	0.004	0.083	0.012	0.113
	(1.41)		*(0.94)*		*(1.15)*	
Lag(Non-performing Loans/Total Loans)	-0.020	-0.061	0.016	0.070	0.042	0.077
	(-1.41)		*(1.38)*		*(1.34)*	
Lag(Return/ Assets)	-0.045	-0.073	0.048 *	0.107	0.059	0.057
	(-1.38)		*(1.73)*		*(0.91)*	
Lag(Cash/Assets)	-0.000	-0.002	-0.002	-0.056	-0.016 ***	-0.180
	(-0.05)		*(-1.07)*		*(-2.75)*	
Lag(Investment/Assets)	0.006 **	0.182	0.006 ***	0.248	0.009 **	0.162
	(2.20)		*(3.64)*		*(2.32)*	
Lag(Expenditure/Assets)	-0.014 **	-0.151	-0.013 ***	-0.196	0.007	0.043
	(-2.16)		*(-2.74)*		*(0.58)*	
Lag(Log of Assets in Dollars)	0.211 *	0.180	0.166 *	0.194	0.470 **	0.237
	(1.86)		*(1.94)*		*(2.14)*	
Adjusted R-squared	0.971		0.971		0.808	
F- Fixed Effects	137.85 ***		149.78 ***		21.353 ***	
F- Macro Variables	23.172 ***		9.494 ***		7.819 ***	
F-Bank Fundamentals	4.919 ***		4.496 ***		3.854 ***	
F-(Macro+System)	32.689 ***		14.321 ***		6.981 ***	
Chi-Hausman	2.288		67.752 ***		6.161	
Number of banks	33		33		33	
Number of observations	556		556		556	

T-statistics are in parentheses. Robust standard errors—White correction for heteroskedasticity.
*, **, *** indicate 10, 5, 1 percent level of significance, respectively.

Table V: Mexico - Panel Estimates for Real Total Deposits

Variables	Mar. 91-Sep. 94		Mar. 91-Sep. 95		Dec. 95 - Mar. 98			
	12 banks		12 banks		12 banks		38 banks	
	Within	Standardized Coefficients	Within	Standardized Coefficients	Within	Standardized Coefficients	Within	Standardized Coefficients
Cash Outside Banks/System Deposits	-0.014 *(-0.76)*	-0.052	-0.022 *(-1.31)*	-0.083	0.019 *(0.90)*	0.096	0.078 * *(1.73)*	0.118
Stock Market Index/CPI	0.786 * *(1.80)*	0.347	0.225 *(1.29)*	0.997	-0.097 *(-0.27)*	-0.050	0.895 *(1.19)*	0.172
Central Bank Reserves/M2	0.005 *(0.29)*	0.037	-0.012 *** *(-2.60)*	-0.142	0.028 *(1.39)*	0.359	-0.047 *(-1.33)*	-0.238
Peso-Dollar Interest Rate Differential	0.042 * *(1.66)*	0.264	-0.000 *(-0.16)*	-0.014	-0.006 *(-1.61)*	-0.290	-0.014 ** *(-2.47)*	-0.185
Lag(Capital/Assets)	0.049 *** *(2.72)*	0.182	-0.009 *(-0.44)*	-0.004	0.032 *(1.29)*	0.203	-0.002 *(-0.20)*	-0.031
Lag(Non-performing Loans/Total Loans)	-0.032 *** *(-2.73)*	-0.204	-0.000 *(-0.05)*	-0.003	-0.007 *(-1.36)*	-0.138	-0.024 *** *(-2.62)*	-0.132
Lag(Housing Loans/Total Loans)	0.009 *(1.40)*	0.104	0.002 *(0.48)*	0.028	0.002 *(0.88)*	0.099	0.009 ** *(2.52)*	0.096
Lag(Consumption Loans/Total Loans)	0.077 *** *(5.79)*	0.340	0.037 *** *(2.59)*	0.210	0.086 *** *(3.89)*	0.517	0.004 *(0.52)*	0.036
Lag(Commercial Loans/Total Loans)	0.003 * *(1.90)*	0.085	0.000 *(0.05)*	0.003	0.000 *(0.73)*	0.088	-0.001 *(-0.42)*	-0.032
Lag(Return over Assets)	-0.040 *(-0.66)*	-0.063	0.012 *(0.20)*	0.022	-0.077 *** *(-4.63)*	-0.447	-0.017 *(-0.59)*	-0.064
Lag(Cash/Assets)	0.049 *** *(3.21)*	0.239	0.042 *** *(3.15)*	0.180	-0.004 *(-0.49)*	-0.058	-0.004 *(-0.58)*	-0.057
Lag(Expenditure/Assets)	0.000 *(0.00)*	0.000	0.000 *(0.03)*	0.002	-0.030 * *(-1.92)*	-0.214	0.089 *** *(3.92)*	0.327
Lag(Log of (Assets/CPI))	1.381 *** *(10.52)*	0.959	1.046 *** *(7.99)*	0.804	0.614 *** *(3.54)*	0.515	0.159 *(0.76)*	0.116
Adjusted R-squared	0.969		0.960		0.979		0.949	
F- Fixed Effects	27.371 ***		31.487 ***		10.093 ***		12.527 ***	
F- Macro Variables	3.210 **		3.455 **		2.790 **		2.653 **	
F-Bank Fundamentals	8.271 ***		4.593 ***		8.105 ***		5.023 ***	
F-(Macro+System)	2.421 *		2.630 **		2.204 *		2.221 *	
Chi-Hausman	12.062 **		0.311		27.111 ***		74.781 ***	
Number of banks	12		12		12		38	
Number of observations	144		192		98		291	

T-statistics are in parentheses. Robust standard errors—White correction for heteroskedasticity.

*, **, *** indicate 10, 5, 1 percent level of significance, respectively.

Table VI: Percentage of Variance Explained by Bank Fundamentals

ARGENTINA

	June 1993 – Sept. 1994	June 1993 – Mar. 95	<10,000	>20,000	>20,000 & < 100,000	>100,000
Peso Deposits	3.21	6.86	74.79	69.59	57.5	68.57
Dollar Deposits	5.09	31.72	69.79	42.73	45.1	24.83

CHILE

June 1981-November 1986	February 1991 – November 1996						
	Peso Deposits (UF)				Dollar Deposits		
Total Deposits	<120	>120	>120 & <1,500	>1,500	<2,000	>2,000 & < 30,000	>30,000
10.87	38.18	18.63	25.53	20.24	8.04	15.65	37.83

MEXICO

	12 banks			38 banks
	Mar 91-Sep. 94	Mar. 91 - Sep. 95	Dec. 95 - Mar. 98	Dec. 95 - Mar. 98
Total Deposits	21.23	7.06	86.39	87.48

Note: The figures indicate the percentage of the adjusted R-squared explained by bank fundamentals, once the fixed effects have been removed. A first regression is run with macroeconomic and systemic variables, then we add bank fundamentals and compute the percentage increase in the adjusted R-squared.

Table VII: Argentina – GMM Estimates – Arellano and Bover (1995)

Variables	Peso Deposits: June 1995 – March 1997				Dollar Deposits: June 1995 – March 1997			
	<$10,000	**>$20,000**	**>$20,000 & <$100,00**	**>$100,000**	**<US$10,000**	**> US$20,000**	**>US$20,000 & <US$100,000**	**> US$100,000**
Cash Outside Banks/System Deposits	0.017	-0.006	-0.004	-0.028	-0.009	-0.015	-0.009	-0.082 **
	(1.35)	*(-0.32)*	*(-0.29)*	*(-1.46)*	*(-0.48)*	*(-1.34)*	*(-0.88)*	*(-2.14)*
Stock Market Index in Dollars	-0.391	-0.325	-0.853 ***	-0.505 *	-0.319	-0.537 ***	-0.185	-1.464
	(-1.44)	*(-1.19)*	*(-3.09)*	*(-1.72)*	*(-0.88)*	*(-3.28)*	*(-1.00)*	*(-1.61)*
Central Bank Reserves/M2	-0.026	-0.021	-0.014	0.026	0.026	0.03 **	0.018	0.106 **
	(-1.30)	*(-0.84)*	*(-0.77)*	*(0.96)*	*(1.04)*	*(1.989)*	*(1.28)*	*(2.52)*
Peso-Dollar Interest Rate Differential	-0.15 ***	-0.113 ***	-0.198 ***	-0.09 **	-0.044	-0.002	-0.013	-0.022
	(-4.81)	*(-3.72)*	*(-7.85)*	*(-2.79)*	*(-1.12)*	*(-0.163)*	*(-1.01)*	*(-0.42)*
Lag(Capital/Assets)	-0.003	0.001	-0.012	0.034 ***	0.015	0.006	0.078 ***	0.013
	(-0.219)	*(0.11)*	*(-0.61)*	*(2.59)*	*(0.49)*	*(0.81)*	*(5.88)*	*(0.42)*
Lag(Non-performing Loans/Total Loans)	0.029 ***	-0.005	0.003	-0.017 ***	0.011	-0.011 ***	0.004	-0.024 ***
	(4.58)	*(-1.38)*	*(0.94)*	*(-4.4)*	*(1.37)*	*(-3.39)*	*(1.13)*	*(-3.26)*
Lag(Real Estate Loans/Total Loans)	-0.038 ***	-0.017 ***	-0.008 **	-0.006	-0.006	-0.01 **	-0.013 ***	-0.004
	(-4.47)	*(-3.08)*	*(-2.01)*	*(-0.86)*	*(-0.29)*	*(-2.53)*	*(-2.64)*	*(-0.31)*
Lag(Personal Loans/Total Loans)	-0.006	0.012 ***	0.018 ***	0.006	-0.011	-0.011 ***	0.001	-0.014 *
	(-1.256)	*(3.00)*	*(2.74)*	*(0.98)*	*(-1.33)*	*(-3.02)*	*(0.25)*	*(-1.77)*
Lag(Return/Assets)	0.026	0.007	0.055 ***	0.039 **	-0.077	-0.018	0.024 **	0.019
	(1.00)	*(0.37)*	*(2.79)*	*(2.2)*	*(-1.27)*	*(-1.32)*	*(2.18)*	*(0.26)*
Lag(Cash/Assets)	0.003	-0.008	0.014	0.019	0.034 **	0.026 **	0.016	0.111 **
	(0.27)	*(-0.37)*	*(0.9)*	*(0.97)*	*(1.98)*	*(2.13)*	*(1.41)*	*(2.43)*
Lag(Bonds/Assets)	0.029 ***	-0.01	-0.007	0.006	0.034 *	-0.006	0.03 ***	-0.029
	(3.43)	*(-1.34)*	*(-0.87)*	*(1.15)*	*(1.89)*	*(-1.35)*	*(5.12)*	*(-0.88)*
Lag(Expenditure/ Assets)	0.019	-0.016	0.041 ***	-0.004	-0.041	0.015 **	0.016 *	0.069
	(1.03)	*(-1.59)*	*(2.61)*	*(-0.25)*	*(-0.99)*	*(2.14)*	*(1.81)*	*(0.69)*
Lag(Log of (Assets/CPI))	0.995 ***	1.199 ***	0.863 ***	1.144 ***	1.103 ***	1.083 ***	1.235 ***	1.095 ***
	(12.17)	*(17.33)*	*(14.51)*	*(14.37)*	*(7.53)*	*(20.93)*	*(20.83)*	*(10.36)*
Sargan test[1]	20.45	30.57	29.24	34.45	23.48	32.77	40.67	11.75
Serial correlation test[2]	-0.76	-0.344	-1.733	0.629	-0.52	-0.522	0.176	0.056
Wald test for bank fundamentals (excluding log of assets)	45.86 ***	28.22 ***	42.89 ***	56.15 ***	23.99 ***	62.48 ***	123.99 ***	44.89 ***
Number of observations	233	236	227	215	233	236	227	215

T-statistics are in parentheses. Robust standard errors—White correction for heteroskedasticity.

*, **, *** indicate 10, 5, 1 percent level of significance, respectively.

1. The null hypothesis is that the instruments used are not correlated with the residuals.

2. The null hypothesis is that the errors in the first difference regression exhibit no second order serial correlation.

Table VIII: Chile & Mexico – GMM Estimates – Arellano and Bover (1995)

Chile

Variables	June 1981-Nov. 1986	February 1991 – November 1996						
	80s	<120 UF	>120 UF	>120 UF & <1500 UF	>1500 UF	<US$2000	>US$2000& <US$30,000	> US$30,000
Cash Outside Banks/System Deposits	0.039 ***	-0.056	0.022	-0.047 **	0.014	-0.056	0.004	-0.234
	(2.96)	*(-0.65)*	*(0.33)*	*(-2.22)*	*(0.16)*	*(-0.65)*	*(0.07)*	*(-1.28)*
Stock Market Index/CPI	0.832 ***	-0.49 **	-0.059	-0.467 ***	-0.129	-0.437 **	-0.231	-0.454 *
	(4.72)	*(-2.78)*	*(-0.28)*	*(-4.78)*	*(-0.59)*	*(-2.55)*	*(-1.58)*	*(-1.67)*
Central Bank Reserves/M2	-0.007 **	0.009	-0.003	0.007 ***	-0.005	0.004	0.001	-0.003
	(-2.11)	*(2.77)*	*(-0.53)*	*(4.29)*	*(-0.65)*	*(0.08)*	*(0.29)*	*(-0.167)*
Peso-Dollar Interest Rate Differential	0.001	0.004 **	-0.005	0.007 ***	-0.003	0.01 **	0.009 **	0.007
	(1.39)	*(1.45)*	*(-1.29)*	*(4.15)*	*(-0.77)*	*(2.26)*	*(2.22)*	*(0.9)*
Lag(Capital/Assets)	0.044 ***	0.034 **	0.055 ***	0.028 ***	0.064 ***	-0.067 **	-0.02	-0.057 *
	(4.04)	*(2.36)*	*(3.98)*	*(3.35)*	*(4.06)*	*(-2.24)*	*(-0.83)*	*(-1.76)*
Lag(Non-performing Loans/Total Loans)	-0.021 ***	-0.046 **	-0.022	-0.014	-0.011	-0.172 **	-0.119 ***	-0.299 ***
	(-3.62)	*(-1.39)*	*(-0.38)*	*(-0.73)*	*(-0.16)*	*(-2.54)*	*(-2.62)*	*(-2.96)*
Lag(Return/Assets)	-0.01	-0.007 ***	0.473 ***	-0.06	0.546 ***	-0.15 ***	-0.042	-0.389
	(-0.55)	*(-0.06)*	*(4.104)*	*(-0.77)*	*(3.73)*	*(-0.64)*	*(-0.18)*	*(-0.98)*
Lag(Cash/Assets)	0.019	-0.011	0.007	0.045 ***	0.02	0.039	0.035 **	-0.029
	(0.66)	*(-0.76)*	*(0.304)*	*(4.98)*	*(0.78)*	*(1.54)*	*(2.14)*	*(-0.59)*
Lag(Investment/Assets)	-0.022 **	0.00 ***	0.003	-0.007 *	-0.008	0.034 ***	0.019 **	0.029 **
	(-3.13)	*(0.026)*	*(0.24)*	*(-1.84)*	*(-0.53)*	*(2.69)*	*(2.38)*	*(2.09)*
Lag(Expenditure/Assets)	0.012 *	-0.009 *	-0.044 *	0.015 *	-0.024	0.051 *	0.033	0.084
	(1.90)	*(-0.81)*	*(-1.68)*	*(1.95)*	*(-0.75)*	*(1.66)*	*(1.47)*	*(1.39)*
Lag(Log of (Assets/CPI))	1.291 ***	1.57 **	1.173 ***	1.66 ***	1.159 ***	0.466 **	0.432 ***	0.129
	(9.65)	*(11.03)*	*(7.94)*	*(15.03)*	*(6.81)*	*(2.51)*	*(2.81)*	*(0.55)*
Sargan test[1]	25.13	14.06	9.67	18.05	10.12	15.52	12.78	12.74
Serial correlation test[2]	0.857	-0.733	1.033	-1.344	1.012	-1.463	0.203	-1.496
Wald test for bank fundamentals (excluding log of assets)	46.85 ***	17.09 ***	79.79 ***	46.17 ***	65.06 ***	38.39	33.65 ***	26.17 ***
Number of observations	998	391	391	391	391	391	391	391

T-statistics are in parentheses. Robust standard errors—White correction for heteroskedasticity.
*, **, *** indicate 10, 5, 1 percent level of significance, respectively.

1. The null hypothesis is that the instruments used are not correlated with the residuals.

2. The null hypothesis is that the errors in the first difference regression exhibit no second order serial correlation.

Mexico

Variables	December 1995 – March 1998
Cash Outside Banks/System Deposits	0.059
	(1.57)
Stock Market Index/CPI	0.887 **
	(2.31)
Central Bank Reserves/M2	-0.003
	(-0.09)
Peso-Dollar Interest Rate Differential	-0.037 ***
	(-2.72)
Lag(Capital/Assets)	-0.004
	(-0.57)
Lag(Non-performing Loans/Total Loans)	-0.053 ***
	(-2.59)
Lag(Housing Loans/Total Loans)	0.026 ***
	(3.10)
Lag(Consumption Loans/Total Loans)	-0.005
	(-1.13)
Lag(Commercial Loans/Total Loans)	-0.002
	(-0.9)
Lag(Return over Assets)	-0.035
	(-1.06)
Lag(Cash/Assets)	-0.007
	(-1.44)
Lag(Expenditure/Assets)	-0.056 ***
	(-2.73)
Lag(Log of (Assets/CPI))	1.073 ***
Sargan test[1]	14.10
Serial correlation test[2]	0.493
F-Bank Fundamentals	65.74 ***
Number of observations	177

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