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# Can Emerging Market Bank Regulators Establish Credible Discipline? The Case of Argentina, 1992–99

Charles W. Calomiris and Andrew Powell

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## 5.1 Introduction

Like those of many other emerging-market countries, Argentina's banking sector was liberalized in the 1990s. That liberalization followed decades of severe financial repression. The return to deposits placed in banks previously was substantially negative; according to Central Bank estimates, if \$100 of deposits had been placed in an Argentine bank in 1944, it would be worth roughly 3 cents in real terms today (and 1 cent in 1990). As recently as 1990, bank deposits were frozen as part of an emergency fiscal adjustment. As elsewhere, liberalization involved lifting controls on interest rates, deregulating the banking sector, allowing the entry of foreign capital, privatizing, and adopting international regulatory standards.

Nevertheless, the experience of the Argentine banking sector over the past decade has been unique in several respects. Many observers view Argentina's reforms as among the most radical attempts to overhaul a banking system. In Argentina credit was traditionally allocated either to the

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public sector or, through public intervention, to specific sectors or projects in the private sector. Moreover, the banking sector suffered from ineffective regulation and supervision, and repeated, forced government rescues contributed significantly to Argentina's past fiscal and inflationary problems. In contrast, many have argued that today there is a credible, restrictive safety net as well as high regulatory and supervisory standards. For example, as shown in table 5.1, one World Bank study rated Argentina's regulatory regime on par with Hong Kong, second only to Singapore, and higher than the longer-lived and much admired regime in Chile.<sup>1</sup> In particular, the Argentine system is praised for its attempt to introduce elements of private market discipline as a central component of its regulatory regime.

Private market discipline is enhanced by the following policies: (a) A strictly limited safety net (comprised of a privately funded, limited deposit insurance scheme and restrictions on the Central Bank's potential lender-of-last resort powers) exposes bank depositors to the possibility of loss. (b) High and credible minimum risk-based capital requirements further ensure that stockholders (rather than taxpayers) bear the risk of bank default. (c) National government programs encourage the privatization of provincial government-owned banks. (d) A credit rating scheme has been introduced whereby each bank must solicit a credit rating from an internationally active rating agency. (e) A subordinated debt requirement mandates that banks must issue a subordinated liability for some 2 percent of deposits each year. (f) Banks must satisfy a liquidity requirement in addition to the capital requirement. This not only reduces portfolio risk, ensures systemic liquidity, and further reduces the potential for taxpayer loss from failed banks, but also (because of the structure of the requirement) rewards banks with lower regulatory cost when the market perceives that their risk of failure is low. (g) The Central Bank publishes basic information about bank loans to individuals and firms that borrow from banks (which enhances transparency of credit risk). (h) The quality of accounting data is enhanced by mandatory private audits conducted according to Central Bank guidelines, and auditors must post a forfeitable bond. (i) Argentina permits free entry and competition among foreign and domestic banks, which not only encourages the efficient management of banks but also enhances the ability of bank depositors to punish weak banks by moving their funds to stronger institutions.

The Argentine system's high marks from the World Bank also reflect the fact that the regulatory reforms put in place in the early and mid-1990s have been tested by external shocks. The banking authorities' reactions to those shocks have encouraged advocates of market discipline. Rather than retreat from the reform process in the face of the tequila crisis of 1994–95,

1. We note, however, that Chile has since revised and strengthened its capital requirements on banks.

**Table 5.1 World Bank Comparison of Bank Regulatory Quality in Developing Economies**

	Total Score	Capital Position	Loan Classification	Foreign Ownership (management)	Liquidity	Operating Environment	Transparency
Singapore	16	1	6	2	5	1	1
Argentina	21	1	4	3	4	7	2
Hong Kong	21	3	9	1	2	2	4
Chile	25	5	1	4	8	5	2
Brazil	30	7	3	4	3	8	5
Peru	35	5	2	6	1	11	10
Malaysia	41	5	9	8	8	3	8
Colombia	44	3	4	11	6	10	10
Korea	45	7	9	10	11	3	5
The Philippines	47	4	6	7	7	11	12
Thailand	52	7	12	12	8	6	7
Indonesia	52	7	8	9	12	8	8

*Source:* World Bank (1998, p. 54).

*Notes:* Numbers indicate rankings (lower numbers mean higher ranking). The total score is a simple average of the six categories.

the Argentine authorities redoubled their efforts to ensure that market discipline prevailed in the banking system. Indeed, many of the features of the current regulatory system just listed were enacted or strengthened after the tequila crisis as part of a new plan for bank oversight developed at the central bank, which is known as the BASIC system of bank regulation.

We define the key elements of that system, and explain its evolution, in section 5.2. These include the new liquidity requirement system (replacing a more traditional reserve requirement approach), capital requirements that reflect banks' trading risks and banking book interest rate risks, an expansion of the publicly available database on the condition of bank borrowers, and the minimum mandatory subordinated debt and credit rating requirement. The authorities have also negotiated a contingent liquidity facility with international banks in order to inject emergency liquidity on the basis of Argentine collateral in the case of a sharp, systemic liquidity shock (this facility currently stands at some \$6.45 billion, excluding a \$1 billion World Bank/Inter-American Development Bank [IDB] enhancement). Also over this period a significant amount of foreign capital entered the banking system such that, at the time of this writing, some 60 percent of private sector deposits are now in banks under foreign control, accounting for some 40 percent of the whole system. Only one large (top-eight) private retail bank that does not have a foreign controlling interest remains.

The only policy reaction to the 1995 crisis that could be construed as a weakening of the commitment to market discipline was the reestablishment of deposit insurance. The significance of this change for market discipline, however, should not be exaggerated. In November 1992 Argentina abolished its deposit insurance system. When the tequila crisis of 1994–95 hit, Argentina reestablished limited insurance for small deposits, but it did not retreat on its commitment to market reform by bailing out insolvent banks. Banks suffered large outflows of deposits during 1995 (see Banco Central de la República Argentina [BCRA] 1995 and D'Amato, Grubisic, and Powell 1997 for an analysis). Although some critics have pointed to government-assisted acquisitions of banks as a partial bailout of some institutions, it is important to emphasize that, as we describe in detail later, several banks were allowed to fail in the wake of the tequila crisis and that there have been subsequent failures too (see Anastasi et al. 1998). In some of these cases, depositors and other creditors suffered significant losses.

During the recent crises in Asia, Russia, and Brazil, Argentina suffered significant macroeconomic fallout, and thus bank deposit growth and credit growth have slowed and interest rates have risen, as shown in figure 5.1 (which plots deposit growth, the sovereign yield, and an index of economic activity). In contrast to some other emerging countries, however, the weakness of the banking sector has not itself been a source of macroeconomic problems, foreign exchange attack, or capital flight. Indeed, it is widely perceived that the banking sector as a whole has weathered these

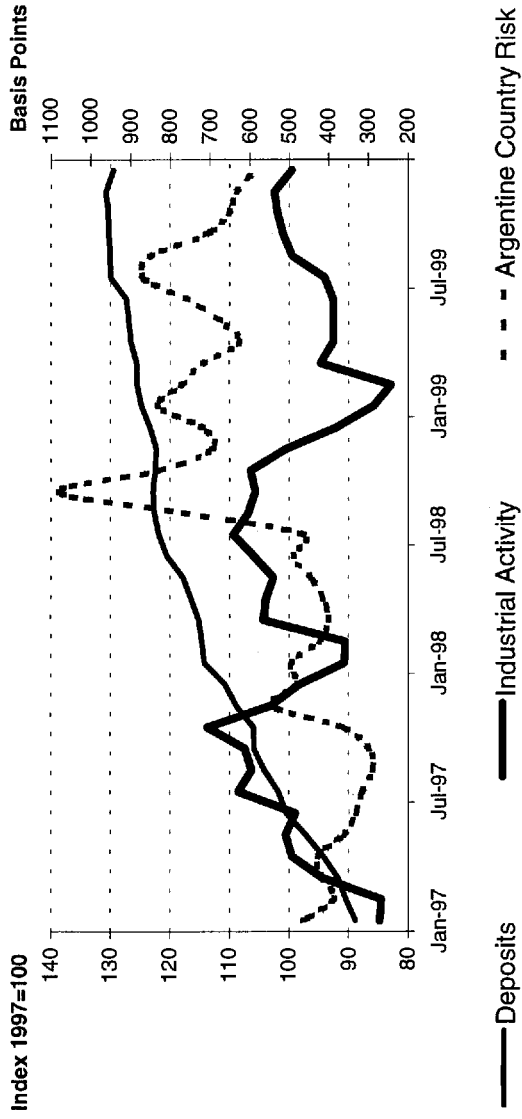


Fig. 5.1 Deposits, economic activity, and country risk

storms extremely well, even though some individual banks have been weakened. That record has added confidence in the credibility of regulation.

In large part, the apparent success of Argentina's banks reflects unique circumstances of history and the current political environment. In particular, Argentina's experience prior to the 1990s with inflation, financial repression, large bank rescues, and low quality in terms of banking services created widespread popular support for the continuation of the currency board as an inflation-fighting tool, a restricted safety net for banks, and tight fiscal discipline. These factors reduced the temptation to bail out financial institutions during the recent crises and also implied that the authorities could allow a significant increase of foreign capital in the sector without fear of any political or popular backlash. Indeed, one puzzle is that although the sector was opened significantly in 1992, and the rest of the economy received large injections of foreign capital between 1992 and 1996, it was only in the years 1997 and 1998 that the banking system saw a very significant increase in foreign capital. One hypothesis is that these international banks waited until the system was tested by its first major external shock before making such significant investment decisions.

Despite this record of apparent success, the reforms and transformation of the banking system have not gone without criticism. Some have suggested that the enactment of limited deposit insurance was unnecessary and counterproductive; that more institutions should have been allowed to fail; and that some assisted mergers, particularly during the tequila period, simply delayed a problem rather than solve it (see World Bank 1998). Other critics have suggested that Argentina's banking regulations are too tight (in particular capital, liquidity, and provisioning) and have diminished banking sector returns and placed the sector at a disadvantage with respect to foreign banks. Other criticisms refer to particular regulations. Some suggest, for example, that a regulatory authority should not establish requirements for the private rating of banks. Others suggest that the effectiveness of the obligation to issue subordinated debt, and therefore market discipline, has been reduced because the penalties for noncompliance have been lowered—a consequence of the perceived difficulties of issuing debt in the wake of the international financial crises of 1997 and 1998. Finally, it has been suggested that the entry of foreign banks may have a drawback; some perceive foreign banks as having more restricted lending practices than national banks and blame those lending policies for exacerbating the current recession.

In this paper we review the record of bank regulation and evaluate that record from the perspective of evidence on the existence of market discipline. We consider evidence on the question of whether and to what extent banks have been disciplined by the market. Section 5.2 provides an overview of the evolution of the regulatory environment from 1992 to the pres-

ent as well as an evaluation of its consequences for the structure and performance of banks and their exposure to market discipline. Section 5.3 brings econometric evidence to bear on the extent to which market discipline penalizes risk and constrains bank behavior. Thus, in addition to evaluating the record of regulatory enforcement in the narrow legal sense, we also examine the economic evidence that market discipline exists, and that it has in fact achieved its desired goal of limiting bank risk taking.

Specifically, section 5.2 summarizes the experiences with privatization, foreign entry, consolidation, bank failure, and depositor loss. Section 5.3 focuses on differences in bank deposit interest rate risk premiums and in deposit growth, with an emphasis on the degree of diversity within the system with respect to these measures of market discipline. It then develops a framework for identifying links between fundamentals that affect bank default risk and market reactions to that risk (as seen through higher interest rates on deposits and lower deposit growth). Finally, we consider evidence on the effectiveness of market discipline in constraining bank risk taking. Section 5.4 concludes.

## **5.2 The Development of the Regulatory Framework, 1992–99**

### **5.2.1 The Origins of Banking Reform**

The economic turbulence of the late 1980s and the hyperinflations of 1989 and 1990 virtually destroyed the Argentine financial system. M3/GDP, which stood at almost 50 percent in the 1940s, declined over the following decades and then fell very sharply, reaching a mere 5 percent as of 1990. The fiscal reforms of 1989 and 1990 sowed the seeds of the end of inflationary financing in Argentina. However, as part of those reforms, the 1989 Bonex plan (which included replacing bank deposits with Bonex bonds trading at deep discounts) had a significant adverse impact on the financial system. A path to reform based on the seizure of private property housed in the banking system does not encourage rapid faith in the safety of bank deposits.

Nevertheless, since 1990 confidence gradually has returned, and deposits have grown strongly. M3 has risen and is now some 30 percent of GDP. Although this is still a low level for a country of Argentina's GDP per capita and level of development, this financial system growth has been rapid and reflects the transformation of a private banking system that has resumed its role of allocating credit to the private sector.

Macroeconomic stability returned with the imposition of the April 1991 currency board (enshrined in the Convertibility Law) and a very significant opening and further liberalization of the economy, including the banking system. The legal and regulatory environment in the financial system was further defined with a new (September 1992) Central Bank char-



**Table 5.2** Main Regulatory Advances in Argentina, 1991–99

April 1991	Currency board adopted (backing of monetary base and ex rate 10,000:1, subsequently 1:1)
September 1992	New charter of the Central Bank
December 1992	Deposit insurance abolished
1992–94	Basel capital requirements adopted, raised to 11.5 percent at December 1994
1994–95	Provisioning requirements tightened
April 1995	Limited, fully funded, deposit insurance, \$20,000 (subsequently \$30,000)
August 1995	Liquidity requirements system (Raised to 20% of Deposits through 1997)
September 1996	Market risk capital requirements
1997–98	BASIC introduced (B for bonds, C for credit rating, etc.)
March 1999	Capital requirements for interest rate risk

ter. This established Central Bank independence (as in its 1936 creation), and recreated the banking superintendency as a semiautonomous unit within the Central Bank. The Central Bank has ten full-time directors (proposed by the executive and approved by the senate), including the president, vice-president, superintendent, and vice-superintendent of banking supervision. The Central Bank was given a significant degree of autonomy with respect to banking regulation and supervision (e.g., capital and other requirements can be changed by a simple decision of the board), but its role in monetary policy and lender-of-last-resort activities is severely restricted by the 1991 Convertibility Law and 1992 charter.

Table 5.2 lists the main regulatory changes over the period 1992–99. The period 1992–94 was one of strong economic growth and fast development of the financial system, albeit from a very small base. In this context the Central Bank worked to impose international capital, accounting, and provisioning standards, and to improve banking supervision. The financial system had lost virtually all deposits, and hence banks were very highly capitalized—implying that high capital standards were not too difficult to impose at that time. A minimum of 9.5 percent of assets at risk was the standard required as of the end of 1992, rising to 11.5 percent from 1 January 1995 (0.5 percent rises were effected every six months). On top of these requirements, Argentina also introduced a capital requirement for credit risk, which uses the interest rate charged on each loan as a signal of credit risk and requires that capital rise accordingly. Actual minimum capital requirements by the end of 1994 were then some 14 percent of assets at risk—well above the minimum capital requirements set by the Basel standards, or those required in other developing economies. Provisioning requirements were tightened significantly at the end of 1994 and throughout 1995.

Other improvements in banking supervision were underway well before

the tequila crisis. In 1992 the Central Bank created a database of the main debtors of the financial system (for loans of more than \$200,000). Argentina also maintained a system of high reserve requirements that were viewed explicitly at the time as a liquidity tool (i.e., both as a means of limiting asset risk and as a way of protecting the banking system from the risk of depositor flight). These nonremunerated reserve requirements were also thought of as a tax on banks. The required reserve ratios were set at high levels on sight deposits and at low levels on time deposits. That difference did not reflect underlying liquidity risk differences between time and demand deposits so much as the inelasticity of demand for sight deposits (i.e., the desire to avoid financial disintermediation in reaction to the taxation of banks). As we discuss later, time deposits actually displayed a greater withdrawal propensity during the crisis than did demand deposits.

The 1980s left Argentina with a very large number of small financial institutions, many of which disappeared in the 1990s. In the prereform period, these institutions had become government financing vehicles rather than a proper means of channeling credit to the productive sectors of the economy. With macroeconomic stability, low inflation, and liberalization, many such institutions—which lacked the skills to survive in the new environment—faced the daunting challenge of transforming themselves into bona fide competitive providers of credit. Many survived into the 1990s as they attempted to change their focus. According to one view of that transition period, the strong economic growth and sharp rises in Argentine asset prices in the period 1992–94 (at least until the change in direction of U.S. interest rate policy in February 1994), coupled with high levels of bank capital, gave a breathing space to many institutions as they attempted to adapt to the new circumstances. An alternative interpretation of this period of economic boom is that it allowed many institutions to survive despite underlying weaknesses that only became apparent in subsequent periods of stress.

Table 5.3 gives statistics on the number and type of financial institutions, as well as on the total size of the system, in Argentina over the 1990s. The table shows that there has been substantial restructuring in the Argentine financial system. From 1980 to 1992 over 250 institutions closed. While 210 of these were nonbank financial institutions, 48 were banks. Between 1992 and 1994 there was actually relatively little restructuring activity; and although a set of further nonbanks closed their doors, new banks opened as the system reoriented its focus. Also in this period the privatization process commenced with three entities privatized. There was then a second quite ferocious wave of restructuring activity through 1995 (the so-called tequila period), and to a lesser extent this process continued through 1999. From the end of 1994 to September 1999 over ninety institutions closed, including fifty-four banks and fourteen nonbanks. There were also a significant number of privatizations (eighteen). As these

**Table 5.3** Structure of the Financial System

	1980	1992	1994	September 1999
No. of institutions	469	212	205	119
Private	179	131	135	81
Wholesale	n.a.	32	34	31
Retail	n.a.	99	101	50
Foreign-owned	27	31	31	48
Public	35	36	33	15
Nonbank	255	45	37	23
Total deposits <sup>a</sup>	55,020	26,002	42,278	74,693

Note: n.a. = not available.

<sup>a</sup>In millions of 1993 pesos.

privatizations were banks transferred to the private sector, the number of total bank closures (including both private and public banks) was seventy-two (fifty-four plus eighteen).

### 5.2.2 The Tequila Crisis

Despite the advances in regulation and supervision in 1992–94, the events of late 1994 (particularly after the 20 December Mexican devaluation) and early 1995 exposed weaknesses in many institutions. The tequila period was a very significant event for the financial system, and as such it is worth explaining the main events and regulatory response in some detail. After 20 December a dramatic fall in Argentine asset prices significantly affected the solvency ratios of several wholesale banks with relatively large government bond portfolios or other financial market exposures. At the same time, because these institutions had only a small amount of sight deposits, they had little in the way of liquidity reserves at the central bank. Several such institutions experienced a significant loss of deposits and hence a sharp liquidity crunch. Cooperative and some provincial banks also fared particularly badly, reflecting their low-quality loan portfolios. Nevertheless, although the financial system lost deposits in January and February, this period could not be described as a systemic panic; larger retail banks and large public banks gained deposits, and deposits denominated in dollars also rose overall (see BCRA 1995 and D'Amato, Grubisic, and Powell 1997 for more details). This phase of the shock was largely a flight to quality.

The Central Bank responded to these events in a number of ways. Within the Central Bank was an interesting debate about whether the problem being faced was a run on the currency, which might require a tightening of monetary conditions (i.e., a raising of reserve requirements), or alternatively a liquidity problem, which would require the opposite policy. In the wake of the monetary contraction and a deteriorating macroeco-

economic environment, it was soon realized that the greater problem was a potential banking sector liquidity crisis, rather than a run on the peso. Hence, reserve requirements were lowered.

The distribution of liquidity within the system was as significant a problem as its aggregate amount. Large retail banks had large reserves in the Central Bank and gained deposits, whereas wholesale banks had low reserves in the Central Bank and were losing deposits. A private liquidity sharing system was negotiated for the banking system. However, the amount of liquidity actually circulated via that mechanism was very restricted. Thus, the authorities also set up an obligatory system through an extra (2 percent) reserve requirement on certain banks, which was then distributed through the publicly owned Banco Nación. Finally the Central Bank extended repos and rediscounts to other affected institutions according to the rules laid down in the Central Bank's 1992 charter.

The end of February 1995 was a critical moment. The Central Bank was finding that the rules on providing rediscounts were very restrictive (being limited to thirty days and to never exceeding the regulatory capital of the borrowing bank), and on 27 February Congress approved a set of changes. These modifications included being able to extend rediscounts for longer periods and, under exceptional circumstances, for an amount exceeding the regulatory capital of the bank. Some interpreted these changes as a weakening of the Convertibility Law itself.

By February Argentina's fiscal position had deteriorated markedly, and there was no agreement yet in place with the International Monetary Fund (IMF). Argentina had missed an IMF fiscal target at the end of 1994, and the authorities had not agreed to a new program. Finally, the May 14th presidential election was looming, and it had been agreed that this election would be fought subject to new electoral rules (a ballottage system) that created new uncertainty. Opinion polls at the time put Carlos Menem in the lead but without enough votes to win comfortably in the first round, prompting speculation of potential second-round coalitions. The opposition parties at the time were not perceived as being strong supporters of the currency board system, nor the very deep liberalization measures that had been pursued.

Rumors abounded in this uncertain economic and political climate. These centered on the state of the banking system and individual banks and the state of the fiscal accounts. A persistent rumor was that the government was considering, as a way out of the crisis, "freezing" bank deposits, as had been done in 1989. The deposit runs that had affected mostly individual banks spread throughout the system, and in the first two weeks of March virtually all banks lost deposits. Indeed, in this two-week period roughly half of the total \$8 billion that left the system fled the country.

This more systemic run was halted in the middle of March with the signing of a new agreement with the IMF and an international support

package with money from the IMF, the World Bank, and the IDB. A private bond was also launched (known as the Patriotic Bond, with internal and external tranches—an early explicit example of “bailing in”). Part of these funds financed two fiduciary funds for the banking system: one to assist provinces in the privatization of provincial banks, and one to assist in the restructuring of the private banking system. Deposits fell slightly from the day after this agreement was signed until 14 May (the presidential election date). After Carlos Menem’s victory in that election, and with much uncertainty thus resolved, deposits started to grow again, and the financial system recovered very quickly.

Despite the fact that the systemic run of March 1995 affected all the banks, depositors fled some banks more than others. Schumacher (1997), Dabós and Sosa-Escudero (2000), and Anastasi and colleagues (1998) all conclude that banks that failed or were forced to merge over this period were much weaker institutions. Each of these papers adopts a logit/probit methodology to explain bank failures as a function of banks’ ex ante observable characteristics. Although each study is slightly different in the samples of banks used and the precise specification of the model, the main results are consistent across all the studies. Each study reports that in over 90 percent of the cases the model correctly predicts failure or survival. Thus, although both Type 1 and Type 2 errors are found, they are very small in number.

Anastasi and colleagues (1998) provide more extensive analysis of market discipline of banks using a larger sample of banks, a longer time series, and a more complete set of models than the other papers. In that paper logit estimates are presented as well as results for a survival analysis, where the predicted variable is the number of months a bank is expected to survive (after December 1994). This is estimated using data as of the end of 1994, and predictions are updated on a quarterly basis. A rather small subset of bank fundamentals are found to be significant explanatory variables, and these variables correctly predict over 90 percent of banks’ survival experiences even when the set of predictors is constrained to the predicting variables as of December 1994. Little is added to predictive power when explanatory variables are updated quarterly.<sup>2</sup>

D’Amato, Grubisic, and Powell (1997) develop a slightly different approach. Here the authors examine whether the amount of deposits lost during the crisis, on a bank-by-bank basis, could be explained by bank fundamentals, macroeconomic factors, or contagion. Contagion is defined

2. As a caveat it is worth noting that if this model is reestimated over different sample periods, although similar prediction success can be obtained, other bank fundamentals are preferred. This indicates some potential instability in model specification, or an alternative explanation might be a very flat likelihood function with respect to the different model specifications. The superintendency is now employing the results of this analysis in its off-site work.

**Table 5.4**      **The Tequila Crisis**

No. of institutions, December 1994	205
Institutions liquidated	12
No. of mergers	39
New institutions	4
No. of institutions, December 1995	158
Institutions suspended and then merged	2
Total deposits in liquidated institutions <sup>a</sup>	958
Estimated total loss of deposits <sup>a</sup>	477
Estimated total loss of other liabilities <sup>a</sup>	249

<sup>a</sup>In millions of pesos.

here as serially correlated losses across banks that could not be explained either by macroeconomic influences or by changes in individual bank characteristics. This interpretation of significant panel time effects (indicating significant residual correlation) as potential contagion may overstate true contagion, because it could also be accounted for by time-varying coefficients or omitted variables. Nevertheless, what is striking in this study is that even this potentially overstated measure of contagion was not the most important influence on deposit loss. When explicit contagion terms were added (e.g., the loss of deposits of other banks in the previous time period), additional time effects in the panel analysis became insignificant, indicating the importance of serial correlation of risk for the banking sector as a whole. However, fundamental macroeconomic factors remained significant in generating aggregate risk, and the majority of the explained variation in deposits was accounted for by bank fundamentals, indicating the importance of bank soundness in depositors' decisions.

Table 5.4 summarizes the effect of the tequila period on the financial system. Between December and May the system lost \$8 billion, or 18 percent, of deposits, and the Central Bank lost some \$5 billion, or 30 percent, of international reserves. Over this single year some fifty-one institutions were closed (twelve liquidated and thirty-nine merged), and two institutions were suspended and subsequently merged in 1996. The total deposits in liquidated institutions in 1995 amounted to \$958 million, and of this depositors received roughly 50 percent of their investments, losing an estimated \$477 million. In addition, other creditors (mainly bondholders) lost an estimated \$249 million. This is a record of market discipline (i.e., actual depositor loss) that few countries have matched in recent decades. (Interestingly, Estonia in the early 1990s—a country also constrained by its commitment to a currency board—is the only other example of significant depositor loss of which we are aware.)

### 5.2.3 Challenges and Reforms after the Tequila Crisis

Argentina had abolished deposit insurance in the early 1990s and managed to weather the tequila storm without it. Nevertheless, there was a perception among some that the complete absence of deposit insurance was too extreme and that its absence may have contributed to the flight from the banking system. A limited deposit insurance scheme was introduced in May 1995 covering deposits of up to \$20,000 and funded through premiums on banks calculated using a risk-based pricing formula. This insurance scheme was implemented through a government-sponsored enterprise—Seguro de Depósitos Sociedad Anónima (SEDESA)—that is separate from the Central Bank. The scheme has since been extended to cover deposits up to \$30,000.

Originally, SEDESA was seen as a body that would simply pay out to depositors in the case of a bank liquidation. However, over time SEDESA's role and powers have been extended. SEDESA is now formally charged with a minimum cost resolution objective. Additionally, the charter of the Central Bank has been altered to allow the Central Bank to separate the assets and liabilities of a failing bank. In effect, this allows the Central Bank to create a “good” bank that can then be sold and a “residual bank” that can be wound up, thus avoiding the liquidation of the whole bank. The residual bank rests in a “trust” backed by bonds. These bonds are then bought by private investors, and bonds have also been bought with SEDESA's funds—consistent with the minimum cost resolution guidelines. In particular cases, for example when the Central Bank had previously given a rediscount to the bank, the Central Bank has also converted its liabilities into bonds backed by the residual bank trust. Other resources, administered through the government's Bank Capitalization Trust Fund, have also been used essentially to facilitate acquisitions by other banks.

These innovative mechanisms for resolving problem institutions have attracted significant attention. Critics (see World Bank 1998) have suggested that these policies have weakened market discipline. A further related concern highlighted in that report is that acquiring banks were not always of sufficiently high quality to ensure that the merged institution had a sustainable future; the World Bank suggested that acquiring banks should have A credit ratings or even higher. Due to these concerns, the Central Bank formed a committee including three outside experts to review its policies with respect to bank resolution; implementing the findings of that committee became a condition in a World Bank/IDB loan program. Torre (2000) provides a very useful review of these policies and the relevant trade-offs.

Thus far, it seems that little in the way of adverse consequences has

resulted from the policies just mentioned, and these policies have produced the tangible benefit of a relatively fast resolution of problem institutions, at least in more recent cases. It is interesting to note that banks rated BB have shown a greater probability of being upgraded than downgraded, and that positive tendency is also reflected in the transition probability matrix of Capital, Assets, Management, Earnings, and Liquidity (CAMEL) ratings (see BCRA 1999). Moreover, although the law in Argentina places depositors in a very senior position and makes it difficult to discriminate between large and small depositors during a liquidation, depositors have lost money in two out of eighteen banks closed since 1995, and losses have been experienced commonly by other liability holders, enhancing market discipline. Finally, although the resolution process has in some cases involved the use of Central Bank funds, the Convertibility Law and the Central Bank charter continue to place strong limits on this activity and ensure that whatever public assistance there is in terms of bank resolution would have to be fiscal and hence transparent in nature. This characteristic of the Argentine financial system continues to provide strong incentives for prudent behavior, reflected in the banking sector's prudence through the recent recession.

Immediately after the tequila shock, beginning in August 1995, there was a very significant reform of the reserve requirement system. During the crisis it was found that sight deposits were more stable than time deposits and that banks with more time deposits had lost a greater fraction of their deposits and (because of the relatively low reserve requirement on time deposits) had less liquidity available to them in the Central Bank. It was decided to replace reserve requirements with a "liquidity requirement" acknowledging explicitly that these reserves were intended for "systemic liquidity protection." These new liquidity requirements were specified on virtually all liabilities (reserve requirements had been placed only on deposits) at rates that declined depending on the residual maturity of each liability and that were required irrespective of the type of liability (sight deposit, time deposit, bond, etc.). Finally, the liquidity requirements introduced were remunerated at rates approximately equal to short-term dollar interest rates, thus alleviating a substantial tax that had been placed on the financial system.

In recent years, the liquidity requirement has been further amended to permit the holding of balances in qualifying foreign banks to count toward as much as 80 percent of the requirement, and to permit the use of standbys from foreign banks as a substitute for deposits held abroad. These rules reflect the intent of the liquidity requirement—a means to insulate the banking system against the flight of deposits—and the recognition that for that purpose hard currency balances held abroad may be as good as or better than deposits held at the Central Bank. Furthermore, the flexibility

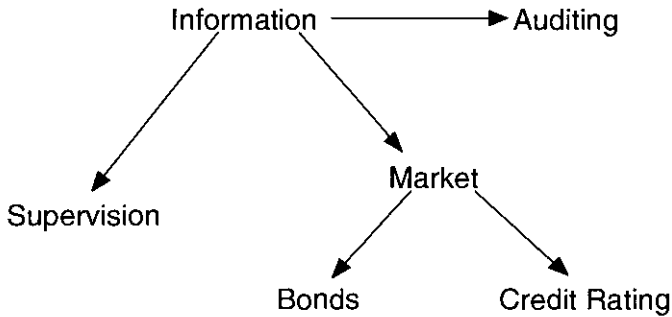


afforded by the use of standbys provides a market reward to low-risk banks because those banks are able to obtain standbys at low cost from foreign banks.

Another lesson from the tequila crisis had been the importance of market risk as wholesale banks had maintained little regulatory capital against relatively large government bond positions. In 1996, Argentina became one of the first countries to implement an adapted version of the Basel market risk capital requirement amendment to the 1988 Accord. Argentina used the “standardized” approach (with simplified rules for offsetting positions reflecting the more limited Argentine bond market), but with higher risk weights calculated via a value-at-risk formula. The Central Bank publishes the volatilities used to calculate these risk weights on a monthly basis. Capital requirements were further augmented in March 1999 with a requirement to cover interest rate risk on the banking book.

The tequila experience underlined certain structural problems with respect to banking oversight, which encouraged new thinking about the benefits of involving markets in the regulatory process. First, although in large part standard statistics monitored by the superintendency do a fairly good job in predicting bank failure, some failures came as a surprise to the authorities. Among the reasons why banks failed but were not identified in advance as problem institutions is that there is a limit to what reported balance sheet and other statistics tell about a bank. Unsound practices and fraud are an important cause of bank failure, and one that is not likely to show itself in reported financial ratios. For example, off-balance sheet contracts (types of derivative operations) and even undeclared off-shore banks were uncovered in the analysis of some institutions that failed during the tequila crisis. That observation (along with the evidence that market deposit interest rates had been useful in forecasting bank failures during the crisis) led policy makers to consider the potential advantages of relying on market assessments as part of the regulatory process. In an emerging country context, in particular, where supervisory technology and resources are relatively constrained, in some cases the market knows more about the existence of derivatives and offshore transactions than does the superintendency.

Furthermore, there can also be differences between the powers and incentives of regulators and those of markets to discipline banks. The legal powers and the legal protection offered to supervisors who attempt to discipline banks are important issues in some emerging market countries. In Argentina, for example, legal protection of supervisors is weak (a point made in World Bank 1998), and the legal tradition does not give much scope for early Supervisory intervention if an institution is still formally complying with regulations. There is a possibility, therefore, that supervisors cannot close an institution or force remedial action even if they know that an institution is facing serious problems. In that case, the market—if



- **Information:** Disclosure rules on banks, Credit Bureau of the Central Bank.
- **Auditing:** Auditors supervised by Central Bank, subject to Financial Bonds and Disqualification.
- **Supervision:** Capital, liquidity and other regulations plus CAMELS system of bank assesment.
- **Bonds:** Obligation to issue 2% of deposits as subordinated liability each year.
- **Credit-Rating:** Each bank must obtain a credit-rating from an internationally active authorized rating agency (4 agencies authorized).

**Fig. 5.2 BASIC system of bank regulation**

it has the correct information—may be more willing and able to discipline weak institutions than are their supervisors (see Powell 1997 on this point).

#### 5.2.4 The BASIC Approach to Bank Regulation

These kinds of considerations led the regulatory authorities in Argentina to develop what has become known in that country as BASIC banking oversight (see Powell 1997 and World Bank 1998 for further details). BASIC is an acronym that stands for Bonds, Auditing, Supervision, Information, and Credit Rating. The main idea behind BASIC is that both market and regulatory discipline are imperfect and that there are complementarities between the two. As we have argued, the superintendency and the market may have different information sets, incentives, and legal powers; hence the quality of monitoring can be improved if both are employed actively to monitor banks. Despite the appeal of the BASIC acronym, the more logical order to discuss the operation of the system is Information, Auditing, Supervision, Bonds, and Credit Rating. Figure 5.2 gives a schematic representation of the main policies under each heading.

Good information is a prerequisite to either market or regulatory discipline. The superintendency in Argentina publishes summarized bank balance sheets, principal regulatory ratios, performance ratios, and details of

the nonperforming loans and provisions on a bank-by-bank basis. Moreover, the superintendency's credit bureau has been extended to cover virtually every loan in the financial system (all those above \$50). The database includes the name of the borrower and a unique identification number (each person and each company in Argentina has a unique identification number issued by the National Registry and used for many purposes), the name of the bank extending the credit, the amount of the credit, the quality category of the loan (the Central Bank has defined a standard categorization system from 1 = normal to 5 = loss), and the details of any guarantees extended. This information is available free of charge on the Central Bank's website debtor by debtor ([www.bcra.gov.ar](http://www.bcra.gov.ar)). In other words, anyone can input the surname of a borrower or a company name and view instantly the total amount of debt that that individual or company has with the financial system and whether that debt is performing or not.

Measures are taken to ensure that the entire database cannot be downloaded. For example, if hundreds of searches are detected from the same source, further access is denied, essentially in an attempt to protect the identity of banks' good creditors from other banks (to ensure that banks can internalize the benefits of their own screening and monitoring investments). However, no measures are taken to protect the identity of individual borrowers. Moreover, the database, except credits of less than \$200,000 in categories 1 and 2 (i.e., performing), is sold at very low cost to all interested parties. The main objectives of this policy are not only to promote transparency with respect to the borrowers of the Argentine financial system, but also to enhance the willingness to pay debts, given what is perceived as a weak legal system.<sup>3</sup> The database maintained by the superintendency has recently been expanded to include many more variables (e.g., basic financial ratios of borrowers and other information that would be relevant for determining the quality of the loan), and these data are also available for limited private use, although comprehensive current data are only available for unlimited private use for nonperforming borrowers.

The usefulness of information depends not only on its quantity and availability but also on its quality. The auditing process is vital to ensure the validity of the information published. In previous decades in Argentina auditing firms have been subject to harsh criticism. In response the Central Bank has set up a list of qualified bank auditors who must post a financial bond. In the event of a dispute, this bond may be forfeited, and the auditor may be struck from the authorized list. Additionally, the Central Bank lays down strict guidelines on minimum auditing requirements and supervises the auditing process.

3. The database also has great potential to analyze, for example, whether provisioning and capital requirements are adequate. Falkenheim and Powell (1999) use the database and a simple portfolio model of credit risk in this vein and conclude that in general provisioning and capital requirements are more than adequate in Argentina given loss probabilities (estimated on data for 1998 and 1999).

“Supervision” in BASIC actually refers to both supervision and regulation (and these activities are separated within the internal structure of the Central Bank). The superintendency has now adopted a version of the U.S. CAMELS system of bank rating. The banks’ CAMELS ratings are then used in several regulations. In particular the CAMELS score affects capital requirements such that banks with poor CAMELS ratings face a higher requirement.<sup>4</sup>

“Bonds” refers to the requirement that banks in Argentina must issue a subordinated liability for some 2 percent of their deposits each year.<sup>5</sup> The idea behind this kind of regulation (as proposed by Calomiris 1997, 1999) is threefold. First, if banks are forced to attract institutional investors and to go to market to issue debt, that process reveals information about the bank to those debt holders and to supervisors. Supervisors may be able to use that information to discipline the bank. Second, sophisticated investors who hold a subordinated liability then have incentives to monitor the bank and are likely to be a constituency for conservatism within the bank because (like the deposit insurer) their claims are senior to equity. In contrast, equity holders in an insured bank that faces large losses may have incentive to increase risk to take advantage of the put option inherent in deposit insurance. Thus when equity capital is severely depleted, it is not a constituency for conservatism.<sup>6</sup> Third, if debts are traded publicly, then the secondary market prices reveal further information about the default risk of the bank over time. In the case of Argentina, where corporate debt markets are extremely thin, it was thought that the first two objectives would be more important.

The subordinated debt regulation has not performed as well as its advocates had hoped. The regulation was adopted in late 1996, to become effective January 1998. However, over this period the Asian crisis struck global capital markets, and Argentina was also affected (specifically, after the speculative attack on Hong Kong in October 1997). Subsequently, Ar-

4. Argentine capital requirements can be expressed as  $CR = 11.5 * w * X * K + MR + IR$ , where CR is the Capital Requirement as a percentage of assets at risk,  $w$  is the average-bank Basel risk weight for counterparty risk,  $X$  is the average interest rate factor (as described in the text, the interest rate on each loan is used as an indicator of counterparty risk),  $K$  is the CAMELS factor, MR is the market risk capital requirement and IR is the interest rate risk (banking book) capital requirement.

5. In this paper we refer to the subordinated debt requirement. In fact, there are several ways to comply, including issuing a bond or holding a deposit/obtaining a loan from certain investors. These investors must be from outside Argentina (and subject to a minimum credit rating) or be local and have already satisfied the requirement. In the case of the bond issue, the bond is not necessarily subordinated to other bonds outstanding, although it is always subordinate to deposits. Meeting the stronger requirement allows subordinated debt to be considered as Tier 2 capital.

6. Bond holders can be depended upon to discipline banks in order to limit their risk taking as long as either (a) equity remains in the bank or, alternatively, (b) an upper limit is placed on the yield on any subordinated debt that counts toward the regulatory requirement (which it is not the case in Argentina, and which Calomiris 1997 argues is a weakness of the current law). For more details, see Shadow Financial Regulatory Committee (2000).

gentina's securities markets suffered further minor shocks as different countries in Asia were affected, then suffered considerably in August 1998 as the result of the Russian debt moratorium, and then was again shaken by the January 1999 Brazil devaluation. To summarize, from roughly October 1997 to mid-1999, the international financial crises made debt or equity issues (foreign or local) from any issuer (sovereign or corporate) difficult. The Central Bank reacted to this by putting back the compliance date for subordinated debt on several occasions, by extending somewhat the range of liabilities that banks could issue in satisfaction of the requirement, and by revising the penalties banks faced for noncompliance.

Currently the regulation remains in force, and banks have a wide range of liabilities that qualify as subordinated debt. Banks that fail to comply face higher capital and liquidity requirements. Banks with foreign parents may comply through their parent.

To investigate how the subordinated debt regulation has been working in practice, we analyze the characteristics of banks according to how they have reacted to this regulation. In particular, in table 5.5 we divide banks into two groups according to whether they have complied with the regulation and how they have complied. In the first group we place banks that either do not have to comply (an exception is made for foreign-owned banks subject to a minimum credit rating) or have complied by issuing a bond or obtaining a two-year deposit from a foreign bank. We call this the high-compliance group. In the second group we place banks that either have complied weakly by obtaining a two-year deposit from a local institution (a category that includes some banks that subsequently failed) or have not complied at all. We designate these low-compliance banks.

The identities of the banks in each of these categories are not a matter of public information. Some critics have argued that the failure to disclose that information weakens the power of subordinated debt to provide signals to the marketplace (i.e., if banks choosing not to comply are weaker, then revealing that information could facilitate market discipline of those banks). The decision not to reveal information about bank compliance reflected supervisors' concerns about creating false impressions of the relative health of banks during the turbulent period of 1998–99. In particular, banks that had issued required subordinated debt early (e.g., before the Asian crisis) did not face the same market challenges as those that had waited to issue debt, and regulators did not think that relative compliance always reflected relative strength. Nevertheless, that lack of confidence in the market's ability to draw proper inferences is somewhat at odds with the motivations for the law in the first place.

Table 5.5 compares various characteristics of these two groups to see if the banks that comply at a high level are the strongest banks (because one would expect that banks with lower default risk would have lower costs of meeting the rigors of market discipline). We report variables that capture

**Table 5.5 Subordinated Debt**

	1993:2–1994	1995	1996–99
Deposit interest rate (US\$ deposits) <sup>a</sup>			
High Compliance			
Average	6.16	8.47	6.96
Std. Dev.	2.28	5.33	3.45
Low Compliance			
Average	6.99	9.98	7.93
Std. Dev.	3.18	7.16	2.76
Loan interest rate (US\$ loans) <sup>a</sup>			
High Compliance			
Average	15.40	16.69	15.12
Std. Dev.	5.63	6.21	9.29
Low Compliance			
Average	19.02	20.70	17.41
Std. Dev.	10.94	11.80	9.70
Change in deposits <sup>a</sup>			
High Compliance			
Average	2.43	0.44	5.30
Std. Dev.	36.8	31.8	30.8
Low Compliance			
Average	3.58	-1.42	4.49
Std. Dev.	14.6	61.2	27.47
Capital ratio (capital integration) <sup>a</sup>			
High Compliance			
Average	15.97	17.85	15.70
Std. Dev.	10.85	13.98	12.14
Low Compliance			
Average	20.20	17.37	18.31
Std. Dev.	14.55	24.75	16.38
Nonperforming loans <sup>a</sup>			
High Compliance			
Average	13.29	16.24	14.16
Std. Dev.	16.04	16.50	12.91
Low Compliance			
Average	23.10	30.00	25.44
Std. Dev.	19.25	22.37	17.35
Loans/liquid assets			
High Compliance			
Average	6.37	6.92	4.16
Std. Dev.	7.52	6.36	4.06
Low Compliance			
Average	7.14	9.25	5.39
Std. Dev.	7.93	10.14	8.42
No. of observations			
High Compliance	177	237	922
Low Compliance	76	97	412

*Note:* Low Compliance means either the bank did not comply or the bank complied through a local subordinated insurance.

<sup>a</sup>In percentages.

elements of asset risk and liquidity, as well as market perceptions of the default risk on debt, and the capital ratio.

Default risk on debt is captured alternatively by the average interest cost on debt for the bank (which reflects a market risk premium) and by the growth rate of deposits. When banks' deposits are perceived as riskier, they have a harder time attracting deposits (for theory and empirical evidence on depositors' aversion to risky deposits, see Gorton and Pennacchi 1990, Calomiris and Kahn 1991, Calomiris and Mason 1997, and Calomiris and Wilson 1998).

Asset risk and liquidity differences are captured by (a) the ratio of loans to assets (which, *ceteris paribus*, indicates higher risk and lower liquidity), (b) the average interest rate on loans (which we view as an indicator of the riskiness of loans), and (c) the ratio of nonperforming loans to total loans (another indicator of the riskiness of loans). This way of defining elements of asset risk isolates three perspectives on asset risk: the proportion of risky assets (loans), the *ex ante* riskiness of loans, and the riskiness of loans based on actual performance.

Bank default risk reflects a combination of asset risk and leverage. The inverse of leverage (the capital ratio) is measured here using book values (the only available measure because virtually none of the banks have publicly traded stock). For the various measures of asset risk, default risk, and leverage, table 5.5 reports data retrospectively for various dates—that is, compliance is measured in 1998 and 1999, and data are reported for previous periods for the groups defined by their recent compliance.

The simple comparisons presented in table 5.5 indicate that banks that achieved the highest degree of compliance with the rule are relatively strong, as indicated by deposit growth and deposit interest rate differences (the exception is the lack of a difference in deposit growth rates in the pretequila period, which predates the subordinated debt regulation by several years). Those differences are also reflected in differences in asset risk, as measured by loan interest rates, nonperforming loans, and loan-to-asset ratios. Capital ratios are higher for the banks that comply least with the law, which reflects a combination of their asset weakness (i.e., that risk-based capital standards are being enforced) as well as the penalty of a higher capital requirement imposed on banks that fail to comply with the rule.

Even though not all banks have complied fully with the subordinated debt rule and there is substantial room for improving the requirement (i.e., disclosing compliance and limiting more what qualifies as subordinated debt), we think the rule can be regarded as a partial success for three reasons: First, compliance patterns with the rule demonstrate the usefulness of market discipline. The fact that weak banks find it difficult to issue subordinated debt, but that strong banks find it easy, is encouraging to ad-

vocates of the rule who see it as a way to reward banks for gaining the confidence of the marketplace.

Second, banks that fail to comply outright are penalized in ways that reduce the gains that banks might otherwise obtain from failing to comply, and that protect against the dangerous moral-hazard problem of risk taking (so-called asset substitution) in distress states. By being forced to increase capital and liquidity, noncomplying banks are not encouraged to increase asset risk easily in the face of weakening in their loan quality, which protects the deposit insurer and the taxpayer from the risks of extreme loss attendant to the pursuit of “resurrection” strategies.

Third, the law makes clear to all parties that supervisors are aware of the failure to comply with subordinated debt, and this has the benefit of enhancing discipline over supervisors. When a weak bank with a long record of failure to comply with the subordinated debt rule fails, supervisors cannot claim to have been unaware of the bank’s weakness, because the market was providing a clear signal of its lack of confidence in the bank. Although market yields on debt issues are one form of signal, the failure to issue subordinated debt is arguably an even stronger one because it indicates that banks would have a very difficult time attracting uninsured long-term debt. The presence of the subordinated debt rule thus eliminates ex post plausible deniability for supervisors—they cannot claim to have been ignorant about bank weakness if that weakness is known in the marketplace.

Finally, the *C* in BASIC refers to the credit rating requirement. The idea of this requirement is also to improve information regarding financial institutions. Whereas the subordinated debt requirement looks to institutional investors to provide discipline and information, the idea of a credit rating is to ensure that public information is available to less-sophisticated investors. As in the case of the subordinated debt rule, however, this regulatory requirement has not proved to be free of problems.

The Central Bank first required banks to obtain credit ratings and permitted the ratings to be produced by any of a set of authorized agencies, which included local and internationally active agencies (eight in all). However, the perception was that this regime was expensive and that the ratings were of varying quality. In other words, there was a perception that some agencies were giving higher ratings than others. Arguably this reflected the fact that local capital markets are still not highly developed; Argentina may currently lack a set of institutional investors capable of providing rating agencies incentives to be conservative.

The Central Bank initially responded to the problem of questionable ratings quality by issuing standardized guidelines for rating agencies to follow. This did not appear to solve the problem. Finally, the Central Bank asked banks to have only one rating (reducing the cost of the regime) but



also restricted the authorized agencies to only internationally active ones. Currently there are four authorized rating agencies.<sup>7</sup> We show in table 5.6 an estimated transition probability matrix of ratings over the history of this regulation. The table illustrates the distribution of current and past ratings as well as the probability of obtaining a particular current rating given a particular previous rating. Table 5.6 shows that most banks enjoy fairly high private ratings. The vast majority of banks rated (89 out of 103) currently enjoy investment-grade ratings (BBB or higher), and 45 banks are rated AA or AAA. There have been significant changes in ratings for individual banks in both directions during 1998, three of which placed banks that had been rated BB, BBB, and A into the F category. The evidence of such dramatic, negative changes in ratings suggests that the ratings are a meaningful signal of quality.

### 5.2.5 Banking System Structure and Performance

There have also been extremely important structural changes in the Argentine financial system since the tequila crisis; these have been facilitated by the policies of permitting free entry and encouraging the privatization of public banks. First, the consolidation process begun in the early 1990s, and accelerated by the tequila crisis, has continued, as shown in tables 5.3 and 5.4. As mentioned earlier, some of these mergers were assisted through the use of the fiduciary fund set up during 1995 with funds from multilateral institutions and some through the use of funds from SEDESA (the deposit insurance agency). Moreover, there was also a strong tendency toward privatization in the banking sector, visible in table 5.7. Some seventeen of the twenty-four provincial banks that have been privatized were assisted through a fiduciary fund set up with the assistance of the multilaterals (see appendix).<sup>8</sup> Privatizations have occurred via a mixture of types of sales and have largely been to existing domestic banks or domestic investment groups. Two very large public banks remain in Argentina—Banco Nación, owned by the federal government, and Banco de la Provincia de Buenos Aires (the largest Argentine province in terms of GDP)—and efforts to privatize them have met significant political resistance. As of July 1999, these two banks represent some 27 percent of banking system deposits. Although former President Carlos Menem expressed his desire to privatize Banco Nación in his second term, this was not approved by congress. The ex-governor of the province of Buenos Aires (Eduardo Duhalde) and his successor (Carlos Ruckhauf) have not come out in favor of privatizing its important provincial bank at the time of this writing.

7. These agencies are, in alphabetical order, Duff and Phelps, Fitch-IBCA, Standard & Poor's, and Thompson Bankwatch.

8. There have also been a number of privatizations of municipal banks that we do not report here.

**Table 5.6 Credit Rating Regulation (transition matrix)**

Evaluations <sup>a</sup>	Evaluations in December 1998										Total	
	AAA	AA	A	BBB	BB	B	CCC, CC, C, D	F	Not Available	Orderly Retirement		Revoked, Suspended
AAA	23	1							1			25
AA	2	14										16
A		2	28	2				1	2		1	36
BBB			1	13	2			1	1	1	3	22
BB					5			1	2			8
B						3			1			4
CCC, CC, C, D												0
F		1									1	2
Not Available	2							1	4	8		15
Total	27	18	29	15	7	3	0	4	10	10	5	128

*Note:* In the cases in which the entity presented two evaluations, the worst one was considered.

<sup>a</sup>Evaluations in December 1997 and March 1998.

**Table 5.7** Bank Privatization in Argentina

	Number of Institutions	Assets <sup>a</sup>		Deposits <sup>a</sup>	
		Before	After	Before	After
1992–94	3	1,128	321	562	498
1995–96	11	3,093	1,993	1,706	1,316
1997–99	4	1,442	1,078	1,004	793
Total	18	5,663	3,392	3,273	2,606

<sup>a</sup>Assets and deposits after and before privatization, in millions of pesos.

The other very significant structural change in the banking system has been the entry of foreign capital. During 1996–98 several significant transactions took place and resulted in the purchase of domestic banks by Spain's Banco Santander and Banco Bilbao Vizcaya, the United Kingdom's HSBC, and Canada's Bank of Nova Scotia (Scotia International), to name a few. Table 5.8 provides figures on specific transactions. Furthermore, Banco Itau from Brazil entered as a start-up and subsequently purchased a local bank. These entrants added to several existing foreign banks, including Citibank, Bank of Boston, ABM Amro, and Lloyds. Deposits in banks with a foreign controlling share now account for some 60 percent of private sector deposits and some 40 percent of total deposits. Foreign banks have heightened competition, and this is most visible in their strong advertising campaigns and, in some products, in their willingness to wage price wars.<sup>9</sup> Foreign competition has also allowed the introduction of new technology, probably more rapidly than otherwise would have occurred, and has assisted in creating a much more stable deposit base.

To a large extent, this entry of foreign capital in the banking sector is simply a reflection of what has happened in the Argentine economy more generally. In fact, the puzzle is really why this did not happen earlier, given that the sector was liberalized in 1992. As noted before, one hypothesis is that foreign investors were waiting to see that the new policy regime was fully tested before making significant investments. It is worth noting that investors in the financial system were unusually late in entering compared to investors in telephones, electricity, gas, water, railways, mining, and petrochemicals. That difference in timing suggests that potential bank investors had specific policy concerns that did not affect other sectors. In partic-

9. There has also been a tendency among some banks to offer bank accounts combined with lotteries, free computers, and other domestic appliances, and even airline tickets. These marketing campaigns may, of course, reflect an immature market rather than real competition. Still, we note that relative to international standards, banking services in Argentina tend to be expensive; bank administration costs tend to be high; nonperforming loans tend to be high; and bank profitability is low.

**Table 5.8**

**Entry of Foreign Capital**

	Local Bank	Purchasing Institution	Origin	Percent of Share Purchased
1 September 1996	Tornquist	O'Higgins-Central Hispano	Chile, Spain	100
1 December 1996	Francés del Río de la Plata	Banco Bilbao Vizcaya (BBV)	Spain	30
1 April 1997	Liniers Sudamericano	BT LA Holdings LLC.	U.S.A.	51
1 July 1997	Trasandino	Abinsa	Chile	51
1 July 1997	Crédito de Cuyo	Abinsa	Chile	67
1 July 1997	Banco Río de la Plata	Banco Santander de España	Spain	50
1 August 1997	Banco Roberts	Hong Kong Shangai Banking Corp.	U.K.	100
1 August 1997	Banco de Credito Argentino	Banco Francés del Río de la Plata (BBV)	Spain	28
1 November 1997	Los Tilos	Caja de Ahorros Prov. San Fernando	Spain	40
1 December 1997	Finvercon	Norwest-Finvercon	U.S.A.	100
1 December 1997	Quilmes	Scotia International	Canada	70
1 January 1998	B.I. Creditanstalt	Bank Austria	Austria	49
1 July 1998	Compañía Financiera Argentina	AIG Consumer Finance Group	U.S.A.	91
1 November 1998	Del Buen Ayre	Banco Itaú	Brazil	100
1 January 1999	Bisel	Caisse Nationale de Credit Agricole	France	36
1 May 1999	Entre Ríos	Bisel (Caisse Nationale de Credit Agricole)	France	82

ular, they may have wished to see proof that the government respected the independence of the Central Bank as a regulator and a monetary agency, and that the government would not appropriate resources from the banking sector during a period of stress—e.g., by freezing deposits, as had been done in 1990. According to that interpretation, after the tequila test these investors were more willing to come in.

Despite the dynamism in Argentine banking, bank profitability remains very low by international standards, which partly is a result of regulations that create incentives for banks to limit their risk and partly reflects the high operating costs of banks in Argentina. Table 5.9 gives a breakdown of the profitability of the Argentine banking system in the last three years for public banks, private banks, and the top ten private banks. Even in the top ten private banks, it can be seen that costs remain high (almost 6 percent of assets), and although service income is relatively high, loan-loss charges are also high (at around 2 percent of assets this year), reducing profits to less than 1 percent of assets. Private banks gradually are less profitable (0.5 percent of assets) with higher operating costs (6.4 percent of assets), and public banks show lower interest margin (3.5 percent of assets as opposed to 4.5 percent for the top ten private banks). Public bank profitability also remains low at 0.4 percent of assets.

The combination of low earnings and high recent acquisition prices is interesting. Projecting current levels of profits into the future would appear not to justify the prices paid for recent acquisitions. Thus, in order to explain these prices, one would have to assume a high forecasted growth rate for the financial system. If those growth forecasts do not materialize, it is possible that some foreign entrants may reassess their decisions to enter the Argentine market in the years to come (we note in passing the decision of Deutsche Bank to sell its Argentine retail business to Bank of Boston as an example of foreign exit). On the other hand, if high growth rates resume, the foreign acquisitions of the 1990s could prove quite successful.

What are the prospects for further improvement in the structure and performance of the Argentine banking industry, and what are the risks posed to the system from delaying those improvements? The World Bank (1998) report suggests that the problems of the remaining weak private institutions and the remaining public institutions are quite distinct, and that neither is a systemic threat or a cause for urgent concern. The World Bank (1998) suggests that the weaker private institutions—because of their relatively small size—pose no threat to the stability of the financial system more generally. The remaining public banks, it was argued, also present no threat to the system (because of their separateness from the private sector) but might well present significant fiscal cost if they were to be privatized today (presumably the authors had in mind a significant clean-up of the public banks' balance sheets).

**Table 5.9 Breakdown of Banks Profitability (annualized, in percentage of net assets)**

	Public Banks			Private Banks			Top Ten Private		
	1997	1998	1999 <sup>a</sup>	1997	1998	1999 <sup>a</sup>	1997	1998	1999 <sup>a</sup>
	Interest margin	3.9	3.9	3.5	3.9	4.7	4.6	4.0	4.5
Service income margin	2.8	2.8	2.5	3.6	3.3	3.1	3.4	3.1	2.9
Gains on securities	0.4	0.6	0.6	1.3	0.8	1.0	1.4	0.6	0.9
Operating costs	-5.5	-5.5	-4.9	-6.8	-6.6	-6.4	-6.3	-6.0	-5.8
Loan-loss charges	-2.8	-1.2	-1.3	-1.9	-1.8	-2.1	-1.8	-1.5	-2.1
Tax charges	-0.3	-0.3	-0.3	-0.5	-0.4	-0.4	-0.5	-0.4	-0.4
Income tax	-0.1	-0.1	-0.1	-0.4	-0.4	-0.4	-0.4	-0.3	-0.5
Other	2.6	0.3	0.4	1.5	1.0	1.2	1.7	1.0	1.2
Total profits	1.1	0.6	0.4	0.8	0.5	0.5	1.5	0.9	0.8

<sup>a</sup>Up to September 1999.

In the eyes of investors, the reforms in the financial system in the late 1990s appear to have produced a very clear positive result. From 1996 to 1998, the financial system grew very strongly, with deposits growing at a roughly 30 percent annualized rate. In the second half of 1998 and through 1999, however, Argentina fell into a recession due to the combination of external factors (high international lending spreads for emerging economies, sharp falls in commodity prices, a high value of the dollar, and a recession in Brazil) and internal factors (political uncertainty leading up to the October 1999 presidential election). That recession has taken its toll on the banking system. Although deposits have kept growing (at just over 10 percent for the year), credit to the private sector has grown very little over the last eighteen months, and interest rates have generally risen, depending on the subperiod analyzed. Nonperforming loans have also risen quite significantly, and thus profitability has suffered.

Although the past year has been a very difficult time in some sectors of the real economy, the banking sector has been very stable. Indeed, the fact that credit supply has tightened in the face of a recession and high loan losses is precisely what one would expect from a banking system subject to market discipline. In that sense, tight credit supply is a sign of the financial system's strength (Calomiris and Wilson 1998).<sup>10</sup> There has been no capital flight from the banking system whatsoever and no capital flight from the country (reserves, in fact, have risen). Thus, the financial system, which had always been an Achilles' heel for Argentina, has recently contributed to the long-run credibility of fiscal, monetary, and regulatory policy, and thus despite the tightness of credit has contributed to macroeconomic stability.

As table 5.10 shows, the reaction by Argentine bank depositors to the recent period of emerging market upheaval (as measured by deposit growth) is strikingly different from the tequila period, even though the recent upheaval (in Brazil) has had larger fundamental consequences for the Argentine economy than did the collapse of the Mexican peso in 1994–95. Not only have deposit growth and international reserves growth remained strong, but interest rates as well have not risen by nearly as much as they did during the tequila period.

10. Some observers argue that market discipline is undesirable because it reduces the supply of credit during downturns and thus exacerbates recessions. We see that effect as unavoidable, and attempts to mitigate market discipline with regulatory forbearance as counterproductive. When regulators forbear—in order to permit banks to undertake greater risk than the market would permit—some (especially insolvent) banks will abuse forbearance by undertaking enormous risk as part of a resurrection strategy. These bets (e.g., in foreign exchange markets) often have large negative expected returns and produce enormous losses to taxpayers. Indeed, the credit contraction attendant to a banking collapse, and the fiscal costs of financing those bailouts—both of which are apparent in Mexico recently—can produce a much worse cyclical drag on the economy than can market discipline on banks. For further discussion of these macroeconomic costs, see Caprio and Klingebiel (1996).

**Table 5.10** Comparison of Two Crises

	Tequila	October 1997 to February 1999
Deposits growth	-18%	19%
Reserves growth	-30%	14%
Maximum rise in interest rates <sup>a</sup>	12.1	7.9

<sup>a</sup>Percentage points increase.

### 5.3 Is Market Discipline Real? Microeconomic Evidence

In this section we take a more formal look at the evidence that market discipline operates on Argentine banks. We define market discipline as reactions of private debt holders to bank actions such that the bank is penalized for increasing the default risk on its debt, either by a higher risk premium on debt, or by the withdrawal of debt.

There is now a large empirical literature summarizing evidence on the existence of market discipline in banking in a variety of contexts. In the United States, that literature focuses on the usefulness of certificate of deposit yields for predicting bank problems (Baer and Brewer 1986; Berger, Davies, and Flannery 1998; Flannery 1998; Jagtiani, Kaufman, and Lemieux 1999; Morgan and Stiroh 1999), whereas in developing countries the empirical focus is on the predictability of deposit interest rates and the contraction of deposits (Peria and Schmukler 1999). Calomiris and Mason (1997) and Calomiris and Wilson (1998) show that during the interwar period in the United States weak banks (measured either by their probability of failure or by their implied risk of default on debt from an asset-pricing model) were forced to pay higher interest and suffered larger deposit outflows than did other banks.

As we mentioned earlier, several studies of the recent Argentine experience have linked *ex ante* bank risk with *ex ante* interest charges and deposit outflows, and *ex post* bank failure (Schumacher 1997; Dabós and Sosa-Escudero 2000; Anastasi et al. 1998; D'Amato, Grubisic, and Powell 1997). Banks with high deposit interest rates and high observable asset risk were more likely to fail during the tequila crisis and afterward, and lost a greater proportion of deposits than other banks. Thus there is already substantial evidence of the operation of market discipline within the Argentine banking system.

Our approach to measuring market discipline focuses on links between observable characteristics of banks (related to asset risk and leverage) and market reactions to those characteristics as captured in market pricing of deposit risk and contractions in the volume of deposits. A banking system in which market discipline is an important constraining force on bank risk taking should display three characteristics. First, market measures of, and



reactions to, deposit default risk should vary across banks. In a banking system in which depositors do not distinguish among banks, market discipline is unlikely to exist. Second, differences in deposit interest rates and deposit growth across banks should reflect differences in bank asset risk and leverage, which, according to economic theory, should be the sources of deposit default risk.

Third, depositor discipline should constrain default risk on deposits. Recent models of banking that emphasize either the liquidity services of bank deposits (as in Gorton and Pennacchi 1990) or delegated monitoring of bank borrowers (as in Calomiris and Kahn 1991) emphasize that depositors do not simply price default risk, but also act to limit it. That is, bank depositors are not only risk-averse, but also risk-intolerant (Calomiris and Wilson 1998). As the level of default risk on deposits increases, deposits become less liquid, and the agency problems inherent in delegated monitoring become magnified. Both of these problems lead to a type of quantity rationing in which depositors withdraw their deposits from risky banks, which acts as a source of discipline over bank risk taking. These arguments imply that increases in default risk caused by adverse shocks to bank asset risk and capital should be mean reverting. Banks that suffer those shocks face a strong incentive to reduce asset risk or increase capital to avoid disciplinary withdrawals of funds by depositors.

Our discussion of microeconomic evidence has three parts. First, we begin by summarizing the evidence on the extent of cross-sectional heterogeneity in the banking system, paying special attention to the heterogeneity in deposit interest rates and flows (our measures of market discipline) during different subperiods. Second, we test a model that relates these two market discipline measures to bank leverage and asset risk measures. That is, according to finance theory (e.g., the Black-Scholes model) default risk should be an increasing function both of asset risk and leverage. In light of that theory, we test to see whether our panel dataset displays observable links that confirm the presence of market discipline in bank debt markets. Third, if depositors are risk-intolerant, then increases in deposit interest rates in response to increased risk should be reversed over time as banks are forced to reduce asset risk and leverage to meet depositors' preferences for low risk. As a first step to testing that theory, we provide some simple tests of mean reversion in deposit interest rates.

### 5.3.1 Market Discipline and Bank Heterogeneity

Tables 5.11–5.14 provide summary statistics for our measures of asset risk, default risk, leverage, and deposit growth. These are provided for separate subperiods and for different sets of financial institutions. Interest rates on loans and deposits are measured in these tables as premiums over the rates of a benchmark, low-interest rate group of foreign retail banks in order to facilitate a comparison of spreads across subperiods. Our measure

**Table 5.11 Pre-Tequila Banking System Heterogeneity, 1994:2–1994:4**

Variables	All Institutions			Private Domestic Retail			Private Domestic Wholesale			Foreign Retail			Foreign Wholesale		
	Avg.	Med.	Std.	Avg.	Med.	Std.	Avg.	Med.	Std.	Avg.	Med.	Std.	Avg.	Med.	Std.
Id – avg. Idf	2.21	2.39	2.77	2.42	2.52	1.73	1.51	1.57	2.02	—	—	—	3.02	1.4	4.89
Il – avg. Ifl	5.15	4.38	7.21	4.54	4.6	3.65	2.3	1.21	5.32	—	—	—	0.51	–0.5	6.57
Npl/loans	14.22	9.96	13.74	11.43	9.89	6.71	5.68	4.61	7.95	8.24	4.0	8.24	11.36	5.92	14.05
Loans/assets	69.37	72.74	28.69	70.78	72.78	11.08	43.15	42.56	21.19	70.41	72.51	10.29	46.34	49.58	26.47
Capital/assets	16.98	13.47	12.09	14.06	12.39	6.45	16.65	10.73	21.98	13.43	12.28	4.18	24.97	24.31	13.99
Deposit growth, 1994:2–1994:4	3.69	3.34	17.24	4.18	3.39	9.58	5.29	3.41	20.04	2.46	5.68	16.14	4.15	1.67	40.88
No. of observations	497			124			44			36			36		
	Provincial Public			National Public			Finance Companies			Cooperative					
	Avg.	Med.	Std.	Avg.	Med.	Std.	Avg.	Med.	Std.	Avg.	Med.	Std.	Avg.	Med.	Std.
Id – avg. Idf	0.57	0.41	2.76	0.08	–0.16	0.51	0.51	8.42	3.22	3.74	2.84	2.84	3.5	3.3	2.27
Il – avg. Ifl	4.82	3.0	10.41	8.28	6.39	8.28	8.42	9.36	10.28	9.92	9.36	9.36	6.54	6.78	3.77
Npl/loans	34.06	29.21	21.27	17.93	13.94	13.94	9.58	6.99	10.96	9.34	6.99	6.99	12.35	10.49	6.49
Loans/assets	90.33	78.12	54.62	76.33	79.04	79.04	12.49	20.88	71.63	78.26	20.88	20.88	74.31	74.96	7.66
Capital/assets	13.46	12.37	11.69	11.1	10.35	10.35	1.64	13.57	23.45	19.73	13.57	13.57	17.08	15.09	7.93
Deposit growth, 1994:2–1994:4	2.08	0.96	10.36	–0.11	0.53	5.46	5.46	3.3	3.3	3.06	23.25	23.25	4.53	4.37	7.1
No. of observations	75			9			70			103			103		

Notes: Id is deposit interest rate. Idf is deposit interest rate for foreign retail banks. Il is loan interest rate. Ifl is loan interest rate for foreign retail banks. Ipl is loan interest rate for provincial public banks. Npl is loan interest rate for national public banks. Fpl is loan interest rate for finance companies. Cpl is loan interest rate for cooperative banks. Interest rates are expressed in dollar units.

**Table 5.12 Tequila Crisis Banking System Heterogeneity, 1995:1–1995:4**

Variables	All Institutions			Private Domestic Retail			Private Domestic Wholesale			Foreign Retail			Foreign Wholesale		
	Avg.	Med.	Std.	Avg.	Med.	Std.	Avg.	Med.	Std.	Avg.	Med.	Std.	Avg.	Med.	Std.
Id – avg. Idf	2.8	2.0	6.38	3.91	3.01	6.26	2.88	2.4	5.04	—	—	—	2.78	-0.35	12.29
Il – avg. Ilf	3.9	2.6	7.69	3.77	3.14	4.27	4.23	2.5	7.03	—	—	—	1.7	-0.54	9.34
Npl/loans	20.61	16.18	17.75	18.95	16.58	13.58	11.21	7.04	11.33	8.84	4.57	8.84	9.05	2.86	1.34
Loans/assets	69.21	73	30.95	71.7	74.84	15.24	47.48	46.88	24.98	71.8	8.33	43.84	40.78	27.04	27.04
Capital/assets	18.54	14.78	17.12	16.03	13.47	9.61	24.95	19.42	18.54	13.71	12.31	4.8	27.59	22.86	18.0
No. of observations	536			152			61			47			58		
Deposit growth, 1994:4-1995:4	-2.25	0.34	26.65	-1.46	1.07	21.11	-3.8	-2.2	38.71	2.24	4.48	15.66	5.25	4.97	44.39
No. of observations	593			160			70			56			65		
Finance Companies															
Provincial Public			National Public			Finance Companies			Cooperative						
Avg.	Med.	Std.	Avg.	Med.	Std.	Avg.	Med.	Std.	Avg.	Med.	Std.	Avg.	Med.	Std.	
Id – avg. Idf	0.02	-0.32	3.85	-0.08	-0.05	2.57	5.88	4.78	6.76	4.02	3.64	3.0	3.64	3.0	
Il – avg. Ilf	3.48	0.5	13.7	3.65	2.52	6.39	6.43	6.31	6.3	5.07	5.46	3.89	5.46	3.89	
Npl/loans	43.63	40.37	22.62	23.37	17.96	9.16	22.01	18.17	12.05	19.27	17.87	8.93	19.27	17.87	
Loans/assets	89.86	83.48	54.5	73.18	74.71	9.75	69.16	75.57	24.83	76.75	77.51	8.42	76.75	77.51	
Capital/assets	9.66	10.49	24.51	17.89	9.67	23.27	25.5	22.8	18.69	20.14	18.65	9.6	20.14	18.65	
No. of observations	84			18			53			63			63		
Deposit growth, 1994:4-1995:4	-4.1	-2.58	13.07	0.1	1.99	8.15	-12.96	-7.4	30.4	-1.52	0.07	18.7	-1.52	0.07	
No. of observations	108			17			61			56			56		

*Notes:* Id is deposit interest rate. Idf is deposit interest rate for foreign retail banks. Il is loan interest rate. Ilf is loan interest rate for foreign retail banks. Interest rates are expressed in dollar units.

**Table 5.13 Immediate Post-Tequila Banking System Heterogeneity, 1996:1–1997:2**

Variables	All Institutions			Private Domestic Retail			Private Domestic Wholesale			Foreign Retail			Foreign Wholesale		
	Avg.	Med.	Std.	Avg.	Med.	Std.	Avg.	Med.	Std.	Avg.	Med.	Std.	Avg.	Med.	Std.
Id – avg. Idf	1.82	1.65	5.13	1.92	1.98	4.04	2.76	2.58	2.84	—	—	—	0.79	0.86	6.73
II – avg. IIf	4.67	3.29	7.09	4.87	3.51	7.25	4.73	3.41	6.78	—	—	—	2.52	0.49	7.76
Npl/loans	20.54	16.57	17.43	22.15	18.53	16.25	16.33	11.38	16.62	10.24	9.71	6.45	11.51	5.28	14.74
Loans/assets	60.10	62.55	20.73	59.74	60.82	18.04	55.61	59.23	18.25	58.22	62.77	16.66	44.10	41.73	26.27
Capital/assets	17.11	12.89	15.41	12.54	11.43	11.64	18.35	15.06	13.57	12.42	11.47	4.56	28.26	18.96	20.71
No. of observations	649			181			52			115			72		
Deposit growth, 1995:4–1997:2	7.05	5.94	22.62	6.75	6.40	16.44	11.95	8.51	24.47	7.51	6.02	9.97	9.73	6.06	36.45
No. of observations	854			286			89			77			100		
	Provincial Public			National Public			Finance Companies			Cooperative					
	Avg.	Med.	Std.	Avg.	Med.	Std.	Avg.	Med.	Std.	Avg.	Med.	Std.	Avg.	Med.	Std.
Id – avg. Idf	0.28	0.84	5.17	0.03	0.04	0.54	4.04	4.60	7.92	2.66	2.74	1.56	6.34	6.39	3.01
II – avg. IIf	3.21	1.39	8.36	5.95	7.41	3.93	8.60	8.06	7.53	15.73	11.25	22.48	21.50	21.50	8.86
Npl/loans	45.13	44.55	22.58	20.10	20.11	2.31	19.80	15.73	11.25	69.00	18.25	62.21	63.18	63.18	6.99
Loans/assets	69.79	62.83	27.06	63.11	62.69	6.35	68.22	69.00	18.25	20.73	16.43	17.91	14.63	14.63	9.15
Capital/assets	11.87	8.77	20.25	9.22	7.97	2.78	26.47	20.73	16.43						
No. of observations	72			16			103			38					
Deposit growth, 1995:4–1997:2	2.48	4.06	28.69	4.68	3.44	10.34	5.74	6.02	23.33	8.57	7.51	8.86			
No. of observations	114			23			116			49					

Notes: Id is deposit interest rate. Idf is deposit interest rate for foreign retail banks. II is loan interest rate. IIf is loan interest rate for foreign retail banks. Interest rates are expressed in dollar units.

**Table 5.14 Post-Asian Crisis Banking System Heterogeneity, 1997:3–1999:1**

Variables	All Institutions			Private Domestic Retail			Private Domestic Wholesale			Foreign Retail			Foreign Wholesale		
	Avg.	Med.	Std.	Avg.	Med.	Std.	Avg.	Med.	Std.	Avg.	Med.	Std.	Avg.	Med.	Std.
Id – avg. Idf	1.47	0.97	3.48	1.14	1.08	2.01	2.18	1.98	2.00	—	—	—	1.55	-0.05	6.41
Il – avg. Ifl	4.09	2.26	7.02	4.77	3.44	6.44	2.70	1.90	5.99	—	—	—	1.33	0.01	5.36
Npl/loans	17.5	13.85	15.48	9.00	14.31	10.20	19.39	9.57	10.26	6.76	8.68	6.76	7.99	3.54	12.24
Loans/assets	55.53	58.11	21.17	54.25	57.44	14.80	61.33	60.54	14.73	51.89	54.85	15.42	36.47	29.32	26.77
Capital/assets	16.86	12.10	13.84	12.98	11.23	7.16	18.27	17.64	7.14	11.14	10.16	4.67	25.27	12.74	24.27
No. of observations	811			227			61			161			94		
Deposit growth, 1997:3–1999:1	2.46	1.82	17.73	1.78	1.10	12.45	0.16	-0.71	19.36	4.68	4.15	12.35	4.75	3.90	30.16
No. of observations	722			201			59			159			90		
	Provincial Public			National Public			Finance Companies			Cooperative					
	Avg.	Med.	Std.	Avg.	Med.	Std.	Avg.	Med.	Std.	Avg.	Med.	Std.	Avg.	Med.	Std.
Id – avg. Idf	0.77	0.72	2.65	-0.94	1.22	3.65	-0.39	0.64	8.2	3.35	4.63	1.71	1.81	1.61	
Il – avg. Ifl	2.29	1.45	6.56	5.68	0.55	7.64	2.118	2.88	20.47	16.96	12.83	3.39	3.67	3.45	
Npl/loans	41.97	43.38	21.42	21.45	21.18	2.88	59.29	10.55	71.15	67.05	17.79	23.64	23.04	8.11	
Loans/assets	55.24	55.34	17.89	58.87	59.29	7.98	7.98	1.51	26.62	23.92	14.40	59.11	61.12	5.35	
Capital/assets	10.34	9.49	11.38	8.00								18.15	14.35	8.4	
No. of observations	68			21			140			39					
Deposit growth, 1997:3–1999:1	0.69	1.12	10.50	3.74	3.64	4.48	1.42	22.44	1.02	2.45	7.75				
No. of observations	68			21			146			28					

Notes: Id is deposit interest rate. Idf is deposit interest rate for foreign retail banks. Il is loan interest rate for foreign retail banks. Ifl is loan interest rate for foreign retail banks. Interest rates are expressed in dollar units.

of deposit interest rates uses interest rates on dollar-denominated deposits to avoid problems from mixing peso-denominated and dollar-denominated debts. Dollar deposits consistently earn lower interest because the peso trades at a forward discount.

The main usefulness of these tables is to (a) indicate the extent of heterogeneity in the reactions of markets to banks (deposit growth and deposit interest rates); (b) describe the average changes over time in measures of asset risk, leverage, deposit growth, and deposit risk premiums; and (c) explore links over time between average bank asset risk and leverage, on the one hand, and average deposit growth and default risk premiums on debt, on the other. A perusal of these tables clearly indicates the pronounced heterogeneity in deposit interest rates and deposit growth, the variation in average performance over time (reflecting the tumult of the 1990s), and the correspondence among measures of asset risk, leverage, deposit interest rates, and deposit growth. We return to those connections among asset risk, leverage, and market discipline in our regression analysis later.

These tables also provide some evidence on how links among asset risk, leverage, and market discipline differ across types of institutions. For example, to the extent that public banks are protected from the risk of insolvency by their sponsoring governments, depositors in those public banks may not penalize asset risk and leverage as much. If that were true, then public bank weakness would not be as evident in deposit interest rate premiums or in lower deposit growth. The tables lend some support for that view. Note, for example, that during the tequila crisis (table 5.12), nonperforming loan ratios for public banks were very high, but deposit interest rates remained very low.

### 5.3.2 Fundamental Determinants of Market Assessments of Bank Liability Risk

Next, we turn to a regression analysis of market discipline as a reaction to deposit risk, as measured by either the interest rate on deposits or the outflow of deposits. The basic model regresses either of these two dependent variables on our three measures of asset risk (loans/other assets, nonperforming loans/loans, and the loan interest rate), a measure of the liquidity of nonloan assets (cash/government bonds), and the (book) capital ratio. We used lagged capital ratios to avoid correlation by construction between deposit growth and the capital ratio. Other independent variables are taken as exogenous within the quarter in which deposit growth or deposit interest rates are set.

We report a variety of regression specifications, including ordinary least squares (OLS), fixed firm and time effects, and random effects. We ran the regressions for different time periods and for different samples (sometimes including all banks, sometimes confining the sample to private commercial

**Table 5.15** Panel Regression Analysis of Bank Deposit Growth Rates, Sample Restricted to Private Commercial Banks (quarterly observations, 1993:3–1999:1)

Variables	OLS (1)	Fixed Firm/Time Effects (2)	Random Effects (3)
Constant	0.018 (0.019)	0.018 (0.031)	0.042 (0.027)
Lagged capital ratio	0.296 (0.064)	0.326 (0.087)	0.277 (0.074)
Loan interest rate	-0.418 (0.106)	-0.190 (0.153)	-0.254 (0.121)
Loans/other assets	-0.0047 (0.0006)	-0.0028 (0.0008)	-0.0032 (0.0007)
Cash/government bonds	0.0000 (0.0002)	0.0000 (0.0002)	-0.0000 (0.0002)
Nonperforming loans/loans	-0.059 (0.051)	0.025 (0.079)	-0.060 (0.060)
Adjusted $R^2$	0.082	0.325	
$p$ -value for Hausman Test			0.309 <sup>a</sup>
No. of observations	1,138	1,138	1,138

*Note:* Numbers in parentheses are standard errors.

<sup>a</sup>The restrictions of the random-effects model are not rejected, implying that the random-effects estimator is preferred.

banks). Our results were generally robust to alternative specifications, although results were stronger when we restricted our sample to private commercial banks. The restrictions imposed by random effects (the orthogonality of regressors with firm and time effects) passed Hausman's test in some cases, and in those cases, random-effects estimation is more efficient. In tables 5.15 and 5.16 we report a subset of our results for the deposit growth and deposit interest rate regressions. Specifically, we report OLS, fixed effects, and random effects specifications for the restricted sample of private commercial banks for the entire period.

Both deposit growth and deposit interest rates reflect fundamental cross-sectional differences in our measures of asset risk. Higher asset risk and leverage are associated with depositor discipline in the form of greater deposit withdrawals, and high asset risk is also reflected in higher interest rates on deposits.

Not all measures of asset risk have the predicted impacts on interest rates and deposit growth in the regressions. The loan interest rate and loan ratio enter significantly and with the right sign in all regressions, whereas nonperforming loans and the ratio of cash to government bonds are either insignificant, or (in the case of the nonperforming loans) switch signs across specifications.

Interestingly, the effect of the capital ratio is of the expected sign for deposit growth (positive); but contrary to our expectation, it is also positive (sometimes insignificantly) for the deposit interest rate. One way to explain the differences in the capital ratio effect between tables 5.15 and 5.16 is to recall that capital ratios are an endogenous variable chosen by the bank. Even though the capital ratio is lagged (to mitigate the endogeneity problem) it is possible that banks anticipate interest rate changes in their deposits one quarter ahead and alter capital ratios to compensate for anticipated increases in default risk.

### 5.3.3 Does Market Discipline Encourage Prudent Risk Management?

The regressions reported in tables 5.15 and 5.16 do not describe banks' dynamic responses to market discipline. For example, the regressions do not examine whether increases in default risk on debt produce reductions in loan-to-asset ratios, or loan risk, or increases in the ratio of cash to bonds. To accomplish this result, one would have to specify a dynamic system of equations (possibly, a panel vector autoregressive [VAR] model), which requires strong assumptions about the relative endogeneity, and the adjustment frequencies, of our various measures of asset risk, deposit risk, deposit growth, and capital accumulation. We have already argued that

**Table 5.16** Panel Regression Analysis of Bank Deposit Interest Rates, Sample Restricted to Private Commercial Banks (quarterly observations, 1993:3–1999:1)

Variables	OLS (1)	Fixed Firm/Time Effects (2)	Random Effects (3)
Constant	0.036 (0.002)	0.060 (0.003)	0.058 (0.004)
Lagged capital ratio	0.035 (0.008)	0.009 (0.009)	0.019 (0.008)
Loan interest rate	0.142 (0.013)	0.086 (0.015)	0.101 (0.014)
Loans/other assets	0.00085 (0.00007)	0.00034 (0.00008)	0.00046 (0.00007)
Cash/government bonds	−0.00002 (0.00003)	0.00000 (0.00002)	−0.00000 (0.00002)
Nonperforming loans/loans	0.038 (0.006)	−0.0205 (0.0079)	−0.007 (0.007)
Adjusted $R^2$	0.269	0.638	
$p$ -value for Hausman Test			0.000 <sup>a</sup>
No. of observations	1,138	1,138	1,138

*Note:* Numbers in parentheses are standard errors.

<sup>a</sup>The restrictions of the random-effects model are rejected, implying that the fixed-effects estimator is preferred.



**Table 5.17** Fixed-Effects Regressions: Deposit Interest Rate Mean Reversion (dependent variable: change in deposit interest rate)

	1993:3–1994:4 (1)	1995:1–1996:2 (2)	1996:3–1997:4 (3)	1997:4–1999:1 (4)
$r_{i,t-1}$	-1.04 (0.04)	-1.06 (0.04)	-1.04 (0.03)	-1.29 (0.04)
Adjusted $R^2$	0.475	0.450	0.545	0.577
No. of observations	989	791	762	688

Notes: Data are from quarterly observations of all financial institutions, 1993:3–1991:1. All regressions include fixed firm and time effects, which are not reported here.  $r_{i,t-1}$  is defined as the lagged deposit interest rate for each bank. Numbers in parentheses are standard errors.

this is treacherous ground; for example, our initial assumption about the exogeneity of capital ratios to interest rate changes is suspect (especially given our findings of a positive partial correlation between deposit interest rates and capital ratios in table 5.16).

Although we think a panel VAR approach to this problem may be promising in future research, here we pursue a simpler approach. We examine whether there is a tendency for individual banks' deposit interest rates to revert to their mean, and whether the speed of mean reversion has changed over time. If depositor discipline forces banks to react to increases in their debt default risk, then high levels of default risk should prompt reductions in interest rates in the future. We test that proposition using a simple model of the time series properties of individual banks' interest rates, and we report our results in table 5.17.

The fixed effects approach to examining mean reversion holds firm and time effects constant and constrains all banks to react similarly to changes in their deposit interest rates. Alternatively, we also estimated the relationship using a random-coefficients approach, which takes advantage of the opportunity to see whether banks differ in the extent to which their deposit interest rates revert to the mean. As the results for these two models were quite similar, we only report the fixed-effects results in table 5.17.

As we discussed at length earlier, regulatory and supervisory monitoring and discipline have improved markedly in Argentina over the period 1992–99. In table 5.17, we investigate whether the speed of mean reversion has increased over time. Specifically, we report results for several subperiods (1993:3 to 1994:4, 1995:1 to 1996:2, 1996:3 to 1997:4, and 1997:4 to 1999:1).

The regression we run for each subperiod is  $\Delta r_{it} = c + \alpha r_{i,t-1} + b_i + f_t + \varepsilon_{it}$ , where  $\Delta r$  is the change in the liability interest rate,  $b$  and  $f$  are fixed firm and time effects, and  $\varepsilon$  is an error term. The  $i$  and  $t$  subscripts refer to individual banks and time;  $\alpha$ , which we expect to be negative, measures the speed at which the interest rate mean-reverts. If interest rates revert by

100 percent in just one quarter, then we expect the  $\alpha$  coefficient to be  $-1$ ; if there is no reversion at all, then we expect the  $\alpha$  coefficient to be  $0$ . We then compare the distribution of the  $\alpha$  coefficients (across banks) for the subperiods.<sup>11</sup>

We find that mean reversion is rapid. Within-firm mean reversion occurs within one quarter ( $\alpha$  is  $-1$  or smaller) in all subperiods. The most recent period, which has witnessed the implementation of the BASIC plan, shows a significantly higher rate of mean reversion (a coefficient value of  $-1.29$ ), which is consistent with the view that banks face stronger incentives to resolve problems of high default risk in the more recent period. It is difficult to interpret a coefficient size less than  $-1$  (which seems to imply greater than mean reversion of interest rates). In specifications without fixed time effects, coefficient sizes tended to be smaller (typically in the range of  $-0.6$  to  $-0.8$ ). Thus we suspect that correlation between average time effects and individual banks' sensitivities to aggregate shocks may explain the apparent overadjustment of rates.

To summarize our empirical results, we find significant cross-sectional differences in market reactions to bank default risk (as measured by deposit interest rates and deposit growth), and our regressions indicate links between those measures and fundamental characteristics of banks related to asset risk and leverage. Furthermore, deposit interest rates revert to the mean very quickly (holding fixed effects and time effects constant), and the rate of mean reversion has increased during the period in which the BASIC framework was implemented. Overall, these results suggest that market discipline is present in measuring bank risk, punishing it, and successfully encouraging banks to pursue risk-management policies that reduce risk after they suffer risk-increasing shocks.

## 5.4 Conclusion

In this chapter, we reviewed the Argentine experience in the 1990s with bank regulatory reform, which has been one of the most determined efforts, among emerging market countries, to inject credible market discipline into the relationship between banks and depositors, and into the regulatory and supervisory process. We have argued that Argentina successfully implemented a system of bank regulation that achieved credible market discipline over banks. Markets, as well as regulators, punish or reward banks depending on the perceived risk of bank failure, and market

11. We also ran regressions excluding fixed firm effects, which constrains all firms to target the same long-run average level of interest rates. Fixed effects have a great deal of explanatory power (raising the adjusted  $R^2$  substantially in all subperiods), and so we only report fixed effects results in table 5.17. In specifications without fixed effects, coefficients on the lagged interest rate were smaller, but the same pattern of increasing coefficient size over time appeared and was even larger in magnitude than the differences reported in table 5.17.

perceptions of risk (as indicated in deposit interest rates and deposit flows) are correlated both with *ex ante* measures of fundamental asset risk and with *ex post* incidences of bank failure. Market discipline encourages rapid, risk-reducing adjustments by banks to shocks that raise their risk of failure.

Despite these favorable findings, clearly there is room for improvement in Argentina's bank regulation regime. First, the privatization of public banks remains unfinished—most notably in the cases of the two largest public banks, which account for more than a quarter of banking system deposits. Second, the least-cost resolution mandate that has been given SEDESA thus far has not proved very costly, but it could become a slippery slope—a means to pay for implicit bank bailouts, and thus undermine the hard-won gains of market confidence and market discipline. Limits to the subsidization of acquisitions that prevent least-cost resolution from becoming an implicit bailout mechanism are, therefore, a potentially important area for reform. Finally, the subordinated debt law could also be improved. Disclosing banks' compliance with the law seems a desirable first step. Placing greater limits on what qualifies as compliance (in particular, excluding domestic interbank deposits from the definition of qualifying subordinated debt and ensuring that subordinated debt is held at arm's length) and limiting the yield of qualifying subordinated debt are two additional steps the government should consider.

Does the Argentine regulatory system provide a model that other countries should adopt? We think the capital requirements, liquidity requirements, and BASIC system offer an excellent set of blueprints for any country to consider if it is serious about fostering market discipline in banking. At the same time, experience in developing and developed economies alike has shown that a regulatory system is only as effective as the political will that underlies its enforcement. In many countries—notably Chile in 1982, the United States in 1984, and Venezuela in 1991—*de facto* deposit insurance was provided despite its *de jure* absence.

During the tequila crisis of 1995 in Argentina (as during the liberalization of Estonia's banks in 1991) the government chose to force insolvent banks to close and permitted depositors in insolvent banks to lose a significant proportion of their deposits. The political commitment to low inflation and reform of the banking system in Argentina in the wake of the inflation and banking disasters of the earlier era set constraints on government policy toward banks in the 1990s, limiting the possibility of large bailout expenditures or other interventions in the banking system. The ability to apply the Argentine approach successfully to other countries likely depends on the existence of a similar political will backing real reform and limiting bailouts. Thus the challenges for reformers in emerging market countries include not only the technical problem of how to design an effective regulatory system, but also the more difficult problem of how to create the political conditions that make such a system credible.

## Appendix

Table 5A.1 The Timing of Privatizations

Bank	Date in Which Law Was Enacted	Date of Loan Agreement	Date of Bid	Date of First Disbursement	Date of Transference	Percentage of Capital Privatized	Total Loan (in millions)
Corrientes <sup>a</sup>	11/1991	—	n.a.	—	5/1993	60	n.a.
La Rioja <sup>a</sup>	n.a.	—	n.a.	—	7/1994	70	n.a.
Chaco <sup>b</sup>	5/1993	8/1995	7/1994	11/1995	11/1994	60	78
Entre Ríos <sup>b</sup>	8/1993	8/1995	8/1994	10/1995	1/1995	60	78
Formosa	2/1995	4/1995	3/1995	7/1995	12/1995	60	80
Misiones	11/1994	4/1995	11/1994	7/1995	1/1996	92.5 <sup>c</sup>	78
Río Negro	3/1995	4/1995	8/1995	7/1995	3/1996	85	80
Salta	7/1994	4/1995	8/1995	7/1995	3/1996	70	50
Tucumán	3/1995	6/1995	7/1995	7/1995	7/1996	75	80
San Luis	12/1989	4/1995	4/1996	10/1995	8/1996	100	50
Santiago del Estero	1/1995	4/1995	3/1996	7/1995	9/1996	95	50
San Juan	7/1995	4/1995	11/1995	8/1995	11/1996	75	80
Previsión Social de Mendoza	3/1995	4/1995	11/1995	5/1995	11/1996	90	100
Mendoza	3/1995	4/1995	11/1995	5/1995	11/1996	90	160
Jujuy	6/1995	6/1995	8/1997	12/1995	1/1998	80	50
Santa Fe	7/1996	12/1996	9/1997	5/1997	6/1998	100	160
Santa Cruz	10/1995	3/1998	3/1998	4/1998	10/1998	56	80
Municipal de Tucumán	12/1993	12/1996	2/1997	6/1997	7/1998	100	25
Catamarca	n.a.	9/1998	—	4/1998	—	70	50
Caja Nacional de Ahorro y Seguro <sup>a</sup>	n.a.	—	n.a.	—	5/1996	100	n.a.

Source: Subsecretaría de Programación Regional—Trust Fund for Provincial Development (TFPD).

Notes: The Banco Municipal de Paraná was assisted by the TFPD by an amount of 20 million dollars for closure. n.a. = not applicable.

<sup>a</sup>Privatizations not supported by the TFPD.

<sup>b</sup>The Banco del Chaco and the Banco de Entre Ríos were privatized prior to the TFPD creation.

<sup>c</sup>Corresponds to the privatization of 100 percent of the bank's capital, since the rest was in private hands.

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## Comment Douglas W. Diamond

Calomiris and Powell provide a very complete description and analysis of the experience in the market-oriented bank regulatory scheme in Argentina after 1992. They carefully describe the evolution of the system, its great successes, and the surprises along the way. In addition to providing their own analysis of recent data on Argentine banks, they outline the results of important earlier work. Given the importance of Argentina as the most complete experiment with market-oriented bank regulation and supervision, this complete and comprehensive presentation is recommended reading for all concerned with contemporary bank regulation (and not just in emerging markets).

The interpretation given to the experience is evenhanded. It is not self-congratulatory and does not trumpet only one view of how the approach worked or was supposed to work. I will provide my own summary of their evidence and use it to evaluate the potential role for requiring issue of subordinated debt.

The most important fact about the success of the entire approach was that the Argentine banking system managed to survive the tequila shock without initial deposit insurance or a domestic lender of last resort (though with some international help). It appears that the currency board limited the regulator's ability to succumb to the temptation to bail out banks and protect depositors. However, regulators clearly understood the long-run benefits of imposing losses. Some banks were allowed to fail.

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After the 1995 tequila crisis ended, the market discipline approach was expanded, but some small safety net was also restored.

### **Information in Bank Runs during the Tequila Crisis**

The cross section of bank runs, deposit losses, and failures during various phases of the tequila crisis is of substantial interest because it provides evidence about the information possessed by depositors. My discussion relies on Schumacher (1996, 2000). Through most of the crisis, it was ex ante low capital banks with poor performance that lost deposits and later failed. The fact that it was not random banks that lost deposits is evidence that some depositors have public information about banks. This, of course, does not show that bank runs do not themselves partly cause banks to increase their losses. Even if runs themselves impose losses on banks, however, this imposition of losses is not indiscriminate. There seems to have been some information that neither regulators nor depositors had: Some of the failures revealed surprise problems, such as fraud.

The crisis deepened and eventually became both a systemic run and a currency run. During this period, runs became indiscriminate (the cross section of severity among domestically owned banks did not depend on a bank's ex ante financial condition). There was little the Argentine government could do to stop it on its own. It needed the help of international agencies. After the new International Monetary Fund, World Bank, and Inter-American Development Bank agreements were reached, the indiscriminate withdrawals stopped, but the runs at poorly performing banks continued.

### **Regulatory Changes after the Crisis**

After the crisis a very limited safety net was established. A limited (and unfunded) deposit insurance for small deposits was introduced, without bailing out losses ex post in failed banks. A new and limited framework to merge banks with some government assistance was set up. In addition, management of liquidity risk was improved. A clearer set of liquidity requirements was imposed, including the use of foreign standby letters of credit as a way to get contingent liquidity.

In addition to the small safety net, an improved regulatory system was put into place: the BASIC system. I want to focus on the most novel part of that system: the subordinated debt requirement.

The intent of the subordinated debt requirement (as well as the credit rating requirement) was to provide verifiable information to avoid deniability by regulators and possibly to provide new information to regulators. At the same time it should increase bank disclosure of information when banks attempt to sell debt or improve their credit rating. In addition, it is possible that the subordinated debt requirement could commit regulators to close banks that are risky and that it would attract outside monitoring

of banks. The experience in Argentina suggests that the commitment benefits may be overstated, and that the monitoring benefits depend on the endogenous amount of losses that regulators will impose on subordinated debt holders when choosing the timing of closure.

### **Investor Commitment, Regulator Commitment, and Creating Liquidity**

A regulator's incentive to close banks differs from that of investors and depositors, but there is a common element to these decisions. If banks make unique relationship loans, there is a problem with closing banks or changing management to discipline the bank to take low risks and operate efficiently. When there is relationship lending (or when capital markets do not exist), and borrowers do not have other equally qualified lenders, there are extra losses imposed if a bank is closed. This reduces the incentive for investors or regulators to close poorly performing banks, reducing the discipline that comes from the threat to close or change management. It is possible, of course, that closure imposes trouble on relationship borrowers as well. Diamond and Rajan (2000, 2001) analyze the ability of uninsured demand deposits to provide commitment to run and thus close the bank whenever depositor losses are anticipated. This commitment can be useful to force the imposition of the closure penalty that is painful to those imposing it. Because of the first-come, first-served property rights of demand depositors, they will rush to foreclose even when bank failure is not in the collective interest of depositors. Other claims like capital (in particular, long-term subordinated debt) can be renegotiated and do not provide this extra discipline. Diamond and Rajan view bank capital choice as a trade-off between commitment and stability. Long-term subordinated debt holders will not force inefficient discipline; they may roll over the debt at maturity or buy new issue.

When subordinated debt is closely held, it will provide even less discipline. Closely held debt is even more easily renegotiated and could end up being held by the owners of equity or other banks with business relations with the issuer. It is interesting that the low compliance banks in Argentina included banks that got capital from other Argentine banks. Even a rate ceiling on newly issued subordinated debt, as suggested by Calomiris (1999), may not work as intended if debt is rolled over by an old owner who wishes not to alert regulators of the bank's condition. Given the lack of a bond market in Argentina, its experience may be different from that of more developed countries, but a private placement arrangement might be the only option for smaller banks worldwide.

### **Did Subordinated Debt Commit Argentine Regulators?**

In addition to the discipline imposed at the maturity of debt, there is also a requirement of regular flotation of new debt. Does this impose extra discipline? If regulators close banks or provide other penalties to banks



that do not meet this requirement, then it will provide added discipline. However, because regulators will still make closure decisions and can extend the deadline, they may not choose to provide ex post inefficient penalties to banks. This is particularly true when many banks cannot issue new subordinated debt on attractive terms. Because the Argentine requirement became effective after the East Asian crisis, it is not surprising that the regulation was not enforced immediately. More generally, if relationship lending is present and banks are important to lending, regulators will be concerned with the flow of credit in the economy. Even international authorities such as the IMF could be less inclined to force bank closure in a crisis situation, although they should be tougher than most domestic regulators.

This may illustrate a more general point. Commitment to close or punish banks comes from political will and regulatory preferences, when regulators retain discretion not to carry through with the penalty. Commitments to issue subordinated debt may only provide verifiable information that regulators did not enforce their own rules. Although this can provide some commitment, it is not just due to the precise nature of the debt contract, such as its priority. Changing the rules can make more information public, improving transparency, or signal “tough” intent. There is a limit on the amount of market discipline a regulatory system can provide.

The currency board already limits government discretion, which means that some bailouts that require resources would require international help. This by itself provides real commitment to local regulators. However, the timing of closure and implied losses still depend on regulatory action. In this setting, the transparency effect of the BASIC system can be effective. Calomiris and Powell’s results suggest that this transparency is very beneficial in helping to make clear to outsiders that there is a given amount of commitment to discipline banks. It is less clear that it adds more commitment than already exists.

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## Discussion Summary

*Ben Bernanke* began the general discussion by suggesting that in trying to think about generalizations of the Argentine experience, it is important to consider the role of the currency board. He noted that one needs a substitute for the lender of last resort under a fixed exchange rate regime.

*Gerard Caprio* cited the Mexican experience, noting that firms as depositors acted as a source of market discipline because of the reliance on trade credit lines. He also wondered about the relationship between credit derivatives and a subordinated debt regime. Finally, he asked if the Argentine model could be exported. He expressed hope that hyperinflation is not a necessary condition.

*James Barth* pointed out that prompt corrective action was in place in the 1970s for savings and loans and that this highlights the key role of political will. *Martin Feldstein* raised the issue of the importance of foreign banks in Argentina as a safe haven. He wondered why they have not attracted even more deposits. *Michael Dooley* noted that with dollar denominated loans and with two currencies in the system, banks faced spread risk that could be avoided with dollarization.

*Eric Rosengren* observed that of the three bank failures, two have investment grade ratings, and four of the five banks that were resolved were also investment grade. External debt ratings appear to be poor predictors of banks. He asked if subordinated debt was a better predictor of bank risk. He also asked about the underwriting and associated costs of issuing subordinated debt.

*Andrew Powell* responded to Bernanke by noting that the Central Bank of Argentina has a systemic liquidity policy. He noted that this mitigates the need for a lender of last resort, and that the run to dollars limits the benefits of a lender of last resort. In response to Caprio, he noted that there was some evidence of even insured depositors leaving banks that subsequently failed. He observed that even though the deposit insurance was ex post credible, the time to resolution may be long and uncertain. He also noted that foreign banks do, in fact, have almost 70 percent of private deposits, but that there are important regional domestic banks in some sectors.

In response to Dooley, Powell noted that dollarization had been considered. He noted that banks were fairly well matched in terms of their peso-dollar books. He noted that there are some short-term peso loans such as overdraft protection and personal loans, but that there were peso deposits as well.

He observed that local rating agencies were competing and that ratings may have had low predictive power, but that now there are only four international-based accredited rating agencies. He conceded that although the Argentine regulatory rating system (CAMELS) outperformed the rating

agencies, there were some higher-rated bank failures due to fraud. Lastly, he noted that the cost of issuing subordinated debt varies by type of issuance and that deals with correspondents may be cheaper.

Also in response to Caprio, *Charles Calomiris* noted that in Mexico good and bad banks had different rates for insured deposits as well. He pointed out that banks paying higher rates had little demand deposits. He suggested that it would be good to look at the composition of deposits and debt. He agreed with Feldstein that the presence of foreign banks is a major source of market discipline, but the operating costs for foreign banks can be very high. He agreed that reliance on public ratings is risky. Lastly, he pointed out that Argentina has \$80 billion of deposits, so it may be hard to draw lessons for smaller developing economies from the Argentine experience.