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**FISCAL IMPLICATIONS OF MEXICO'S 1994
BANKING CRISIS AND BAILOUT**

Abstract

Could the cost of the 1994 Mexican banking crisis have been lower had the government reacted differently and, if so, how much lower? This paper addresses this question by looking at the Mexican crisis in comparative perspective. Forty crisis episodes around the world were statistically analyzed and the results used to evaluate the Mexican case. A robust association was found between crisis fiscal costs and government policy. Measures such as liquidity support, re-capitalization, and relaxation or non-enforcement of regulation/supervision significantly increase fiscal costs. There is also empirical support for the hypothesis that the nature of the regulatory environment may exercise a negative effect on the capacity of banks to quickly recover from crisis situations. Finally, evidence was found to support the idea that certain policies may lead to even more expensive crises when they are implemented in unreliable legal environments. The Mexican case is, overall, no exception in these regards. The fiscal cost of the 1994 Mexican crisis could have been lower had the government opted for a more limited policy strategy. Better systems of property rights protection and contract enforcement could have also induced a less expensive crisis.

Resumen

Podría haber sido más bajo el costo de la crisis bancaria mexicana de 1994 si el gobierno hubiera reaccionado de manera diferente? Este documento intenta responder esta pregunta mediante la evaluación del caso mexicano desde una perspectiva comparada. Cuarenta episodios de crisis bancaria sistémica fueron analizados estadísticamente y los resultados utilizados después para evaluar el caso mexicano. Se encontró una robusta relación entre el costo fiscal de las crisis y las medidas del gobierno para combatirlas. Estrategias como la transferencia de liquidez, la recapitalización, y la relajación de regulaciones y supervisión bancarias pueden incrementar significativamente el costo fiscal de la crisis. También se encontró que la naturaleza de la regulación bancaria puede ejercer un efecto negativo sobre la capacidad de los bancos para recuperarse rápidamente de situaciones de crisis. Finalmente, los resultados estadísticos apoyan la idea de que ciertas medidas pueden inducir crisis más caras cuando estas son puestas en marcha en marcos legales deficientes. Las conclusiones para el caso mexicano son muy similares. El costo fiscal de la crisis bancaria de 1994 en México podría haber sido menor si el gobierno hubiera optado por una estrategia anti-crisis mas limitada. Un mejor sistema de protección a los derechos de propiedad e impartición de justicia podría haber coadyuvado a reducir los costos de la crisis.

Introduction

Mexico's 1994 currency crisis had significant economic and financial consequences. On the financial side, the crisis revealed the unsoundness of a banking sector privatized a couple of years before. In the eyes of the Mexican government, the rising level of non-performing loans was putting the financial system on the verge of collapse. As a consequence, the authorities put in place a rescue operation that included actual bank interventions, as well as capitalization, relief, and restructuring programs.

Such immediate government action was relatively effective at containing the problem in the short run but, unfortunately, it soon proved to be insufficient. Non-performing loans remained at high levels while the credit supply remained low. The persistence of insolvency in a number of banks, and the questionable nature of some of their operations, forced the government to undertake new interventions and sell some of these banks. The resolution of the crisis was not exclusively complicated by financial sector problems alone. The political environment during the crisis grew increasingly hostile to the bank rescue as the Institutional Revolutionary Party (PRI) lost its long-time control of Congress in 1997.

The bank rescue has not yet been completed and under all estimations it has accounted for more than 10% of the country's GDP. The cost of the rescue operations has not been officially incorporated as public debt. Obligations acquired by the government as a result of the bailout have been transferred to the Institute for the Protection of Savings (IPAB). Every year, the Mexican Congress has to sanction IPAB's activities and, if necessary, approve the disbursement of public funds to finance this institution's asset management tasks. Still, although not officially recognized as public debt, the significant fiscal cost associated with the bank rescue and the heated debate it brought about in the legislature have raised a number of important issues. On the one hand, the Mexican government's involvement in the crisis has been severely questioned by a variety of political forces.

Criticisms have mainly focused on the extent and scope of the rescue efforts relative to the losses troubled banks were required to assume. Words like cronyism and collusion – between government and bankers – became frequently cited in the written press and regularly mentioned by important political figures as the key reason for a fiscally and economically expensive crisis. Moreover, analysts and observers of financial markets remained skeptical about the effectiveness of Mexico's bank rescue efforts because, in their view, they did not quickly restore banks' financial viability and intermediation capacities despite the enormous public investment made. A key question emerges from this debate: Could the cost of the crisis have been lower had the Mexican government reacted differently and, if so, how much lower?

The Mexican crisis cannot be considered, in a number of ways, a unique event. Banking crises have been particularly recurrent in recent decades. Over 130 countries, comprising almost three fourths of IMF's membership, have experienced significant banking sector problems during the last thirty years. According to one source, the number of actual banking crises has increased dramatically over the same period: approximately 112 episodes of systemic distress have occurred in 93 countries since the late 1970s.¹ Developing and industrial market economies alike have been affected as well as most of the so-called economies in transition. Most of these crises have also had strong negative impacts on public finances as resolution strategies usually involve the use of public funds that eventually have to be absorbed in the form of higher taxes or spending cuts. Available evidence shows that there are significant cross-national differences in the fiscal costs resulting from banking crises, begging the obvious question: What explains this variation? And going back to the country of interest: How does the cost of the Mexican crisis compare with the international experience?

Despite all the attention given to the cost and resolution of recent banking crises – in which the Mexican experience is a salient case – very few systematic empirical efforts have been made at answering the questions just posed or, in general, at understanding how the cost of solving these problems pile up. On the one hand, available literature – mostly to be found in the economics field – has basically used economic theory to produce policy recommendations aimed at minimizing the fiscal cost of crises without really identifying the extent to which these policies do have a quantifiable impact. On the other, these recommendations tend to forget that policies are never implemented in an institutional vacuum. The effectiveness of many policies implemented to fight banking crises depends heavily on adequate regulatory and oversight frameworks, as well as on legal systems capable of property rights protection and contract enforcement.

This paper attempts to contribute to fill these gaps by looking at the Mexican crisis in comparative perspective. Using econometric tools, I analyze forty crisis episodes around the world for which complete data on policies and institutions are available. The results are then used to evaluate the Mexican case through a variety of simulation exercises.

The evidence shows a robust association between the fiscal costs associated with the crisis and the policy mixes chosen by governments. More specifically, strategies such as liquidity support to banks, re-capitalization programs, and relaxation or non-enforcement of regulation/supervision contribute significantly to fiscal costs. Empirical support was also found for the hypothesis that the nature of the regulatory environment – specifically, the degree to which the commercial and non-financial activities of banks are restricted – may exercise a negative effect on the capacity of banks to quickly recover from crisis situations. Finally, the statistical results support the idea that certain policies – particularly debt-relief schemes – may

¹Caprio, G. and D. Klingebiel, *Episodes of Systemic and Borderline Financial Crises*. Washington, D.C.: The World Bank, 1999.

lead to even more expensive crises when they are implemented in unreliable legal environments. The Mexican case is, overall, no exception in these regards. The fiscal cost of the 1994 Mexican crisis could have been lower had the government opted for a more limited policy strategy. Better systems of property rights protection and contract enforcement could have also induced a less expensive crisis.

As a way of analytic framework, Section I of the paper discusses the potential impact of crisis-fighting policies and the regulatory and legal environments on the fiscal cost of the crises. An overview of the Mexican case may be found in Section II. Sections III and IV present the methodology employed for the quantitative exercises and the main results. Concluding remarks are the subject of Section V.

I – Banking Crises and Government Intervention: A Framework for Analysis

1 – The Cost of Banking Crises

The study of banking crises has been essentially centered on the micro- and macro-economic factors that determine the emergence, or increase the probability of systemic failure. As a result, we now know that banking systems become unsound and banks fail for a variety of reasons, including poor and negligent management, excessive risk-taking, a poor operating environment, fraud, or a sharp deterioration in the economic conditions that invalidates the assumptions under which loans and investments were initially made.² Economic explanations for what determines the fiscal cost of banking crises are far more limited in both number and scope, in part because useful data has barely been collected.

Typically, the severity of a banking crisis is measured in terms of its fiscal cost, defined as the ratio of total resolution costs to GDP. Resolution costs include the value of obligations acquired by the government – either in the form of shares from the insolvent bank or through the liabilities incurred if guarantees to deposits and credits are made effective; disbursement estimations associated to debt-relief and liquidity support programs; the reductions in tax income from the banking sector as a result of bank losses; and the bond-emission increases required to back up liquidity support to the financial system. Also considered part of the total resolution costs are

²Excellent surveys on the determinants of financial crises can be found in: Caprio, G., *Banking on Crisis: Expensive Lessons from Recent Financial Crises*. Washington, D.C.: The World Bank, June 1998; Chang, R. and A. Velasco, *Financial Crises in Emerging Markets: A Canonical Model*. Federal Reserve Bank of Atlanta Working Paper, July 1998; Gavin, M. and R. Hausmann, *The Roots of Banking Crises: The Macroeconomic Context*, Washington, D.C.: Inter-American Development Bank, January 1998; and Kaufman, G.G., *Banking and Currency Crises and Systemic Risk: A Taxonomy and Review*. Federal Reserve Bank of Chicago Discussion Paper, August 1999.

central bank liquidity transfers to distressed institutions, reductions in the required reserve ratios, and emergency reserve guarantees for deposits.³

Countries affected by systemic banking crises have dedicated important proportions of their gross domestic product to rescue their financial systems, as can be observed in Table 1. Economists have argued that, in short, holding the nature and the magnitude of the crisis constant, fiscal costs are a direct function of the strategies chosen to deal with the crisis. Governments across the world have implemented a variety of policies aimed at containing and solving banking crises. The most common measures are: *a)* establishment of depositor guarantees, *b)* open-ended liquidity support to banks, *c)* repeated capitalization schemes, *d)* debt-relief programs, and *e)* relaxation of supervisory and regulatory measures. When discussing these alternatives, experts have mainly focused on recommending or discrediting these measures on the basis of economic theory and a number of case observations.⁴

2 – Crisis-fighting Strategies

In the event of a banking crisis, intervention is not – and should not be – the automatically preferred choice for governments. However, a wide variety of governments have assisted their financial institutions with an assortment of policy measures. Government intervention has taken many forms but, quite frequently, it has involved at least some form of financial assistance. This section explores the most common policies governments have considered and implemented in order to contain the crisis and to rehabilitate and restructure the financial system.

³Central banks may be forced to provide reserve guarantees on deposits if a bank turns out insolvent. An important distinction needs to be made here. When a bank has liquidity problems – the bank is illiquid – it means that the bank is fundamentally solvent but is not able to meet its obligations when they fall due. An insolvent bank has a fundamental inability to fulfill its obligations; it cannot use its own funds to cover credit and other losses. Liquidity is usually reflected in an insufficient ratio of liquid assets to some indicator of business size (like total assets or total deposits). Capital adequacy indicators (ratio of capital to total assets or to risk assets) normally measure insolvency.

⁴Examples are: Amieva-Huerta, J. and B. Urriza-González, *Crisis bancarias: causas, costos, duración, efectos y opciones de política*. Santiago de Chile: CEPAL, 2000; Daniel, J.A., *Fiscal Aspects of Bank Restructuring*. Washington, D.C.: IMF, Working Paper 52, 1997; and Enoch, C., G. Garcia, and V. Sundararajan, *Re-capitalizing Banks with Public Funds: Selected Issues*. Washington, D.C.: IMF, Working Paper 139, 1999.

Table 1
Fiscal Cost of Selected Banking Crises*

<i>Country</i>	<i>Recovery Period</i>	<i>Fiscal cost</i>	<i>Country</i>	<i>Recovery Period</i>	<i>Fiscal Cost</i>
Argentina	1980-82	55.1	Mexico	1994-ongoing	19.3
Argentina	1995	1.6	New Zealand	1987-90	1.0
Australia	1989-92	1.9	Norway	1987-93	8.0
Benin	1988-90	17.0	Paraguay	1995-ongoing	5.1
Brazil	1994-96	13.2	Philippines	1983-87	13.2
Bulgaria	1996-97	13.0	Philippines	1998-ongoing	0.6
Chile	1981-83	41.2	Poland	1992-95	3.5
Colombia	1982-87	5.0	Senegal	1988-91	9.6
Cote d'Ivoire	1988-91	25.0	Slovenia	1992-94	14.6
Czech Republic	1989-91	12.0	South Korea	1997-ongoing	26.5
Ecuador	1996-ongoing	13.0	Spain	1977-85	5.6
Egypt	1991-95	0.5	Sri Lanka	1989-93	5.0
Finland	1991-94	11.0	Sweden	1991-94	4.0
France	1994-95	0.7	Tanzania	1987	10.0
Ghana	1982-89	3.0	Thailand	1983-87	2.0
Hungary	1991-95	10.0	Thailand	1997-ongoing	32.8
Indonesia	1992-94	3.8	Turkey	1982-85	2.5
Indonesia	1997-ongoing	50.0	Turkey	1994	1.1
Japan	1992-ongoing	20.0	United States	1981-91	3.2
Malaysia	1985-88	4.7	Uruguay	1981-84	31.2
Malaysia	1997-ongoing	16.4	Venezuela	1994-97	22.0
Mauritania	1984-93	15.0	Zambia	1995	1.4

* Fiscal costs as proportions of GDP.

Source: International Monetary Fund, 2000.

Liquidity Support

Open-ended liquidity support comprises measures such as central bank credit, government deposits, and long-term financing. Of the countries analyzed in this paper, approximately 68% have used some form of liquidity support.⁵ Arguably, the official purpose of these measures is to restore public confidence in the market, particularly at the early stages of the crisis, when fundamentally solvent banks face short-term liquidity problems preventing them from meeting their obligations. Liquidity support may also buy regulators some time to determine underlying solvency problems when these are not readily noticeable.

Liquidity support measures, however, may generate the kind of moral hazard problems that are likely to turn it into a very expensive strategy. In principle, for liquidity support to be effective this assistance should be provided over a limited time period and in limited amounts. It should only be supplied to solvent but illiquid

⁵These countries are: Bulgaria, Chile, Colombia, Egypt, Finland, Ghana, Hungary, Indonesia in the 1990s, Ivory Coast, Japan, Malaysia in the 1980s, Mexico, New Zealand, Norway, Paraguay, Philippines, Poland, Senegal, South Korea, Spain, Thailand in the 1990s, Uruguay, and Venezuela.

banks at penal interest rates, and only if adequate oversight exists. Usually, however, it is difficult to distinguish between illiquid and insolvent banks as many of them hold assets with no ready market value (junk bonds, non-performing portfolios, and the like). If governments decide to provide open-ended liquidity support to all banks, regardless of their financial standing, this could delay crisis recognition and interventions in de-facto failed institutions, distorting the incentive structure managers and shareholders face.⁶

Explicit Guarantees on Deposits

In many cases, financial crises have accelerated moves to introduce and strengthen formal schemes for protecting depositors in order to stem the loss of confidence in the financial system and avoid bank runs. Of the countries included in our sample, close to 68% have devised some kind of guarantee on deposits.⁷

Deposit insurance schemes may exercise a positive influence on the bank restructuring process basically for two reasons. First, well-designed deposit insurance schemes may protect market participants – particularly small depositors – unable to distinguish the quality of banks' portfolios, and encourage competition.⁸ Second, the existence of deposit insurance may help to diffuse the political pressure associated with delays in the resolution of banking crises. A credible guarantee on deposits thus may reduce the incentive to withdraw funds from banks, to lobby government for more expensive solutions, or to engage in lawsuits against financial institutions, all of which usually delay the crisis resolution process and increase its costs.

Deposit insurance schemes, however, may substantially increase the cost of a banking crisis as well. For one, universal or quasi-universal deposit insurance schemes may discourage large depositors from monitoring banks for financial soundness. They can also limit the government's maneuverability to allocate losses in the future, with the result that they may end up carrying most of the cost on the budget. In addition, although a pricing policy may be devised to minimize moral hazard, in practice forecasting financial crises is extremely difficult and deposit

⁶In Venezuela during the early nineties, for example, eight banks were granted special liquidity lines to deal with massive withdrawals because they were believed to be solvent. A few months later all these banks were unable to repay.

⁷These countries are: Bulgaria, Chile, Colombia, Czech Republic, Egypt, Finland, Ghana, Hungary, Indonesia in the 1990s, Ivory Coast, Japan, Malaysia in the 1990s, Mexico, Norway, Paraguay, Poland, Senegal, Slovenia, South Korea, Sri Lanka, Sweden, Thailand in the 1990s, Turkey in the 1990s, and Uruguay.

⁸This argument rests on the assumption that, under certain circumstances, depositors may uncritically avoid smaller financial institutions and favor state-owned banks, large private banks, or foreign banks.

insurance schemes are likely to price risk incorrectly.⁹ Assuming that risk premia can be set in a very precise manner, these may turn out very expensive for some already weak institutions and erode the financial stability deposit insurance is supposed to promote.¹⁰

Relaxing Regulation and Supervision

In almost all of the countries analyzed here governments have implemented indirect intervention policies aimed at restoring banks capital position and resolve their bad assets. The basic idea here is to tolerate certain behaviors and/or relax regulation and supervision in the expectation that banks will be able to increase their profits and, consequently, strengthen their capital base over time. One possibility is to allow the continued operation of banks known to be insolvent and that even had experienced depositor runs.¹¹ Public officials may also opt for letting severely undercapitalized banks to remain open under existing management for an extended period of time (more than a year).¹²

A third choice available to governments consists of temporarily relaxing prudential regulations such as loan classifications and loan loss provisioning requirements. Simultaneously, authorities may decide to ignore violations of laws and standards, or to deregulate the financial system in order to open alternative profit opportunities to financially weak banks (by permitting them to get involved in other businesses such as securities trading, investment banking, credit card and travel services, for example) that – frequently – do not have the necessary expertise to undertake.¹³

⁹Under this policy, insurance premia vary with the risk level of each individual bank, so that weak or poorly capitalized banks are forced to pay more. In order to avoid adverse selection, the deposit insurance scheme is made compulsory for all financial institutions.

¹⁰Garcia, for example, analyzes 17 cases in which an expected cost of crisis was calculated and used to establish target levels for the deposit insurance schemes (often expressed as a proportion of the total number of guaranteed deposits). She finds that in only four of these cases it has been possible to accumulate enough funds to meet the target. See Garcia, G., *Deposit Insurance: A Survey of Actual and Best Practices*. Washington, D.C.: IMF, 1999.

¹¹Of the cases analyzed in this paper, only 27% favored this course of action: Brazil, Bulgaria, Ecuador, Ghana, Ivory Coast, Philippines in the 1980s, Slovenia, South Korea, and the United States.

¹²About 65% of the countries in our sample opted for this measure: Argentina in the 1980s, Brazil, Bulgaria, Chile, Czech Republic, Egypt, Ghana, Hungary, Indonesia (both crises), Ivory Coast, Japan, Malaysia in the 1990s, Mexico, Paraguay, Philippines in the 1980s, Poland, Senegal, Slovenia, South Korea, Thailand (both crises), Turkey in the 1990s, the United States, Uruguay and Venezuela.

¹³Countries who implemented these policies are: Argentina in the 1980s, Brazil, Bulgaria, Chile, Czech Republic, Egypt, Ghana, Hungary, Indonesia (both crises), Ivory Coast, Japan, Malaysia in the 1990s, Mexico, Paraguay, Philippines in the 1980s, Poland, Senegal, Slovenia, South Korea, Thailand (both crises), Turkey in the 1990s, United States, Uruguay and Venezuela.

When the financial distress is relatively contained, this type of measures might help to avoid negative real sector repercussions without heavy-handed government intervention. When the crisis is systemic, however, the banking system is already so exhausted that it will probably be unable to take advantage of these opportunities. And if some banks do, it will most likely be at the expense of asset quality. In the end, this may turn out to be a very expensive strategy, as most of these banks will have to be restructured at a much higher cost.¹⁴

Repeated Capitalization Measures

Injecting capital to troubled banks is perhaps one of the most direct forms of government involvement in a financial crisis. In theory, capitalization schemes are usually directed at viable but insolvent or marginally insolvent institutions. Re-capitalization of weak financial institutions can be done only once or in stages, the latter with the purpose of mitigating the full fiscal impact of using public funds to re-capitalize banks.

It could be argued that directly injecting capital to banks has some advantages. If the government provides capital in the form of equity, its supervisory role over the restructuring process becomes more direct, banks are not imposed any repayment burden and, once the banks recover, the government will have a share in their increased value – a share that may be sold afterwards. In some instances, however, governments may feel that having such direct involvement in the banking sector may decrease confidence in an overall economic project based on liberalization and deregulation, or they might simply consider this involvement more expensive. These governments then choose to participate in the capitalization process through the issue of hybrid debt instruments or subordinated debt.¹⁵

Opponents of liquidity support claim that, although injecting capital to banks through these mechanisms may help to shore up their solvency problems, it also

¹⁴Again, the savings and loans crisis in the United States is good for illustration purposes. Savings and loans institutions first incurred significant losses during 1980-82, mostly due to maturity mismatches. Authorities then allowed them to offer adjustable rate mortgages, consumer credit, and commercial real estate loans. White comments that while savings and loans institutions were able to reduce the share of home loans in their total assets, the new policy created the incentives for them to move to areas where they did not have the necessary experience. In addition, he notes, this expansion was not accompanied by adequate prudential regulation and supervision on the part of US authorities. According to White, other policy measures that contributed to the crisis were the relaxation of interest rate ceilings on deposits, the increase in deposit insurance limits, and the decision to tolerate these institutions reporting their assets at values higher than standard accounting rules allowed. See White, L.W., *The Savings and Loans Debacle*. New York: Oxford University Press, 1991.

¹⁵Hybrid debt instruments are characterized by the following conditions: they are unsecured, subordinated and fully paid-up, they are not redeemable at the initiative of the holder or without prior consent of the supervisory authority, they are available to participate in losses without the bank being obliged to cease trading, and debt service obligations can be deferred. Subordinated debt usually has minimum maturity of five years, is subject to specific amortisation arrangements, and represents no more than 50% of banks core capital.

reduces their incentives to collect bad loans in anticipation of the next bailout. They argue that, if at all, capital injections must be highly conditional to banks meeting more strict requirements.¹⁶

Debt-relief Programs

These programs are usually perceived as an indirect way to assist troubled banks when debt payment is imperiled by macroeconomic conditions. A sharp rise in the interest rate, for example, may decrease the value of collateral relative to the loan itself, when this is contracted at variable rates. If debtors find it increasingly difficult or face reduced incentives to service their debts, massive default may follow, affecting bank asset quality and liquidity. To avoid this situation some countries have implemented a variety of universal, debt-specific, or sector-specific relief schemes.

The main disadvantage of debt-relief programs has to do, again, with moral hazard. Debtors may decide to stop servicing their debts in the expectation that the government will prolong its support to them, or will implement another program. This is particularly true when public assistance to borrowers has been regular in the past. In addition, as the Mexican case illustrates, if the real value of the collateral continues to decrease while the real value of the debt skyrockets, the incentives to default on the loans will not easily disappear.

3 – *The Institutional Environment*

The claim that institutions matter is hardly controversial these days. For many years, however, institutions were absent from any serious policy-oriented debate or analysis. Only recently have international organizations and scholars brought institutions back to the forefront of their analyses. This is in part due to the valuable insights from what has come to be called New Institutional Economics (NIE). Although most of the work under this flag concerns issues of growth and development, their key premise extends beyond this issue area and is worth recalling: countries able to “get their institutions right” are more likely to encourage optimal levels of healthy and profitable market transactions.¹⁷ Financial systems in

¹⁶In Thailand, for example, the government assisted troubled banks up to 2.5% of the capital adequacy ratio. After that, private sector agents had to match further injections. In Japan, capital injections depended on the health of the bank in question and were highly conditional on structural reform, the bank's role in the regional economy, management changes, or acquisitions of failed banks.

¹⁷A thorough description of the debate about why, how, when, and what kind of institutions matter is beyond the scope of this paper. Excellent compilations and discussions on the subject may be found in: Clague, C., Ed., *Institutions and Economic Development. Growth and Governance in Less-Developed and Post-Socialist Countries*. Baltimore: The Johns Hopkins University Press, 1997; North, D.C., *Institutions, Institutional Change and Economic Performance*. New York: Cambridge

general, and banking institutions in particular, should not be an exception to this rule.

Indeed, bank performance depends heavily on the quality of the institutional structure surrounding the financial system. The regulatory environment, for instance, heavily determines the nature of banking activities insofar as it imposes restrictions on what they can and what they cannot do. Even if some of these restrictions are temporarily removed or relaxed during a crisis it is reasonable to suppose that banks' reaction will still be at least partially conditioned by the pre-crisis regulatory regime. A major feature of regulatory frameworks is the extent to which bank activities are limited to the traditional deposit taking and loan making tasks. There is disagreement as to the implications of more or less restriction for the stability and efficiency of banking systems.

According to one view, important conflicts of interest may arise when banks are allowed to participate in markets such as securities, or real estate. In addition, the possibility of participation in these activities may also strengthen moral hazard incentives and lead to inefficient decisions.¹⁸ Another argument focuses on the consequences of less restriction for the organization of the banking industry. According to this view, an unrestricted environment may create a very concentrated banking sector, one dominated by a few functionally diverse firms. In these circumstances, market discipline is affected by less competition and even monitoring by regulators/supervisors could be affected – to the point of delaying crisis recognition.¹⁹

The main conclusion here is that relatively few restrictions on banking activities may have negative consequences for the efficiency and stability of the financial system. Following this logic it is possible to argue that the inefficiency and fragility produced by this type of regulatory environment banks may face stronger incentives to favor overly risky ventures in an attempt to solve their liquidity/solvency problems. This “gambling to resurrect” type of behavior may have more severe consequences if banks do not have the capacity or experience to undertake the other activities they are allowed to but do so in a desperate attempt to increase profits and improve their capitalization position during a crisis.

Arguments in favor of less restriction emphasize the link between business diversification and stability.²⁰ Banks that are allowed to enter other activities may be better equipped to deal with difficulties because they have alternative sources of profits. According to this view, allowing banks more freedom to engage in non-banking activities may encourage them to increase the franchise value of their

University Press, 1990; Williamson, Oliver E., *The Mechanisms of Governance*. New York: Oxford University Press, 1996.

¹⁸See Boyd, J.H., C. Chang and B.D. Smith, “Moral Hazard Under Commercial and Universal Banking” in *Journal of Money, Credit and Banking*, 30, 1998.

¹⁹See: Camdessus, M., “The Challenges of a Sound Banking System” in Enoch, C. and J.H. Green, Eds., *Banking Soundness and Monetary Policy*. Washington, D.C.: IMF, 1997.

²⁰See: Mishkin, F.S., “Financial Consolidation: Dangers and Opportunities” in *Journal of Banking and Finance*, 23, 1999.

institutions and behave prudently to sustain it. Another advantage of fewer regulatory restrictions has to do with the competitive edge diversification induces as banks can become more capable of adapting to ever changing needs in the non-financial world. In short, this view claims that less restricted environments have a positive effect on banks' efficiency and stability. Under these conditions, banks facing a crisis should be more capable of overcoming their problems without necessarily requiring government intervention.

As discussed in the previous sub-section, adequate regulatory and supervisory institutions are also very important in order for most crisis-fighting strategies to have positive effects. When quality regulation and supervision do not exist, incentives for moral hazard become even stronger and the cost of the crisis may start to pile up. Open-ended liquidity support and deposit insurance schemes are good illustrations of this point.

In theory at least it should be possible to minimize moral hazard problems associated with open-ended liquidity support provided that government time limits for the supply of liquidity are credible, and by making the assistance contingent on shareholders presenting a restructuring plan for the bank.²¹ This presupposes, however, that the government agencies involved in implementing this policy are independent enough to make such commitments credible, that adequate bank supervision exists, or that bankers have limited influence on policy-making. When none of these conditions exist, the incentive structure for both government officials and bankers is distorted, and liquidity support may end up being a highly expensive crisis resolution strategy.

In the case of deposit insurance schemes, their overall effectiveness depends heavily on their credibility. The credibility problem is twofold though. On the one hand, depositors must believe that their savings will be protected in the event of a crisis to avoid a generalized panic. On the other, limitations to the insurance coverage need to be credible as well to avoid moral hazard effects – if an insolvent bank is not closed, the deposit insurance would de facto provide expensive complete coverage as the restructuring process develops. For these reasons, the need to accompany deposit insurance schemes with adequate resources, regulation, and supervision has been repeatedly emphasized:

²¹In Poland and Finland, for example, government loans (provided through the central banks) to banks had penal – above market – interest rates in order to encourage banks to repay early. For more extensive discussions on these cases see: Drees, B. and C. Pazarbasioglu, *The Nordic Banking Crises: Pitfalls in Financial Liberalization?* Washington, D.C.: IMF, 1998; Kawalec, S., S. Sikora, and P. Rymaszewski, "Dealing with Bad Debts: The Case of Poland" in Caprio, G., D. Folkers-Landau, and T. Lane, *Building Sound Finance in Emerging Market Economies*. Washington, D.C.: IMF, 1994.

The creation of deposit insurance schemes with insufficient resources, capacity and legal powers to deal with the problems can be disastrous. These institutions give the illusion of a responsible agency without the substance. Deposit protection agencies in Kenya and the Philippines were not provided with sufficient resources to deal with the rising level of bank problems, and in the end the rescuers had to be rescued.²²

In general, problems and deficiencies in accounting and information systems, as well as in legal and judicial structures, affect market discipline and effective supervision. This, in turn, has negative repercussions on bank soundness and profitability. On the one hand, the lack of reliable, precise and timely information about debtor credit quality or bank balance sheets makes it very difficult for depositors to monitor and discipline problem banks. On the other, when accounting rules for bank asset classification are not entirely clear or adequately enforced, banks have incentives to manipulate their figures (i.e. presenting actual non-performing loans as performing because they extended due dates). As long as banks' bad assets are underestimated, loan-loss provisions will be inadequate and both capital and profits will be overestimated. Situations like this encourage expensive delays in crisis recognition.

Finally, the quality of the legal system is equally important. Bank losses and financing costs for firms could be abnormally high if the legal system makes it difficult to collect or transfer collateral, if it prevents debtors from releasing collateral in order to obtain a new loan, or if it hampers collection in bankruptcy cases. Inadequate legal systems, incapable of protecting property rights and enforcing contracts, are thus likely to increase the probability of a more expensive financial crisis as debtors face incentives to undertake riskier activities, and ultimately, incur in default.

The importance of appropriate regulatory, supervisory and legal frameworks for the adequate functioning of banking systems has been explored before in a variety of ways by scholars, financial analysts and observers alike.²³ In the context of banking crises, the impact of regulatory, supervisory and legal institutions has received less empirical attention, with important exceptions. Barth, Caprio and Levine use a sample of 60+ countries to study the impact of regulatory restrictions on the activities of commercial banks and on the mixing of banking and commerce

²²Sheng, A., "Bank Restructuring Techniques" in Sheng, A., Ed., *Bank Restructuring: Lessons from the 1980s*. Washington, D.C.: The World Bank, 1996.

²³Some excellent discussions can be found in: Dziobek, C. and C. Pazarbasioglu, *Lessons from Systemic Bank Restructuring: A Survey of 24 Countries*. Washington, D.C.: IMF, 1997; Martinez, L., *La Importancia de la Proteccion a los Derechos de Propiedad en el Sistema Financiero y en el Crecimiento Economico*. Banco de Mexico: Documento de Investigacion No. 2000-07, Diciembre de 2000; Rojas-Suarez, L. and S. R. Weisbrod, *Towards an Effective Regulatory and Supervisory Framework for Latin America*. Paper presented at the Inter-American Development Bank Conference on "Safe and Sound Financial Systems: What Works for Latin America?", Washington, D.C., September 1996; Stern, G.H., *Managing Moral Hazard with Market Signals: How Regulation Should Change with Banking*. Paper presented at the 35th Annual Conference on Bank Structure and Competition, Chicago, IL, May 1999;

on the probability of having a banking crisis.²⁴ They find that countries that restrict commercial banks from engaging in securities activities and countries that restrict commercial banks from owning non-financial firms have a higher probability of suffering a major banking crisis. In another cross-national study, Demirguc-Kunt and Detragiache find evidence that weak law enforcement institutions may add to the probability of having a banking crisis when other macro and micro economic factors are accounted for.²⁵

This paper elaborates on most of this work by looking at a less explored dimension of the problem, namely, the impact of regulatory, supervisory, and legal institutions on the fiscal cost of banking crises.

II – The Mexican Case

1 – Background

Liberalization of Mexico's financial sector started at the beginning of last decade. Mexico's banks, which had been nationalized in the early 1980s were privatized between 1991 and 1992. According to one source, the banks were sold for an average of more than three times their book value and nearly fifteen times the previous year's earnings. In total, the Mexican government received approximately \$12 billion dollars for the transaction.²⁶

At the time, the privatization process was considered a success for the Mexican government and was praised by the international community as being efficient, transparent, and lucrative. Over time, however, the privatization process became subject of heavy scrutiny, and has often been blamed for setting the stage for subsequent problems in the financial sector. Robert Mackey, for example, argues that the "price maximization" focus of privatization has been one of the "underlying causes of the banking crisis".²⁷ The new private owners had little experience in the banking business and, given the high price paid for the banks they were likely to take risks in order to recuperate their investments quickly. Over the years, the financial sector was supplying credit on a broader basis as Graph 1 shows. In fact, credit grew steadily over the 1990s to reach a climax between 1994-1995.

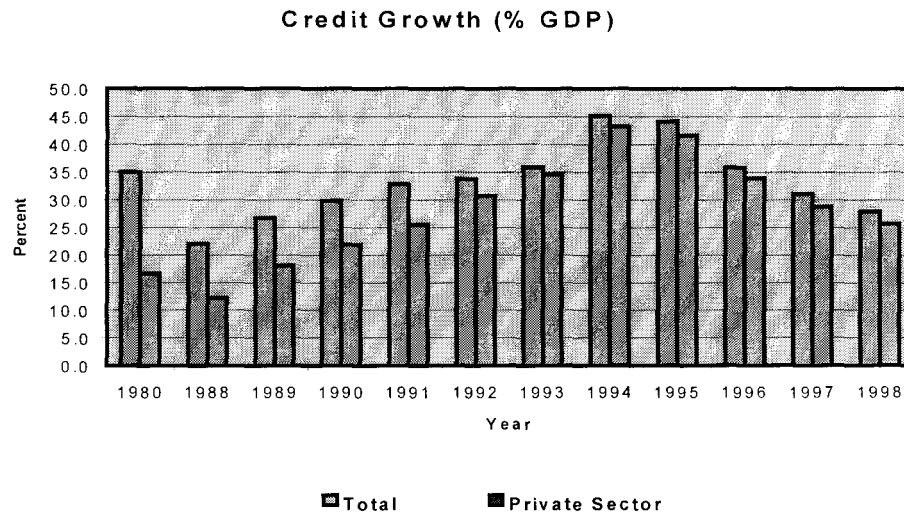
²⁴Barth, J.R., G. Caprio, and R. Levine, *Banking Systems Around the Globe. Do Regulation and Ownership Affect Performance and Stability?* Milken Institute Policy Brief, No. 15, July 2000.

²⁵Demirguc-Kunt, A. and E. Detragiache, *The Determinants of Banking Crises: Evidence from Developed and Developing Countries.* Washington, D.C.: The World Bank Working Paper, May 1997.

²⁶For further details on the process see, for example: Gruben, William C. and Robert McComb, "Liberalization, Privatization, and Crash: Mexico's Banking System in the 1990's" in *Economic Review*, Federal Reserve Bank of Dallas, First Quarter, 1993.

²⁷See Mackey, Michael W., *Report of Michael W. Mackey on the Comprehensive Evaluation of the Operations and Functions of the Fund for the Protection of Bank Savings "FOBAPROA" and Quality Supervision of the FOBAPROA Program 1995-1998.* Report Submitted to the Congress of Mexico, July 1999.

Graph 1
Credit Growth as a Proportion of GDP*



Year-end GDP

Source: Banco de Mexico and Comision Nacional Bancaria y de Valores.

There is reason to believe, however, that credit expansion was not accompanied by adequate risk assessment. Gavito, *et al.*, for example, point out that banks tended to overlook some regulations and did not devote enough attention to minimizing the problems of asymmetric information that were inherent in the market.²⁸ The rise in non-performing loans was already notorious before the 1994 currency crisis (Graph 2). As an additional sign of distress, the Mexican government had already intervened in Banco Union and Banca Cremi by November of 1994, as a result of fraudulent practices.

As foreseeable or not as the crisis might have been, there is reason to believe that the stability of the peso under a managed exchange rate policy allowed banks to run operations relatively smoothly. During 1994, severe attacks on the peso precipitated a number of devaluations despite Banco de Mexico's interventions. As foreign reserves declined heavily, authorities decided to let the peso float as their ability to sustain the currency value was exhausted.

The exchange rate crisis and subsequent devaluation of the peso had far-reaching consequences for the banking sector as a result of the sharp rise in interest rates and inflation, as well as the contraction of economic activity. After the

²⁸See Gavito Mohar, Javier, Aaron Silva Nava and Guillermo Zamarripa Escamilla, "Recovery after Crisis: Lessons for Mexico's Banks and Private Sector" in Roett, Riordan, Ed., Mexico's Private Sector: Recent History, Future Challenges. Boulder: Lynne Rienner Publishers, 1998.

devaluation, the inability of many borrowers to repay their loans meant that banks did not have sufficient capital to cover losses and, therefore, were technically insolvent. In addition, high interest rates made borrowing so expensive that credit stagnated and, with it, banks ability to earn interest income. By the end of 1995 the share of non-performing loans had reached 16.9% - a figure significantly higher than the 7.3% reported at year-end 1994 (Graph 2). Although the economy reactivated between 1996-1998, the share of non-performing loans continued well above 10% (Graph 2).

In sum, Mexican banks were already unhealthy before the 1994 peso crisis. The crisis, however, made their problems more than evident and jeopardized the stability of the entire financial system. In order to prevent a systemic breakdown, the Mexican government decided to intervene in the crisis with the policy decisions summarized in the next subsection.

2 – Mexican Policies to Fight the Banking Crisis

Liquidity Support

The first policy measure undertaken by the Mexican government at the onset of the crisis was to provide liquidity support to banks in the form of dollar credits. Mexican banks had a large foreign-exchange exposure but concerns associated to the country's external debt and low international reserve levels were putting Mexico's creditworthiness at risk. Indeed, Mexican banks were proving increasingly unable to rollover their foreign currency-denominated debt after the devaluation of the peso. Banco de Mexico then decided to supply liquidity to these banks at above-market interest rates.²⁹ Banks were able to start repaying these loans quite rapidly. In fact, towards the end of 1995 all credits had been entirely serviced.

Explicit Guarantees on Deposits

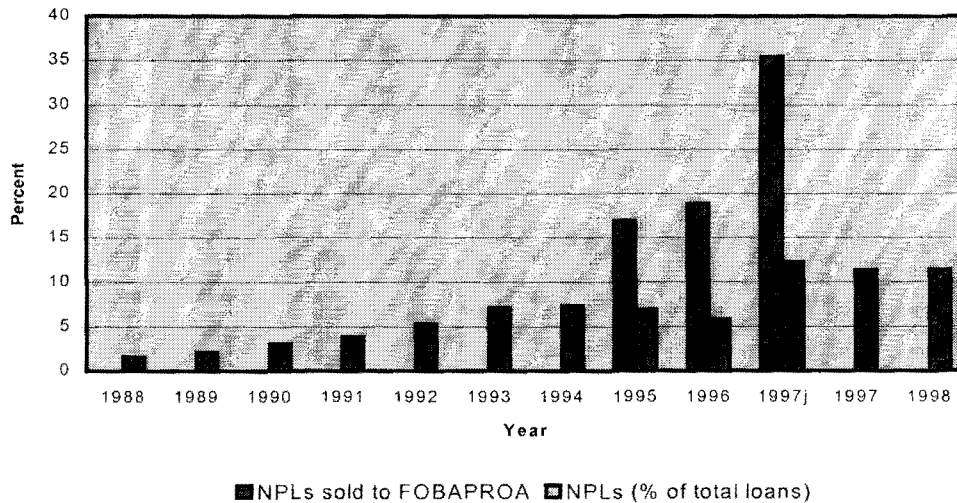
The existence of deposit insurance in the Mexican case is nothing new. Early in the 1980s Mexican authorities had devised a trust fund at the central bank with the purpose of protecting depositors' savings. By 1990, this mechanism had temporarily assisted eight banks with success.³⁰ That same year, the trust fund was transformed into the Bank Trust Fund for the Protection of Savings (FOBAPROA). Through

²⁹Dziobek reports Banco de Mexico using two different interest rates: 25% and 17.5%, the lower rate applicable only to outstanding balances below a threshold set by the central bank. See Dziobek, C., *Market-Based Policy Instruments for Systemic Bank Restructuring*. Washington: IMF, 1998.

³⁰For further detail on these cases see Martinez R., A., "Regulacion y supervision de la banca en Mexico" en CEPAL, *Regulacion y Supervision de la Banca: Experiencias en Latinoamerica y el Caribe*. CEPAL/UNDP, 1992.

FOBAPROA, Mexico has been one of the very few countries offering complete protection over deposits placed at commercial banks. The Fund, however, was not created with a systemic crisis in mind. Soon after the onset of the 1994 crisis, FOBAPROA proved to be insufficient to face the generalized insolvency in which the Mexican banking system had incurred, as the magnitude of the problem surpassed bank accumulated contributions.

Graph 2
Evolution of Non-Performing Loans



(*) Year-end figures except for 1997. The first bar for 1997 corresponds to January and the second one is the year-end figure. Both have been introduced here to account for the changes in accounting practices that took place that year.

Source: Banco de Mexico and Comision Nacional Bancaria y de Valores.

Relaxing Regulation and Supervision.

While Mexican public officials have repeatedly claimed that it was impossible to foresee the magnitude of the crisis from the indicators available before the peso devaluation, experts opined that poor regulation and supervision have played their part in the costs of resolution. McQuerry, for example, asserts that "hindsight shows that [regulatory and supervisory] agencies were unprepared and resources were insufficient for the magnitude of the problems...[...].different interpretations of core regulatory requirements in Mexico, compared with international standards, provided

another reason that potential problems were undetected or poorly understood".³¹ Furthermore, in his report to Congress, Mackey concludes that

The weak supervisory environment in which both the new and privatized banks found themselves, coupled with the implicit guarantee given by the government that all liabilities, including deposit liabilities, would be met, gave the banks the opportunity, and possibly the incentive, for excessive risk taking and removed the incentive to put in place proper management structures. The regulatory authorities have agreed that, in hindsight, the privatization process should have been conducted in a more prudent manner.³²

Finally, according to the Bank for International Settlements, Mexican authorities tolerated the occurrence of "irregular operations affecting the stability and solvency of the [financial] institution or the public interest".³³

As I discussed previously, there are reasons to believe that banks privatization was conducted in a rather careless manner, at least from the financial point of view. Still, the nature of the privatization process, although important, does not entirely reflect the extent to which the Mexican government has used discretionary instruments of intervention in the financial system. Mexican government officials allowed the continued operation of banks with serious capitalization problems for extended periods of time.³⁴

Moreover, in January of 1997 regulatory authorities required banks to report their balance sheets using a variant of the generally accepted accounting principles (GAAP) in order to impose a greater degree of disclosure on banks and improve their reporting of non-performing loans.³⁵ The introduction of this new system revealed to some extent the degree of laxitude that the Mexican government had exercised in terms of prudential regulation (see Graph 5.2.).

Capitalization Schemes

The Temporary Capitalization Program (PROCAPTE) and the Loan Purchase and Capitalization Plan were designed to help problem banks improve their asset position in the face of increasing non-performing loans. Through PROCAPTE banks were allowed to issue and sell to FOBAPROA five-year convertible bonds in order to

³¹See McQuerry, Elizabeth, "The Banking Sector Rescue in Mexico" in Economic Review, Federal Reserve Bank of Atlanta, Third Quarter, 1999.

³²See Mackey, Michael W., Op. Cit.

³³BIS, Bank Restructuring in Practice. Basel: Bank for International Settlements, p. 65.

³⁴ According to data compiled by Comision Nacional Bancaria y de Valores, this was the case of Promex, Bitel, Serfin, Atlantico and Probusa.

³⁵ Under the new system, the value of past due loans is reported as the total unpaid balance of the loan. Under the old regulation, only missed payments were entered as past due and the outstanding balance could still accrue interest. With the GAAP system, the outstanding balance is considered past due after a set number of payments (varying by type of loan) is missed.

take their capital-to-assets ratio above the minimum standard of 8% set at Basel. The government was entitled to take over those banks unable to convert their debt into equity capital. In addition, banks were charged higher inter-bank interest rates and were prohibited from issuing other subordinated debt until they exited the program. A total of six banks participated in this program. Of these, two were later intervened (Bancen and Oriente) and three required further capitalization (Serfin, Bital, and Confia). Scotiabank afterwards acquired the remaining bank, Inverlat.

Through the Loan Purchase and Re-capitalization Plan, banks were able to exchange delinquent loans for ten-year, zero-coupon, non-tradable government-issued bonds in order to improve their balance sheets and asset quality. Under this program, bank shareholders were required to increase their capital by one peso for every two pesos of bad loans transferred to the FOBAPROA trust, and to set aside approximately 25% of the total debt transferred in the form of reserves. A total of ten banks participated in this capitalization and loan purchase scheme. Of these, six required government support twice (Promex, Serfin, Bital, Atlantico, Banorte and Probursa) and one was later intervened by the authorities (Serfin).

Debt-relief Programs

The Mexican government implemented two important debt-relief schemes: the Small Debtor Support Program (ADE) and the UDI Debt Restructuring Program. Under these programs, borrowers were allowed to make more manageable payments on both principal and interest until the economy recovered. ADE provided a temporary interest rate subsidy, subject to debt restructuring. The UDI Debt Restructuring Program was created in order to deal with the negative impact of high interest and inflation rates on the real value of credits. Loans restructured under this type of inflation-indexed investment units offered the benefit of quasi-constant payments throughout the loan's entire term.

The ADE and UDI schemes were followed by other programs specifically directed towards mortgage holders, agricultural borrowers, and small and medium size firms. Together, these debt-relief schemes amounted to approximately \$174.3 billion pesos or about 4% of the estimated GDP for 1999. That same year, IPAB reported that 8% of this amount had been completely covered.

3 – Institutional Environment in Mexico

The Mexican government introduced a number of reforms to the legal framework regulating credit institutions between 1989 and 1990. At least officially, the main purpose of these reforms was to strengthen the banking sector through a variety of measures including limits to credit risk concentration and to bank stock investments; prohibition of in-house loans; minimum accounting standards and best practice provisions. Members of governing boards and chief executive officers were subject

to monitoring and sanctioning by the National Banking Commission (CNB). In fact, the CNB was given power to approve, suspend or remove board members, auditors, chief executive officers and other high-ranking staff members.³⁶

These new rules, however, were not enough to avoid the increasing deterioration of bank balance sheets at the beginning of the 1990s. In spite of appropriate rules aimed at preventing risk-prone behavior on the part of bankers, regulators lacked the resources, capacity and experience necessary to keep bank risk under control. The NBC could not keep up with the abundance of credit and an increased competition in resource allocation. The absence of credit bureaus contributed to the situation, as banks had no way of knowing the quality of small debtors' credit history.

It is probably easier to understand Mexico's deficiencies in regulation and prudential supervision before the crisis by looking at the reforms introduced in 1995. The key idea behind these reforms was to increase transparency of transactions in financial markets by forcing market participants to provide complete and reliable information. They were also aimed at strengthening the role of external auditors, risk-qualifying agencies, and credit bureaus as suppliers and evaluators of information. New rules for bank capitalization were also introduced with the idea of taking into account not only credit risk but also market risk. Accounting standards were modified to approach international practices and banks were required to consolidate their balance sheets and abide by minimum requirements for loans.

The crisis also made evident the need to have more efficient legal and judicial frameworks in order to avoid affecting bank solvency unnecessarily. Judicial institutions in Mexico are not known for their timeliness or efficiency. Bankrupt and loan default procedures can last several years, time during which the value of collateral and guarantees is severely affected. To this we should add problems of lack of courts, adequate employees, and corruption. In the end, it is reasonable to suppose that these deficiencies in the Mexican legal justice system negatively affected bank performance by contributing to increases in non-performing loans and the "no-payment" culture.

III – Methodology

A key purpose of this paper is to quantify the impact of different policy alternatives and institutional characteristics on the costs of banking crises. A statistical approach can provide valuable insights in this regard. The sample in this study has been constructed with a focus on systemic banking problems. All the countries included in the sample have experienced situations in which a significant group of financial institutions have had liabilities exceeding the market value of their assets, leading to runs and other portfolio shifts, collapse of some financial firms, and government

³⁶A more detailed discussion of these measures can be found in: Aspe, Pedro, *El Camino Mexicano de la Transformación Económica*. México, D.F.: Fondo de Cultura Económica, 1993.

intervention. These have been financial distress experiences in which an increase in the share of non-performing loans, an increase in losses (because of foreign exchange exposure, interest rate mismatch, and contingent liabilities, among other factors) and a decrease in the value of investments have caused generalized solvency problems in the financial systems and have led to liquidation, mergers, or restructuring.³⁷ The outcome to be explained in this study is the fiscal cost of banking crises – the final or most recent computation of the fiscal outlays associated with the crisis as a proportion of GDP (*fcost*).

The choice of independent policy variables follows the discussion in Section II. Basically eight policy variables were used, all of them binary. The first of these represents whether emergency liquidity support was provided to banks (*liqt*). A second one indicates the presence – or absence – of explicit guarantees or implicit protection to financial market participants in the event of loss (*depin*). Three indicators account for relaxing regulation and supervision: *a*) whether insolvent banks were permitted to continue functioning (*relsup1*), *b*) whether severely undercapitalized banks were permitted to function under existing management (*relsup2*), and *c*) whether bank prudential regulations were suspended or not fully applied (*relsup3*). I have also included binary variables to account for repeated recapitalization support (*repcap*) and the implementation of debt relief programs (*debt*).

The choice of institutional variables follows the discussion in Section III trying to capture, on the one hand, the regulatory environment in which banks operate and the capacity of the supervisor to deal with bank problems and, on the other, the efficiency and reliability of the rule of law. The banking regulatory environment chosen describes the commercial and other non-financial ownership restrictions on banks (*ownrst*). The capacity of supervision variables are: *a*) the degree of independence of the banking supervisor (*supind*), *b*) the declaring solvency power of supervisors (*solpwr*), *d*) the prompt corrective action power of supervisors (*corrppwr*), *e*) the restructuring power of the supervisor (*respwr*). I also created a compounded index from the scores of *solpwr*, *corrppwr*, and *respwr* to account for the overall official power of the regulatory/supervisory authority (*ofsupwr*). To account for the inadequacy of the legal system (including weak property rights protection and contract enforcement) I use a combined law enforcement index constructed on the basis of BERI and ICRG scores (*law*). The index is increasing in weakness.

Because government ownership is commonly associated with poorly developed and inefficient banking systems, I have included a variable that describes the proportion of bank assets owned by government (*govown*). Although it is possible to argue that government ownership may delay crisis recognition – since banks are more likely to receive public funds in situations of distress – the

³⁷Here I follow the definition provided by Sundararajan and Balino in Sundararajan, V. and T. Balino, Eds., *Banking Crises: Cases and Issues*. Washington, D.C.: International Monetary Fund, 1991.

connection is far from straightforward and remains to be more thoroughly explored.³⁸

I have used two types of control variables in this exercise: macroeconomic and banking sector indicators. Macroeconomic indicators are necessary as control variables because many crises were triggered or exacerbated by exogenous economic shocks. The economic theory available predicts that shocks that adversely affect the economic performance of bank borrowers and cannot be diversified should be positively correlated with systemic banking crises. Furthermore, for given shocks banking systems that are less capitalized should be more vulnerable. The empirical literature has highlighted a number of economic shocks associated with episodes of banking sector problems: cyclical output downturns, terms of trade deterioration, and declines in asset prices such as equity and real state among others.³⁹ Here I have explored the following macroeconomic indicators: real interest rates on deposits (*rate*), GDP growth (*growth*), change in equity prices (*stock*), current account as a proportion of GDP (*acct*), fiscal balance as a proportion of GDP (*fiscal*), change in terms of trade (*ttrade*), and foreign debt as a proportion of GDP (*fdebt*).

Generalized financial distress may also be rooted in difficulties being experienced by the members of the financial industry. For example, experiences across the globe show that crisis episodes are usually preceded by strong credit growth. Although it is expected that credit will shrink after the onset of the crisis, this is not always the case as the moral hazard literature illustrates. If no changes in credit growth are visible after the crisis has started this might be reflecting a delay in the response to the problem and, therefore, could be correlated with the crisis cost. In addition, crises associated to adverse macroeconomic shocks may tend to be more expensive in countries where the banking system has liquidity problems. Microeconomic control variables accounting for credit growth (*creditg*), capitalization (*capital*), bank borrowing (*borrow*), and liquidity (*liquid*) were incorporated to the model.

As a first approach to the problem, I used a standard generalized linear model to explain unit variations in the cost of banking crises across countries.

³⁸La Porta, Lopez-de-Silanes and Shleifer, for instance, find that greater state ownership of banks tends to be associated with more poorly developed banks, non-banks and securities markets. They, however, do not extend their discussion to account for financial fragility or the behavior of banks during a crisis situation. In a cross-national study of regulation, ownership and financial development and fragility, Barth, Caprio and Levine do not find significant evidence linking government ownership to the probability of banking crises but they do not study the behavior of state-owned banks once the crisis is present. References: La Porta, R., F. Lopez-de-Silanes, and A. Shleifer, "Government Ownership of Commercial Banks", Harvard University, unpublished manuscript, 1999; Barth, J.R., G. Caprio, and R. Levine, *Banking Systems Around the Globe. Do Regulation and Ownership Affect Performance and Stability?* Santa Monica, CA: The Milken Institute, 2000.

³⁹See for example Caprio, Gerard Jr. and Daniela Klingebiel, *Dealing with Bank Insolvencies: Cross-Country Experience*. The World Bank, 1995; Gorton, Gary, "Banking Panics and Business Cycles", *Oxford Economic Papers*, 40, 1988; Kaminsky, Graciela and Carmen Reinhart, *Op. Cit.*; and Lindgren, Carl-Johan, Gillian Garcia and Michael Saal, *Op. Cit.*

Detailed descriptions of the model and all the variables can be found in the Data and Statistical Appendix.

IV – Statistical Results

1 – General Results

An analysis of bivariate correlations shows that there is generally no strong relationship between the most common policy choices against banking crises (Table 2). From these results it is possible to infer that governments choose their policy options quite independently, in other words, they do not seem to follow a particular optimization rule. A noteworthy exception is the correlation coefficients between *depin* and *repcap*. A plausible explanation for this relationship arises from the fact that, once explicit guarantees are in place, repeated capitalization might be necessary to sustain the guarantees' credibility and, thus, avoid a bank run. This would imply that at least large depositors are capable of monitoring the liquidity status of financial intermediaries. Results below will show that while *depin* is not significant to explain the cost of the crisis, *repcap* is a highly influential policy variable.

Table 2
Correlations between Policy Options(1)

	<i>depin</i>	<i>liqt</i>	<i>relsup1</i>	<i>relsup2</i>	<i>relsup3</i>	<i>repcap</i>	<i>debt</i>
<i>depin</i>	1.000	0.305	-0.121	-0.029	0.300	0.501*	-0.055
<i>liqt</i>	0.305	1.000	-0.026	0.233	0.233	0.099	0.179
<i>relsup1</i>	-0.121	-0.026	1.000	0.041	0.297	-0.165	0.320
<i>relsup2</i>	-0.029	0.233	0.041	1.000	0.095	-0.088	-0.007
<i>relsup3</i>	0.300	0.233	0.297	0.095	1.000	0.297	0.261
<i>repcap</i>	0.501*	0.099	-0.165	-0.088	0.297	1.000	0.016
<i>debt</i>	-0.055	0.179	0.320	-0.007	0.261	0.016	1.000

(1) See Data and Statistical Appendix for detailed descriptions of each variable.

(*) Significant at the 5% level or higher.

Analysis of correlations for the institutional variables tells a rather different story (Table 3). Putting aside *ofsupwr* (see previous section and Data and Statistical Appendix), most variables describing the capacities of the banking regulator/supervisor appear to be meaningfully related. The degree of restructuring power – *respwr* – is positively and significantly correlated with *corrpwr* and *solpwr* but these two variables are not. This suggests that although these two capacities – prompt correction and declaring solvency – may be independent, they are both necessary for restructuring purposes. The results also suggest that a more independent regulator/supervisor is more likely to have greater capacity for controlling the banking sector as the positive and significant correlations between

supind, *respwr* and *ofsupwr* show. The variable capturing the nature of the regulatory environment, namely, how restricted the banking system is – *ownrst* – is not correlated the any of the previous variables suggesting that magnitude of regulation and quality of supervision are not necessarily related. Government ownership of banks – *govown* – appears to be unrelated with magnitude and quality of regulation/supervision as suggested by the insignificant correlations between these variables.

Finally, the variable *law* shows no significant correlation with any regulatory variable suggesting, at least in principle, the independence of these two institutional environments, that is, neither the quality of supervision nor the magnitude of the regulation are chosen taking the legal system into consideration.

Table 3
Correlations between Institutional Variables(1)

	<i>respwr</i>	<i>corrpwr</i>	<i>solpwr</i>	<i>ofsupwr</i>	<i>supind</i>	<i>law</i>	<i>ownrst</i>	<i>govown</i>
<i>respwr</i>	1.000	0.394*	0.482*	0.531*	0.436*	0.087	0.025	-0.244
<i>corrpwr</i>	0.394*	1.000	0.290	0.653*	0.165	0.063	0.236	-0.016
<i>solpwr</i>	0.482*	0.290	1.000	0.479*	0.392*	0.190	0.072	0.031
<i>ofsupwr</i>	0.531*	0.653*	0.479*	1.000	0.423*	0.195	0.269	0.022
<i>supind</i>	0.436*	0.165	0.392*	0.423*	1.000	-0.090	0.143	-0.147
<i>law</i>	0.087	0.063	0.190	0.195	-0.090	1.000	-0.060	0.251
<i>ownrst</i>	0.025	0.236	0.072	0.269	0.143	-0.060	1.000	0.129
<i>govown</i>	-0.244	-0.016	0.031	0.022	-0.147	0.251	0.129	1.000

(1) See Data and Statistical Appendix for detailed descriptions of each variable.

(*) Significant at the 5% level or higher.

I first specified a model that includes only policy variables to identify the explanatory power of this group of indicators ignoring the institutional environment. The main results are presented in Table 4. Of all the macro and micro-economic variables tested, only *rate* turned out consistently significant. As for the policy variables, *depin*, *debt*, *relsup1* and *relsup2* were never statistically significant. I decided, however, to keep *depin* and *debt* in subsequent model specifications because of its substantial contribution (the other variables were substantially insignificant as well) and interaction effects with institutional variables, as will be presented below.

Basic statistical results, ignoring for the moment the institutional environment, are presented in Table 4. This model specification indicates that of all the policies commonly used to deal with a banking crisis, measures such as open-ended liquidity support to banks, repeated capitalization, and some forms of regulatory relaxation account for highly expensive resolutions. These variables alone are capable of explaining more than 40% of the total variation we find in the fiscal cost of crises across countries.

Table 4
Basic Results for Fiscal Cost

Variable	Model 1		Model 2	
	Coefficient (1)	t-statistic	Coefficient (1)	t-statistic
<i>c</i>	-5.031 (5.063)	-0.994	-5.078 (4.697)	-1.081
<i>rate</i>	2.419 (1.496)	1.617	2.431 (1.410)	1.724*
<i>depin</i>	-3.320 (3.900)	-0.851	-3.300 (3.769)	-0.876
<i>liqt</i>	9.299 (3.467)	2.682**	9.303 (3.406)	2.732**
<i>relsup12 (2)</i>	-0.141 (5.065)	-0.028		
<i>relsup3</i>	6.657 (3.783)	1.760*	6.626 (3.547)	1.868*
<i>repcap</i>	10.484 (4.383)	2.392**	10.514 (4.174)	2.519**
<i>debt</i>	2.048 (4.496)	0.456	2.004 (4.139)	0.484
N	38		38	
R-Squared	0.514		0.514	
Adj R-Squared	0.397		0.417	
F	4.390		5.298	
Probability > F	0.002		0.001	

(1) Standard errors in parentheses.

(2) Interaction term: $relsup1 * relsup2$.

(**) Significant at the 5% level or better; (*) significant at the 10% level.

Interestingly, the coefficient on *depin* is negative, suggesting that the presence of deposit insurance may help to contain the crisis by avoiding bank runs or a generalized loss of confidence in the financial system. This coefficient, however, is not statistically significant (standard errors are very large), forcing us to exercise caution in its interpretation. Something similar should be said about *debt* although in this case the coefficient has a positive sign. In any case, each one of these policies is capable of increasing the fiscal cost of the crisis in sizable proportions, as will be shown below.

Using this model specification we could obtain a preliminary estimation of the individual cost associated with each policy option using the median country-crisis episode as a baseline. Table 5 presents the results of this exercise.

Table 5
Absolute Cost by Policy Choice

Choice	Policy Cost	Fiscal Cost	% Increase in Fiscal Cost
none	--	2.215	--
depin	-1.130	-1.085	-149
liqt	9.303	11.518	420
relsup3	6.626	8.841	299
repcap	10.514	12.729	475
debt	2.004	4.219	90.5

Individually, open-ended liquidity support to banks and repeated capitalization schemes are the most expensive crisis-fighting strategies, followed by regulatory forbearance and debt-relief programs. The government of the typical (median or baseline case) country-crisis episode in this sample used a three-way strategy to deal with the problem: deposit insurance, liquidity support to banks, and relaxation or non-enforcement of regulation. This government decided not to let banks in open distress and did not use repeated capitalization or debt-relief schemes. Table 6 suggests public officials have done well avoiding these two policies, particularly repeated capitalization. Although the fiscal cost of the crisis would be 13.5 percent higher had debt-relief schemes been included, a much more meaningful increment – 70.85 percent – would be observed with repeated capitalization measures. In addition, while the coefficient on *debt* was never statistically significant by itself, the one on *repcap* was always significant.

Table 6
Change in Cost by Additional Policy Choice

Choice	Fiscal Cost	% Increase in Fiscal Cost
baseline case	14.844	--
repcap	25.358	70.85
debt	16.848	13.50

As I argued earlier, however, policies are not chosen or implemented in an institutional vacuum. The correct model specification then should include variables that proxy or capture the extent and quality of bank regulation/supervision and the rule of law. Table 7 condenses the results of regressions using these measures.

Table 7
Results for Fiscal Cost with All Variables

Variable	Model 1		Model 2	
	Coefficient(1)	t-statistic	Coefficient(1)	t-statistic
<i>c</i>	-24.550 (8.759)	-2.803**	-21.145 (7.576)	-2.791**
<i>rate</i>	2.891 (1.372)	2.107**	2.823 (1.176)	2.401**
<i>depin</i>	-2.057 (3.976)	-0.517	1.792 (3.608)	0.497
<i>liqt</i>	8.537 (3.461)	2.467**	6.156 (3.054)	2.015**
<i>relsup3</i>	4.194 (3.570)	1.175	2.779 (2.089)	1.330
<i>repcap</i>	11.843 (4.105)	2.885**	9.739 (3.576)	2.723**
<i>debt</i>	4.379 (4.089)	1.071	-5.547 (4.659)	-1.191
<i>govown</i>	0.111 (.087)	1.275	0.137 (0.075)	1.836*
<i>ownrst</i>	5.451 (3.038)	1.795*	5.568 (2.602)	2.140**
<i>law</i>	0.299 (0.279)	1.074	-0.123 (0.272)	-0.453
<i>lawdebt</i>			2.145 (0.664)	3.231**
N	38		38	
R-Squared	0.636		0.743	
Adj R-Squared	0.510		0.641	
F	5.049		7.237	
Probability > F	0.000		0.000	

(1) Standard errors in parentheses.

(**) Significant at the .05 level or better; (*) significant at the .10 level.

Not one of the variables describing the capacities of the bank regulator/supervisor – *solpwr*, *corrpr*, *respwr*, and the composite index *ofsupwr* – or its degree of independence had, by themselves, statistical or substantial significance to explain fiscal cost. For instance, *solpwr* and *corrpr* exercised negative effects on *depin* and *relsup3* respectively when incorporated to the model but they tended to worsen the fit of the model without being substantially or statistically significant.

These results are not necessarily surprising since institutions may have an effect on economic outcomes only through specific policy choices. If this is the case, we expect institutional variables to have an effect on the policy coefficients – as in the previous examples – or to produce significant coefficients when interacting with policy variables. Although I included different interaction terms in a number of

model specifications (most notably *depin*solpwr* and *relsup3*corrppwr*) none of them turned out significant.

A relatively different story emerges when the nature of banking regulation is incorporated to the model. As we can see in Table 7 Model 1, the relationship between fiscal cost and the degree of ownership restrictions on banks – *ownrst* – is positive and substantial although statistically significant only at the 10% level. The model also shows that as the proportion of bank assets in government hands increases, the fiscal cost of the crisis is likely to increase as well. The coefficient on *govown*, however, is not substantially meaningful or statistically significant. The variable capturing the unreliability of the rule of law – *law* – has the expected sign (positive) but is not substantially or statistically significant by itself.

As argued previously, however, the effects of institutional variables may be better appreciated when they are made to interact with policy variables. I created different interaction terms between such variables and *law* but, following the discussion in Section II, I was particularly interested in the interaction *law*debt*. In fact, no other interaction yielded significant results (See Data and Statistical Appendix). Model 2 in Table 7 shows what happened when this interaction was included in the model. As the quality of property rights protection and contract enforcement decreases (unreliability increases), the use of debt-relief schemes may significantly increase the fiscal cost of the crisis.

The incorporation of regulatory and institutional variables has a visible effect on the coefficients, particularly than on *relsup3*. This effect is mostly attributable to *ownrst*, as this variable represents a weighted assessment of the ownership restrictions imposed on the banking sector over a period of time longer than the crisis itself. The model then suggests that the effects of temporarily relaxing banking regulation/supervision may not be as important as the original room for maneuver banks are given to find market solutions to their liquidity or solvency problems. Two policy effects, however, remain highly significant regardless of the regulatory and legal environment: open-ended liquidity support and repeated capitalization schemes. The results of the model suggest, in principle, that these policies are likely to generate expensive moral hazard effects regardless of the regulatory and legal environment in which they are implemented.

In the context of this new – and arguably more accurate – model it is possible to re-calculate the average fiscal cost of each policy variable for the typical country-crisis episode in terms of both institutions and macroeconomic conditions. The median case in this sample imposes moderate commercial ownership restrictions on the banking sector and owns approximately 24% of bank assets. This country, in addition, has a legal system with generally deficient practices for property rights protection and contract enforcement.

Table 8
Absolute Cost by Policy Choice under Typical Institutions

Choice	Policy Cost	Fiscal Cost	% Increase in Fiscal Cost
none	--	3.877149	--
depin	1.792	5.669149	46.22
liqt	6.156	10.03315	158.78
relysup3	2.779	6.656149	71.68
repcap	9.739	13.61615	251.21
debt	0.888	4.765149	22.90

Table 8 shows that while repeated capitalization schemes and open-ended liquidity support continue to be the most expensive strategies, their cost is now smaller. The institutional environment also affects the cost of deposit insurance and debt-relief schemes, making the first one positive and the second one almost negligible. Both *depin* and *debt*, however, remained statistically insignificant. Using the results of this model it is possible to assess the fiscal cost impact of a variety of institutional changes using the median policy package and macroeconomic conditions as a starting point. The main insights from this exercise can be found in Table 9.

Let us recall that the median policy package consisted of deposit insurance, open-ended liquidity support, and relaxation of banking supervision and regulation. Table 9 shows how the baseline fiscal cost changes with each standard deviation in government participation and ownership restrictions.

Table 9
Changes in Fiscal Cost by Institutional Change for Typical Case

<i>Institutional Change</i>	<i>Fiscal Cost</i>	<i>% Increase in Fiscal Cost</i>
baseline case	14.60415	--
+1 s.d. govown (43.7%)	17.24976	18.12
+2 s.d. govown (63.1%)	19.89536	36.23
- 1 s.d. govown (5.1%)	11.95854	-18.16
+1 s.d. ownrst	17.57022	20.32
+2 s.d. ownrst (Max)	20.53630	40.63
- 1 s.d. ownrst	11.63808	-20.32
- 2 s.d. ownrst (Min)	8.672002	-40.63

The model suggests that in financial systems characterized by heavy government intervention, banking crises will tend to have a higher fiscal cost, everything else constant. In fact, the percent increase associated with a movement towards majority government ownership of banks results in an approximately 36.23% increase in the fiscal cost of a crisis. Something similar can be observed in the case of regulatory

restrictions on non-banking activities for banks. As banking regulation becomes more restrictive, episodes of systemic distress appear more likely to be fiscally expensive. For instance, as the level of restrictions approach the minimum recorded in the sample (-2 s.d.), the fiscal cost of the crisis relative to the baseline case can decrease in approximately 41%, *ceteris paribus*.

Table 10
Changes in Fiscal Cost by Legal Institutional Change under Debt Relief Programs

<i>Institutional Change</i>	<i>Fiscal Cost</i>	<i>% Increase in Fiscal Cost</i>
baseline case (law = 3)	15.49215	--
law = 1	11.44815	-26.10
law = 2	13.47015	-13.05
law = 4	17.51415	13.05

Table 10 presents the results of a similar static analysis where the baseline case has been slightly modified to include the use of debt-relief schemes. The purpose here is to see the impact on fiscal cost that changes in the quality of the legal system may have under the specified conditions. Relative to the baseline case, we can see how as property rights protection and contract enforcement mechanisms improve the fiscal cost of the crisis can be reduced up to 26% when debt-relief schemes are used – everything else constant.

2 – Fiscal Cost of the Crisis in Mexico.

One of the most uncomfortable facts about Mexico's recent bank rescue has been its high fiscal cost. Even more so because these costs have been the subject of constant revisions and, in all occasions, increments have been reported. The fiscal cost has gone from representing 5.1% of GDP in 1995, to account for 19.3% in 1998. Up to 1998, the largest share of the cost corresponded to the net cost of FOBAPROA bonds, calculated from the difference between the fund's liabilities and the estimated value of its assets.⁴⁰ The recent evolution of IPAB's liabilities is presented in Table 11.

Clearly, the cost associated with the rescue and restructuring of the banking system continues to be high but, over the last three years, economic dynamism has slightly reduced the burden of IPAB's debt. As long as the Mexican economy continues to grow and IPAB remains capable of servicing the real component of its obligations, the fiscal cost of the crisis will continue of decrease.

⁴⁰A disaggregated and very detailed estimation of these different expected recovery rates may be found in: Lacoursiere, Robert J. and Alejandro A. Santa-Cruz, Mexico: Banking Sector. Bear-Stearns Emerging Market Equity Research Paper, April 1999.

Table 11
Recent Evolution of IPAB's Liabilities*

<i>Program</i>	<i>Balance</i> <i>1999</i>	<i>Balance</i> <i>% GDP(1)</i>	<i>Balance</i> <i>2000</i>	<i>Balance</i> <i>% GDP(1)</i>	<i>Balance</i> <i>2001</i>	<i>Balance</i> <i>%GDP (1)</i>
Capitalization and Loan Purchase Schemes	86.32	1.72	92.37	1.59	98.06	1.65
Bank losses	99.51	1.98	125.37	2.16	79.78	1.34
Liabilities derived from interventions	177.16	3.53	71.13	1.24	68.44	1.15
Loans (banks and other entities)	205.50	4.20	271.98	4.69	265.34	4.49
Debtors Program	16.50	0.33	17.78	0.31	9.41	0.16
Donations-in-Payment Program	14.01	0.28	14.52	0.25	--	--
Other liabilities	1.25	0.03	1.04	0.01	--	--
Savings protection	1.20	0.02	84.54	1.46	160.88	2.72
Total	601.45	12.09	678.93	11.71	681.91	11.51

(*) Billion pesos. Both short- and long-term liabilities included. (1) Current prices, year-end.
Sources: Balance data is from IPAB; GDP data is from INEGI.

The results of a static analysis on individual policy choices for the Mexican case are presented in Table 12. As for the whole sample, *liqt* and *repcap* turned out to be the most expensive crisis resolution policies in Mexico. The marginal cost of each policy in Mexico and the median case in the sample is pretty much the same; more interesting differences are observed when the resulting fiscal cost from implementing each policy measure is calculated under the median and Mexico's institutional conditions.

Mexico is close to the median case in terms of legal institutions – overall the country is considered to have generally deficient practices of property rights protection and contract enforcement. The regulatory environment, however, appears to be more liberal than in the typical country in the sample. In fact, Mexico is categorized as a country that imposes moderate restrictions on bank commercial and non-financial activities. In terms of ownership of banks and policy strategies to fight the crisis, the Mexican government is very distant from the mean government. Before the 1994 crisis the proportion of bank assets controlled by the Mexican government was essentially negligible.⁴¹ In addition to the use of deposit insurance, liquidity support to banks, and relaxation or non-enforcement of regulation (that characterize the typical case in the sample), the Mexican government also implemented repeated capitalization and debt-relief schemes.

⁴¹After privatization, according to IMF reports. The situation has changed significantly since the Mexican government intervened in the 1994 crisis. Some experts believe the Mexican government to currently hold approximately 25% of total bank assets as a result of bank intervention and restructuring operations but point out that this figure is in constant flux, making it very difficult to confirm.

Table 12
Cost by Policy Choice under Mexico's Institutional Environment

<i>Choice</i>	<i>Policy Cost</i>	<i>Fiscal Cost</i>	<i>% Increase in Fiscal Cost</i>
none	--	0.92	--
depin	1.92	2.84	208.71
liqt	6.28	7.20	682.61
relysup3	2.91	3.83	316.30
repcap	9.87	10.79	1072.83
debt	0.89	1.81	97.39

It is interesting to note that despite the use of such expensive policies, the overall fiscal cost associated with using each policy – holding macroeconomic and institutional variables constant – is smaller for Mexico than for the typical case in the sample. This suggests that had the banking system been more restricted or the Mexican government more involved in it, the cost of the crisis would have been higher.

Could the fiscal cost of the crisis have been lower? The model would predict that this would have been the case in the absence of Banco de Mexico's dollar-denominated credit support, PROCAPTE and the Loan Purchase and Capitalization programs. The ADE and UDI schemes would have had an almost negligible effect on the total resolution costs but, given the quality of Mexico's legal institutional environment, these programs increased the fiscal burden of the crisis by approximately 4.15%. The impact of this and other institutional variables on the cost of the crisis for the Mexican case is more extensively described in Table 13.

Table 13
Changes in Fiscal Cost by Institutional Change for Mexico

<i>Institutional Change</i>	<i>Fiscal Cost</i>	<i>% Increase in Fiscal Cost</i>
baseline case*	22.27**	--
govown at mean level	25.61	15.01
govown at minimum	22.27	0.00
govown at maximum	32.13	44.28
ownrst at mean level	25.06	12.53
ownrst at minimum	18.10	-18.73
ownrst at maximum	30.63	37.54
law = 1	18.23	-18.14
law = 2	20.26	-9.03
law = 4	24.31	9.16

(*) $depin=1, liqt=1, relysup3=1, repcap=1, debt=1, govown \cong 0, ownrst \cong 2, \text{ and } law = 3.$

(**) Predicted fiscal cost for Mexico; $Pr [37.15 > Y_0 > 7.39] = 95\%$

According to the model, Mexico could have reduced the fiscal cost associated with the crisis by approximately 19% had regulation been less restrictive before the crisis. Perhaps, indeed, diversification imposes some degree of market discipline and makes banks not only more responsible but also more adaptable. Again we find that the quality of legal institutions matters substantially when the potential for moral hazard situations is high. A significant improvement in the quality of the legal system would have reduced the fiscal costs of the Mexican crisis in up to 18%, even in the presence of repeated capitalization and debt-relief programs. For the most part, these conclusions are consistent with those obtained from the analysis of the whole sample although the numbers are different for obvious reasons.

V – Concluding Remarks

This paper has tried to put the 1994 Mexican banking crisis into perspective. It has done so by identifying the factors that can potentially contribute to the fiscal cost associated with a banking crisis and by quantifying their impact. The evidence presented provides support for the claim that the policy mix used to fight the crisis significantly affects the total price tag attached to the problem resolution but also suggests that the regulatory and legal environment in which the crisis takes place may exacerbate or ameliorate not only the effects of the crisis itself, but those of the policies employed to contain and resolve it. According to the model, the relatively high cost of Mexico's bank rescue is mainly attributable to FOBAPROA's recapitalization activities, open-ended liquidity support to banks, and two debt-relief programs (ADE and UDI) implemented under deficient systems of property rights protection and contract enforcement.

The preceding analysis begs the question: Could the Mexican government have done better? The statistical results suggest that Mexico did not do that bad after all, if we compare the 1994 crisis with similar episodes across the globe. Of course, most of the time these comparisons are of interest and relevance only to a small group of people. The majority of citizens may legitimately ask whether other choices were available, that is, whether bailing out banks was the only feasible alternative. If the answer to this question is affirmative, then it is equally legitimate to ask whether a different – less expensive – support strategy could have been chosen.

Intervening to support banks in a crisis is not – and should not be – the automatically preferred choice of governments. Before a decision of this sort is made, we expect governments to ponder the costs and benefits of alternative strategies. Letting (at least some) banks fail, for instance, should not be discarded as an adequate option to induce market discipline. The experience of other countries has shown that it is possible for healthy banks to capture deposits or buy assets from weak banks, which helps to strengthen the whole system.

According to the official story, there was no other choice but to support the banking system. And, quite possibly, this was indeed the right decision. The Mexican government was successful at preventing a systemic breakdown in the country's financial system without forcing any savings losses or inducing a major payments suspension. Still, once the decision to support the banks was made, the Mexican government could have reduced the expected fiscal cost of the crisis had they chosen an alternative policy mix, most notably, one that avoided repeated capitalization of banks that, at the end of the day, had to be intervened and restructured. A different strategy could have also reduced the potential for moral hazard situations in the future on the part of both creditors and debtors. The negative fiscal impact of the policies implemented to deal with the crisis could have also been lower under a more adequate institutional structure.

On the one hand, there are reasons to believe that re-capitalization programs generated incorrect incentive structures for banks. It is yet unclear whether banks perceived that the cost of recovering their assets from FOBAPROA would be higher than those associated with loan loss or with keeping the Fund's promissory notes. In addition, the irrecoverable portion of these assets has to be absorbed by the federal government as losses. On the other hand, the extent to which banks and borrowers were actually benefited by the ADE and UDI programs is questionable. The available evidence suggests that these programs were not entirely successful at dealing with the culture of "no payment". As the value of collateral decreased with respect to the value of the loan due to high interest rates, many borrowers did not find enough incentives to service their debts and the share of non-performing loans remained significant towards the end of the 1990s. Because policies are not immune to the institutional environment in which they are formulated and implemented, the shortcomings of Mexico's justice system and legislation should be seriously considered. In this sense, a step in the right direction may have been taken with the introduction of a new bankruptcy and payment suspension law which significantly improves incentives against default and facilitates asset (collateral) collection procedures.

It has been argued that the Mexican crisis should be evaluated taking into account the limitations of bank monitoring and supervision practices. Although no evidence was found in this regard, the issue certainly deserves more attention. During the last years important reforms have been made to accounting and reporting standards and procedures. We can only hope that these reforms increase the transparency of financial operations and balance sheets and that, as a result, simplify monitoring and supervision.

A final comment is concerned with the statistical results. The evidence presented here is preliminary and should be interpreted with caution. The reader will be able to see that some results are clearly affected by the sample size while others are attributable to the way the independent variables are measured. A larger data set and more disaggregated policy and institutional indicators should be able to measure cross-country variations better. Obviously, the conclusions are also the product of static analysis – in reality, variables interact with each other at any given point in time and isolating the effects of each one may become a daunting task. Still, these results are a good starting point for further research into the politics and economics of banking crises, and even more so as better data becomes available.

Data and Statistical Appendix

The Sample

The sample is composed of observations from forty different country crisis episodes and includes developing, advanced industrial and transition countries alike. It should be noted that some countries are represented twice in the sample (Mexico, Argentina, Turkey, Thailand, Philippines, and Indonesia) because they have had more than one crisis episode. I have decided, however, to treat each one of these episodes as independent events adding a control factor to the right hand side of the equation.

The sample was also constructed on the basis of data availability. Financial crises have taken place in more countries than those included in the sample. Unfortunately adequate and complete data on fiscal costs, policies used, regulatory practice and institutions are not available for all countries. On the other hand, I have tried to make the sample as comprehensive as possible by incorporating cases from different parts of the world. It is reasonable to assume therefore that most economic, social and political contexts are being taken into account. Countries with crisis costs equal to zero (i.e. that have not experienced systemic crises) have also been excluded from the sample.

Finally, most of the crisis episodes in the sample started after 1980 (except in the case of Spain). This is partly due to the fact that vast majority of financial crises have occurred throughout the eighties and nineties. In addition, these cases are also better documented, increasing data availability.

Variable Descriptions and Data Sources

Fiscal Cost (cost). The final – or most recent – computation of the fiscal outlays associated with the crisis as a proportion of GDP. Data source: International Monetary Fund (IMF).

Liquidity Support (liqt). Binary variable taking on the value of 1 if emergency liquidity support was provided to banks during the crisis, 0 otherwise. Data sources: International Monetary Fund and Bank for International Settlements.

Deposit Insurance (depin). Binary variable that takes on the value of 1 if explicit guarantees or implicit protection to financial market participants were in place before the onset of the crisis, 0 otherwise. Data source: Bank for International Settlements.

Relaxation of rules/regulation/supervision 1 (relsup1). Binary variable that indicates whether insolvent banks were permitted to continue functioning for a period of six months or more. Data source: Bank for International Settlements.

Relaxation of rules/regulation/supervision 2 (relsup2). Binary variable that equals 1 if bank prudential regulations were suspended or not fully applied at any moment during the crisis, 0 otherwise. Data source: Bank for International Settlements.

Relaxation of rules/regulation/supervision 3 (relsup3). Binary variable that takes on the value of 1 if any type of regulatory tolerance was exercised at any time during the crisis. Data source: Bank for International Settlements.

Repeated Capitalization (repcap). Binary variable that indicates the presence or absence of repeated capitalization measures during the crisis. Data source: International Monetary Fund.

Debt-relief Schemes (debt). Binary variable that accounts for the use of debt-relief or debtor-support programs during the crisis. Data sources: International Monetary Fund and Bank for International Settlements.

Interest Rates (rate). Measured as the average real interest rate on deposits for one year before the onset and over the duration of the crisis. Data source: International Financial Statistics, IMF.

Economic Growth (growth). Entered as average real GDP growth rate for one year before the onset and over the duration of the crisis. Data sources: The World Bank, International Monetary Fund.

Equity Prices (stock). Describes the average percent change in stock market prices for one year before and over the duration of the crisis. Data source: International Financial Statistics, IMF.

Current Account (acct). Indicates changes in the current account as a proportion of GDP for two years before and over the duration of the crisis. Data source: International Financial Statistics, IMF.

Fiscal Balance (fiscal). Measured as the average fiscal balance as a proportion of GDP for two years before and over the duration of the crisis. Data source: International Financial Statistics, IMF.

Terms of Trade (ttrade). Entered as average percentage change in terms of trade for one year before and during the crisis period. Data source: International Financial Statistics, IMF.

Foreign Debt (fdebt). Describes the average foreign debt as a proportion of GDP for one year before and over the crisis period. Data source: International Financial Statistics, IMF.

Credit Growth (creditg). Measures the average growth of bank credit to the private sector as a proportion of GDP for one year before and over the duration of the crisis. Data sources: International Financial Statistics and The World Bank.

Bank Liquidity (liquid). Indicates average loan-to-deposit ratios for one year before and over the whole duration of the crisis. Data sources: International Financial Statistics, IMF and Bank for International Settlements.

Bank Borrowing (borrow). Accounts for the average proportion of central bank lending to total bank deposits for one year before and over the entire crisis

period. Data sources: International Financial Statistics, IMF and Bank for International Settlements.

Legal Quality (Law). Combined index that reflects quality of protection to property rights, contract enforcement and overall respect for the rule of law. The variable is coded to take on values from 1 to 4, where a higher score indicates lower levels of institutional quality. Data sources: International Country Risk Guide (ICRG) and Business Environmental Risk Intelligence (BERI).

Government ownership (govown). Proportion of total commercial bank assets owned by government. Data source: The World Bank.

Ownership restrictions (ownrst). Combined index that measures: *a*) the degree to which national regulatory authorities allow commercial banks to engage in securities, insurance, and real estate activities, and *b*) the extent to which non-financial firms are allowed to own and control banks. The index goes from 1 to 4 where a higher score indicates a more restricted system.

The Econometric Model

As a first approach to the problem, I used a standard linear model to explain unit variations in the cost of banking crises across countries. The hypothesis is that crisis cost is a function of a vector of n explanatory variables X_i . Let Y_i be a variable that takes on values within a continuous range for crisis episode C_i , being equal to the minimum value of zero only when C_k does not present fiscal costs or these are negligible.

Let also β be a vector of n unknown coefficients which values will minimize the function $U_i = Y_i - X_i\beta$, where U is a vector of disturbances. The estimated β vector of coefficients will indicate the magnitude of the change in Y_i that results from a one-unit change in X_i .