

Caballero, Ricardo J.

**Working Paper**

## Structural Volatility in Mexico: A Policy Report

Working Paper, No. 420

**Provided in Cooperation with:**

Inter-American Development Bank (IDB), Washington, DC

*Suggested Citation:* Caballero, Ricardo J. (2000) : Structural Volatility in Mexico: A Policy Report, Working Paper, No. 420, Inter-American Development Bank, Research Department, Washington, DC

This Version is available at:

<https://hdl.handle.net/10419/88025>

**Standard-Nutzungsbedingungen:**

Die Dokumente auf EconStor dürfen zu eigenen wissenschaftlichen Zwecken und zum Privatgebrauch gespeichert und kopiert werden.

Sie dürfen die Dokumente nicht für öffentliche oder kommerzielle Zwecke vervielfältigen, öffentlich ausstellen, öffentlich zugänglich machen, vertreiben oder anderweitig nutzen.

Sofern die Verfasser die Dokumente unter Open-Content-Lizenzen (insbesondere CC-Lizenzen) zur Verfügung gestellt haben sollten, gelten abweichend von diesen Nutzungsbedingungen die in der dort genannten Lizenz gewährten Nutzungsrechte.

**Terms of use:**

*Documents in EconStor may be saved and copied for your personal and scholarly purposes.*

*You are not to copy documents for public or commercial purposes, to exhibit the documents publicly, to make them publicly available on the internet, or to distribute or otherwise use the documents in public.*

*If the documents have been made available under an Open Content Licence (especially Creative Commons Licences), you may exercise further usage rights as specified in the indicated licence.*



*Inter-American Development Bank  
Banco Interamericano de Desarrollo (BID)  
Research department  
Departamento de investigación  
Working Paper #420*

# **Structural Volatility in Mexico: A Policy Report**

Ricardo J. Caballero\*

**\*Massachusetts Institute of Technology,  
National Bureau of Economic Research**

August 2000

**Cataloging-in-Publication data provided by the  
Inter-American Development Bank  
Felipe Herrera Library**

Caballero, Ricardo J.

Structural volatility in Mexico : a policy report / Ricardo J. Caballero.

p. cm. (Research Dept. Working paper series ; 420)

Includes bibliographical references.

1. Structural adjustment (Economic policy)--Mexico. 2. Mexico--Economic policy--1994-. 3. Mexico--Economic conditions--1994-. 4. Economic stabilization--Mexico. I. Inter-American Development Bank. Research Dept. II. Title. III. Series.

338.543 S473--dc21

82000

Inter-American Development Bank  
1300 New York Avenue, N.W.  
Washington, D.C. 20577

The views and interpretations in this document are those of the authors and should not be attributed to the Inter-American Development Bank, or to any individual acting on its behalf.

The Research Department (RES) publishes the *Latin American Economic Policies Newsletter*, as well as working papers and books, on diverse economic issues. To obtain a complete list of RES publications, and read or download them please visit our web site at:  
<http://www.iadb.org/res/32.htm>

## **Contents**

1. SUMMARY AND GENERAL RECOMMENDATIONS	5
2. THE FACTS AND MECHANISMS	10
2.1 Aggregate Volatility	10
2.2 Weak International Financial Links and External Shocks	12
2.3 Domestic Shocks And Amplification Mechanisms	17
2.3.1 The Credit Crunch and Financial Underdevelopment Problem	17
2.3.2 The (Shadow) Fiscal Fragility Problem	26
2.3.3 The Credibility and Monetary Policy Problems	30
3. TAKING STOCK AND POLICY RECOMMENDATIONS	34
3.1. Improving the Links with International Financial Markets	34
3.2. Fostering Domestic Financial Markets and Credit Flows	38
3.3. Strengthening Fiscal Resilience	41
3.4. Limiting High and Low Frequency Fluctuations in the Nominal Exchange Rate	42
Appendix	46
References	54

## **Acknowledgments**

This report is one of a series of brief studies aimed at identifying and hinting at possible solutions to the main sources of volatility in several Latin American economies. This series is being directed by the author of this report by request from the Office of the Chief Economist at the IADB, and can be downloaded from <http://web.mit.edu/caball/www>. I am particularly grateful to Ricardo Hausmann for many discussions related to the project, to Vittorio Corbo, Lorenza Martinez and Alejandro Werner for their comments, and to Fernando Broner, Guido Lorenzoni and Eric Parrado for their insightful comments and research assistance. I am indebted to AEI, where part of this report was written, for its hospitality and support. None of them, and in particular the IADB, is responsible for the opinions expressed in this report.

## 1. Summary and General Recommendations

After a rudderless path during much of the 1980s, Mexico embraced dramatic reforms. Inflation lost two digits thanks to the Economic Solidarity Plan, banks and a wide range of public corporations were privatized, the land tenure system was modernized, the private sector was authorized to participate in infrastructure projects, the public deficit vanished, public debt markets were developed, exchange rate controls were abolished, foreign investment and imports were liberalized, NAFTA was passed, and the list goes on. Leveraged by the advent of the Brady Plan, the reforms were cheered by the international financial community, which supported them with substantial capital flows. This cooperation found an abrupt end in the mid-1990s, when Mexico, as in the early 1980s, was again at the epicenter of an emerging markets crisis. Mexico's relative "success" during the current global crisis has surprised most, demonstrating that the fear of yet another devastating crisis is latent.

As with the author's other studies of volatility, the goal of this investigation is not so much to describe the most directly observable culprits during crises—be it an overvaluation, a large current account deficit, or a preceding lending boom—as it is to identify and hint at potential remedies for the structural reasons behind these episodic outbreaks of uncertainty and systemic breakdowns.

As in most other emerging economies, (a) *weak international financial links and external conditions* have played a central role in Mexico's vulnerability during the 1990s, just as they did in the early 1980s. But external factors alone have not been responsible, as internal factors have both invited and amplified the external ones. There are at least three domestic vulnerability factors that are strongly complementary. The first and most central is (b) *a recurrent credit crunch and financial underdevelopment problem, with particularly fragile banks*.<sup>1</sup> Partly because of this and the external factors mentioned above, there is also (c) *a weak fiscal situation, not due to chronic imbalances, but due to extreme vulnerability to internal and external shocks*; and (d) *a latent monetary policy credibility problem*.

---

<sup>1</sup> See Caballero and Krishnamurthy (1999) for a model of the negative dynamic interactions between weak international financial links and underdeveloped domestic financial markets.

This report is optimistic, nonetheless. Mexico has recognized many of these shortcomings and is gradually making progress on them. Moreover, it is probably the case that the performance of post-reform Mexico during the years preceding the 1994-1995 crisis has been overly criticized. The precarious initial conditions its banks faced after years of financial repression and inflation, the sectoral and technological imbalances caused by a long period of protectionism and under-investment, and the weak performance of its main trading partner and pulling factor, the U.S., during the early stages of the reform period, did not offer Mexico much access to a risk-free, export-led transition.<sup>2</sup> On the other hand, the U.S. dependence factor does raise concerns regarding whether Mexico's success during the recent wave of crises is primarily due to a sounder structure or due to a fast growth, low interest rate U.S. scenario.

In a nutshell, and matching the deficiencies highlighted above, this report contains policy recommendations on four general items:

- 1) *Improving external financial links and reducing direct exposure to external shocks.* In addition to dealing with the domestic problems mentioned in the report, which are in themselves conducive to fragile international financial links, there are at least five slightly more specific recommendations and considerations:
  - a) Adopt international standards of contractual enforcement, disclosure, and corporate governance.
  - b) Find a mechanism to institutionalize lines of credit, and credit relationships in general, between large corporations with access to foreign financial markets and their domestic suppliers, which in turn may do the same with other domestic firms. The *maquiladora* sector is an obvious candidate for such development.
  - c) Build self and contracted insurance mechanisms against external shocks. In order to build self-insurance, consider a public sector oil-stabilization fund and a financial crisis stabilization fund (earmarking foreign reserves for this purpose

---

<sup>2</sup> See Sachs, Tornell and Velasco (1996) for a view that also lowers the blame put on Mexico's policymakers, since it relies on the realization of a bad equilibrium among many possible ones. On the other end, see Dornbusch and Werner (1994) for one of the first and–pre-crisis–articles, and hence its merit, blaming the lack of growth primarily on the exchange rate overvaluation.

- and charging the private sector for their opportunity cost). To build external insurance continue expanding the range of contracted credit lines. The costs associated with these contracts could be reduced by making them contingent on clearly verifiable and exogenous events (e.g., oil prices, U.S. shocks, etc.).
- d) Along similar lines, the credit line against political cycles contracted recently is an excellent idea. However, it does have a problem in its predictability. Everybody knows when elections are scheduled, which may lead to opportunistic behavior. Ideally, one should make the cost of the contract more expensive as the public deficit and other traditional indicators of misconduct in a political cycle deteriorate.
  - e) Finally, it is apparent that most of the volatility in capital flows comes from speculative flows (in contrast, FDI is very stable). Part of this volatility is not due to “healthy” speculation, but rather to problems with foreign investors’ balance sheets during crises. It may be prudent to require liquidity ratios (that could take the form of investment in prime foreign assets) from foreign institutional investors, or to favor closed over open-end funds. Since financial integration is a primary goal, nonetheless, every effort must be made to avoid costly net taxation of capital flows.
- 2) *Accelerating the path of domestic financial deepening and strengthening existing arrangements.* In particular, consider:
- a) Mexico needs banks urgently. A speedy re-capitalization of the most viable domestic banks, and importing the rest from countries with good supervision, should be high on the short-term agenda.
  - b) In the medium term, one can be more subtle about tradeoffs. While foreign banks from G10s often come with solid built-in supervision from their homelands, they may not always facilitate the smoothing of sharp aggregate contractions as much as equivalent domestic banks do. This said, the solution to this potential problem lies not in limiting foreign banks’ participation, but in ensuring that structurally important financial lines remain open when necessary.



- c) Most importantly, domestic collateral (e.g., real estate) is often inadequate for crises, particularly those triggered by the sudden scarcity of capital inflows. The same holds true of loans to some non-tradable sectors. This suggests imposing additional capital-adequacy requirements with respect to assets exposed to systemic risk, and to foster the usage of collateral that is more adequate to foreign investors.<sup>3</sup> Such measures would also significantly help strengthen Mexico's external financial links. Moreover, with the passage of time these processes should reinforce each other, broadening the class of assets that are deemed acceptable to foreign investors.
- d) In order to compute these macro-capital adequacy ratios it is imperative that banks' off-balance sheet activities be monitored, for it appears that a significant fraction of the macro-risk taken during the 1994-95 crisis took place through this channel.
- e) Also worrisome is the unbalanced development of financial markets in Mexico. The mix of underdeveloped domestic financial markets with very sophisticated hedging instruments may generate a dangerous imbalance, as international investors use the peso-forwards to hedge other regional currencies as well. Swings and flows may be too large relative to the size of Mexico's financial system. There may be a need to regulate participation in those markets until the rest of the financial system develops.
- f) During the period following the 1994-1995 crisis, Mexico has been able to finance substantial amounts of private investment and activity, despite a most severe credit crunch. This suggests that a wide array of informal lending channels have developed. An effort should be made to institutionalize and support these activities.
- g) As the case of Chile has shown, pension funds have great potential in terms of developing domestic financial markets. This should be one of the criteria considered when determining the constraints and possibilities of Mexico's NSPs.

---

<sup>3</sup> E.g., shares or claims on export-oriented companies, which may in turn hedge their own risks with claims from non-tradables. Of course these transactions may be carried out within the banking system, but the point is that the macro-capital adequacy ratio must take these into account.

- h) More generally, fostering and nurturing the development of well supervised institutional investors is an efficient mechanism to delegate the enforcement of good corporate governance standards to the private sector, as these institutions often consider these factors in their investment decisions.
- 3) *Reducing public accounts exposure to internal and external shocks.* To this effect, consider:
- a) Implementing an oil-stabilization fund as described above.
  - b) Reducing the implicit bailouts strategy by institutionalizing an explicit insurance system where fees and contributions are clearly established.<sup>4</sup>
- 4) *Stabilizing very high and very low frequency movements in nominal exchange rate.*
- a) Sudden jumps in the exchange rate are harmful to the domestic economy and those of neighbors. Very low frequency movements are only conducive to inflation. Fluctuations in the medium frequency of nominal exchange rates may facilitate adjustment in the presence of nominal rigidities. Suppressing very high and very low frequency movements through a *viscous-anchored* exchange rate system (or “flexible” currency board) seems sound. This could be done with a simple partial adjustment model, where the driving force is largely predetermined (e.g., the current account deficit, U.S. credit conditions, etc.) and the anchor is the unit-parity to a strong currency.
  - b) As mentioned above, it is important to create explicit stabilization funds and other mechanisms that reduce the fiscal impact of private sector imbalances.
  - c) Stabilization of the exchange rate reduces the cost associated with taxing and limiting the use of future markets. The latter is needed, as discussed above, because investors seem to use the Mexican future markets to hedge against the risk of other currencies correlated to Mexico’s through financial contagion.

---

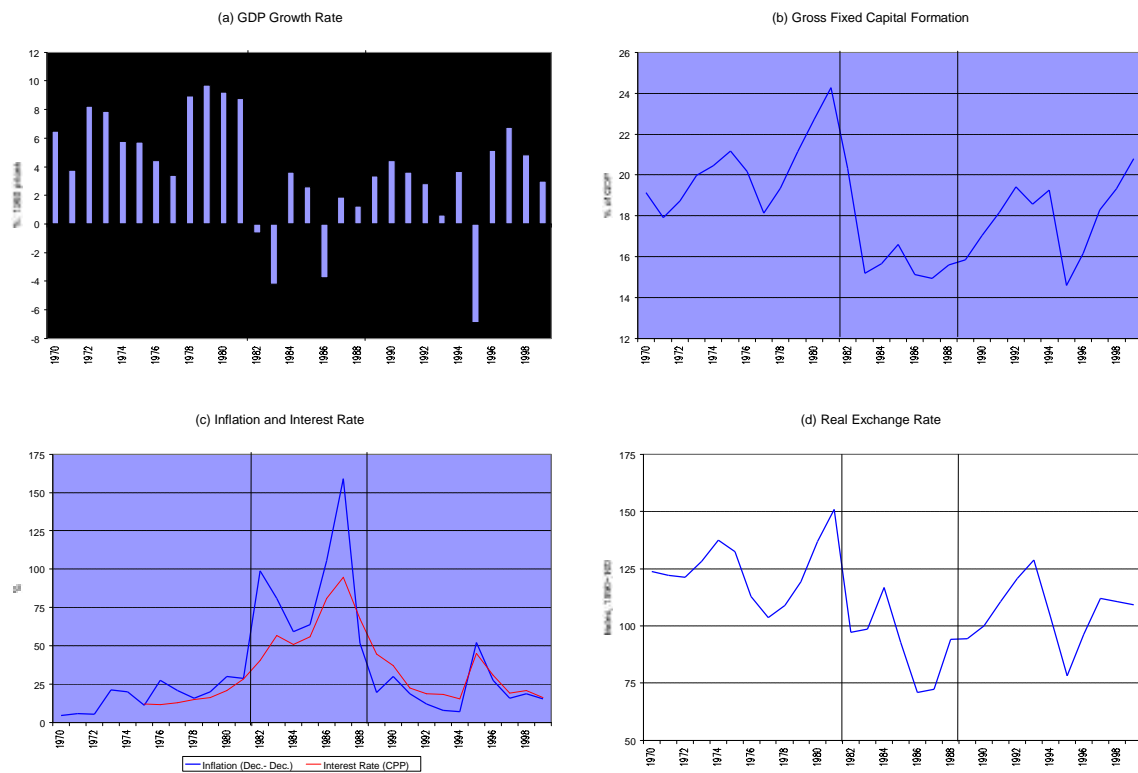
<sup>4</sup> The new banking legislation and the creation of the IPAB, as well as the new debtor support program, “punto final,” are important steps in this direction, as well as in the revitalization of the domestic banking system.

The rest of this report supports these recommendations and diagnoses when possible, given the data at our disposal, highlights their conjectural nature in others, and in some cases hints at further research needed to make these conjectures more precise.

## 2. The Facts and Mechanisms

### 2.1 Aggregate Volatility

Figure 1: Growth and Volatility



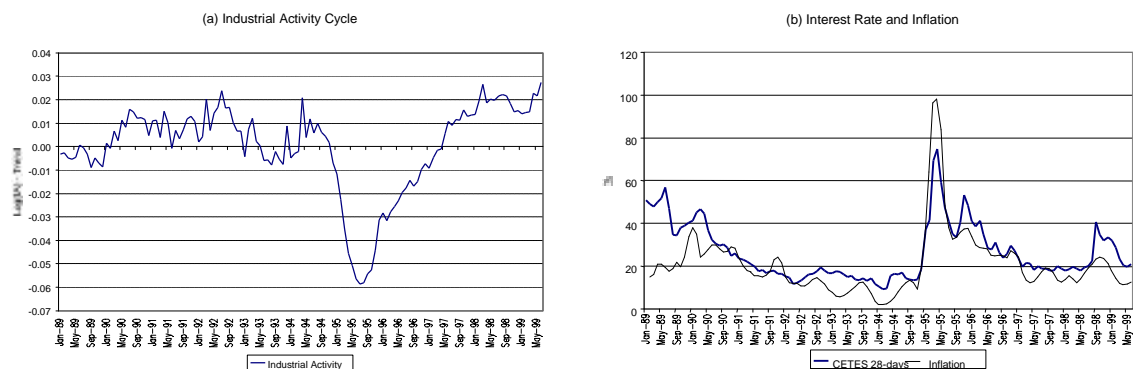
Notes: Used preliminary data for 1998 and predicted data for 1999. Panel (d): A decrease in the Real Exchange Rate index means depreciation.

Source: IFS, INEGI and Banco de México.

Figure 1 divides the last three decades into three sub-periods, delimited by vertical lines. These periods represent the pre-debt crisis, the distress that followed that crisis, and the post-reform period that began around 1989 and was consolidated by the implementation of the Brady Plan and the ensuing return of capital flows to Latin America. While the post-reform period established a clear departure from the turmoil that

followed the debt crisis, it was still a far cry from the stability and overall performance of the economy during the 1970s.<sup>5</sup> Panels (a) and (b) document this pattern for GDP growth and the investment rate. One feature that becomes apparent in the figure is that neither growth nor investment has returned to its pre-debt crisis levels. I will come back to this aspect below since it has often been connected to the deep crisis starting at the end of 1994. More directly connected to a study of volatility, the latter crisis made it apparent that Mexico's reforms have not shielded it from large swings in growth performance. The next two panels reinforce this pattern of improved performance (relative to the 1980s) but untamed volatility, now for inflation and interest rates (panel c) and the real exchange rate (panel d).

Figure 2: Post-Reform Period



Notes: Industrial Activity (Log of seasonally adjusted series without trend – 3 months MA). Inflation (SA 3 months MA, annualized monthly variations).  
Source: INEGI and Banco de México.

This report focuses on the post-reform period. The path of the industrial production index, inflation and the nominal interest rate in Figure 2 highlight two particularly interesting episodes within this period. The first and more dramatic is the infamous “tequila” crisis at the end of 1994.<sup>6</sup> The second, which is interesting for what happened as much as for what did not, is that which followed the sequel of emerging markets crises that began with the

<sup>5</sup> It is worth pointing out that the 1970s already represented a decline in terms of aggregate performance relative to that of the 1960s.

Asian crisis in mid-1997 and landed solidly in Latin America with the Russian crisis during the second half of 1998. While the turmoil triggered by the latter crisis is perceptible in the industrial production index in panel (a), it is apparent that the crisis has been significantly milder in Mexico than in most of the other major Latin American economies. Panel (b) is less comforting, as it shows a substantial rise in interest rates and a reversal on the inflation-control front, thus making it clear that the costs of the recent episode are still not fully paid for.<sup>7</sup> The following subsections describe the structural factors that are most likely to have generated these scenarios in post-reform Mexico.

## **2.2 Weak International Financial Links and External Shocks**

The relatively small size of emerging economies' current account deficits is a perennial symptom of their limited access to international capital markets. Mexico is no exception.<sup>8</sup> From the point of view of aggregate volatility, however, it is not only the level but also the fragility in this limited access that counts.

Panel (a) in Figure 3 illustrates the path of capital flows to Mexico and their close connection with Mexico's business cycle during the 1990s, especially during the deep crisis in 1994-1995. As both residents and foreigners became aware of the dollar-illiquidity of the government and country, and confidence vanished, private capital inflows rapidly turned from an annual inflow well above five percent of GDP into a rapid outflow.<sup>9</sup> No country can withstand such a turnaround; Mexico experienced a deep recession despite the rapid response of the U.S. and the IMF, as can be seen in the temporary rise of public capital inflows.

---

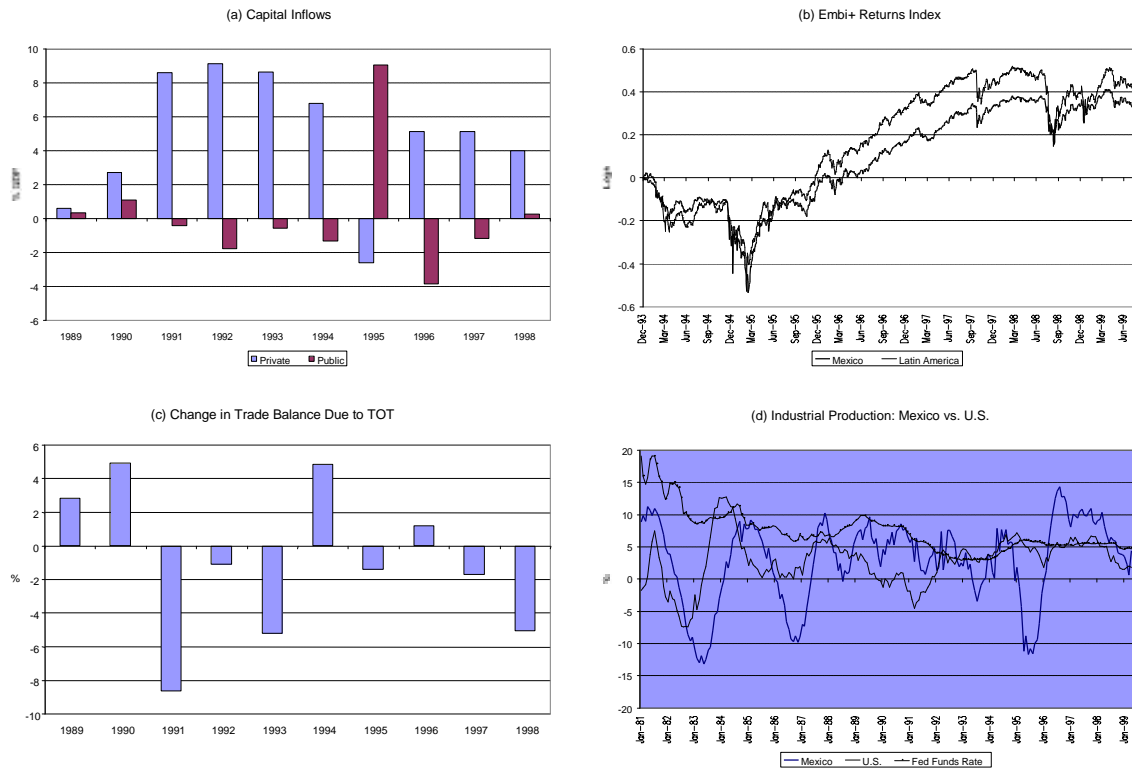
<sup>6</sup> The growth slowdown in 1993 and the recovery attempt that followed it are, to a large extent, part of this episode (see below).

<sup>7</sup> Although by mid-1999 inflation seems to have regained its pre-crisis path.

<sup>8</sup> While much has been said about the "unstable" deficits in current account experienced by Mexico before 1995, it is important to stress that the argument of sustainability is one of empirical (for emerging economies) relevance rather than one of frictionless-neoclassical soundness, where these deficits should be an order of magnitude larger.

<sup>9</sup> It is certainly inaccurate to blame foreigners exclusively for the outflows. See, e.g., Garber (1998) for a discussion of the role of domestic banks' off-balance sheet activities before the 1994-1995 crisis. These activities "inflated" capital inflows before the crisis and automatically reversed them after the crisis.

Figure 3: External Conditions during Latest Crises



Notes: Panel (a): Public sector capital flows includes general government and monetary authorities, excluding reserves and related items. Private sector corresponds to total capital flows minus public sector. Panel (c): was calculated using the following relation,  $dP_{x,t}/P_{x,t-1} - \alpha \cdot dP_{m,t}/P_{m,t-1}$ , where  $\alpha = P_{m,t-1}M_{t-1}/P_{x,t-1}X_{t-1}$ .

Source: IFS except panel (b): EMBI+ JP-Morgan Emerging Markets Bonds Index from Datastream.

Stark as it is, this figure underestimates the severity of the external constraint during crises since it ignores strained renegotiations and other mechanisms that smooth observed–relative to “latent”–capital flow movements. Some of this underestimation can be gauged from price data; the thick line in panel (b) shows the return index of Mexico’s sovereign debt, which exhibits dramatic drops around the crisis dates. The thin line in the same panel portrays the return index of Latin American sovereign debt. The high correlation between this series and Mexico’s does not absolve Mexico of responsibility for the weak nature of its international financial links, especially during the 1994-1995 crisis, which Mexico may have started, but it does illustrate the fact that the shocks and financial amplification are not a purely domestically-driven phenomenon. There are many second-best considerations that arise from such scenarios–e.g., whether short-term capital flows and “large” current account deficits should be avoided like the plague–

as well as the more fundamental concern of why emerging economies are subject to these “tests” of resilience. I return to these concerns in the policy section below.

Mexico depends on the rest of the world in more ways than one. Panel (c) plots the impact of terms of trade changes as a fraction of total exports. Since volatile oil represents a large share of its exports, Mexico experiences large terms of trade shocks. It is apparent, nonetheless, that it is not a terms of trade shock that negatively affected Mexico at the end of 1994, and that Mexico’s good relative performance during the recent global crises has occurred *despite* the weak terms of trade it faces. While terms of trade shocks are an ongoing source of concern, particularly because they may be leveraged and trigger a tightening in international financial constraints, they do not seem to have been the main factor during the post-reform period volatility.<sup>10</sup>

Panel (d) plots better statistics for Mexico’s good fortune: U.S. growth in industrial production and its federal funds rate. Much has been said about the positive role the U.S. expansion has had in insulating Mexico from a large share of the current global turmoil. There is probably plenty of truth behind that. By the same token, however, it seems unreasonable to solely blame Mexico for its poor growth performance, particularly in exports, during the early 1990s, since the U.S. was not growing much, either. Moreover, the rise in U.S. rates during the mid-1990s undoubtedly complicated the Mexican scenario. The following stylized characterization seems not too far off: When U.S. activity is depressed so are its interest rates, which means that the export pull for Mexico is low but capital flows are abundant, so the current account deficit can be financed. As the U.S. expands, on the other hand, it pulls Mexican exports and activity but as soon as the Fed tightens, capital flows reverse and complicate the Mexican scenario.<sup>11,12</sup> Normally, the financial U.S. factor has proved stronger than the real U.S.

---

<sup>10</sup> On the other hand, since oil is largely public owned, its price fluctuations have significant impact on the fiscal side. I return to this issue below. Also, this interaction between depressed terms of trade and international financial tightening may account for a significant fraction of the turmoil experienced by Mexico during the 1980s.

<sup>11</sup> See Calvo *et al.* (1993) for the “classic” reference on the impact of U.S. monetary policy on capital flows to Latin America.

<sup>12</sup> Of course, as the U.S. tightens, the end of its expansion also appears in the horizon, which complicates further the Mexican outlook.

factor, while in the current episode the reverse has occurred since the U.S. interest rate response has been subdued when compared with the prolonged nature of its expansion.

Figure 4 illustrates yet another, albeit more conjectural, dimension of the weak and volatile international financial links. Panel (a) uses U.S. stock returns data to illustrate the variance of returns over a 3-month window centered on the indicated date. The thick line corresponds to a prime-firms' index (S&P100), while the other two are more inclusive indices (S&P400 and S&P600). As one would expect, the more inclusive indices are more volatile, especially at times of aggregate turbulence and distress, reflecting the greater vulnerability of smaller firms. Panel (c) is similar but with a 12-month window. This sensible volatility ranking is in sharp contrast to that found in Mexico.

Despite the fact that the relative vulnerability of small firms is probably at least as large in Mexico as in the U.S., the pattern of relative volatility portrayed in panels (a) and (c) is reversed for Mexico. This can be seen in panels (b) and (d), which plot with a thick line the variance series for the IPC (prime-companies) and with a thin line that of a more comprehensive index (Total Market). One interpretation of this reversed volatility ranking is that foreign investors focus mainly on firms whose stocks are in the IPC, and hence it is mainly these stocks that reflect large capital flows swings.<sup>13</sup>

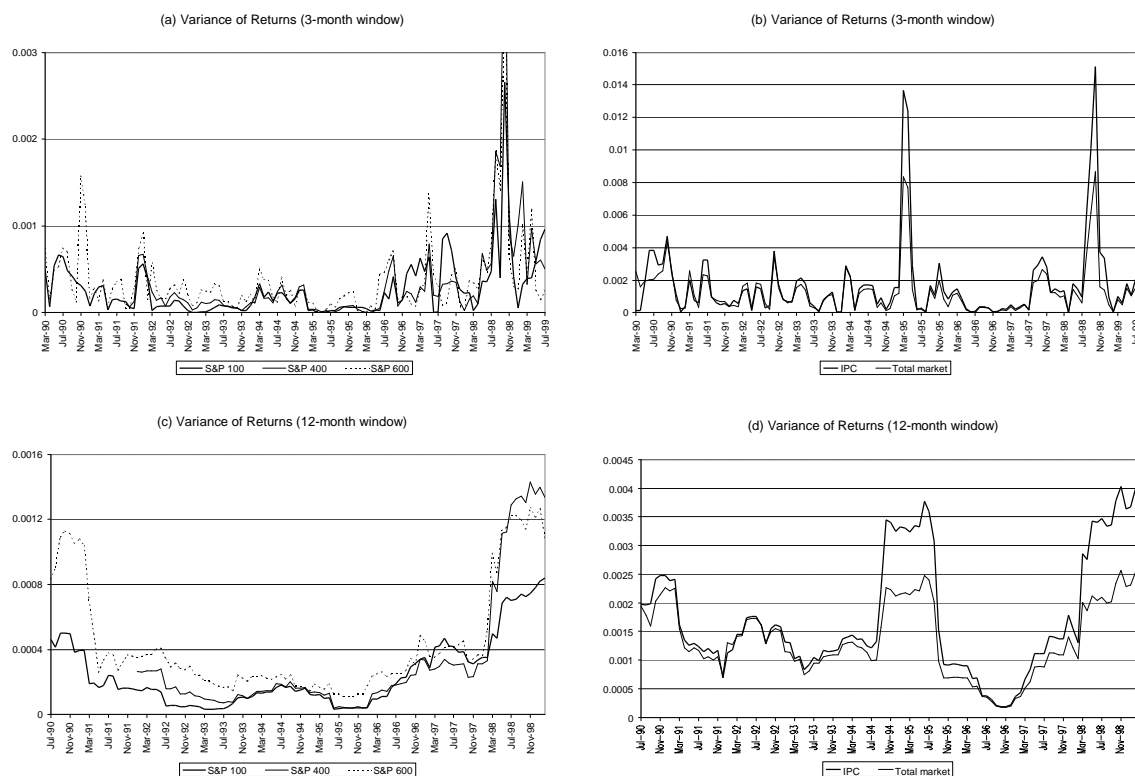
---

<sup>13</sup> Another interpretation is that the finding is spurious, as the more comprehensive series is polluted by too many no-trades. Although this remains as a possibility, a similar pattern was observed in Argentina (see companion report) where aggregate volume data did not seem to support this alternative interpretation.

It is also important to realize what the relative-volatility claim in the text is not about. It does not say that large firms' financing is more distressed than that of smaller firms during crises. Indeed, reality is quite the opposite, as concerned local banks reallocate their loans toward larger companies. It just says that an important segment of the demand for the shares in prime companies fluctuates with international sentiment about emerging markets and Mexico's financial strength.



Figure 4: Variance of Stock Returns. United States vs. Mexico



Source: Datastream.

Finally, Table 1 compares the performance of several Mexican sovereign bonds with that of several U.S. corporate bonds of equivalent credit rating. It reports the average spreads of these instruments over U.S. Treasury instruments, as well as the variance of these spreads and that of their changes.<sup>14</sup> The evidence is quite clear: relative to U.S. corporate bonds, Mexican bonds pay a higher spread and their returns are substantially more volatile. Moreover, the spread-premium is probably a result of this “excess volatility.” As Figure 3 already demonstrated, much of this volatility stems from episodes where financial markets tighten for emerging markets. Mexican bonds look “illiquid”

<sup>14</sup> It is important to raise a couple of warnings with respect to these comparisons: First, it is difficult to assess the relative diversification features of these different bonds and spreads. And second, it is also well known that the volatility of “junk” bonds varies substantially over time.

from the point of view of spreads and volatility, despite the fact that their volume is often much larger than that of the specific U.S. corporate bonds described in the table.

Table 1:  
Comparing Mexican Sovereign Bonds and U.S. Corporate Bonds of Similar Rating

	S&P rating	Moody's rating	Spread average	Spread variance	Variance of spread changes
Mexican Sovereign Bonds	BB		3.25	1.69	0.19
	BB	Ba2	3.53	5.09	1.99
		Ba2	3.55	4.47	2.72
Average			3.45	3.75	1.64
U.S. Corporate Bonds	BB	Ba1	2.51	0.45	0.41
	BB		1.92	0.48	0.07
	BB		3.01	0.67	0.10
	BB	Ba2	3.61	2.77	0.68
	BB	Ba2	4.03	0.35	0.10
	BB		3.27	2.88	1.66
	BBB-	Ba2	2.44	0.21	0.16
Average			2.97	1.12	0.45

*Notes: Spread average means average over bond lifetime (or starting at earliest date available in Datastream). Mexican Sovereign Bonds: MEXICO-PAR (B-Q) 6 ¼% 90-19, MEXICO 8 ½% 92-02, MEXICO 6.97% 93-00. U.S. Corporate Bonds: AMERICAN MED. INTER. 0% 82-02, FRUIT OF THE LOOM 7% 81-11, CLARK OIL REFINING 9 ½% 92-04, NAVISTAR INTL. TRANS. 9% 85-04, ROWAN COS. INCO. 11 7/8% 91-01, STANDARD PACIFIC 10 ½% 93-00, TIME WARNER INCO. 8 ¾% 98-17.*  
*Source: Bond data from Datastream.*

To summarize: the level of capital flows is low; the volatility of terms of trade does not seem large enough to justify the volatility of these flows and their prices; unlike the U.S., prime-firms' stocks, which are the target of foreign investors, are more volatile than more comprehensive stock indices; and finally, Mexico's bonds pay a higher spread and are more volatile than U.S. corporate bonds of comparable credit rating. While each piece of evidence is only "circumstantial," the evidence as a whole appears to add up to a convincing case that Mexico's connection to international financial markets is fragile.

## 2.3 Domestic Shocks and Amplification Mechanisms

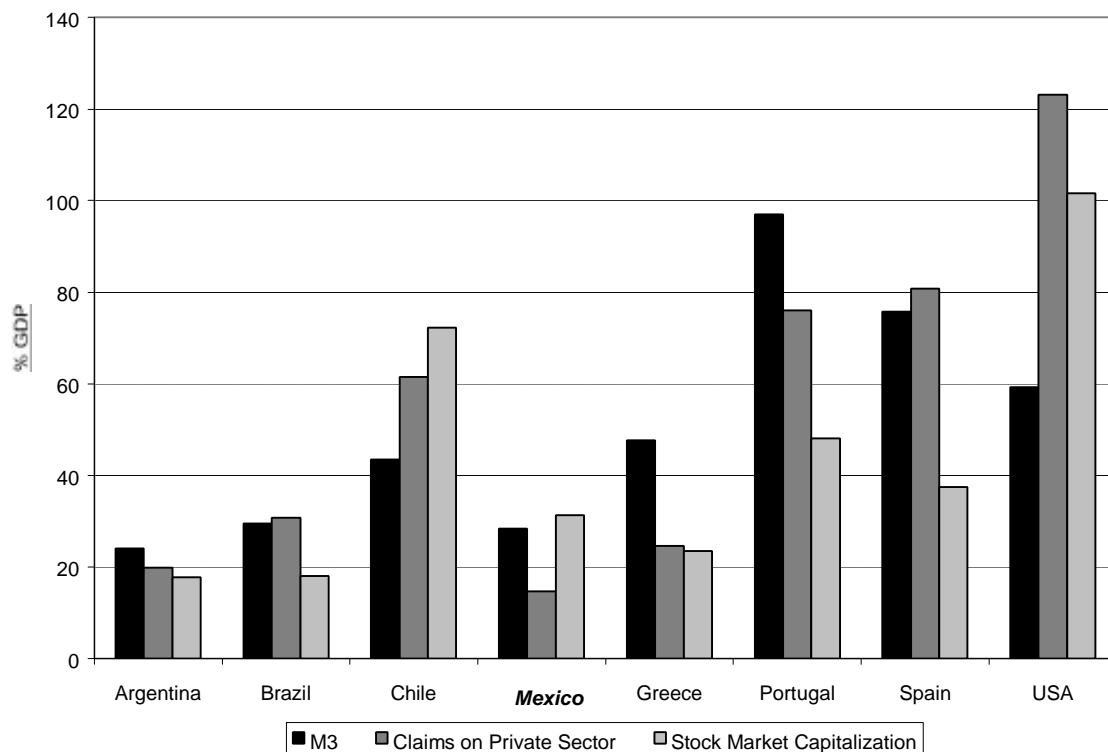
### 2.3.1 The Credit Crunch and Financial Underdevelopment Problem

In general, the development of domestic financial markets is instrumental not only in fostering investment and growth, but also in aggregating resources during distress.

Underdeveloped financial markets limit the prompt reallocation of resources and, as a result, cause wasteful contractions in those markets most affected by shocks or less plugged into the financial pipelines. On the other hand, as financial development rises so does leverage, and with it the fragility of the system to shocks to the financial system itself also rises. As the next paragraphs suggest, Mexico has suffered from both ends: chronic financial repression and underdevelopment and, when moving away from that, large-scale collapse of the banking system.

Figure 5 highlights Mexico's "level problem." Regardless of how it is measured, and despite significant improvements over the last decade, Mexico's financial markets and level of financial intermediation are sub-standard. M3, loans, and stock market capitalization—all of them as a fraction of GDP—fare poorly with respect to OECD economies and leading countries within the region.

Figure 5: Financial Market Development

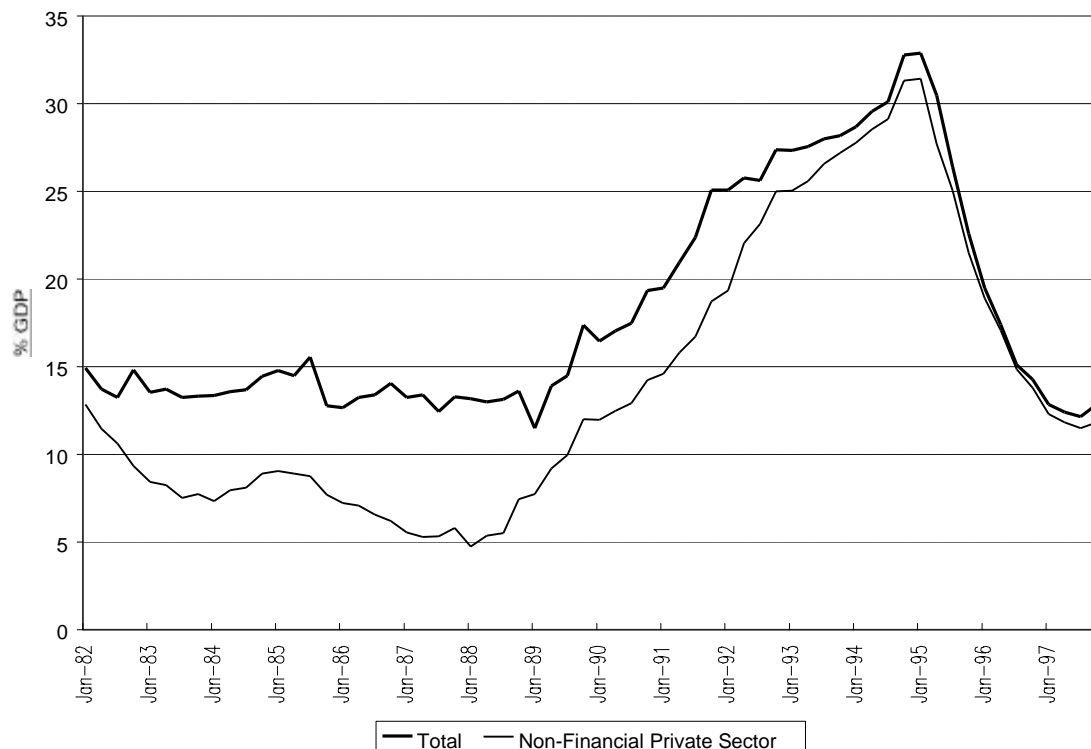


Notes: Data as of end of 1997.

Source: M3 and claims on private sector from IFS. Stock market capitalization from Datastream.

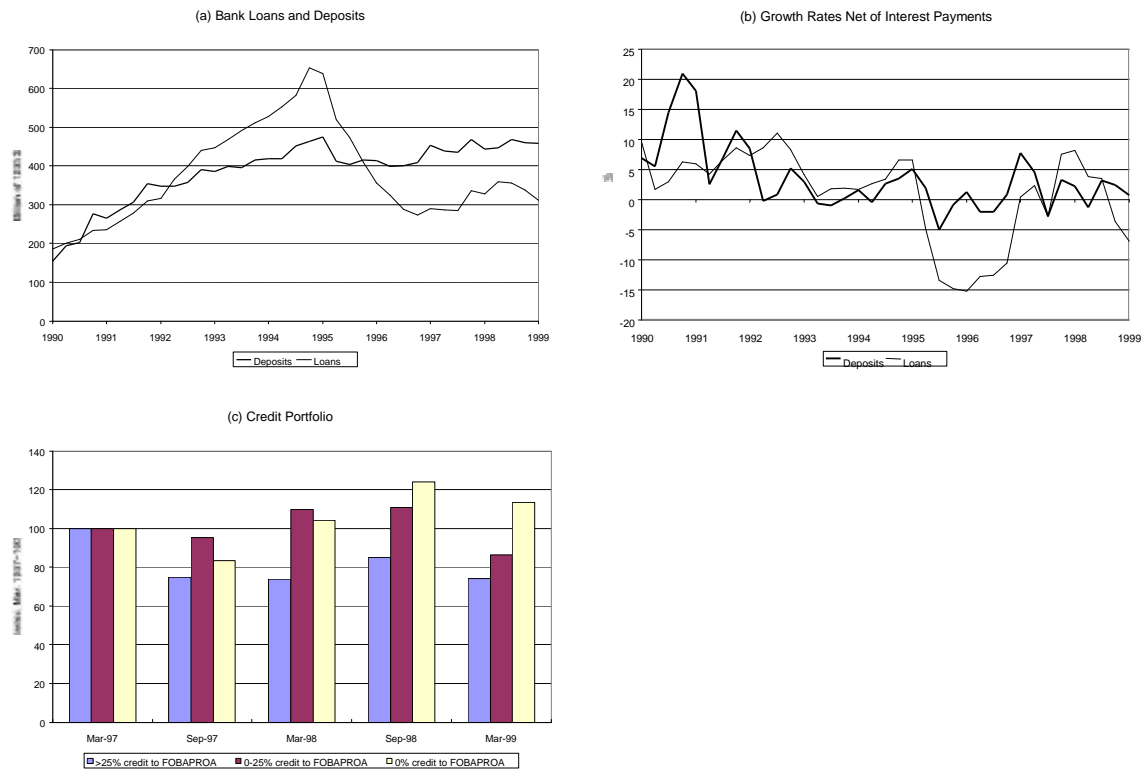
But the level in Figure 5 hides important dynamic and cyclical aspects of Mexico's financial markets, particularly banks. After the crisis of the early 1980s, banks were nationalized and Mexico went through a period of severe financial repression, with banks' loans directed primarily at the public sector and selected private firms and sectors. This situation turned around during the early 1990s, when banks were privatized and the government turned to a newly created domestic debt market for its financial needs. The sharp credit boom at that time has often been blamed for the deep crisis at the end of 1994, a point I qualify below. Regardless of who is to be blamed for the crisis, it was followed by a severe credit crunch that has yet to be fully worked out. Figure 6 highlights these broad patterns. The thick-solid line portrays the path of total bank credit as a fraction of GDP, while the thin-solid line represents credit to the non-financial private sector. Both the increase in the share of the latter in total loans, as well as the rise and abrupt turnaround of bank credit can be clearly seen.

Figure 6: Bank Credit



Source: IFS.

Figure 7: Behavior of Private Sector Deposits and Loans



Notes: Panel (a): Loans correspond to bank credit to the private sector, while deposits are the sum of demand, time and savings deposits. Panel (b) shows the growth of rate of loans (deposits) minus the interest rate on loans (deposits).  
Source: IFS and Banco de México.

There is no doubt that the severe credit crunch significantly leveraged the 1994-1995 crisis and that the collapse in the banking system will impose costs on the economy and public accounts for many years to come. With an eye on the policy section, it is worth asking what went wrong. What are the sources of instability in the Mexican banking system? Figure 7 offers some clues. Panels (a) and (b) show that, unlike the case of Argentina during the same period, the problem was primarily on the loans rather than on the deposits side of the balance sheet.<sup>15</sup> While there was a mild decline in deposits, it was far from an outright run and certainly not enough to explain the sharp collapse in

<sup>15</sup> In Argentina the sharp run on deposits probably had less to do with the health of banks than the survival of the convertibility system.

loans. Indeed, it is new loans that imploded early on during the crisis, especially as the currency went into free fall and dragged the already weak balance sheets of Mexican banks with it.

Panel (c) reinforces that point for the current, and by now chronic, credit crunch. It shows that the decline in credit has been particularly acute in those banks that required intervention, where intervention is measured by the proportion of the bank's credit portfolio that was placed in FOBAPROA.<sup>16</sup> The data in this panel represents success from the point of view of regulation, since one important principle of bank crisis intervention is that banks with bad loans should be prevented from rolling over loans to unprofitable projects. On the other hand, it highlights the severity and persistence of the credit crunch that followed the 1995 banking crisis.

But was it the banks' reckless behavior that caused the crisis, or were the banks victims of the crisis itself? The majority of opinions are supportive of the former, which probably means that there is plenty of truth behind it.<sup>17</sup> But it is also probably true that the consensus view has been influenced by the outcome: ex-post the loans did not perform, hence they must have been bad loans.<sup>18</sup> Figure 8 raises two points in "defense" of the Mexican banks.

First, panels (a) and (b) show the paths of the stock market value of financial and non-financial sectors in Mexico and Thailand around their respective crises (marked with vertical lines). The comparison is relevant because Thailand's banks have been blamed for much of the events that triggered the recent Asian crisis. It is apparent in these panels that while one can argue that investors realized ahead of the Thai crisis that the banks were very exposed (their stock value was declining faster than the rest of the economy a year prior to the crisis), the same cannot be said about Mexican banks. While the significant fraction of non-performing loans was well recognized—and perhaps the main

---

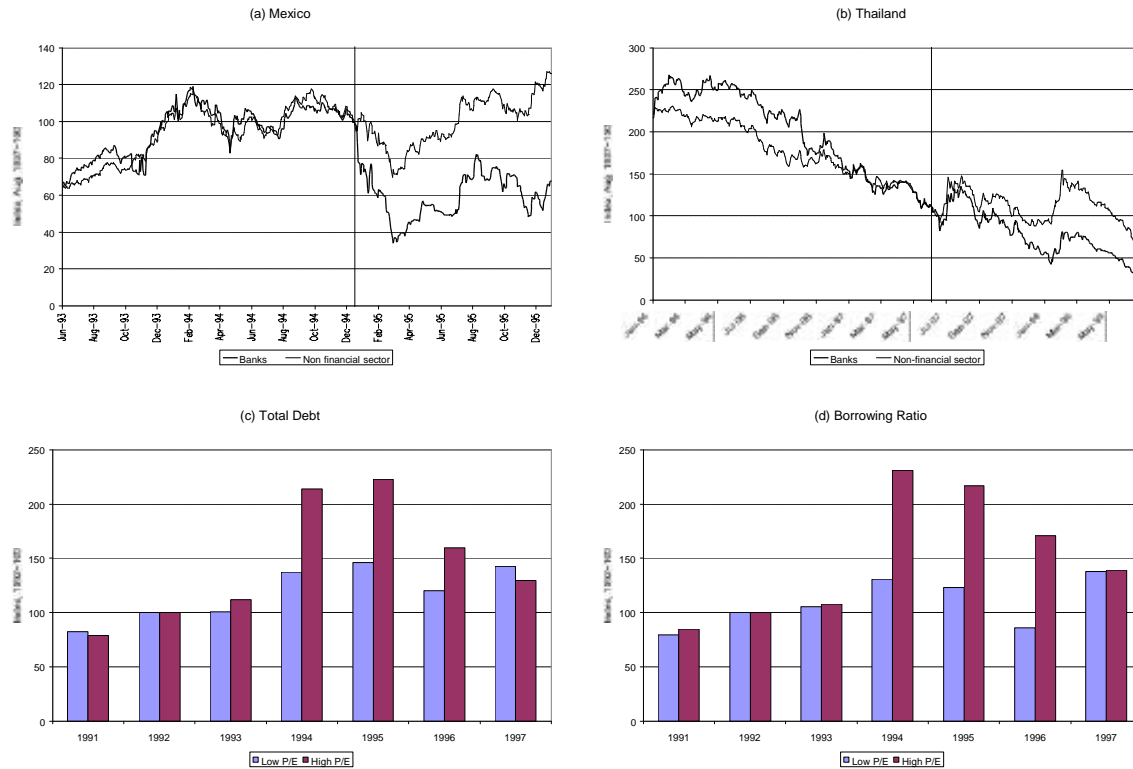
<sup>16</sup> The deposit insurance institution that bought part of the bad loans of banks as part of post-95 intervention package.

<sup>17</sup> See Caballero and Krishnamurthy (1998) for a model of banking crisis and its feedback into real activity. In that model, banks reflect the imbalances of the corporate sector with respect to foreign financiers. See Gavin and Hausmann (1996) for a discussion of the impact of macroeconomic shocks and policies on banks' vulnerability.

<sup>18</sup> Of course, this is not to deny that Mexican banks were vulnerable and had already shown an increasing trend of non-performing loans before the crisis.

factor behind the loose monetary policy during 1994 (see below)—it did not particularly discourage investments in banks’ stocks.<sup>19</sup>

Figure 8: Credit Allocation



Notes: Group 1:  $P/E < 11$  includes 11 companies: 2 transport, 2 building materials, 1 metal manufacturing, 1 tourism, 1 merchandising, 3 multi-industry, 1 telecommunications. Group 2:  $P/E > 11$  includes 11 companies: 2 building materials, 1 construction, 1 beverages, 1 paper, 1 tourism, 3 merchandising, 2 multi-industry.

Source: Datastream.

Second, panels (c) and (d) highlight the other side of the coin: what banks did with their funds. At least from the perspective of a sample of large Mexican firms available in Datastream, banks’ lending seems to have been directed to firms that were perceived to be profitable by the stock market. These panels illustrate indices of the degree of leverage (total debt) and borrowing ratio (total debt over total assets) for firms

<sup>19</sup> To argue that the reason for this is that investors expected a bailout is, in my view, to take the “moral hazard” argument too seriously. While expected bailouts surely can add a few points to expected returns, it

with different Price/Earnings ratios at the end of 1992, where the latter is a raw measure of how the stock market evaluated the growth prospects of these firms. It is apparent in the figure that it is the firms with higher P/E that were on the receiving end of the 1992-1994 credit boom.<sup>20,21</sup>

If not only misbehavior and corruption, what else? A distinct possibility is the combination of the weak initial conditions faced by banks and their overexposure to macroeconomic shocks. After a period of deep financial repression during the 1980s, banks were privatized at the same time that the economy was undergoing a deep structural reform. The first ingredient—the history of financial repression—is bad because after years of lending to the public sector there was little expertise on the analysis of credit risk. Banks substituted for this lack of knowledge by requiring collateral, mostly in the form of real estate, a great idea in the case of idiosyncratic shocks but not when these are aggregate.<sup>22</sup> The second ingredient—deep restructuring—is always bad for banks (especially for existing loans) because their gains are limited on the winners’ side while they take a large share of the losses of those sectors and firms that are on the destruction end of the creative destruction process. Moreover, this process and the problems it generates may have been worsened by the difficulties faced by the expanding side of the economy as growth in the U.S. was subdued at best through much of the late 1980s and early 1990s.<sup>23</sup>

---

is highly unlikely that they will be enough to attract investors aware of the fragile condition of the potential “bailoutee.”

<sup>20</sup> This figure is only suggestive for it does not measure bank lending directly. However, given the underdevelopment of the Mexican private bonds market it is likely that the increase in debt involved an increase in bank borrowing.

<sup>21</sup> The firms considered are large firms quoted on the stock market, so it is still possible that banks were misallocating credit in the small/medium firms sector for which stock market data are not available.

<sup>22</sup> The proportion of loans over 20 million pesos that were collateralized right after the crisis was around 70% of the total for most banks. Gelos and Werner (1999) document that banks’ use of collateral increased after privatization.

<sup>23</sup> In the literature, the latter factor seems to have been underplayed relative to the exchange rate overvaluation argument as an explanation of depressed growth in Mexico. The overvaluation, the argument goes, was primarily due to exchange rate based stabilization program. An alternative –or at least complementary– interpretation, especially for those years well after the initial adjustment to the stabilization program, is that the “overvaluation” was an equilibrium consequence of the massive credit inflows largely made possible by the low U.S. interest rates. Of course, when these flows turned around abruptly, the exchange rate became overvalued.



The banks also made an error of judgment on the permanence of the fixed exchange rate system. The collapse of the system helped to destroy their balance sheets as they were very real estate-intensive in loans and collateral and had apparently gambled on the off-balance sheet side. In sum, it appears that the deficiencies were not only in the banks handling of the microeconomic aspects of credit, as is often emphasized, but also, and perhaps primarily, in their handling of macroeconomic risk. I will return to this issue in the policy section.

The consequences of underdeveloped and unstable domestic financial markets are ultimately reflected in the economy's failure to reallocate resources in an expedient manner, especially at times of crises. Figure 9 reports the path of a measure of the cross-sectional dispersion of the stock market returns for a group of approximately twenty Mexican industries (thick line).<sup>24</sup> The figure shows the dramatic surge in this cross-sectional dispersion during the 1994-1995 crisis and during the recent global turmoil.<sup>25</sup> As a comparison, the thin and dashed lines illustrate the path of the same cross-sectional dispersion measure for Chile and Argentina. It is apparent that Chile, a country with deeper financial markets, exhibited a much milder increase in dispersion, suggesting that resource aggregation does play an important role in limiting the damage caused by crises.<sup>26</sup> Argentina, on the other hand, has responses closer to those of Mexico, which is consistent with the fact that its financial markets are also very underdeveloped (see the companion report on Argentina). Finding more direct evidence on this mechanism is an

---

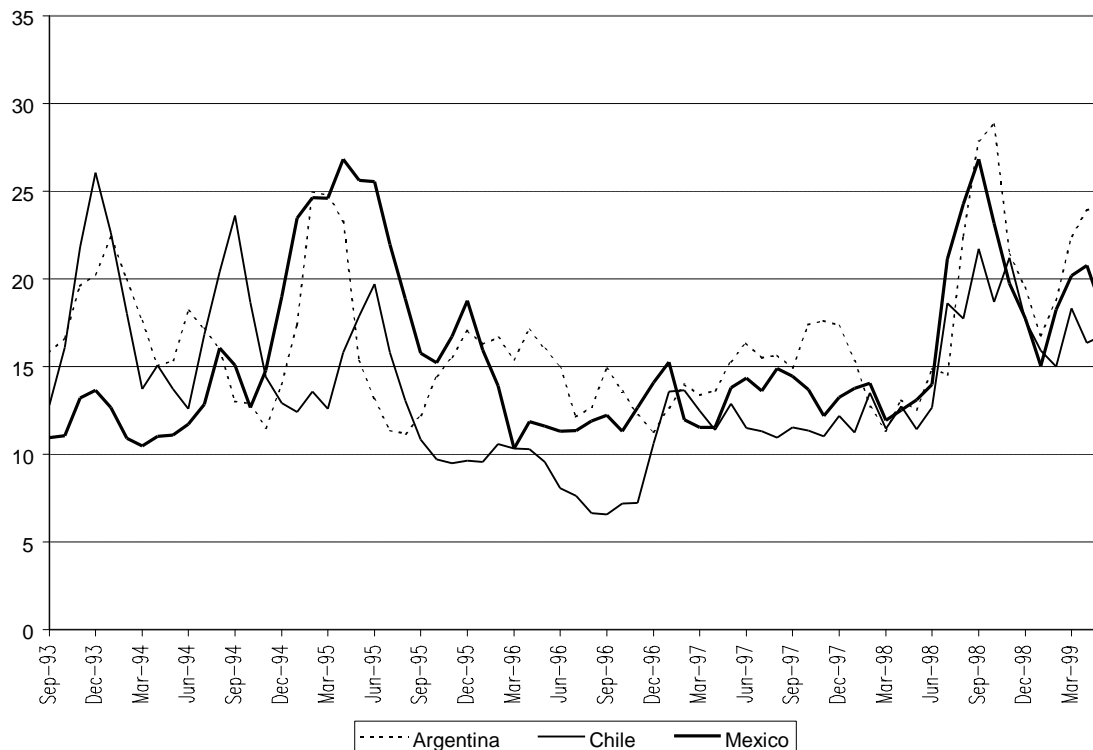
<sup>24</sup> The industries correspond to the stock market subsectors at level of disaggregation 5 of the Datastream classification, which includes 116 potential entries. For Argentina, Chile, and Mexico, 26, 20 and 24 sectors respectively were represented during the period considered. Similar results were obtained when using different measures of dispersion.

<sup>25</sup> See Aguiar and Broner (1999) for an interesting and suggestive study of sectoral stock indices in Argentina and Mexico during the periods surrounding the crises of the 1990s. Among other things, they illustrate the negative correlation between sectors' relative stock-return during crises and these sectors' relative responsiveness to interest rates and credit variables during tranquil times.

<sup>26</sup> Of course the argument is somewhat circular. One could argue that the shocks were larger for Mexico, hence the larger increase in dispersion—although it seems difficult to argue that by late 1998 Chile had been affected by a smaller terms of trade shock than Mexico.

important research theme, as is the analysis of the effects of financial underdevelopment on the relative size and volatility of traditionally credit-using sectors.<sup>27</sup>

Figure 9: Cross Sectional Variability of Sectoral Stock Returns



Notes: Interquartile range 15%-85% (3-month MA). The number of sectors used for Argentina, Chile, and Mexico is 26, 20, and 24 respectively.

Source Datastream.

Also note that under the metric of Figure 9 Mexico appears more stable/developed than Argentina and Chile before the 1994-1995 crisis. Thus one could conclude that the evidence is ambiguous. I believe this is the wrong interpretation, at least when extrapolated to the whole sample, for two reasons: First, these series have substantial noise due to the impact of occasional large transactions and restructuring in relatively small markets, thus attention must be centered only on those episodes where a clear aggregate shock is present. Second, it is indeed the case that Mexico's financial system was more developed—or at least bank loans were more readily available—before the 1994-1995 crisis.

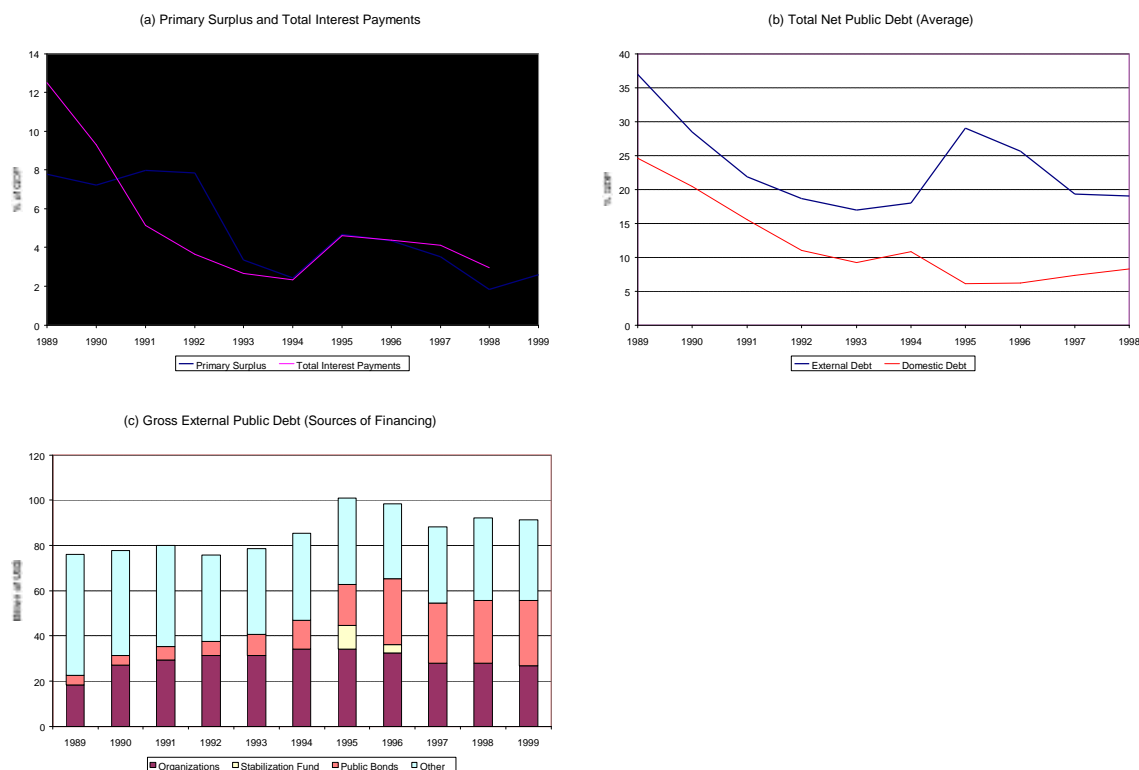
<sup>27</sup> See Rajan and Zingales (1998) for a comparison of relative sectoral size among OECDs, and for evidence on the connection between this and the degree of development of local financial markets. A related theme worth exploring is that of the composition, as opposed to the level, of available domestic financial instruments. Is this composition very different from that of OECD's—e.g., in terms of the ratio of short and long term loans and bonds—and, if so, which sectors and firms are most likely to suffer from such bias?

In sum, regardless of how it is measured, the depth of Mexico's financial markets and financial intermediation is significantly suboptimal; banks were at the center of the problem during the 1994-1995 crisis and have remained in a crunch-mode since then. The increased dispersion of sectoral returns hints at the presence of significant problems with the aggregation and distribution of financial resources during crises.

### *2.3.2 The (Shadow) Fiscal Fragility Problem*

Mexico's fiscal discipline is not, at least directly, at the heart of its volatility. More often than not, the public sector has been the residual claimant of its private sector's imbalances. The solid line in panel (a) of figure 10 illustrates a consistent primary surplus over the post-reform period, often to match the significant interest payments on the existing stock of public debt (dashed line). But it is panel (b) which best hints at the fragility problem. It shows a steady and fairly dramatic decline in both external and domestic debts throughout the period, a large part of it undoing the surge in public debt inherited from the private sector during the debt crisis of the early 80s. This trend was abruptly interrupted during the 1994-1995 crisis, when the government once again had to fetch new resources from abroad to bail out a distressed banking system. Panel (c) reinforces this impression by showing the path of external public debt and its components, with a large role played by the stabilization package put together by the U.S Treasury and the IMF in 1995.

Figure 10: Public Finance



Notes: Panel (c): Data at end of period, except for 1999 (march). Organizations item includes Bilateral and Multilateral organizations; other item includes Suppliers, Reprivatizations Bonds, Restructured, Non-Restructured and Base Money 1990-92.  
Source: Banco de México and SHCP (Ministry of Finance).

Many have argued that it is this systematic bailout practice which is responsible for some of the private sector “excesses.” As I stated above in the context of the banking sector, I believe that the importance of this form of moral hazard, while significant, is often vastly exaggerated. Regardless of whether this is the case, the bailout practice does have another negative side: It raises the specter of fiscal fragility even when the official accounts look fine. A sudden burst in the government’s financial needs and illiquidity is always around the corner, which means both real and nominal interest rates are ready to jump at any sign of distress anywhere in the economy (more on this in the next section),

which in turn creates further distress.<sup>28</sup> This feature probably compounded with the large dollar-amortizations coming due in early 1995 to trigger the crisis. Figure 11 shows the path of domestic interest rates, international reserves, and the path and composition of domestic public debt.

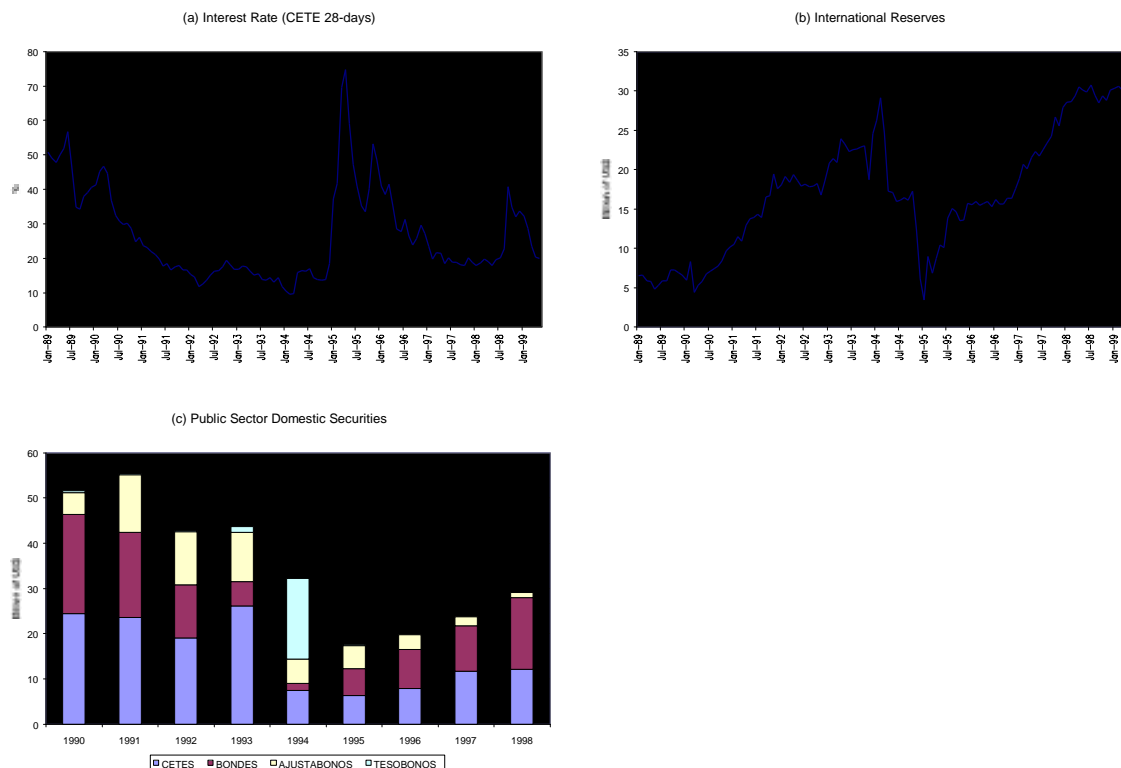
The sharp rise in interest rates that followed the devaluation and crisis at the end of 1994 and in early 1995 is just the last chapter of the pressure building during the previous months, as is reflected in the sharp reserve losses as well as in the shift in public instruments issuance away from peso-denominated CETES and Ajustabonos, toward cheaper short-term dollar-denominated Tesobonos. Perhaps more relevant to the point being made here is the sharp response of domestic interest rates during the recent emerging market crises, despite the fact that the fiscal and external accounts looked healthy. I will discuss this issue further in the context of the lack of credibility of Mexico's monetary policy.

Regardless of whether the crisis materializes or not, these increases in interest rates put enormous pressure on fiscal targets, which often triggers offsetting contractionary forces on the primary surplus side. Panels (a) and (c) in Figure 12 plot the large impact of interest rate spikes on the budget. Furthermore, these flows are probably an underestimate of the present value consequences of a period of high rates, as not all debt is contracted at variable rates. Panels (b) and (d), on the other hand, plot the contribution of changes in the price of oil to revenues. The absence of a stabilization fund makes these shocks equally harmful

---

<sup>28</sup> Of course, it is not at all clear whether a hands-off policy would bring about more economy-wide stability. I return to this discussion in the policy section.

Figure 11: Interest rate, International Reserves, and Composition of Domestic Public Debt

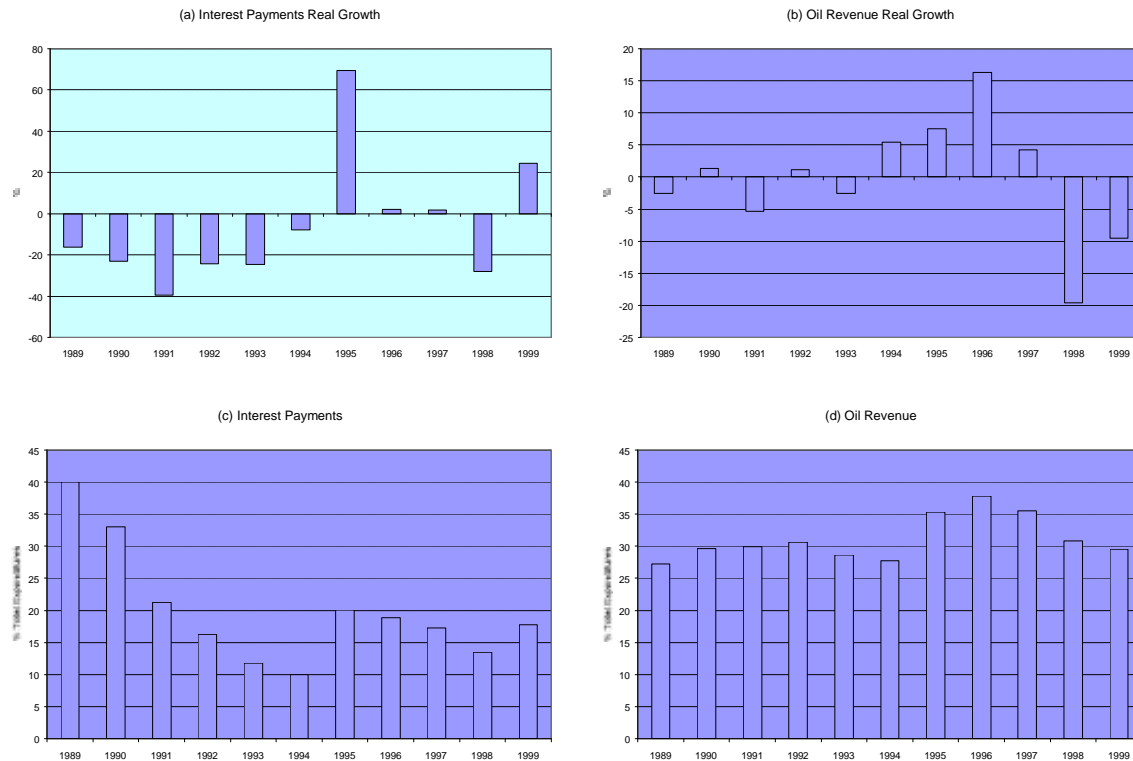


Notes: Panel (c): Cetes instruments are treasury bonds (28, 91, 182, 364, and 728 days); Bondes are instruments with interest rates linked to the yield on 28-day Cetes (364 and 728 days), or bank promissory notes; Ajustabonos are instruments indexed to the CPI (1,092 and 1,820 days); and Tesobonos are instruments indexed to the free market exchange rate (91, 182, and 364 days). The exchange rate in 1990 was 2.95 \$/US\$. Source: SHCP (Ministry of Finance).

Crowding out by the government has not been a major problem in the post-reform period, while it was very extreme in the financial repression period that preceded it. In the current episode, nonetheless, the government has turned inwards for its financial needs as foreign markets have closed (see panels c in Figure 10 and Figure 11). Large firms are probably doing the same, facilitating a domestic fly-to-quality process. Such a mechanism can have devastating consequences for the PYMES, which seldom have direct access to external financing. While this mechanism is probably not yet at the center of post-reform Mexican volatility, this may occur as the segmentation of sectors and firms accelerates, with a never-ending credit crunch process and the government choosing to tap the relatively friendlier domestic markets at times of distress. (See Caballero, 2000 for a more extensive discussion of this issue in Argentina.)

In sum, during the post-reform period the government account's fragility and its consequences for the real economy seem to have been drawn from the private sector's fragility, especially that of the financial sector. The extreme volatility in Mexican interest rates probably derives from this mechanism, especially once filtered through the closely related monetary policy credibility problem, an issue I move to next.

Figure 12: Public Debt Financial Cost and Oil Revenues



Notes: Data at end of period. Used preliminary data for 1998 and predicted data for 1999  
Source: SHCP (Ministry of Finance), INEGI and Banco de México.

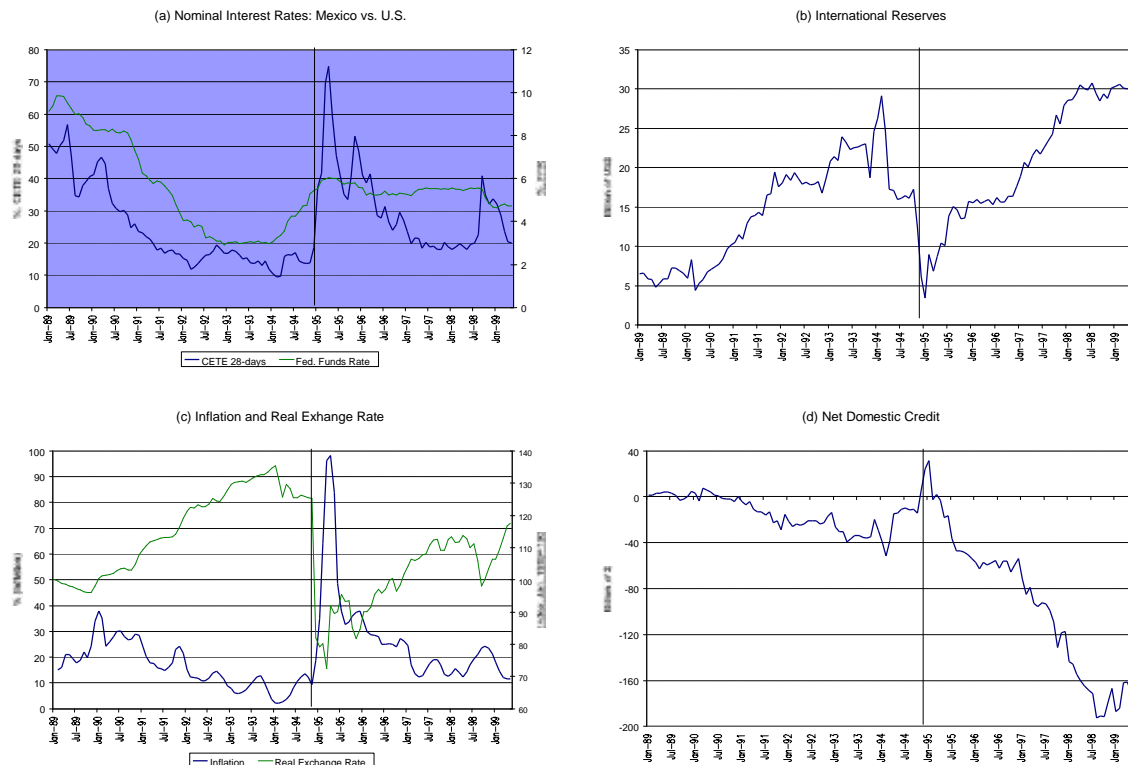
### 2.3.3 Credibility and Monetary Policy Problems

The conduct of monetary policy in emerging economies is extremely difficult. Not only is it subject to many political pressures and constrained by the fragility of its financial system, but also the demand for local assets experiences large fluctuations. During the early stages of the “fixed” exchange rate system, as Mexico became the darling of the international community, monetary policy was continuously tight in a fruitless attempt to

sterilize massive capital inflows. Foreign reserves accumulated rapidly and the real exchange rate appreciated steadily.

This pattern is most apparent in the tightening of 1993 (see Figure 13). By 1994 an opposite and much more difficult situation prevailed. As the international perception of the health of the Mexican economy began to change and the U.S. went into tight credit mode, the Bank of Mexico worried about the country's economic health if its banks chose to keep interest rates low (see panel a in Figure 13). The result was a massive loss of reserves (see panel b) and confidence, matched by further expansion in domestic credit to support the banks (see panel d), and the eventual collapse of the exchange rate system at the end of the year (see panel c). Banks' balance sheets, for which all these measures had been undertaken, collapsed, leveraging the recession and depositing on the government a large amount of future commitments.

Figure 13: Monetary Policy

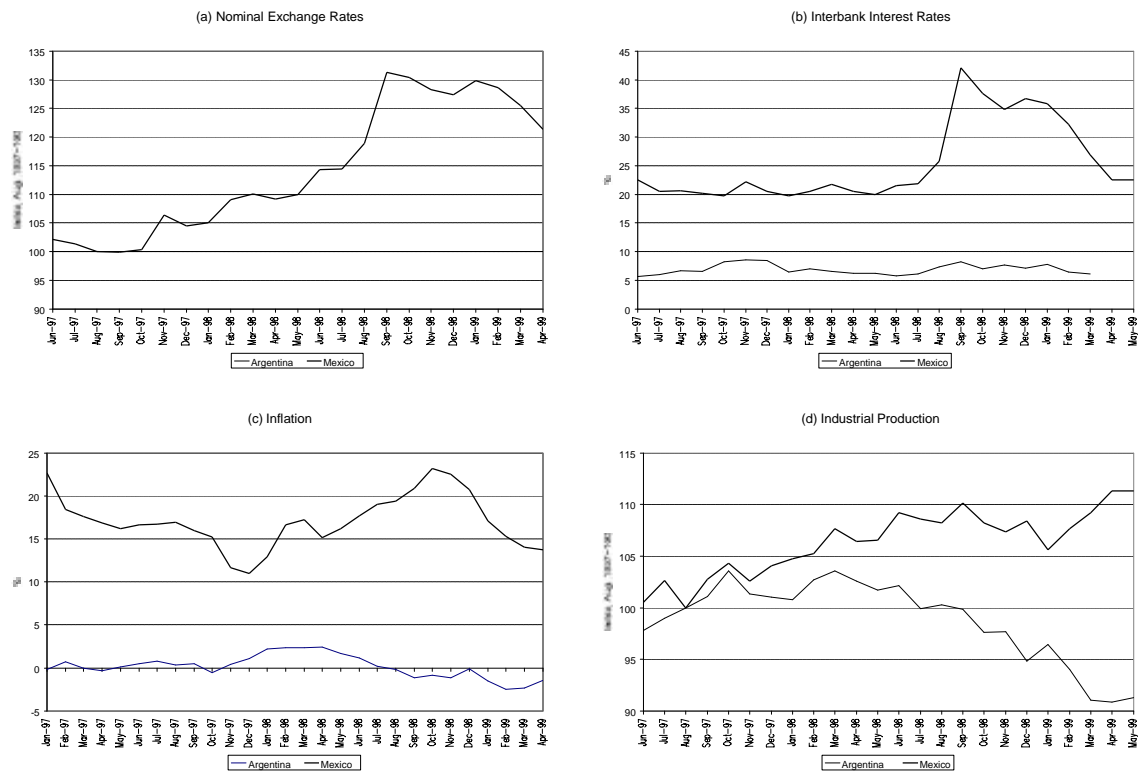


Source: INEGI and Banco de México.



Without the fundamentals, and perhaps with no good reason to commit to an exchange rate, Mexico adopted an almost free float. And float it did as emerging markets felt the pressure during the recent crises. Figure 14 looks at the experience of Mexico as compared with Argentina, a country with a much stronger exchange rate and monetary commitments. It is apparent from the first three panels that the exchange rate moved substantially during the turmoil and a large component of it was reflected in inflation. Interest rates also rose sharply, mostly reflecting the rise in actual and expected inflation. Nothing similar was observed in Argentina, although the latter suffered much more dearly on the real side (panel d).

Figure 14: Relative Performance: Argentina and Mexico

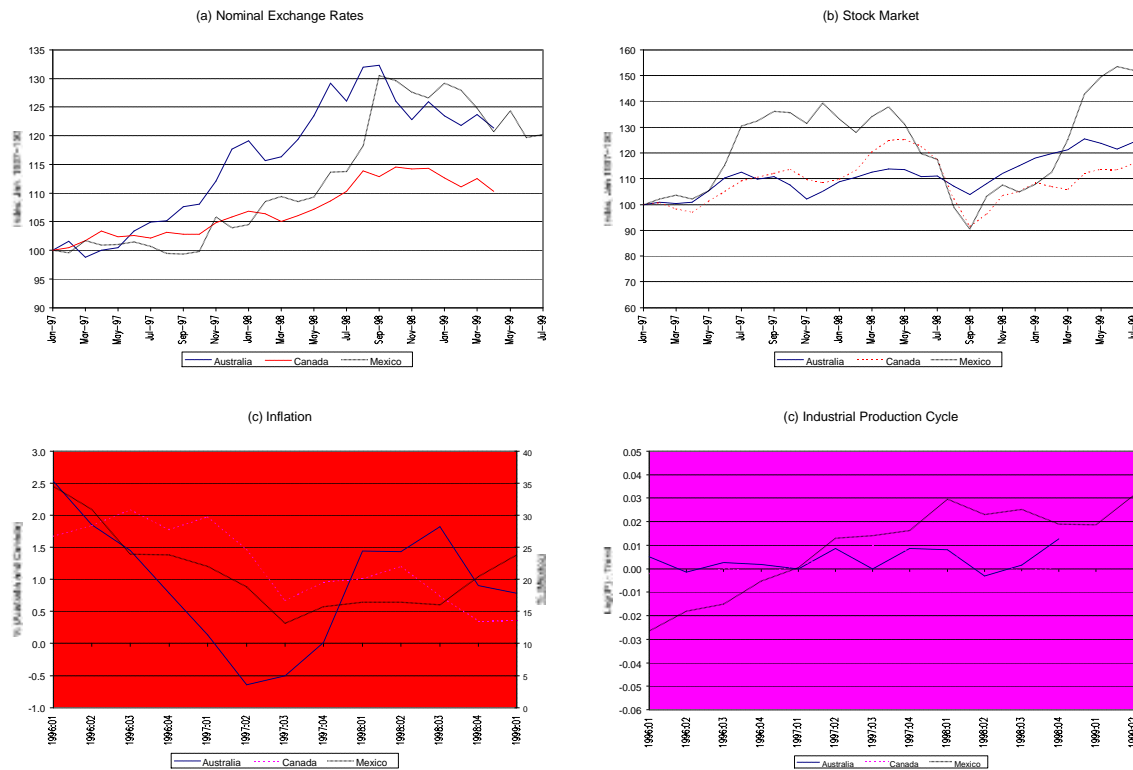


Notes: Panel (c): Inflation (SA 3 months MA, annualized monthly variations). Panel (d): Industrial Production is seasonally adjusted.  
Source: IFS.

While the float and the good health of the U.S. economy seem to have served Mexico well during this round of international crises, lack of monetary credibility has

taken its toll both on interest rates and inflation. Figure 15 compares the experience of Mexico to that of two more advanced economies with flexible exchange rate systems: Australia and Canada. It is apparent from the figure that, while all these countries experienced large and comparable nominal depreciations during this period, Mexico had much less to show for it in terms of a real devaluation, as inflation eroded a large part of the nominal depreciation (note the different scale used to report Mexico's inflation). Rather mechanically, one can interpret this in terms of a very high pass-through. My view is that the problem results from a lack of a credible monetary anchor that drives both the exchange rate and domestic inflation up at the first sight of trouble. Thus Mexico gets the real exchange rate depreciation it needs, but it also gets a rise in expected inflation.

Figure 15: Relative Performance: Australia, Canada, and Mexico



Notes: Panel (b) Share prices Australia: All Ordinaries (AORD), Canada: TSE 300 Index (TSE), and Mexico: MXSE IPC (MXX).  
Source: IFS and Commodity Systems, Inc.

To summarize, Mexico's monetary policy cannot depart too much from what U.S. and world conditions dictate without incurring serious risks; it seems that the flexible

exchange rate system has helped Mexico follow this dictum in a smoother way, but it has also made expected inflation and interest rates very volatile.

### **3. Taking Stock and Policy Recommendations**

The diagnostic contains four basic elements: (i) limited and fragile links with international financial markets, coupled with strong dependence on external conditions; (ii) domestic financial underdevelopment and chronic credit crunches; (iii) a weak fiscal situation due to vulnerability to external *and* internal factors (primarily bailouts); and (iv) lack of credibility in monetary policy aspects.

Reflecting these elements, the general policy recommendations highlighted in the introduction were grouped into four categories as well: (i) improve external financial links and their use during crises and reduce direct exposure to external shocks; (ii) accelerate the development of domestic financial markets and intermediation; (iii) reduce public accounts exposure to internal and external shocks; and (iv) stabilize very high and low frequency movements in nominal exchange rates.

While at a general level the connection between recommendations and diagnostic is apparent, there are specific aspects that are worth developing further.

#### **3.1. Improving Links with International Financial Markets**

By now, there is widespread consensus on a series of general recommendations to improve these links, which can be found in most “international financial architecture” pamphlets (see, for example, the appendix in the template of this project). These include norms of transparency and accountability, banks’ sound practices for supervision, settlement, accounting and disclosure, aggregate risk management, and a series of related measures and practices aimed at improving the country’s contractual environment and corporate governance.

There should be no doubt that, at a general level, this advice needs to be followed closely if international financial links are to be strengthened significantly. The recent

Asian crisis has brought this important issue to the fore. More concretely, a recent example of the impact that good corporate governance standards have on investors makes the point clearly: The Teachers Insurance and Annuity Association-College Retirement Equities Fund (TIAA-CREF), one of the largest institutional investors in the U.S., has made public that it simply does not invest in claims issued by companies with poor corporate governance standards.<sup>29</sup> Among its requirements are that: (i) a company's board consist of a substantial majority of independent directors (i.e., no significant personal ties, current or past); (ii) a company's board must obtain shareholders approval for actions that could alter the fundamental relationship between shareholders and the board; (iii) companies must base executive compensation on a "pay for performance" system and should provide full and clear disclosure of all significant compensation arrangements. It does not take an in-depth knowledge of Latin American corporations to realize that very few of them would make it into TIAA-CREF's good corporate governance list.

Importing and adapting to local conditions the corresponding laws and regulations from the developed world is probably the easiest step of all. The real obstacle is in their enforcement, which not only requires competent and fair courts, but in many instances it requires a deep "cultural" change.<sup>30</sup>

In the meantime, and aside from the policies aimed at solving other problems highlighted in this report but that offer significant synergies with respect to international financial links, the following steps should be considered:

- 1) Find a mechanism to institutionalize lines of credit, and credit relationships in general, between large corporations, especially foreign-owned ones, with access to foreign financial markets and their domestic suppliers, which in turn may do the same with other domestic firms. The *maquiladora* sector is an obvious candidate for such development.

---

<sup>29</sup> See pages 10-11 in the May 1999 issue of *Participant*, TIAA-CREF's quarterly news and performance magazine.

- 2) Build self and contracted insurance mechanisms against external shocks. To build self-insurance, consider a public sector oil-stabilization fund and a financial crisis stabilization fund (earmarking foreign reserves for this purpose and charging the private sector for their opportunity cost). To build external insurance, continue expanding the range of contracted credit lines. The costs associated with these contracts should be reduced by making them contingent on clearly verifiable and exogenous events (e.g., oil prices, U.S. shocks, etc.).
- 3) Along similar lines, the credit line against political cycles contracted recently is an excellent idea. However, it does have a problem in its predictability for everybody knows when elections are scheduled and hence it may lead to opportunistic behavior. Ideally, the cost of the contract should become more expensive as the public deficit and other traditional indicators of misconduct in a political cycle deteriorate.
- 4) Finally, it is apparent in Figure 16 that most of the volatility in capital flows comes from speculative flows (in contrast, FDI is very stable). Part of this volatility is not due to “healthy” speculation but due to problems with foreign investors’ balance sheets during crises. It may be prudent to require liquidity ratios (that could take the form of investment in prime foreign assets) from foreign institutional investors, or to favor closed over open-end funds. Since financial integration is a primary goal, nonetheless, every effort must be made to avoid costly net taxation of capital flows.

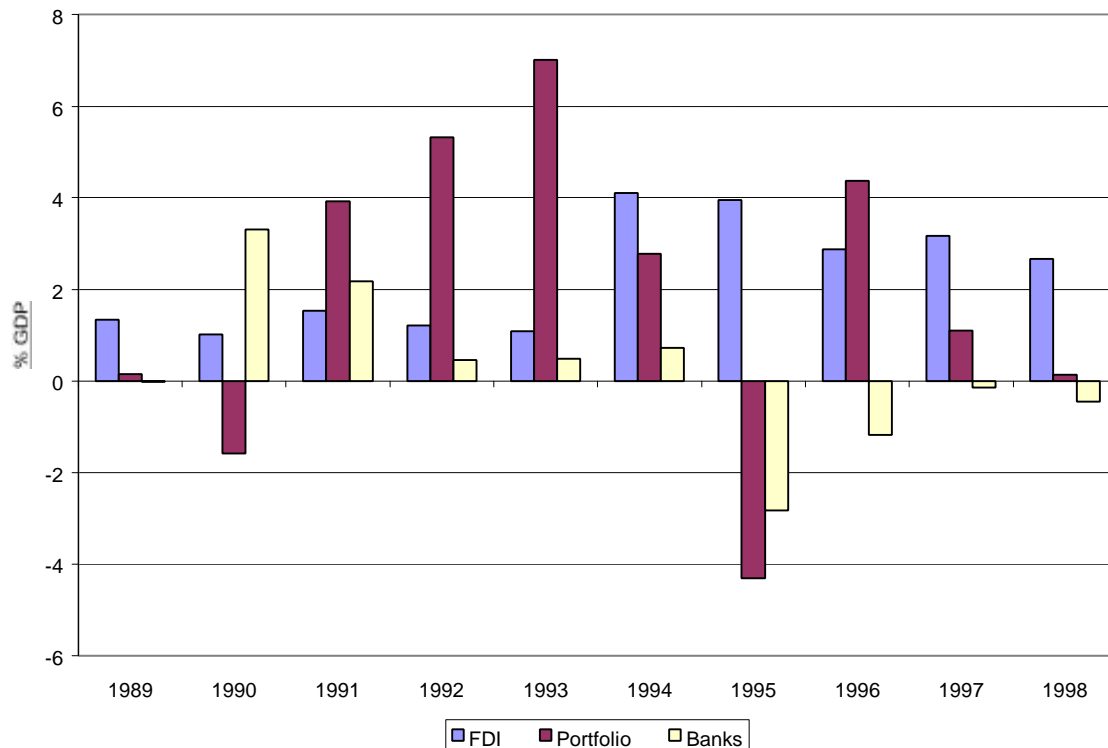
While less clear in terms of their implementability and possibilities, there are two additional consideration and remarks that relate to the strengthening of links with international financial markets:

---

<sup>30</sup>It is also important to consider the second best nature of the analysis. Thus the sequencing in the adoption of international standards and practices is an important consideration. The existence of economic conglomerates, for example, may remain the institution of choice until a sound bankruptcy and collateral-seizure law is fully implemented.

- a) The possibility of forming a Latin American market with homogeneous financial instruments should be pondered (more on this in the project's concluding section). The additional liquidity that a larger market would bring is a significant enhancement from the point of view of large foreign investors. Such system must come with mechanisms designed to prevent free-riding problems.

Figure 16: Capital Inflows



Source: IFS.

- b) In the meantime, the combination of weak international links and underdeveloped domestic financial markets and intermediation offer a clear case for taxing capital flows and mandating liquidity provisions.<sup>31</sup> On the other hand, one of the major costs of such policies is that they may reduce further the liquidity of Mexican asset markets. Measures of this type should probably only be considered in conjunction

<sup>31</sup> See Caballero and Krishnamurthy (1998) for a formal argument justifying this recommendation. In that paper, we show that weak international financial links alone are not enough to justify such intervention. It is the domestic markets problem that leads to an undervaluation of international collateral provision.

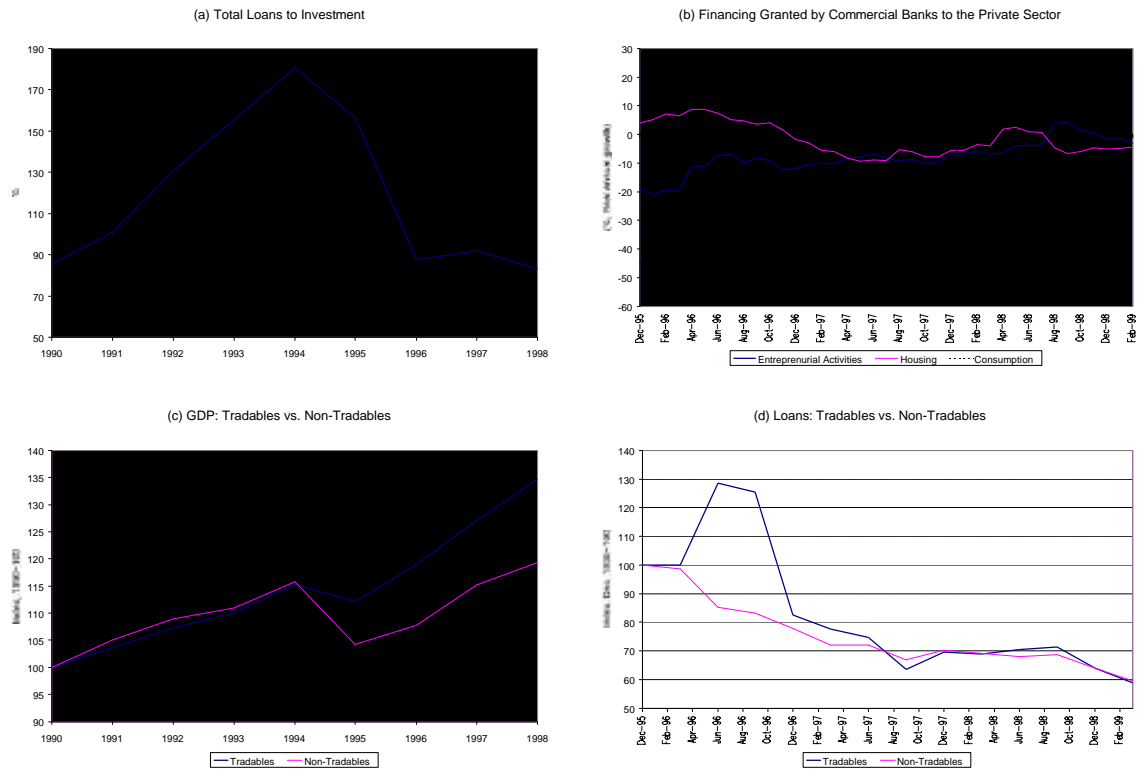
with measures aimed at fostering the development of these markets. If the latter is not possible, it may be better to stay away from these obstacles to financial integration.

### **3.2. Fostering Domestic Financial Markets and Credit Flows**

At a general level, the institutional and contractual reforms, as well as the stabilization measures described above, should also have a direct impact on the development of domestic financial markets. In addition to these, there are a few considerations that are particularly concerned with domestic markets and banks.

- 1) Mexico needs banks urgently. Figure 17 reinforces the conclusions in Section 2 by portraying the deep and widespread credit crunch that has followed the 1994-1995 crisis. A speedy re-capitalization of the most viable domestic banks, and importing the rest from countries with good supervision should be high on the short-term agenda.

Figure 17: Credit Crunch



Notes: Panels (a), (c), and (d): Tradables: Agriculture, Mining, Manufacturing, Transportation, and Financial Services; Non-Tradables: Construction, Utilities, Commerce, and Social Services.  
Source: IFS, INEGI, and Banco de México.

- 2) In the medium-term, one can be more subtle about tradeoffs. While foreign banks from the G10 often come with a solid built-in supervision from their homelands, they may not always facilitate the smoothing of sharp aggregate contractions as much as equivalent domestic banks do. This said, the solution to this potential problem lies not in limiting foreign banks' participation but in ensuring that structurally important financial lines remain open when necessary.<sup>32</sup>
- 3) Most importantly, domestic collateral (e.g., real estate) is often inadequate for crises, particularly those triggered by the sudden scarcity of capital inflows. The same holds



true of loans to some non-tradable sectors. This suggests imposing additional capital-adequacy requirements with respect to assets exposed to systemic risk and fostering the usage of collateral that is more adequate to foreign investors.<sup>33</sup> Such measures would also significantly help strengthen Mexico's external financial links. Moreover, with the passage of time these processes should reinforce each other, broadening the class of assets that are deemed acceptable by foreign investors

- 4) In order to compute these macro-capital adequacy ratios it is imperative that banks' off-balance sheet activities be monitored, for it appears that a significant fraction of the macro-risk taken during the 1994-95 crisis took place through this channel.<sup>34</sup>
- 5) Also worrisome is the unbalanced development of financial markets in Mexico. The mix of underdeveloped domestic financial markets with very sophisticated hedging instruments may generate a dangerous imbalance, as international investors use peso-forwards to hedge other regional currencies as well, with domestic banks often taking the other side of the position. Swings and flows may be too large relative to the size of Mexico's financial system. There may be a need to regulate participation in those markets until the rest of the financial system develops. (More on this point follows in the exchange rate subsection.)
- 6) During the period following the 1994-1995 crisis, Mexico has been able to finance substantial amounts of private investment and activity, despite a most severe credit crunch (see Figure 17). While retained earnings have probably contributed, this suggests that a wide array of informal lending channels has been developed. Consider the possibility of institutionalizing them.

---

<sup>32</sup> In Chile, for example, Citicorp has just announced that it will expand its business to medium size corporations and consumption credit. The bad side of this story is that it took many years of operation in what is one of the most advanced financial systems in emerging markets for Citicorp to take this step. The good side of it is that it probably did it because it faced fierce competition in the prime market from other foreign banks.

<sup>33</sup> E.g., shares of or claims on export-oriented companies, who may in turn hedge their own risks with claims from non-tradables. Of course these transactions may be carried out within the banking system, but the point is that the macro-capital adequacy ratio must take these into account.

<sup>34</sup> See Garber (1998).

- 7) As the case of Chile has shown, pension funds have great potential in terms of developing domestic financial markets. This should be one of the criteria considered when determining the constraints and possibilities of Mexico's NSPs.
- 8) More generally, fostering and nurturing the development of well supervised institutional investors is an efficient mechanism to delegate the enforcement of good corporate governance standards to the private sector, as these institutions often consider these factors in their investment decisions.

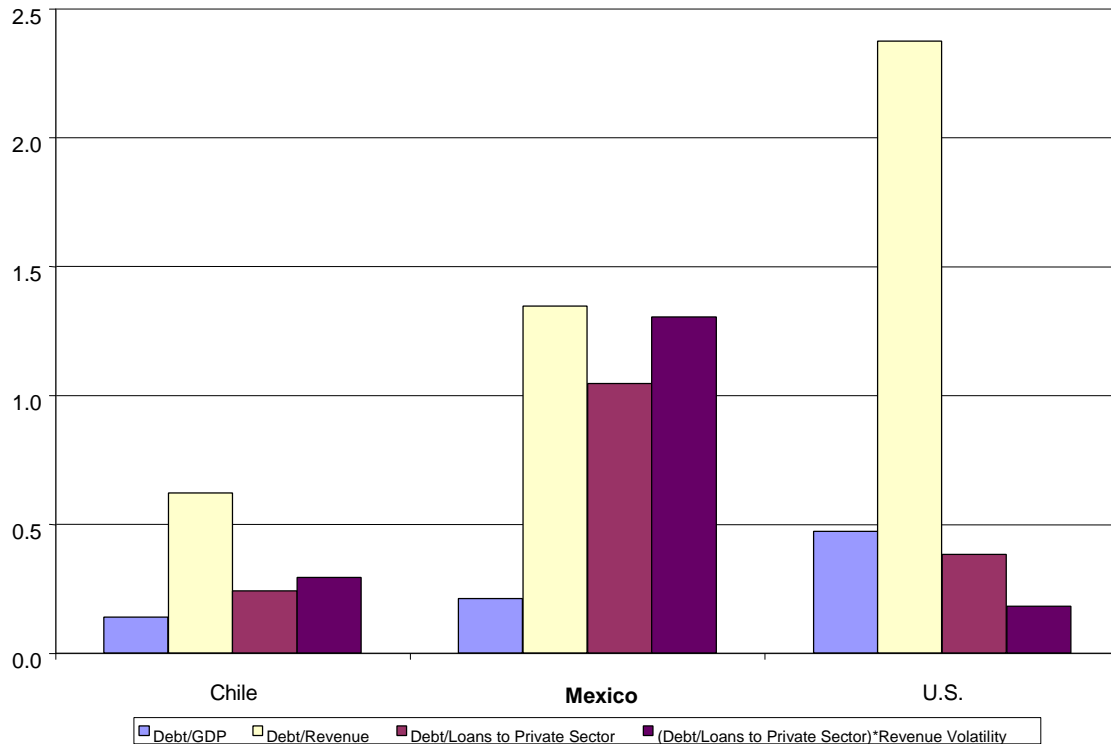
### **3.3. Strengthening Fiscal Resilience**

The fiscal fragility problem is particularly clear once one looks for metrics for public debt other than GDP. Figure 18 compares the situation of Mexico to that of Chile and the U.S., two countries whose fiscal situation is not perceived as problematic. The first bar shows that in terms of their respective GDPs, Mexico's public debt situation is far from critical. It looks substantially worse once normalized by fiscal revenue, but so does that of the U.S. The real difference, however, starts to arise when that debt is compared to the size of domestic financial markets, here indexed by claims on the non-financial private sector. The size of Mexico's public debt is large relative to its minute financial markets. And it looks its worst when multiplied by the volatility of fiscal revenue (last bar), which captures the speed at which fiscal conditions may deteriorate.<sup>35</sup>

---

<sup>35</sup> And this is an underestimate since expenditures (when including those below the line) are much more volatile in Mexico as well, as a result of recurrent bailouts.

Figure 18: Public Debt under Different Metrics



*Note: All data are from 1997. Revenue volatility is calculated using real growth rates and normalized to average volatility over countries.*

*Source: IFS and Banco de México.*

I have already discussed measures to deepen domestic financial markets. The other required ingredient is to reduce the volatility of public revenues and expenditures. With this purpose, consider:

- 1) Implementing an oil-stabilization fund as described above.
- 2) Reducing the implicit bailouts strategy by institutionalizing an explicit insurance system where appropriate fees and contributions are clearly established.

### 3.4. Limiting High and Low Frequency Fluctuations in the Nominal Exchange Rate

After the 1994-1995 crisis Mexico opted for floating its exchange rate. While the experience has been largely successful, when combined with its fiscal fragility, it has left Mexico with volatile interest rates, inflation, and nominal exchange rates. Partly as a result of the latter, Mexico has had to develop future markets for its exchange,

which have brought additional volatility problems. In order to deal with these issues consider:

- 1) Sudden jumps in the exchange rate are harmful to the domestic economy and those of neighbors. Very low frequency movements are mostly conducive to inflation. But medium-frequency fluctuations in nominal exchange rates may facilitate adjustment in the presence of nominal rigidities. Suppressing very high and very low frequency movements through a *viscous-anchored* exchange rate system (or “flexible” currency-board) seems sound. This could be done with a simple partial adjustment model, where the driving force is largely predetermined (e.g., the current account deficit, U.S. credit conditions, etc.) and the anchor is the unit-parity to a strong currency. For the long-run anchor to work, it is central that the driving forces selected be stationary. This strategy does have some of the problems associated with price level targeting—as opposed to inflation targeting—in the sense that temporary shocks need to be undone, but this is just the cost side of the substantial gains in terms of long-term credibility and stability of an otherwise “weak” currency.<sup>36,37</sup> Figure 19 highlights the importance of credibility for interest rate volatility. It shows that the large volatility in rates observed for Mexico relative to Argentina (see Figure 14), cannot be tracked down to the ratio of reserves holdings to monetary aggregates (often thought of as the foundation of Argentina’s solid currency board system);<sup>38</sup> the difference is instead in the degree of commitment made by each country to a nominal anchor: it is the words (commitment), not the war-chest!<sup>39</sup> This message is even more apparent when one looks at this ratio for Australia and Canada, for example.<sup>40</sup>

---

<sup>36</sup> See Hausmann *et al.* (1999) for a discussion of some of the costs of such weaknesses for financial development.

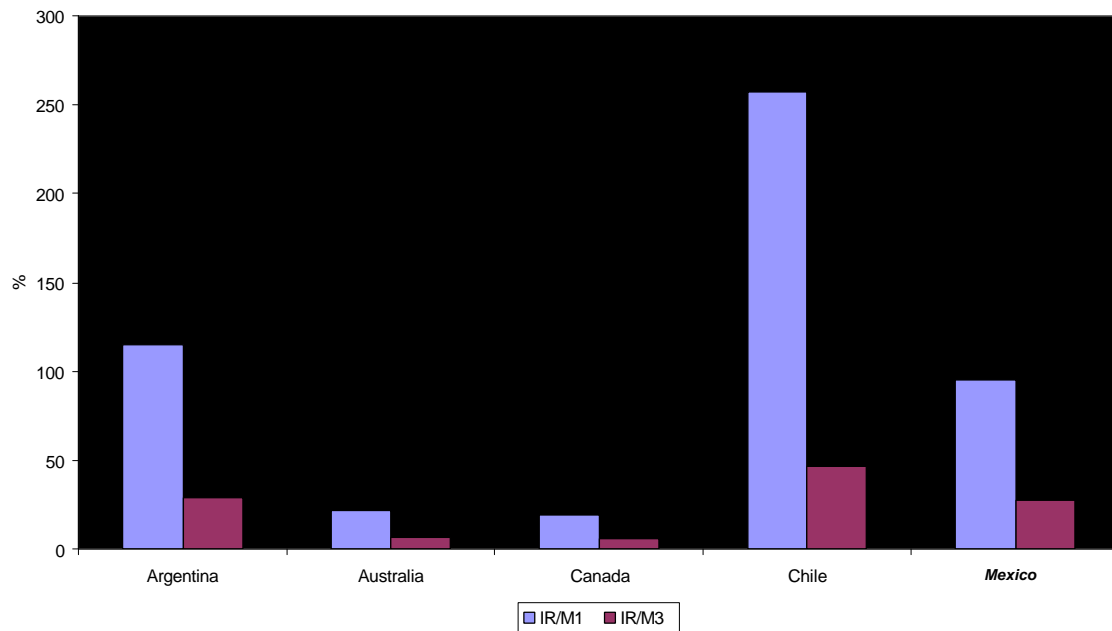
<sup>37</sup> In principle, it is also possible to add an inflationary component to the rule, but the combination of a reasonably flexible labor market with the lack of a first order dependence on inflationary financing does not seem to justify it in the case of Mexico.

<sup>38</sup> Moreover, note that Argentina’s reserves include about 7 percent of Argentine public instruments denominated in dollars (which are certainly not international reserves in the conventional sense).

<sup>39</sup> This is certainly not meant to claim that the rigid Argentine currency board system is preferable to the flexible system of Mexico. But the figure certainly highlights the value of a solid nominal anchor.

<sup>40</sup> The case of Chile is interesting as well, since it was attacked despite its substantial “war-chest” (measured relative to the size of its financial sector). See the companion Chile report.

Figure 19: International Reserves to Monetary Aggregates (1998)



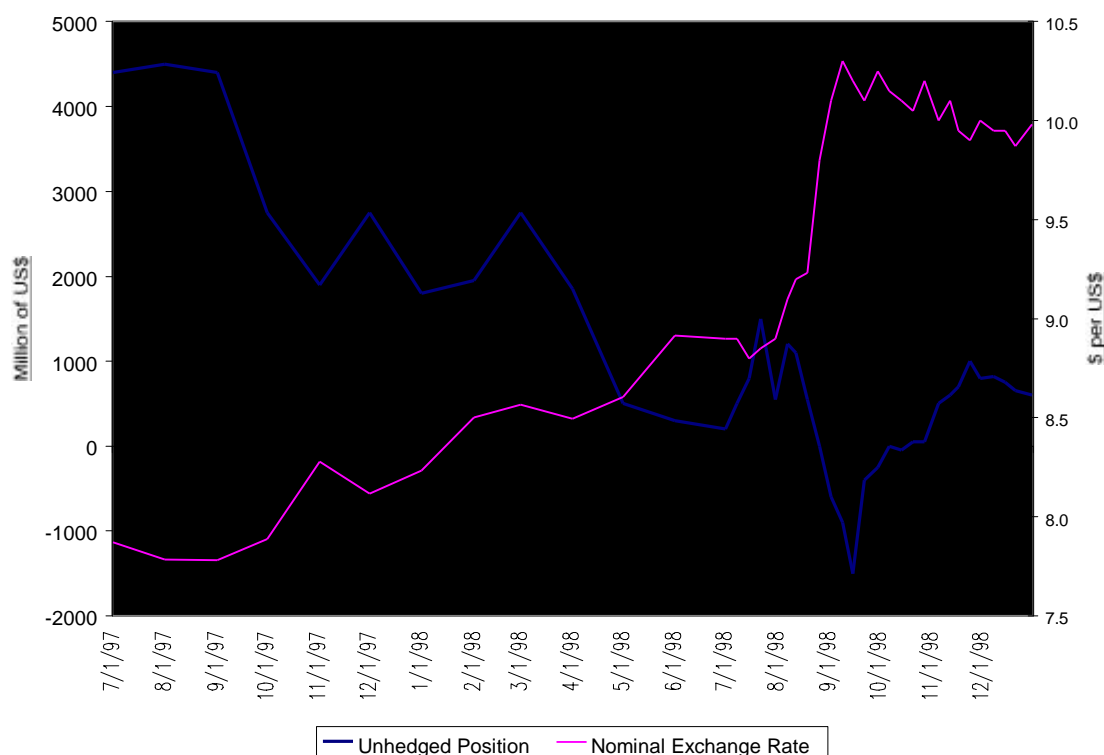
Notes: M1 and M3 correspond to lines Money and Money plus Quasi-Money in IFS, respectively.  
Source: IFS.

- 2) Of course, it is not only the commitments that matter, but also the shocks. As mentioned above, it is important to create explicit stabilization funds and other mechanisms that reduce the fiscal impact of private sector imbalances.
  
- 3) Finally, the stabilization of the exchange rate facilitates the implementation of other policies as well. In particular, it reduces the cost associated with taxing and limiting the use of future peso markets. The latter is needed, as discussed above, because investors seem to use the Mexican future markets to hedge against the risk of other currencies correlated to Mexico's through financial contagion. This puts undue pressure on Mexico's spot market as its banks, the counterpart of the future contracts, balance their positions.<sup>41</sup> This can be clearly seen in Figure 20, which shows the strong negative contemporaneous correlation, particularly during times of emerging

<sup>41</sup> See Banco de Mexico (1999).

market crises, between the spot exchange rate and the net position of foreigners in future markets.<sup>42</sup>

Figure 20: Exchange Rate and Foreign-Held Fixed Income Unhedged Securities



Notes: Including government securities and bank notes. From July 1998 is weekly data.  
Source: Banco de México ("The Mexican Economy 1999," Chart 46, page 95).

To conclude, I shall emphasize that the overall outlook for Mexico, from the point of view of the issues addressed in this report, looks promising. Many of the relevant reforms are either taking place or under discussion, and the rest seems well within the reach of a country on the right track of its stage II reforms. By all means, this does not mean that complacency would not be costly. Quite the opposite, Mexico still exhibits enough weaknesses to consider itself extremely lucky that the U.S. was experiencing one of its very best moments in the post-war period when the recent emerging markets crisis hit the world.

<sup>42</sup> Thus, Banco the Mexico (1999) argues, and I concur, the sharp depreciation in the exchange rate during the Russian crisis was influenced by international investors' concern with a possible devaluation in Brazil.

## Appendix: Chronology

### *General Trends:*

*1988-1994:* Inflation falls from 52% to 7%.

*1988-1992:* Public sector borrowing requirement changes from 12.5% of GDP to surplus of 0.5% of GDP.

*1989-1994:* Fixed exchange rate. Trade liberalization. Trade and current accounts deteriorate (CA moves from \$405m surplus in 1989 to \$18.5bn deficit in 1994.)

*1995-present:* Floating peso. Large real depreciation in 1995, partly reversed since then. A \$7.1bn trade surplus turns into deficit by mid-1997.

*Throughout:* Trade liberalization occurs through NAFTA and other free trade pacts. Other measures include deregulation, privatization, and more attractive foreign investment rules. The financial sector is liberalized; reforms include liberalization of interest rates and credit terms, elimination of obligatory lending to public sector, privatization of banks controlled by Government, and the establishment of new domestic banks and subsidiaries of banks operating in the U.S. and Canada.. Manufacturing exports increase significantly, particularly in the *maquiladora* sector, metal products, machinery and equipment, and the automotive sector. Exports increased from \$40.7bn in 1990 to \$110bn in 1997 (including *maquiladoras*.) The share of manufactures in exports increases from 68% to 86%, while the share of crude oil and minerals decreases from 25% to 11% in the same period. U.S. takes 85% of exports and provides 75% of imports. Public indebtedness increases substantially. Ratio of public debt to GDP at end of 1998 is 30.3%, but there are extra liabilities of 17% of GDP of the former Fondo Bancario de Protección al Ahorro (FOBAPROA).

---

The peso-dollar future contracts provided a good hedge against that risk.

### ***Developments and Events:***

#### *Late 1970s:*

Large oil fields are discovered, and unprecedented economic growth takes place.

#### *1976-1982:*

Growth is magnified by massive inflow of foreign loans during presidency of José Lopez Portillo. This period is characterized by an expansionary fiscal policy (during 1982, public sector deficit amounts to 17.6% of GDP, and public expenditure amounts to 46.9% of GDP, up from 29.5% five years earlier.) The government repeatedly attempts to defend an increasingly overvalued peso.

#### *1982:*

The debt crisis arises, accompanied by an abrupt end to growth. The commercial banking system is nationalized. Dual exchange rates are introduced: controlled (official) and free (crawling peg).

#### *1982-1988:*

Miguel de la Madrid is president. During this time Mexico has no reserves, no international financing, and large debt. Exports rise and imports fall, at the expense of consumption and investment. Economy grows at an average rate of 0.1% from 1983-1988, with high inflation. Monetary policy is dominated by the need to finance the public sector deficit. Government financing requirements force the private sector out of the domestic bank credit market.

#### *1985:*

*Overall:* A major earthquake occurs in Mexico City.

*August:* Free exchange rate (crawling peg) is replaced by controlled float.

#### *1986:*

Mexico joins GATT. Oil prices fall sharply. Current account turns into deficit for the first time since debt crisis. Capital account records first surplus (due to debt-equity swap and



high interest rates). Mexico begins discussions with commercial banks to renegotiate debt.

*1987:*

*Overall:* As oil prices recover, the current account goes back into surplus. New commercial bank lending and capital repatriations also help reserve position.

*December:* Mexico is forced to devalue free rate (which was a controlled float exchange rate). The Pacto de Solidaridad Económica (an anti-inflationary program) is introduced. Wages and prices are frozen, and import tariffs are reduced. Inflation falls from 159% in 1987 to 52% in 1988.

*1988:*

*Overall:* Carlos Salinas de Gortari is elected president. A public sector deficit of 10.9% of GDP in 1988 is to become a 1.6% surplus by 1992. A process of bank reforms begins which allow banks to compete with other financial entities; provisions include free interest rates and a reduction in effective reserve requirements from 90% to 30%. Private sector borrowing recovers in 1989 and 1990.

*February:* The peso is devalued, then fixed for the rest of the year in support of anti-inflationary drive.

*1989:*

*Overall:* After years of post debt-crisis stagnation, the economy starts moving again (in 1989-1991, GDP growth averages 4.5%, and inflation and interest rates decline sharply). New legislation allows foreigners to purchase stocks, though without voting rights. Tax reform, together with more efficient tax collection, faster economic growth, lower interest rates, and higher oil prices, reduces public sector borrowing requirements to 5.7% of GDP.

*January:* The Pacto de Solidaridad Económica is replaced by the Pacto para la Estabilidad y el Crecimiento Económico, which allows for daily devaluation of the peso as well as periodic adjustments of prices and minimum wage. The public sector deficit is reduced, and inflation declines from 52% in the previous year to 19.7%.

*1990:*

Foreigners are allowed to purchase Mexican T-bills. Brady Plan is implemented. Inflation surges again to 26.7% due to the relaxation in credit conditions, the removal of subsidies, and the realignment of public sector prices.

*1991-1992:*

The eighteen banks in which the government had majority shareholding (nationalized in 1982) are returned to the private sector. Privatized banks have poor asset quality.

*1991:*

*Overall:* Mexico signs a free trade agreement with Chile and an agreement on cooperation with the European Community. Mexico becomes a member of the European Bank for Reconstruction and Development.

*November:* Exchange controls are abolished and the two exchange rates, free and controlled, are unified.

*1992:*

GDP growth slows down to 3.6%, and exports growth to 5%. Imports and investments nonetheless rise by 19.6% and 15% respectively.

*1993:*

Mexico is admitted as a full member of the Asia-Pacific Economic Cooperation group. Government allows the establishment of new domestic banks. Doubts arise regarding NAFTA. Investment falls by 3.3%. Interest rates rise. Banks begin to restrict lending. End of U.S. recession increases export growth rate. GDP growth slows to 2%. Fiscal policy is restrictive.

*1994:*

*Overall:* Mexico joins the OECD and signs free trade agreements with Costa Rica, Bolivia, Venezuela, and Colombia. Government allows the establishment of foreign banks (with operations in the U.S. or Canada). The percentage of bad loans remains high, even during boom, reaching 8.3% by the end of 1994. Capital account surplus falls to

\$14.6 billion from \$32.5 billion in 1993, wiping out most reserves. Higher U.S. interest rates, political shocks, and concerns regarding current account deficit diminish foreign investors' confidence. In the first half of the year, government spending increases significantly. Exports grow by 17.4%. Employment and wages recover.

*January:* Mexico joins NAFTA. Zapatista uprising takes place in Chiapas.

*March:* Presidential candidate Luis Colosio is assassinated.

*April:* Banco de Mexico becomes independent, though finance ministry retains control over exchange-rate policy.

*August:* Ernesto Zedillo is elected president.

*September:* PRI secretary-general Francisco Ruiz Massieu is assassinated.

*December:* Zedillo takes office. The peso is devalued.

*1995:*

*Overall:* Peso continues to plunge as investors fear government will not have enough resources to pay \$29 billion of Tesobonos due in 1995. Capital account surplus increases to \$15.4 billion, but reduction in current account deficit allows rebuilding of reserves. Banking system is affected by devaluation and high interest rates. Bad loans reach 17.2% by September. A major recession occurs, as GDP falls by 6.2%, though the non-financial public sector achieves a surplus of 0.7%.

Several programs to deal with bad loans are formulated. Assistance to borrowers includes the conversion of loans into Unidades de Inversion, linked to CPI, and programs targeted to mortgages, consumer, small business, and agricultural loans; in 1997 these programs are expanded to support state and local governments. Assistance to banks includes the Programa de Capitalización Temporal to meet capital provisions and the establishment of a fund to take over bad debts in exchange for new capital injections by shareholders; the government takes control of some institutions.

The cost of the bailout, estimated at \$60 billion, or 17% of 1997 GDP, is to be written down over a 30-year period. The peso is floated, and a large drop occurs in private investment as well as public investment and spending.

*January:* Government agrees with labor and business community on emergency economic plan, consisting of a tighter fiscal and monetary stance and wage restraint.

International salvage plan (U.S. \$20 billion, BIS \$10 billion, IMF \$17.8 billion).

*March:* The government is forced to boost its adjustment effort. VAT is raised from 10% to 15%. Public prices are raised, public spending cut, and wage increases contained.

*October:* A new pact, the Alianza para la Recuperación Económica, is signed. Unlike its predecessors, it is not anchored by a crawling-peg exchange-rate policy. Although free float is considered a transitional phase (while confidence is restored and reserves accumulated), it has remained in place. During 1996 and 1997, the peso remains fairly stable.

*1996:*

*Overall:* Capital account surplus falls to \$4.1 billion. Reserve accumulation stalls.

Fiscal and monetary austerity. Inflation halved from 52% at end of 1995 to 27.7% a year later. Non-financial public sector deficit is kept at 0.1% of GDP. Spending is cut due to defaults on tax payments and the cost of supporting the banking system. Exports start pulling the economy out of recession, with GDP growth at 2.2%. Private consumption and spending do not pick up, though, because of a credit crunch, unemployment, and low real wages.

*July:* Electoral reforms are passed.

*1997:*

*Overall:* Capital account surplus back up to \$15.4 billion. Current account deficit increases as well, but by less. International reserves increase from \$6.3 billion to \$19.8 billion, much more than expected. Large inflows of foreign direct investment occur. Economic recovery broadens and strengthens, aided by strength of U.S. economy. Private consumption rises.

*February:* An exchange rate stabilization mechanism is established: when the peso depreciates by more than 2% against the dollar in a single day, an auction of a maximum of \$200m is carried out at a price at least 2% higher than the one prevailing the previous day.

*July:* PRI loses control of the house of representative for the first time in seventy years. The PRI also loses important governorships, including Mexico City. New capitalization

pension system, expected to increase savings rate, begins operation.

*October-November:* After a period of exchange rate stability for the peso, the Asian crisis brings about a devaluation of almost 10%.

*1998:*

*Overall:* Oil prices begin to collapse in December 1997. (Pemex accounts for 37% of federal government revenue in 1997.) Three budget cuts take place, in January, March, and July, totaling 1% of GDP. Central government and state-owned enterprises post deficit of 1.24% of GDP (coinciding with target) even though the price of oil falls and the economy slows. Nonetheless, a strong U.S. economy keeps it growing much faster than the rest of Latin America. Private sector investment increases 16.9% while public investment falls 20.4%. Private consumption grows by 6.4% while government consumption shrinks by 1.3%. The capital account surplus reaches \$16.2 billion, the highest level since 1993.

*March:* Monetary policy stance moves from neutral to restrictive.

*1999:*

*Overall:* GDP growth rate expected to slow to 2.5%. In January, *maquiladora* sector increases 10.3% with respect to January 1998, while other manufacturing industries increases 0.3%. Unemployment is not yet increasing, though the partial employment rate (people working less than 35 hours, published by INEGI) decreases from 22.5% in February 1998 to 20.7% in February 1999. Trade deficit narrows due to weak peso and slowing economy. Exports of manufactures in February are 9.7% above previous year. Mexico keeps access to international capital markets, paying reasonable yields.

*January:* In the aftermath of the Brazilian devaluation, the ER stabilization mechanism is used twice. Monetary policy is tightened.

*February:* Fiscal restraint measures are announced, but they are limited in scope, with savings of around \$200 million. Remaining restrictions on foreign ownership of Mexican banks are removed.

*March:* Peso recuperates from fall in January, even as interest rates are brought down.

*April:* Bill on credit guarantees is sent to Congress, allowing greater scope for seizing

assets being used as guarantees for loans; this measure, though, is not expected to be approved for a few months. A deal with oil producing countries substantially increases the price of oil.

## References

- Aguiar, M. and Broner, F. 1999. "Emerging Market Crises and Macroeconomic Fundamentals." Cambridge, United States: Massachusetts Institute of Technology. Mimeographed document.
- Banco de Mexico. 1999. *The Mexican Economy 1999*. Mexico City, Mexico: Banco de México.
- Blommestein, H. J. 1997. "Institutional Investors, Pension Reform and Emerging Securities Markets." Working Paper 359. Washington, DC, United States: Inter-American Development Bank, Research Department
- Caballero, R.J. 2000. "Structural Volatility in Argentina: A Policy Report." Working Paper 422. Washington, DC, United States: Inter-American Development Bank, Research Department.
- Caballero, R.J. and Krishnamurthy, A. 1998. "Emerging Market Crises: An Asset Market Perspective." Cambridge, United States: Massachusetts Institute of Technology. Mimeographed document.
- Calvo, G.A., Leiderman, L. and Reinhart, C. 1993. "Capital Inflows to Latin America: The Role of External Factors." *IMF Staff Papers*. 40: 108-151.
- Dornbusch, R. and Werner, A. 1994. "Mexico: Stabilization, Reform, and No Growth." *Brookings Papers on Economic Activity*. 1: 253-297.
- Garber, P.M. "Derivatives in International Capital Flows." NBER Working Paper 6623. Cambridge, United States: National Bureau of Economic Research.
- Gavin, M. and Hausmann, R. 1996. "The Roots of Banking Crises: The Macroeconomic Context." In: R. Hausmann and L. Rojas-Suárez, editors. *Banking Crises in Latin America*. Washington, DC, United States: Inter-American Development Bank.
- Gelos, R. Gaston, R. and Werner, A.M. 1999. "Financial Liberalization, Credit Constraints, and Collateral-Investment in the Mexican Manufacturing Sector." IMF Working Paper 25. Washington, DC, United States: International Monetary Fund.
- Hausmann, R. *et al.* 1999. "Panama." Washington, DC, United States: Inter-American Development Bank. Mimeographed document.
- Rajan, R. and Luigi Zingales, L. 1998. "Financial Dependence and Growth." *American Economic Review*. 88: 559-586.
- Sachs, J., Tornell, A. and Velasco, A. 1996. "The Collapse of the Mexican Peso: What Have We Learned?" *Economic Policy: A European Forum*. 22.