

INTER-AMERICAN DEVELOPMENT BANK

Macroeconomic Volatility in Reformed Latin America

Diagnosis and Policy Proposals



Ricardo J. Caballero

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DIAGNOSIS AND POLICY PROPOSALS

RICARDO J. CABALLERO

INTER-AMERICAN DEVELOPMENT BANK

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PREFACE

From late 1998 to early 1999, I collaborated with the Office of the Chief Economist of the Inter-American Development Bank on a project aimed at uncovering the sources of structural volatility in Latin America. My task was to provide a conceptual framework that would guide countries in their search for the factors responsible for macroeconomic instability as well as to provide a solid foundation for making and evaluating policy recommendations. In identifying common sources of volatility, this framework had to be sufficiently abstract in order to be useful in explaining widespread volatility. Nevertheless, the design of country-specific remedies requires a careful analysis of each country's economic institutions.

Although these objectives are somewhat contradictory, I found a reasonable compromise by focusing the analysis on the sources of volatility in a subset of advanced Latin American economies: Argentina, Mexico, and Chile. These countries have mostly conquered the traditional public imbalances of the developing world, but their institutional infrastructure still falls short, to varying degrees, of that of the industrialized world. The focus here greatly reduced the variance in sources of volatility that limited the necessary level of abstraction. Moreover, the use of case studies ensured that this research was well connected to the facts for each country.

The context of this book is the experience of advanced Latin American countries in the 1990s, but the lessons learned have much broader implications, as the differences between these economies and the industrialized world today forecast the challenges for undeveloped economies in the near future. The framework outlined here is in some sense a template that can be used not only to explain aggregate volatility in other parts of the world but also to design policy that reduces the frequency and magnitude of new episodes.

The core of this book is composed of three case studies. Aside from integrating them—with each other and with the introductory and concluding chapters—I have left the original country reports nearly unmodified. This was done in part because many of the predictions and policy proposals in them have since occurred. A perspective of the events as they were unfolding is more attractive than one distorted with an after-the-facts distance. Still, the overview of the framework and more general policy recommendations are new and, when relevant, do incorporate more recent events and policy decisions.

I undertook this task to learn about the intricacies of the Latin American economies directly from the regional experts and policymakers. And indeed it was a learning

experience. In particular, I benefited greatly from regular interactions with Ricardo Hausmann and his team at the Office of the Chief Economist. Many others offered insightful comments at different stages of the project: Mark Aguiar, Adam Aschcraft, Victor Beker, Olivier Blanchard, Eduardo Borensztein, Fernando Broner, Vittorio Corbo, Jorge Desormeaux, Gaston Gelos, Guido Lorenzoni, Lorenza Martínez, Eric Parrado, Roberto Rigobón, Francisco Rosende, Julio Rotemberg, and Alejandro Werner, to name a few. Perhaps as important as the comments on the applied part of this work was my ongoing theoretical work on financial factors in emerging-market crises with Arvind Krishnamurthy. The underlying framework in this project owes entirely to that work. Finally, I was blessed with superb research assistance throughout: Adam Ashcraft, Fernando Broner, Laura dos Reis, Guido Lorenzoni, and Eric Parrado all did their share and more in different phases of this project.

PART ONE

Summary

Two financial deficiencies present in modern Latin America can be held accountable for a large part of aggregate volatility in the 1990s: weak links to international financial markets and underdeveloped domestic financial markets. After documenting broad evidence of their presence (based on the evidence reported in the individual cases), chapter 2 describes a simple framework to illustrate how these ingredients create real volatility and how these financial deficiencies leverage other factors (like terms-of-trade shocks or financial crises in other parts of the world). This framework lays an important foundation for the country-specific policy proposals that are presented in the case studies in part II and the general lessons reported in part III.

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INTRODUCTION

Latin America experienced deep transformations during the 1990s. In many countries of the region traditional imbalances were largely abated, privatizations were widespread, openness of both trade and financial accounts was largely accomplished, supervisory and enforcement institutions were improving steadily, pension systems were modernized, and so on. Symptoms of success abounded.

An important exception to this rosy scenario was the untamed and widespread volatility of real and financial variables.¹ In a few countries this volatility was still explained by the traditional maladies that plagued Latin America in earlier decades, namely large fiscal imbalances and monetary and political instability. But in many others the deep transformations ruled out these easy answers. The volatility affecting the modern and reformed end of the Latin American economies apparently had a more subtle financial origin, perhaps similar to that afflicting Southeast Asia recently. These financial factors were often compounded by leftover weaknesses resulting from the mismatch between the dramatic increase in financial activity required by the post-Brady era and the shortage of institutional and human capital infrastructure created by nearly a decade of post-debt crisis turmoil and financial repression.

Although some of these financial factors undoubtedly are part of the new global economy—in particular, the greater flexibility and options for capital as well as the highly leveraged nature of many of these investors—a significant component of the problems associated with them can be attributed to domestic weaknesses present in even the most advanced economies of the region. This book attempts to identify those weaknesses, which will continue to challenge Latin America in the near future. The bulk of the evidence corresponds to the recent experiences of Argentina, Chile, and Mexico, three of the region's most advanced economies.

Rather than attempting to characterize every possible shock and amplification mechanism, this book offers a parsimonious account of volatility in countries that already have

¹ See Inter-American Development Bank (1995) for an excellent and forceful exposition of Latin America's volatility problem.

tamed most of the traditional sources of macroeconomic instability in Latin America. It builds on two widely observed weaknesses: (a) weak links with international financial markets and (b) underdeveloped domestic financial markets. Weak international financial links are simply financial constraints, possibly time-varying, that limit the public and private international borrowing (broadly understood) of emerging countries. These constraints limit the smoothing of shocks over time and are themselves a source of shocks, creating excessive volatility in the real economy. Underdeveloped financial markets limit the prompt reallocation and proper aggregation of resources, creating wasteful contractions in those markets most affected by shocks or less plugged into the financial pipelines. Once interacting, these two ingredients not only explain the observed volatility of the 1990s but also generate clear externalities that require policy intervention. This framework thus provides a clear foundation for policy analysis. Most other shocks and deficiencies are only leveraged—even made possible—by these two factors. Moreover, to the frustration of highly competent policymakers, the environment becomes intolerant of policy mistakes.

OVERVIEW AND CONCEPTUAL FRAMEWORK

This chapter provides a conceptual framework flexible enough to be adapted to a broad set of circumstances, but precise enough to speculate on policy issues. The first, and main, part of this chapter presents the essence of the framework, while the second part discusses a few canonical shocks and their impact within the outlined environment.¹ These parts are referred to as the core (of the analysis) and the periphery, respectively.

The Core

Emerging economies have two fundamental weaknesses: a weak link to international financial markets and underdeveloped domestic financial markets. These two ingredients constitute the core weakness, in the sense that, even after addressing the traditional imbalances, they remain present and ready to cause and leverage crises. Some evidence for each of these key ingredients is presented here, and they are discussed more extensively in later chapters within the context of a specific country.

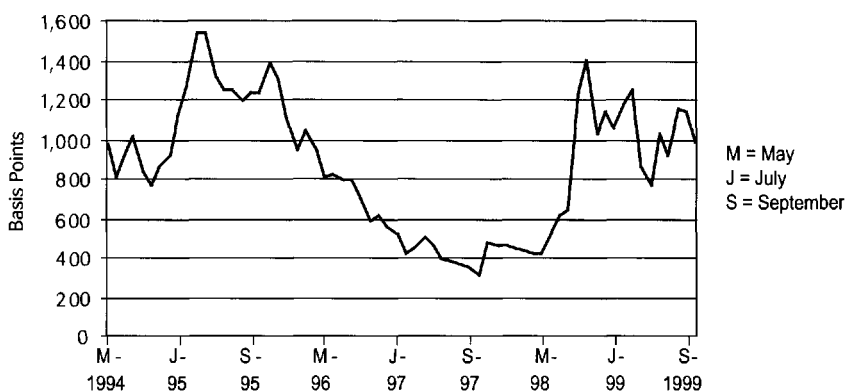
Weak international financial links are simply financial constraints, possibly time-varying, that limit the public and private international borrowing (broadly understood) of emerging economies. Weak links to international financial markets limit the smoothing of shocks over time and are themselves a source of shocks, creating excessive volatility in the real economy.

There is substantial evidence that weak links are present in modern Latin America. For example, consider quantities, prices, and volatility premia.

- *Quantities.* An immediate piece of evidence is that Latin American economies, unlike those in the Organisation for Economic Co-operation and Development

¹ The essence of the conceptual framework is an adaptation of that in Caballero and Krishnamurthy (2000a, 2000b). The examples and applications are mostly from Caballero (1999a, 1999b, 1999c). All of these papers can be downloaded from <http://web.mit.edu/caball/www>.

Figure 2.1. Spread of Brady Bonds Yield versus the U.S. Benchmark in Latin America



Note: The time series is an average of Argentina, Brazil, Mexico, and Venezuela.

Source: Datastream Research Service.

(OECD), typically exhibit procyclical fiscal deficits.² As standard macroeconomic stabilization arguments indicate that these deficits ought to be countercyclical, this pattern has been interpreted as a seriously suboptimal policy and most likely the result of the financial constraints faced by the governments themselves. The very low levels of current account deficits when compared to a neoclassical benchmark, or the large swings in capital flows that bear little relation—at least in magnitude—to changes in fundamentals, are further evidence.

- *Prices.* There also is evidence of financial constraints in the price data. Figure 2.1 illustrates the path of an index of sovereign spreads for Latin America's largest economies over the second half of the 1990s. The large surge in these spreads around the Mexican and Russian crises starkly illustrates the massive withdrawal of much-needed foreign support for Latin American assets.
- *(Self-fulfilling?) volatility premium.* Moreover, while less-than-prime corporate assets in the United States also suffered during the Asian and Russian crises, their premia rose substantially less. This difference can also be appreciated over longer time intervals. Table 2.1, for example, compares the performance of several Argentine sovereign bonds with that of several U.S. corporate bonds of equivalent rating. The table 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.

² See, for example, Inter-American Development Bank (1997) for a discussion of the procyclical nature of fiscal deficits in Latin America.

Table 2.1. The Volatility Premium

	S&P Rating	Moody's Rating	Spread Average	Spread Variance	Variance of Spread Changes
<i>Argentine sovereign bonds</i>	BB-	B1	4.28	2.25	0.36
	BB	Ba1	5.11	3.10	1.74
	BB		4.65	3.97	2.66
	BB	B1	4.59	4.12	1.76
Average			4.66	3.36	1.63
<i>U.S. corporate bonds</i>	BB		1.92	0.48	0.07
	BBB-	B1	3.38	0.62	0.41
	BB-	B1	4.50	0.49	0.23
	BB-	B1	4.49	0.44	0.15
	BB-		3.17	1.32	0.48
	BB		2.97	0.67	0.10
	BB-	B1	3.36	1.02	0.28
	BB-		4.91	6.51	2.13
Average			3.59	1.44	0.48

Note: Spread average means average over lifetime of the bond (or starting at the earliest date available in Datastream). Argentine sovereign bonds: ARGENTINA-PAR G/R 93-23, ARGENTINA 11 3/8% 97-17, ARGENTINA 11% 96-06, ARGENTINA 8 3/8% 93-03. U.S. corporate bonds: FRUIT OF THE LOOM 7% 81-11, MAXUS ENERGY CORP. DEB 8 1/2% 89-08, SEA CONTAINERS 12 1/2% 93-04 (B), SEA CONTAINERS 12 1/2% 92-04 (A), AK STEEL HOLDING CORP. 10 3/4% 94-04, CLARK OIL REFINING 9 1/2% 92-04, BETHLEHEM STL CORP. DEB 8.45% 86-05, TRSP.MARITIMA MEXICO 9 1/4% 93-03.

Source: Bond data from Datastream Research Service.

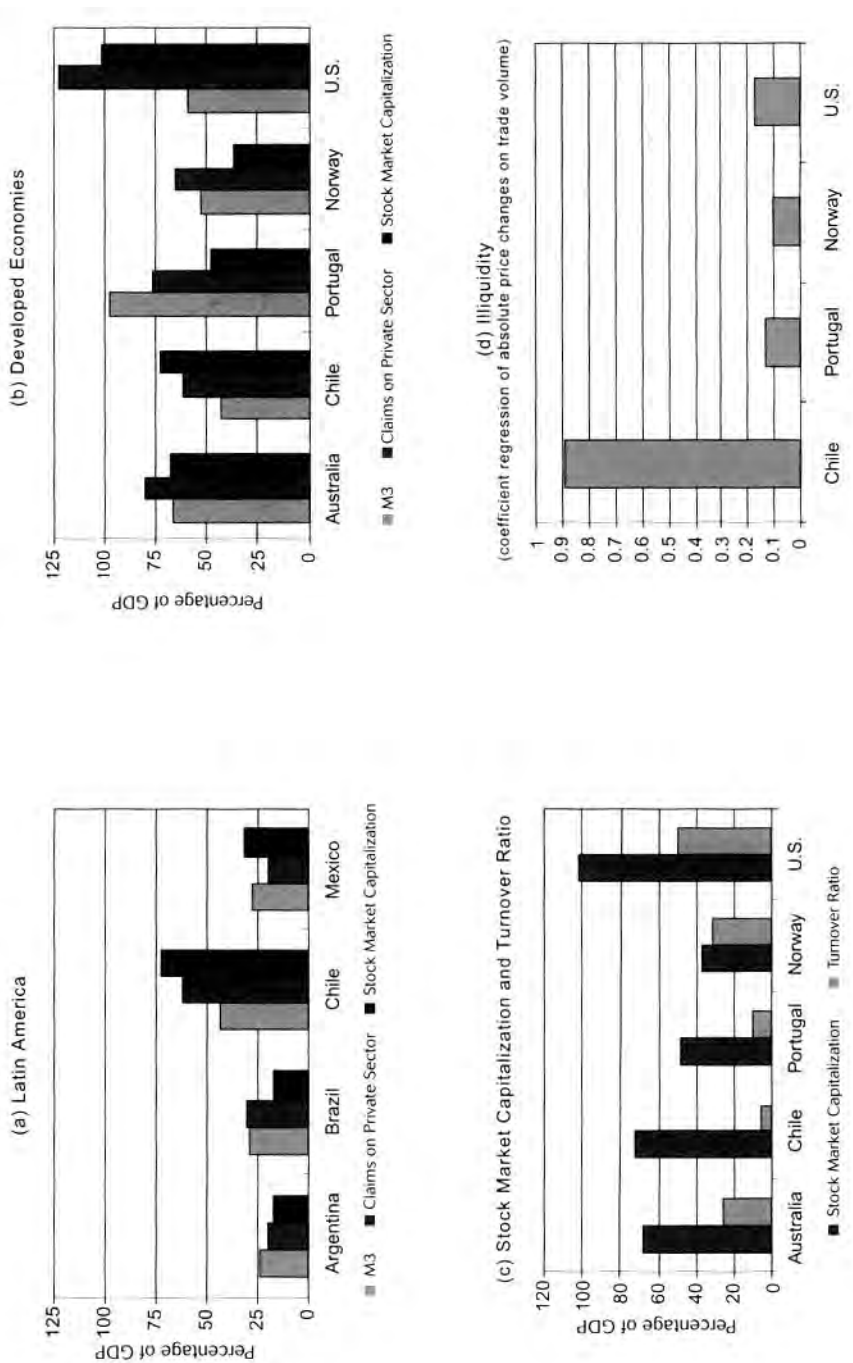
Relative to U.S. corporate bonds, Latin American bonds pay a higher spread, and their returns are substantially more volatile.³ Moreover, the spread premium is probably a result of the excess volatility that mostly comes from episodes when financial markets tighten for emerging markets. Latin American bonds look illiquid 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.⁴

The second ingredient—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, creating wasteful contractions in those markets most affected by shocks or less plugged into the financial system. However, as financial development rises, so does leverage and,

³ A similar pattern appears in other Latin American countries. See chapter 4 for evidence in Mexico.

⁴ The conclusions must be interpreted cautiously. It is difficult to assess the relative diversification of these different bonds and spreads, and the volatility of junk bonds varies over time.

Figure 2.2. Latin America's Level Problem



Note: Illiquidity is measured by a coefficient of the regression of daily absolute price changes on daily volumes over market capitalization. Sources: For panels a, b, and c, *International Financial Statistics and Banco de Chile*. For panel d, *Datastream Research Service global indices for January 1990 to September 1999*.

with it, the vulnerability of the financial system to shocks. Many Latin American economies have suffered at both ends, experiencing chronic financial repression and underdevelopment and, when moving away from that, large collapse of the banking system.

Most significant, following Caballero and Krishnamurthy (2000a, 2000b), this *domestic* underdevelopment naturally creates externalities that justify macroeconomic policies aimed at improving the country's management of international liquidity. Consider two basic features of these markets:

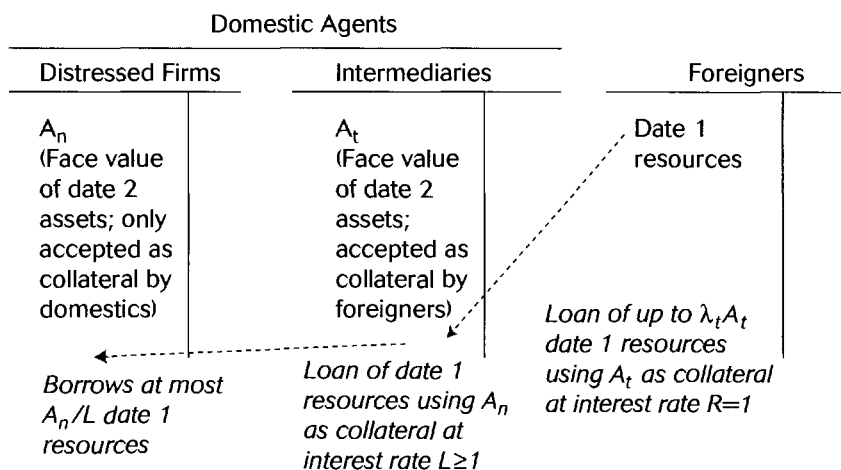
- *Low levels of financial intermediation.* Figure 2.2 highlights Latin America's level problem. Regardless of how it is measured, and despite significant improvements over the 1990s, Latin America's financial markets and level of financial intermediation are substandard. In panels a and b, it is clear that M3, loans, and stock market capitalization, each relative to gross domestic product (GDP), fare poorly with respect to OECD economies.
- *Illiquidity.* Even when the standard measures of financial depth are at world-class levels, there is always evidence of underdevelopment. On the one hand, the dark bars in panel c confirm that, in terms of stock market capitalization values, Chile is an outlier in the region and fares well compared with more advanced economies. On the other hand, the light bars show that Chile has a substandard turnover ratio.⁵ Panel d reports the results of running a simple regression of the absolute value of daily price changes (a measure of volatility) on the change in the fraction of total capitalization traded. Literally interpreted, it reveals that, on average, an increase in the volume traded, in terms of total capitalization value, is associated with an increase in price volatility that is about 10 times larger in Chile than in countries with presumably better developed financial markets.

A Simple Model

This section uses diagrams to outline a structure for thinking through the macroeconomic consequences—and, later on, the policy implications—of the two core ingredients that create excessive volatility: weak international financial markets and underdeveloped domestic financial markets.⁶

⁵ Although excessive churn can be wasteful, it is highly unlikely that Chile's depressed levels are enough to support a solid infrastructure of market makers able to provide optimal levels of immediacy and liquidity. Moreover, the wastes associated with normal churn may be a cost worth paying to reduce the extent of systemic liquidity crises when these arise. This is a theme worth researching further in the context of emerging economies.

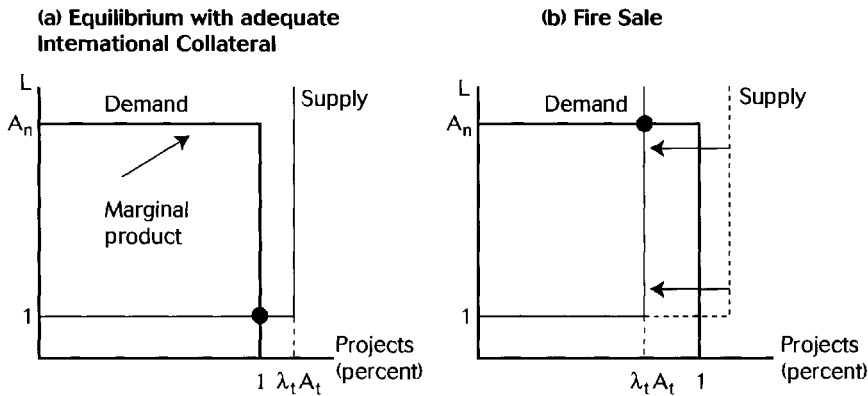
⁶ See Caballero and Krishnamurthy (2000a) for a fully fleshed model along these lines.

Figure 2.3. Equilibrium in Domestic Financial Markets

- Distressed firms have profitable projects but need date 1 resources
- Foreigners require collateral when lending date 1 resources at the international interest rate
- Only domestic intermediaries own internationally accepted collateral

Environment. It is not too far-fetched to think about an emerging economy's timeline in the following terms. Date 0 corresponds to normal times, when investment, planning, and prevention are all relevant. A significant part of this planning has to do with anticipating and preventing a crisis in the perhaps not too distant future at date 1. Date 2 represents the future, always brighter than the present, but a significant obstacle is that the country—both its government as well as its corporations—often fails to persuade foreign financiers fully that they will share in that bright future if they help to avert the crisis (weak international financial links).

External crisis. Figure 2.3 describes the elements creating a crisis driven entirely by insufficient external resources, but with a perfectly functioning domestic financial system—that is, when only the first ingredient is present. We can think of a crisis as a time when (a) a significant fraction of firms or economic agents are in need of financing either to repay debt or to implement new investments needed to save high-return projects—these agents are referred to as distressed firms—and when (b) on net, the economy as a whole needs substantial external resources but does not have enough assets and commitment to obtain them. These assets and commitment are referred to loosely as collateral, meaning the resources that are likely to be recouped by a lender. In order to make things as stark as possible, imagine that distressed firms have no assets of value to foreigners, but that the high date 2 return A_n on their investment projects, if successfully maintained, is fully pledgeable to other domestic agents. To be concrete, think of A_n as the date 2 value of a

Figure 2.4. Fire Sales

- A limited number of projects are profitable
- Scarcity of international collateral limits the transfer of funds to distressed firms
- A decline in the quality of a country's international collateral can cause a fire sale

building (nontradable) and assume that, absent a crisis, the discount of future flows is simply 0, the international discount rate. For convenience, the mass of these projects is normalized to 1.

Other domestic firms and investors (or foreign specialists) have assets, A_t , that are good collateral to foreigners. For example, foreign investors may deem U.S. Treasury bills, the present value of exports, as well as other domestic assets—like telecoms—to be relatively transparent and trustable. As it is highly unlikely that foreigners would be willing to provide financing equivalent to the full value of these assets—due to a sovereign problem, for example—assume that one unit of A_t only secures a loan of $\lambda_t < 1$ date 1 resources.⁷ Much of the policy discussion later on has to do with increasing the value of this parameter.

Domestic financial markets are essentially the place where up to $\lambda_t A_t$ date 1 resources are lent to the distressed firms, who have date 2 assets A_n to pledge as collateral. When the economy's pledgeable resources are greater than the needs of distressed firms, arbitrage keeps the internal cost of funds L equal to the gross international interest rate (of 1 by assumption). All distressed firms are able to borrow funds, and only a fraction of domestic collateral A_n needs to be pledged. This is the case in panel a of figure 2.4. In this simple example, where all projects have the same high return, the domestic demand for

⁷ In addition to binding microeconomic incentive problems, sovereign risk may be associated with many of these assets, especially in the event of crises. Sovereign risk affects foreigners' valuation of these assets, even when they acquire the private control rights.

international liquidity by distressed firms is flat up to the point where all projects are fully refinanced. The supply, however, is flat at the international interest rate until international collateral $I_n A_t$ runs out, where it becomes vertical.⁸ When the aggregate needs of distressed firms are greater than the pledgeable resources, competition among distressed firms transfers all of their private surplus (return above the international interest rate) to the domestic suppliers of international liquidity. Panel b illustrates this *fire sale* of domestic assets. The fraction of projects financed is $I_n A_t < 1$, and the domestic discount rate jumps from 1, the international level, to $L = A_n > 1$.

Externality and Policy Problems

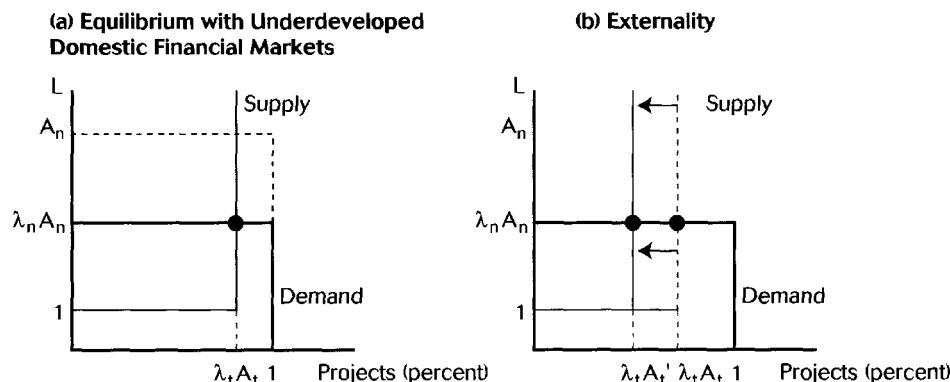
Underprovision. Although this scenario can indeed represent a great source of uncertainty and volatility for a country, it is not clear that there is a role for policy, aside from a structural one (see chapter 6). Since domestic providers of international liquidity receive all of the surplus during crises, they are given the right incentives to supply this liquidity. It is here where the second ingredient plays a central role. When domestic financial markets are imperfect in the sense that distressed firms without direct access to international financial markets do not have the means to fully pledge their returns to other domestic firms or informed investors, the *ex ante* incentive to hoard and supply international liquidity is weakened. Market making is not a great business in a market with constrained demands. Imperfect domestic financial markets are captured here by the assumption that only a fraction $I_n < 1$ of a distressed firm's value can be pledged to other domestic firms. As the capacity to compensate domestically available international liquidity is reduced for any given level of investment, the price of this liquidity L also falls.

Panel a in figure 2.5 illustrates this scenario. Given the date 0 allocations, a decline in I_n reduces the effective demand for (payment capacity of) international liquidity because the maximum payment per unit of investment is now only $I_n A_n < A_n$, leaving the marginal product curve (dashed line) unchanged. While the returns to supplying liquidity fall, liquidity providers continue their lending, given the fixed supply of international collateral, as long as pledgeable assets are greater than the opportunity cost of funds (the international interest rate).⁹

⁸ These abrupt changes in slopes are only meant to capture as clearly as possible the fact that there are some regions where most firms can satisfy their financial needs and international conditions determine the cost of credit and some regions where the domestic availability of international assets determines such cost.

⁹ A lower L does not necessarily mean that the explicit domestic rate is lower than in the case with well-developed financial markets (for a given supply of international collateral). It essentially means that a lower fraction of investments and loans can be collateralized and is likely to be recouped by the lender.

Figure 2.5. Excess Vulnerability



- Imperfect domestic collateral reduces the effective demand for funds
- Lower demand reduces intermediaries' expected returns for lending
- These lower returns reduce date 0 investment in international collateral
- Less international collateral increases the vulnerability of the economy to bad shocks

Of course, the problem is that the domestic availability of international collateral does not remain unchanged. In this environment, frictions in the market for domestic assets distort the private returns to holding domestic and international collateral. The ex ante equilibrium response to such distortion at date 0 is captured in panel b, with an inward shift in the ex ante supply of international liquidity or collateral. Since domestic financial constraints limit the returns received by providers of international liquidity below the full return of distressed projects, the incentive to provide such liquidity declines. In so doing, the economy experiences more frequent fire sales and more severe distress in the event of an international squeeze on the country. The economy is, in the end, made too vulnerable to external shocks as domestic investors do not value international liquidity enough, creating less international collateral than is socially optimal.¹⁰

Distorted external maturity structure and currency denomination. A similar situation arises with respect to short- and long-term debt. Long-term debt is equivalent to short-term debt plus rollover insurance. When domestic financial markets are underdeveloped, there is less incentive to buy the insurance that is socially optimal since the holders of that insurance do not experience distress, and financial needs at date 1 do not receive the full

¹⁰ This does not mean that international liquidity is valued less than in the first best (when $L = 1$)—quite the contrary. The claim is that it is valued less than the second best indicates.

social return of their guaranteed debt rollover.¹¹ The same holds true for debt denominated in external currency, which does not include insurance against events that put pressure on the exchange rate. These issues are discussed again in chapter 6.

To summarize, the *core* of an advanced emerging economy has two basic features. First, it frequently finds itself near the limit of its capacity for international financing (stocks or flows). In such a position, intertemporal smoothing is limited, and changes in external or domestic conditions can have potentially large effects on domestic activity. Second, domestic transfers of value are limited by underdeveloped financial markets and the institutions that support them. As a result, the incentive to reduce the vulnerability brought about by the first feature is undervalued by the private sector, and the decentralized equilibrium is excessively volatile. The next section discusses shocks within this framework, and chapter 6 as well as the concluding subsection of each case study discuss appropriate policy responses to deal with excess volatility problems given the structure (the *Is*) as well as measures to improve the structure.

Shocks and the Periphery

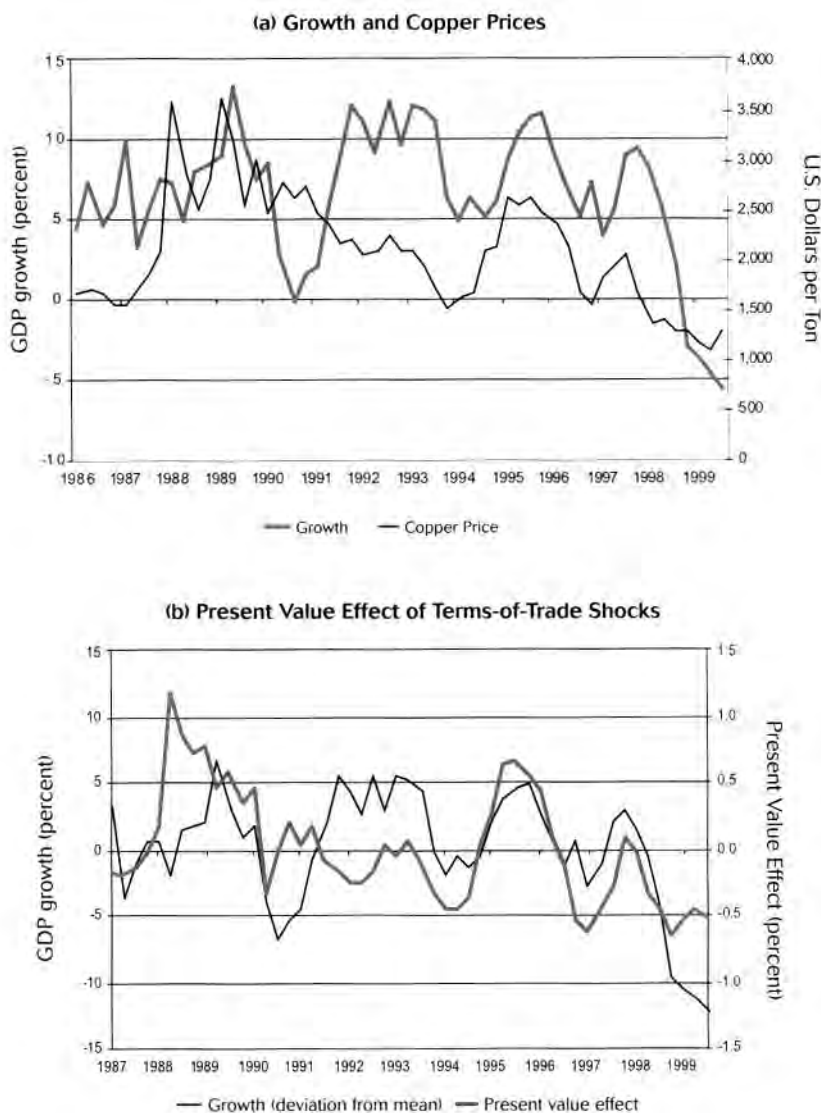
Once in this environment, the bulk of the volatility observed in advanced Latin American economies can be described using just two canonical external shocks. Sometimes it is the direct effect of these shocks that creates volatility, while in others it is simply the fear of them that leads the authorities to create precautionary recessions or the private sector to speculate on their potential arrival.

Canonical Shocks

External financial shocks. The most direct shock conducive to a fire sale and crisis is indeed a sudden loss in the international appeal of a country's assets. This can be due to country-specific factors as well as to changes and shocks in the segments of international financial markets relevant for the country. The turmoil after the Russian crisis in October 1998 as well as the debt crises that followed U.S. interest tightening during the early 1980s are two prototypical examples of the latter.

A shock of this nature can be captured in the model as a deterioration in the quality of an emerging economy's international collateral, I_t , that shifts the supply curve to the left as the country's capacity to borrow abroad is reduced. As the spread between the domestic and international interest rates rises, there is a fire sale of domestic assets because the

¹¹ See Caballero and Krishnamurthy (2000a).

Figure 2.6. Excess Sensitivity and Chile

Sources: Growth from International Monetary Fund (IMF), International Financial Statistics; copper prices (London Metal Exchange) from Datastream Research Service.

domestic opportunity cost of holding these assets is high when credit is scarce.¹² The counterpart of the fire sale is the limited reinvestment and costly termination of distressed high net present value projects.

Terms-of-Trade Shocks. Shocks need not come directly from external financial factors to reflect the weakness of financial links. Panel a in figure 2.6 plots the paths of the spot price of copper on the London Metal Exchange and Chile's quarterly GDP growth. The resemblance is stark, with the only important exception being the 1990 slowdown in growth and its recovery episode, which had a purely domestic origin. Panel b documents the excessive sensitivity of Chile's GDP response to copper prices by plotting the annuity value of the expected present value impact of the decline in copper prices as a share of GDP.¹³ It is apparent from this figure (the different scales in the axes, in particular) that fluctuations in GDP are an order of magnitude larger than a smoothing model would dictate.¹⁴

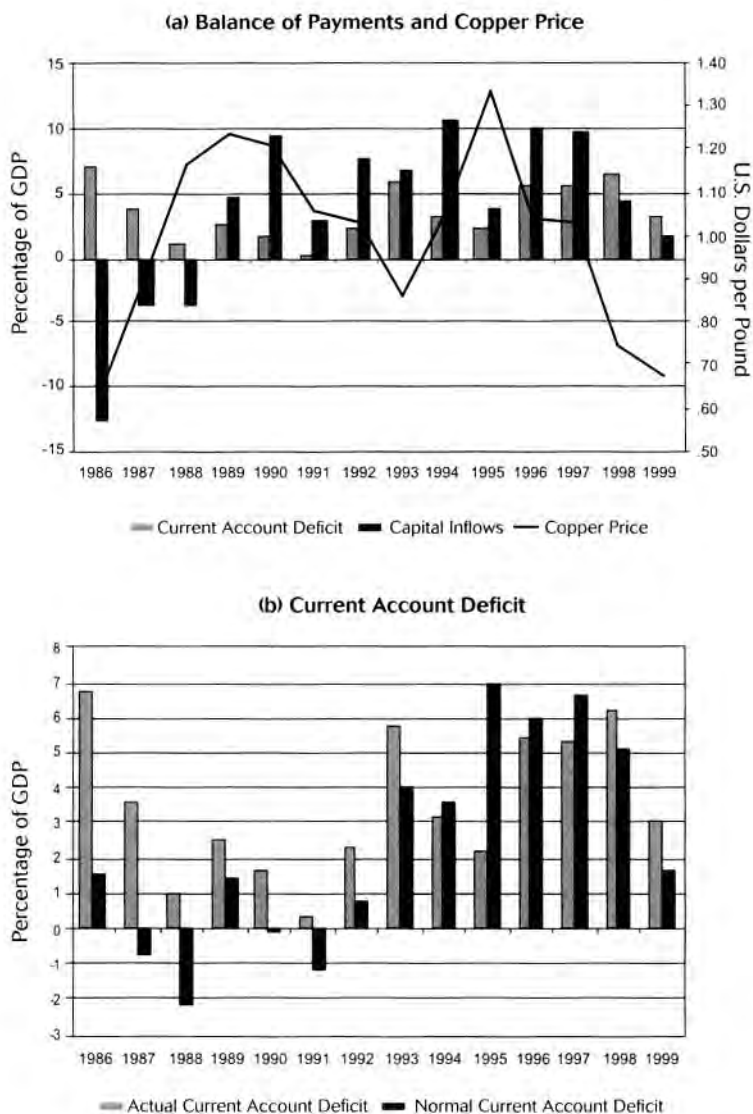
The fundamental problem is one of weak links to international financial markets. Panel a of figure 2.7 reinforces this conclusion, illustrating the *positive* correlation between the current account deficit and the price of copper, opposite to what one would predict from standard smoothing arguments. The tequila crisis of 1995 appears to be the exception that proves the rule, as the high price of copper gave the Chilean economy enough liquidity to ride through the crisis and experience fast domestic growth despite the large international credit crunch experienced by emerging economies.¹⁵ This is confirmed in panel b, which demonstrates that Chile used a large fraction of the liquidity given by the

¹² Foreigners or nonspecialists are unable to capture these high returns because at times of crises they only hold and arbitrage claims backed by international collateral. Although their arbitrage during normal times keeps the international spread at zero, it is immaterial when the international collateral constraint binds. That is, the interest parity condition shifts until domestic equilibrium, rather than international arbitrage, holds.

¹³ The present value effect is computed assuming an $AR(4)$ process for the spot price of copper, a constant growth rate for copper production (7 percent), and a fixed discount rate (7.5 percent).

¹⁴ The price of copper has trends and cycles at different frequencies, some of which are persistent (see Marshall and Silva 1998). There seems to be no doubt that the sharp decline in the price of copper in 1996 was mostly the result of a transitory demand shock brought about by the Asian crisis. As the latter economies began recovering, so did the price of copper. Conditional on the information that the shock was a transitory demand shock, the univariate process used to estimate the present value impact of the decline in the price of copper in figure 2.3 overestimates the extent of this decline. The lower decline in future prices is consistent with this view. The variance of the spot price is six times the variance of 15-month-ahead future prices. Moreover, the expectations computed from the AR process track reasonably well the expectations implicit in future markets, but at the very end of the period, when considerations of liquidity premia may have come into play.

¹⁵ Capital flows were high, matching the high price of copper, but the current account was not. The other exception reflects a domestically induced recession, as it resulted from the monetary tightening implemented at the beginning of the new government to offset the inflationary pressures of the preceding political cycle. Capital flows remained high but ultimately led to the accumulation of international reserves rather than to financing a current account deficit.

Figure 2.7. Copper Prices and Chile's Current Account

Sources: Instituto Nacional de Estadísticas and Banco Central de Chile.

high price of copper to offset the decline in capital inflows as the current account deficit at normal prices reached its highest level during that year. Most important, exactly the opposite occurred during the 1998-99 crisis, as the price of copper plummeted (erasing Chile's liquidity) at the precise time when international financial markets tightened.¹⁶

In order to place this scenario in the context of the model, for simplicity international collateral is assumed to represent only tradable goods, while domestic collateral represents nontraded goods. An adverse terms-of-trade shock is simply a decline in the value of traded goods, A_t , which reduces the country's borrowing capacity and shifts the supply curve to the left in a manner similar to the external financial shocks described above. A sufficiently large or sufficiently long sequence of terms-of-trade shocks can significantly reduce a country's international liquidity, causing a fire sale and a corresponding real decline. Needless to say, the extent to which this is likely to happen depends critically on the tightness of external financial markets.

Anticipating Future Shocks

In isolation, these canonical shocks seldom are large enough to justify the observed aggregate volatility created by a crisis, and at times crises occur even without their apparent presence. These features do not contradict the basic premise, for both their presence as well as a high likelihood of them becoming a factor in the near future typically suffice to trigger public and private responses with recessionary consequences.¹⁷

Monetary policy shocks. The case of Chile during its 1998 recession starkly illustrates a precautionary recession. The Central Bank of Chile has two basic mandates: to meet a declining inflation target and to prevent the current account deficit (at normal terms of trade) from going too much beyond 4 percent. The second mandate becomes more important when external financial conditions tighten.¹⁸ It is clearly an institutional reflection of the country's concern with external crises. Under this mandate, the 1998 scenario represented the Central Bank's worst scenario. The sharp decline in terms of trade put pressure on the peso, and hence on inflation, and directly worsened the current account via its income effect. All of this happened in the middle of a very difficult external financial

¹⁶ Terms of trade were also bad in 1993, and, consistently, growth slowed down that year as well (see chapter 5). However, international financial markets were buoyant at the time, so this decline did not coincide with a severe credit crunch.

¹⁷ Of course, these responses may prevent larger crises in the near future.

¹⁸ There is an extensive debate in Chile on whether this was indeed the Central Bank's mandate or whether it was simply an inadequate interpretation of it. This distinction is irrelevant for the point made here.

Table 2.2. The Real Benefits of Depreciation

Type of Depreciation	Asia	Russia	Both
A. Nominal depreciation			
Australia	17.33	-0.07	17.25
Canada	4.47	6.60	11.36
Mexico	10.71	15.76	28.15
B. Real depreciation			
Australia	17.46	-0.07	17.38
Canada	4.94	7.09	12.38
Mexico	0.04	7.67	7.72
C. Ratio (B/A)			
Australia	1.01	1.11	1.01
Canada	1.10	1.08	1.09
Mexico	0.00	0.49	0.27

Note: January 1997 is the base year in each panel. Nominal exchange rates are relative to the United States. Real exchange rates are constructed using the consumer price index and are relative to the United States. Asia includes the depreciation from 97:3 to 98:2, while Russia includes depreciation from 98:2 to 98:4.

Source: Data are from IMF, International Financial Statistics (1997 and 1998).

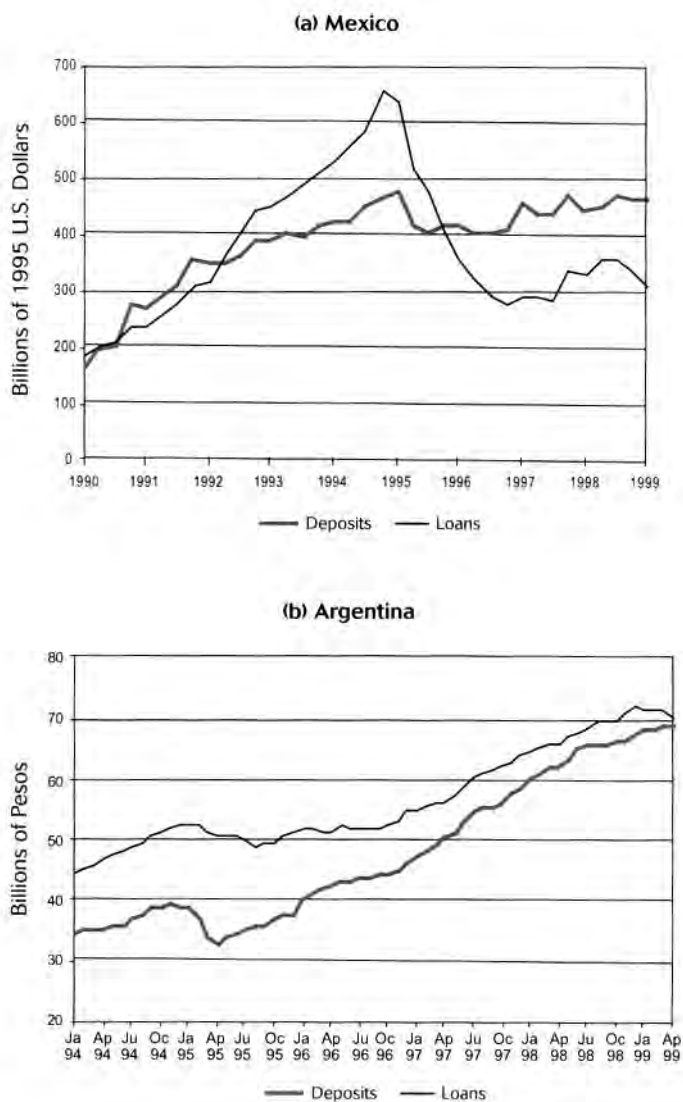
markets scenario. It was in the mandate—optimal or not—to do what the Central Bank did; a sharp tightening of monetary policy was the outcome.

Speculative Attacks and Credibility Problems. At times, as indeed was the case of Chile in the episode just described, the private sector also anticipates the potential external bottleneck. In doing so, it typically runs against the currency and domestic assets, exacerbating their fire sale and the central bank's precautionary tightening. Nonetheless, absent the potential external constraint, these attacks have a very diminished chance of succeeding, and a fragile domestic financial system makes them more likely and more costly.¹⁹

Conversely, the much-needed adjustment of the real exchange rate during times of external crises—an adjustment that is mostly required by the limited availability of external financing—is sometimes hampered by the lack of credibility of domestic monetary policy. The case of Mexico during the Russian crisis makes the point. Table 2.2 compares the experience of Mexico to that of more advanced economies with flexible exchange rate systems: Australia and Canada. Although all these countries experienced large and com-

¹⁹ Nevertheless, there are times when attacks are based purely on the anticipation of a monetary policy that is inconsistent with the existing nominal exchange rate rather than on the anticipation of a sharp shortage of real external resources.

Figure 2.8. Credit Crunches



Sources: For panel a, Banco de México; for panel b, Banco Central de la República Argentina.

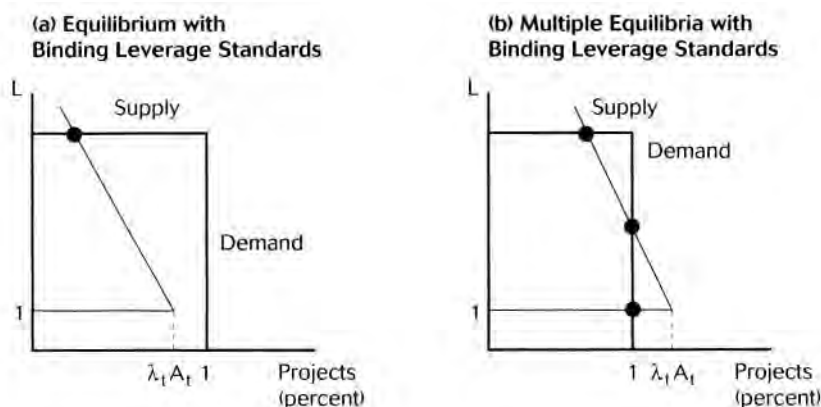
parable nominal depreciations during this period, Mexico had much less to show for them because inflation eroded a large part of the nominal depreciation. Rather mechanically, one can interpret this in terms of a very high pass-through. The problem results from a lack of a credible monetary anchor that drives up both the exchange rate and domestic inflation at the first sight of trouble.

Domestic financial system shocks and amplification: credit crunches and runs. The description of levels in figure 2.2 hides important dynamic and cyclical aspects of financial markets and of banks in particular. These play important roles as amplification and causes of external crises. Panel a of figure 2.8 illustrates the severe Mexican credit crunch that followed the tequila crisis. Loans, and in particular new loans, imploded early in the crisis, especially as the currency went into free fall, dragging the already weak balance sheets of Mexican banks with it. There is no doubt that the severe credit crunch significantly leveraged the 1994-95 crisis and that the collapse in the banking system will impose costs on the economy and the public accounts for many years to come.

The Argentine case during the same episode started from the other side of bank balance sheets. Panel b of figure 2.8 illustrates the path of deposits and loans, indicating not that the value of the loans imploded—perhaps because the exchange rate did not collapse—but rather that depositors ran for their deposits in order to convert them into dollars because they expected that the tight external conditions would make the convertibility system unsustainable.

The basic model is easily extended to include a banking sector that replaces the domestic credit chains. For example, in order to capture a Mexican-style credit crunch, let banks make loans to firms funded at date 0 by issuing debt to foreigners. At date 1, domestic holders of international assets mortgage them and deposit the proceeds in the banking system, which in turn intermediates new loans to distressed firms. Banks are subject to capital adequacy standards such that the ratio of the market value of capital to loans must be at least a . When banks are unconstrained, the economy is equivalent to one with perfect domestic financial markets and weak financial links. Once adequacy standards bind, however, the supply curve for internal funds becomes backward bending as bank capital is eroded by higher interest rates that in turn lower asset prices.

Panel a of figure 2.9 illustrates that this fire sale of assets may sharply reduce the banking sector's lending capacity, creating a credit crunch. Frictions in the banking sector are actually more serious than those described in undeveloped financial markets. Constrained banks become a financial bottleneck as excess domestic resources are not properly channeled to distressed firms, wasting otherwise good international collateral. While the contraction in the supply of loans causes the increase in interest rates, the collapse in asset prices deepens the credit crunch caused by the balance sheets of distressed banks. Panel b illustrates how the feedback between asset prices and feasible intermediation can easily bring about the possibility of multiple equilibria.

Figure 2.9. Bank Capital Crunches

- Banks must hold sufficient capital against date 1 loans to distressed firms
- Higher interest rates reduce the value of date 0 loans, increasing market leverage
- Binding leverage standards require banks to reduce date 1 lending as interest rates increase

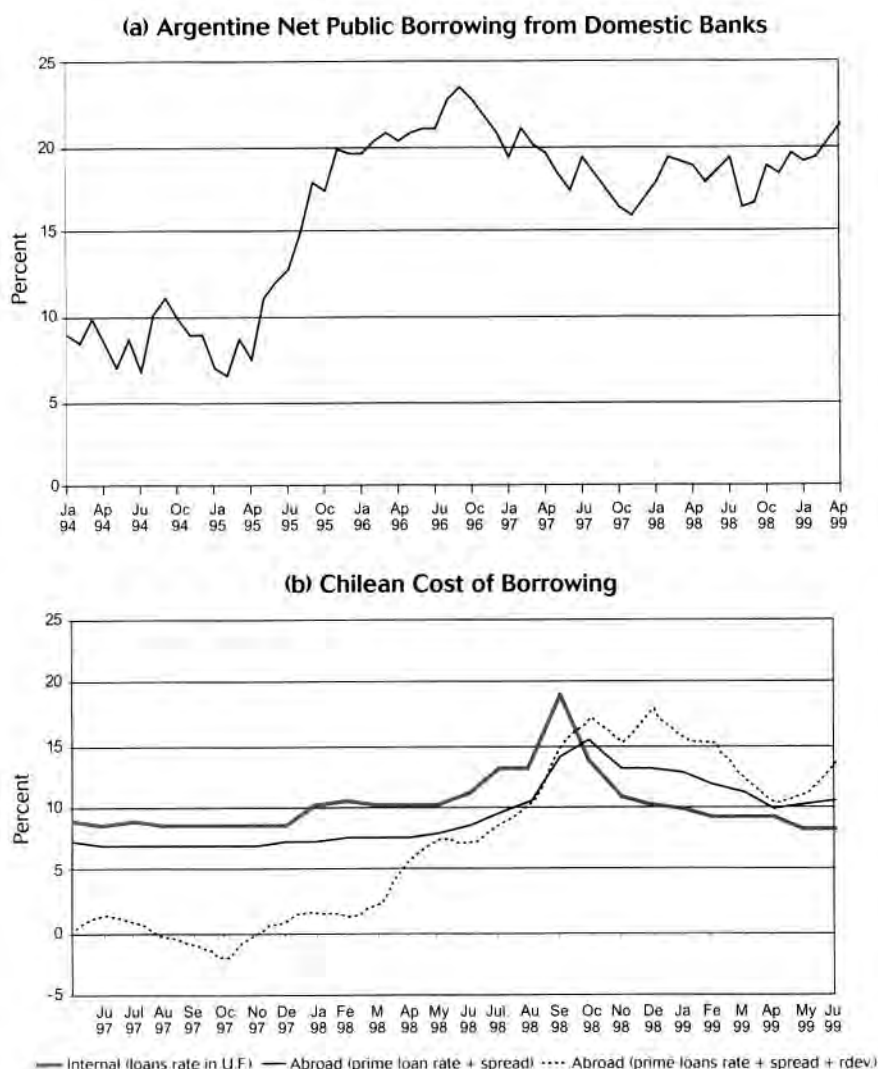
Further Amplification Mechanisms: Crowding Out and Labor Market Rigidities

Traditional sources of macroeconomic problems become more troublesome in the financially fragile environment affecting Latin American economies.

Crowding out by the government. When financing from foreigners evaporates, Latin American governments frequently turn to domestic markets for financing, crowding out private sector investment. This is costly, since one of the main features of financial crises is that funds lose their fungibility—the source of government funding is no longer irrelevant. Moreover, the government normally has the most opportunity to access international financial markets. Thus the government should shift its financing away from domestic markets. The Argentine case during the tequila crisis illustrates the lack of such adjustment. Panel a in figure 2.10 shows a sharp increase in the share of loans by domestic banks going to the government during that episode.²⁰ The slow recovery of loans to the private sector relative to deposits can be partly attributed to this shift.

²⁰ During the 1997–99 crisis the Argentine government resorted to domestic financing again, this time selling bonds to the pension funds rather than borrowing from the banking system.

Figure 2.10. Crowding Out



Note: The domestic interest rate corresponds to the financial system average rate for loans with maturity 90 to 365 days adjustable in unidad de fomento (U.F.—a monetary unit that fluctuates daily based on the variation of the consumer price index). The sovereign spread is the cost of borrowing abroad for a prime company (Enersis) minus the U.S. Treasury-bill rate. The term rdev. corresponds to the annualized monthly real devaluation.

Sources: For panel a, Banco Central de la República Argentina; for panel b, Banco Central de Chile, Ministerio de Hacienda, U.S. Federal Reserve.

This mechanism should be distinguished from that when the government itself is perceived as the source of the problem. Whether such perception is justified or not is more or less analogous to the issues behind the private sector's I_s (which, in turn, may be partly due to problems of the government). In such a case, tightening fiscal accounts may be an unavoidable response rather than one of smoothing across domestic margins.

Crowding out by large firms. As external financing tightens for large firms, they too turn to domestic markets as preferred customers, facilitating the flight-to-quality demand by domestic financiers. The social cost of this strategy is that small firms generally do not have access to international financial markets, regardless of price. To make matters worse, this not only happens during the crisis but also may extend to the recovery phase. Some evidence of this can be found during the recent Chilean recession. As the perception began to emerge that the worst of the crisis had passed and that the contraction had been more severe than expected, interest rates were lowered sharply, so much so that large firms turned to domestic financial markets for financing. Panel b in figure 2.10 illustrates approximate measures of the cost of international versus domestic borrowing for a prime Chilean firm.²¹ The line in between represents the cost of borrowing in dollars. It is apparent that although borrowing abroad was probably cheaper for these firms before the crisis (especially given the real appreciation of the peso), the opposite held after the crisis.²²

Labor rigidities and inflexibility. Lastly, exchange rate and real rigidities are once again a more serious source of concern in an environment of limited financial resources. Absent the latter constraint—and aside from medium-term problems—short-term lack of adjustment in prices should have limited impact on long-term investments and projects. Present these, short-term problems also affect these long-term decisions.

Argentina is the regional prototype here, with its strict convertibility law and European-style labor markets. Although the credit crunch experienced by the Argentine economy during 1995 probably could not have been averted by a more flexible real wage, in the still-unraveling recession such rigidity probably enhanced the crisis by generating a collateral squeeze—that is, a decline in the appeal of the firm's outlook from the point of view of the banks.²³ Firms are severely squeezed from two complementary ends: financial and labor markets.

²¹ The figure compares the U.S. prime rate plus a measure of the international spread on Chilean corporate debt and two different measures of the peso's real devaluation.

²² With time, if the situation persists, local banks probably will borrow abroad to lend to small firms. But in the short run, given uncertainty and the conservative attitude of banks, this mechanism is limited. In fact, one may think of the crowding-out mechanism in reverse: the sharp increase in the banks' appetite for quality lowers the equilibrium rate and exacerbates the rationing mechanism.

²³ Of course, one could argue that with real wage flexibility, particularly through exchange rate flexibility, the run on deposits and the ensuing credit crunch would have been avoided altogether.

Moreover, the relative rigidity of wages in Argentina during crises underestimates the extent of the relative rigidity of the Argentine system. On the one hand, countries with more flexible exchange rate systems may choose not to utilize this flexibility as much in the midst of a crisis, when controlled devaluations are risky.²⁴ On the other hand, and more significant, the lack of real exchange rate adjustment today comes together with a lack of adjustment in the near future as well. The perceived present value of overvaluations relative to crisis overvaluations is likely to be higher in the Argentine system than in more flexible ones.²⁵

²⁴ See Hausmann and others (1999) for preliminary, but suggestive, evidence on devaluation refrainment.

²⁵ This concept is difficult to measure, although some information can be obtained from peso-dollar spreads, stock markets, and real activity. In chapter 3, this phenomenon is referred to as claustrophobia, and evidence is reported on its costs and on how it changes the interpretation of movements in interest rates.

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PART TWO

Case Studies

The main goal of the research project summarized in this book is to create a template for analyzing and controlling structural sources of volatility. Part I provides the general organizing principles behind this template. This part looks in more detail at the specific experiences of Argentina, Chile, and Mexico. Although the core weaknesses are easily recognizable in each of these cases, their idiosyncrasies help to expand the template by highlighting the flexibility of the fundamental view.

The cases were mostly written during the spring of 1998 and fall of 1999. They have not been updated because part of their merit is in anticipating several of the positive and normative events following that turbulent period.

The particular order in which the first two cases—Argentina and Mexico—are presented is irrelevant. Chile is discussed at the end, however, because it arguably has the most advanced financial and institutional development in the region. Its weaknesses, therefore, offer lessons for the next stage of Argentina and Mexico as well as the rest of Latin America.

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ARGENTINA

The Argentine economy experienced a dramatic transformation during the 1990s. Inflation became a matter of the past due to a strong convertibility law, the government stopped being a major player in the production of goods and services, trade and capital accounts were largely liberalized, the pension system was modernized and partially privatized, the banking sector became more solvent, transparent, and liquid, and so on. An important exception to this rosy scenario was the untamed volatility of output and employment. This chapter seeks to identify and hint at potential remedies for the structural causes of Argentina's volatility.

The shocks behind this volatility have changed over time. During the 1980s their source was mostly domestic—such as stabilization attempts and their failure—but in the 1990s external factors sparked most of the volatility. As with many other emerging economies, weak international financial links played a central role in the two crises facing Argentina during the post-convertibility era. Although external factors seem to have started the recent crises, their impact was magnified, and at times fostered, by deficiencies on the domestic front. There are at least three strongly complementary domestic amplification mechanisms in modern Argentina: a recurrent credit crunch and financial underdevelopment problem; a fragile fiscal situation and a multiple-layer crowding-out mechanism that includes the government and large firms; and a pervasive profit and collateral squeeze brought about by a rigid labor market and exchange rate system.

These domestic deficiencies, which are tested and stressed by external shocks, are at the same time likely factors behind the weak international financial links. This complementarity creates a harmful process of volatility feedback, but it also hints at the potential synergies of a multidimensional policy package aimed at addressing these problems simultaneously.

Although not the exclusive factor, the convertibility system is a central ingredient in the three domestic amplification mechanisms. Since there are very good reasons rooted in the stability of the payments system not to abandon such a system in the near future, policy reforms must work within its constraints. Argentina's technocratic economic team recognized this and set an example of good liquidity management within a currency board

system. Argentina made substantial progress, especially on the credit crunch and financial underdevelopment problem and on some aspects of both the crowding-out mechanism and the profit and collateral squeeze mechanism, over the past five years.

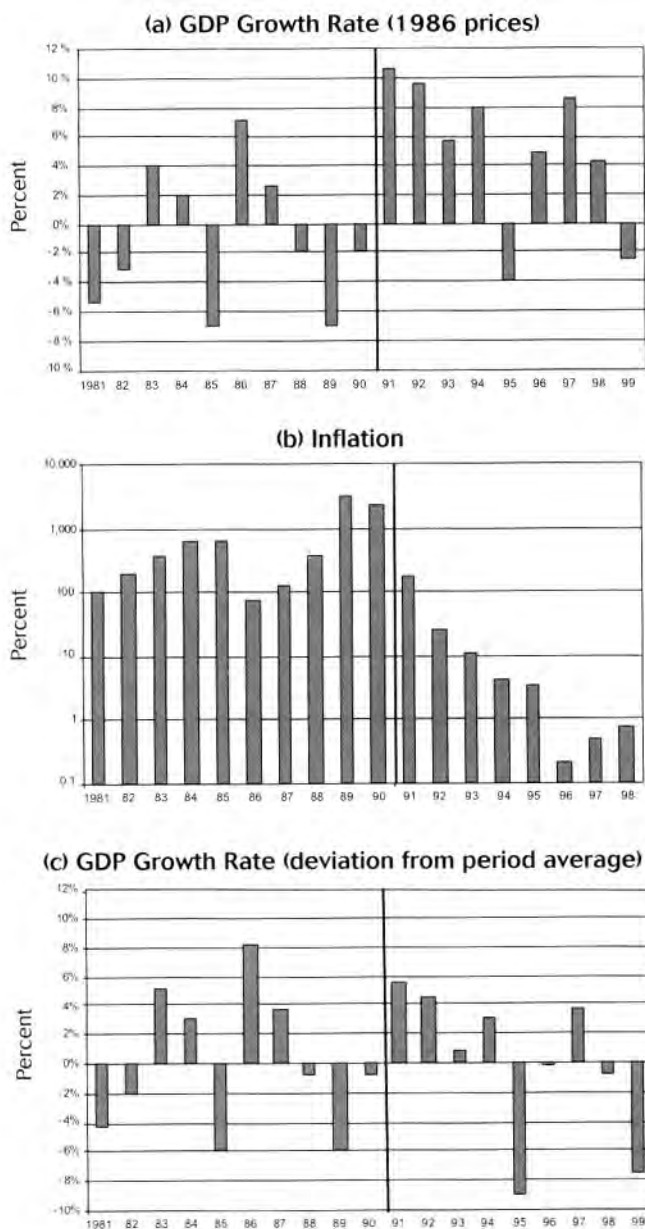
In a nutshell, and in accordance with the deficiencies highlighted above, this chapter contains policy recommendations on four general items.

The first item is to *improve external financial links and the use of these links during crises*. With this goal in mind, there are at least four slightly more specific recommendations and considerations: (a) adopt international standards on contractual enforcement, disclosure, and corporate governance; (b) implement an active policy of export promotion in order to improve the international liquidity of Argentina's productive structure; (c) create incentives for the government and large corporations to internalize their privileged position with respect to foreign investors and financiers during crises; and (d) improve the fundamentals and other aspects of vulnerability discussed in this chapter.

The second item is to *continue and accelerate the path of domestic financial deepening*. In particular, (a) consider the possibility of channeling the resources of *Asociaciones de Fondos de Jubilación y Pensiones* (AFJPs—Associations of Retirement and Pension Funds) to develop some domestic as well as regional markets, (b) foster and nurture the development of well-supervised institutional investors as an efficient mechanism for delegating the enforcement of good standards of corporate governance to the private sector, as these institutions often ponder such factors in their investment decisions, and (c) ensure that structurally important financial lines remain open, when needed, rather than limiting the participation of foreign banks. Although foreign banks often come with solid, built-in supervision from their homeland, they do not always facilitate the smoothing of sharp aggregate contractions as much as domestic banks do. This poses a delicate tradeoff.

The third item is to *give very high priority to reducing the public debt*. To this effect, two types of measures, although clearly suboptimal in the long run, may prove helpful in the short and medium run: a fiscal convertibility clause and limits on the collateralizability of the provinces' co-participation receipts. Although the availability of countercyclical fiscal policies is a blessing in more advanced economies, such policies are of little use when the nature of the crisis is mostly the loss of confidence by international financial markets. Thus the cost of losing this policy tool during the typical Argentine recession may not be large relative to the gains associated with achieving a healthy fiscal stance during good times.

The fourth item is to *address the fundamental incompatibility between labor market rigidities and a highly inflexible exchange rate system, coupled with very low world inflation*. Although this chapter endorses the idea of dealing with labor market rigidities, while postponing any potential flexibilization of the exchange rate, it addresses concerns about dollarization as well.

Figure 3.1. Growth and Volatility: Pre- and Post-Convertibility

Note: Pre-convertibility period: 1981–90. Post-convertibility period: 1991–99. Preliminary data for 1998 and predicted data for 1999.

Source: IMF, International Financial Statistics (various years).

On the labor market side, it is important to continue with the process of labor market reform, perhaps reintroducing some form of temporary contracts. Although temporary contracts have proven ineffective in dealing with structural unemployment in Europe, they may provide an important buffer for economies like Argentina's that are occasionally subject to very large shocks. The tension between structural damage and cyclical benefits can be dealt with by making temporary contracts contingent on aggregate conditions (for example, only acceptable during recessions). It is not clear whether the dominant cyclical inflexibility in wages at this time is real or nominal. Although both forms of rigidity feed into each other, their solutions are quite different. Given the current exchange rate system, most nominal rigidities will fade away with the passage of time—and sustained low inflation—rather than with deregulation. In the short run, reforms aimed at reducing the nonwage component of labor costs should be fast-tracked, but they must work in conjunction with offsetting fiscal adjustments so as not to further weaken a fragile fiscal situation. During external shocks, supply incentives should have a higher payoff than demand ones, justifying the tradeoff.

At an even more conjectural level than the rest, although it is wise to discuss the issue of dollarization in the midst of a crisis, it probably is not a good idea to implement it. Given the near irreversibility of the decision, dollarization should not be adopted unless long-run considerations support it, and this is highly unlikely (at least as a unilateral action). Moreover, the short- and medium-run advantages of dollarization may have been exaggerated.

The rest of this chapter supports these recommendations and the diagnosis when possible given the available data, highlights their conjectural nature in some instances, and in some cases hints at further research needed to make these conjectures more precise.

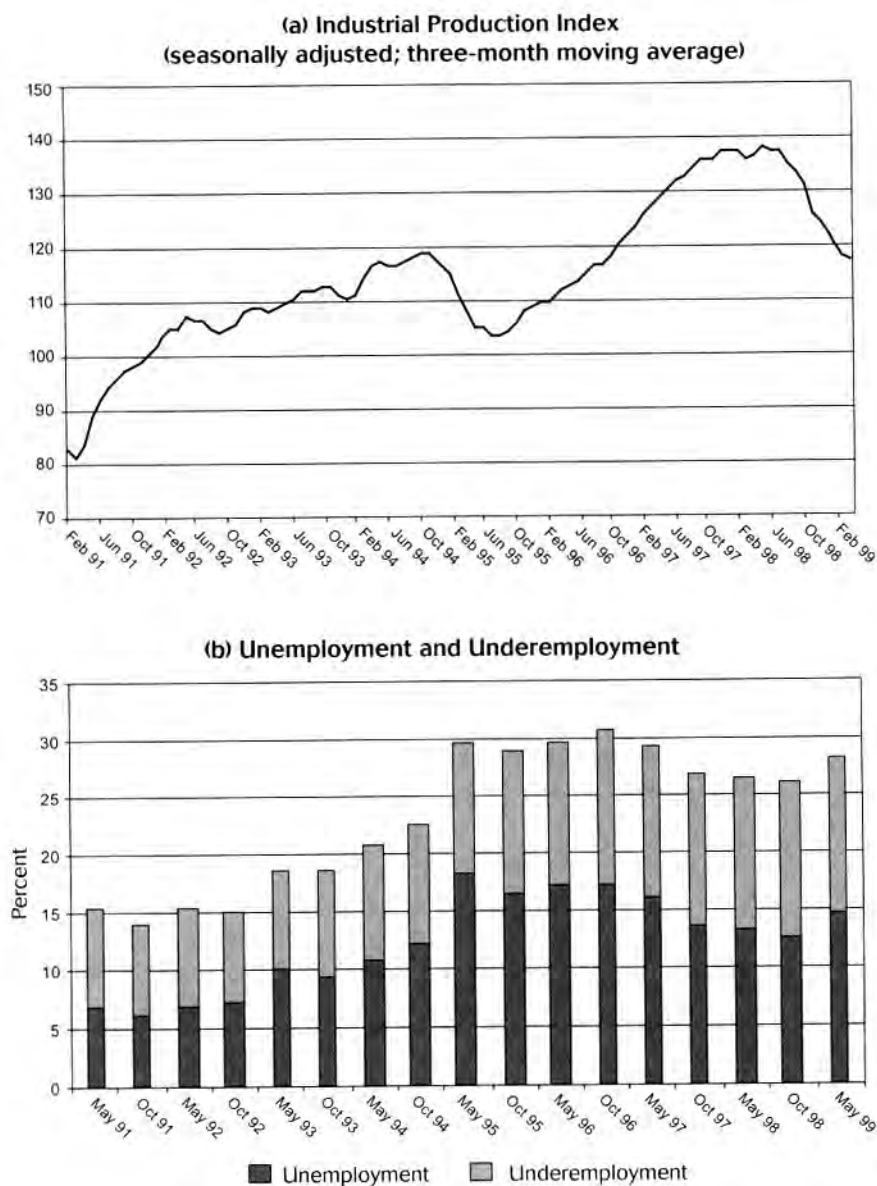
The Facts and Mechanisms

Aggregate Volatility

The real side of the economy remains highly volatile. While panels a and b in figure 3.1 highlight the clear success as measured by higher growth and dramatic stabilization of inflation attained during the post-convertibility period (delimited by a vertical line in the figures), panel c shows that output remains volatile. It portrays the growth rate of gross domestic product (GDP) minus the average growth rate for the corresponding period (pre- and post-convertibility). Not only has volatility remained high, but the relative contribution of deep crises (skewness), as opposed to a regular business cycle, has risen.

There have been two sharp crises during the post-convertibility phase, as shown by panel a in figure 3.2. The industrial production index dipped following the Mexican

Figure 3.2. Post-Convertibility Crisis



Note: Industrial production data from Estudio Broda. Underemployment includes both *demandantes de empleo* (job seekers) and *no demandantes de empleo* (non-job seekers).

Source: Estudio Broda and Instituto Nacional de Estadísticas y Censo.

crisis at the end of 1994, and it did so again after the Asian crisis, gradually at first and then with increasing strength as the Russian and Brazilian crises intensified. Panel b shows the path of unemployment and underemployment, both building up as structural reforms took place and then sharply boosted by the tequila crisis. Due to the normal lags in the response of unemployment to a crisis, the worst unemployment numbers probably are still to come.

Weak International Financial Links and Other External Shocks

The relatively small size of emerging economies' current account deficits is a perennial indication of their limited access to international capital markets. Argentina is no exception. Its current account deficit never exceeded 4 percent of GDP during the 1990s, despite the fact that its average growth rate exceeded 5 percent, more than double that of the OECD nations during the same period.

With respect to aggregate volatility, however, it is not only the level but also the fragility of this limited access that matters. Panel a in figure 3.3 illustrates the path of capital flows to Argentina and their close connection with the two crises of the 1990s, especially the tequila episode. Stark as it is, this figure underestimates the severity of the external constraint because it ignores strained renegotiations and other mechanisms that smooth the movement of capital flows.¹ Some of the underestimate can be determined from price data; the thick line in panel b shows the price index of Argentine sovereign debt, which dropped dramatically around the dates of the crises of the 1990s.

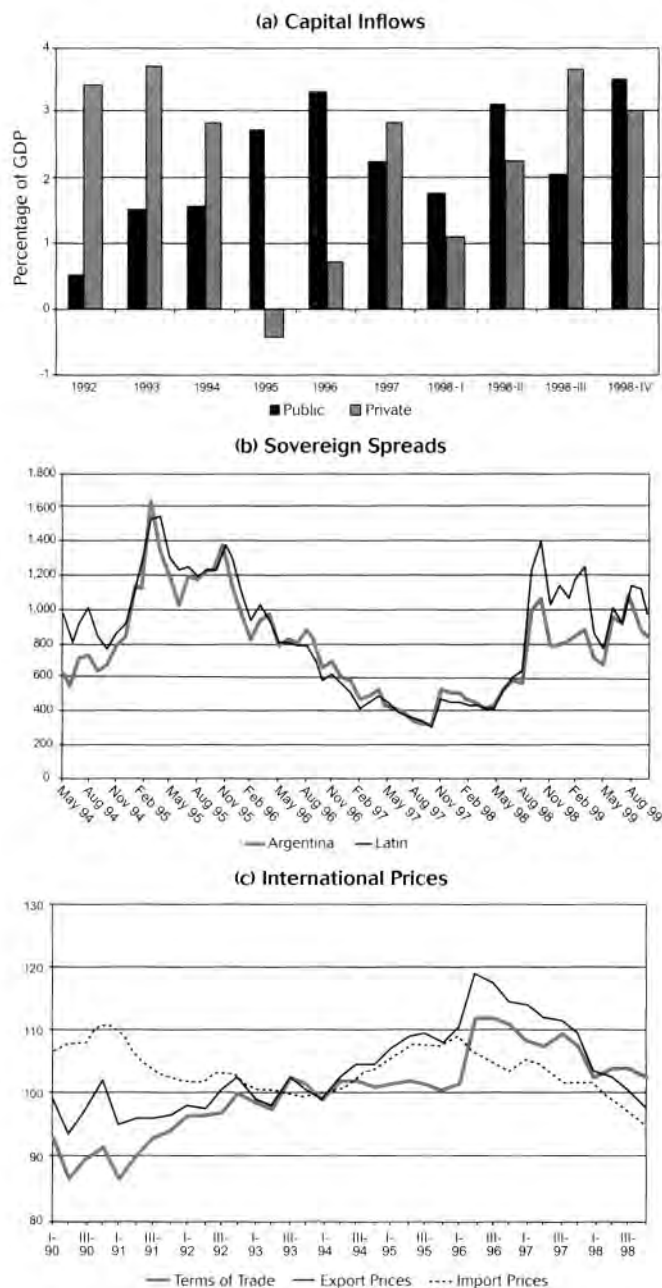
The thin line in the same panel portrays the price index of Latin American sovereign debt. The high correlation between this series and Argentina's sovereign debt does not free Argentina from its share of responsibility for the weak nature of its international financial links, but it does illustrate that the shocks are not a purely domestically driven phenomenon.

Panel c plots the terms of trade. Although the terms of trade helped Argentina during the tequila crisis and its recovery phase, they affected it negatively during the 1997-99 crisis.² However, since Argentina is a fairly closed economy, it is highly unlikely that terms-of-trade shocks and competitiveness shocks can be responsible for anything significant, unless leveraged many times by the other problems highlighted here.

¹ The reversal of capital flows during the last crisis can be seen more clearly in the nonfinancial private sector, where they declined to \$2.7 billion in 1998 from \$8.2 billion the previous year. In contrast, official flows rose, supported by loans from the World Bank and Inter-American Development Bank.

² Many have argued that had it not been for the massive overvaluation of Brazil's currency at the time of the tequila crisis, Argentina's currency board system would have collapsed then.

Figure 3.3. External Conditions during Crisis



Note: Capital inflows are from International Financial Statistics. Panel b: spread of Brady bonds yield versus U.S. benchmark (30 years). Latin is the average of Argentina, Mexico, Brazil, and Venezuela. Source: Datastream Research Service. International prices from Instituto Nacional de Estadísticas y Censo.

At a more conjectural level, figure 3.4 illustrates yet another dimension of Argentina's weak and volatile international financial links. Panel a uses U.S. stock returns to illustrate the variance of returns over a three-month period centered on the indicated date. The thick line corresponds to a prime firms' index (S&P100), while the other two represent 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 illustrates a 12-month period. This sensible volatility ranking in the United States is in sharp contrast to that found in Argentina.

Despite the fact that the relative vulnerability of small firms is at least as large in Argentina as in the United States, the pattern of relative volatility portrayed in panels a and c is reversed for Argentina; this can be seen in panels b and d, which plot with a thick line the variance series for the Merval (an index of prime companies) and with a thin line that of a more comprehensive index (IGPSA). One interpretation of this finding is that foreign investors focus mainly on the Merval, and hence these stocks mostly reflect large swings in capital flows.³

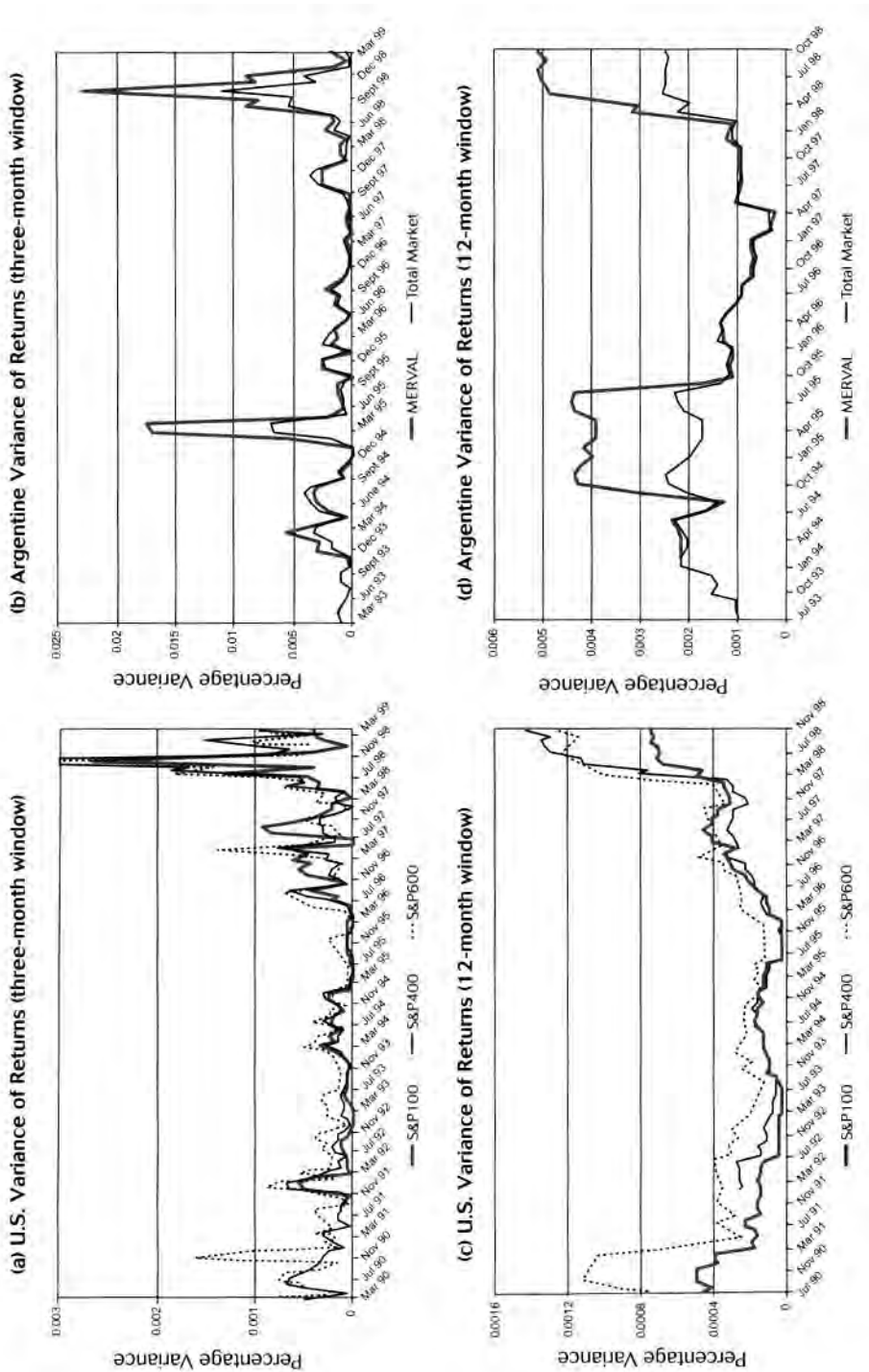
Finally, table 2.1 in chapter 2 compares the performance of several Argentine sovereign bonds with that of several U.S. corporate bonds of equivalent rating, reporting the average spreads of these instruments over U.S. Treasury instruments as well as the variance of these spreads and their changes. The evidence is quite clear: relative to U.S. corporate bonds, Argentine 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 3.3 shows, the bulk of this volatility comes from episodes in which financial markets tighten for emerging markets. Argentine bonds look illiquid from the point of view of spreads and volatility, although their volume is often much larger than that of the specific U.S. corporate bonds described in the table.

In sum, the level of capital flows is low;⁴ the volatility of terms of trade and competitiveness does not seem large enough to justify the volatility of capital flows and their price; unlike the United States, the equities of prime firms in Argentina, which are the target of foreign

³ Another interpretation is that the finding is spurious, as the more comprehensive series is polluted by too many no-trades. Although this remains a possibility, data on aggregate volume for both indices do not reveal a pronounced relative decline in the number of transactions in the IGPSA. Moreover, the relative-volatility claim does not say that the financing of large firms is more distressed than that of smaller firms during crises. Indeed, reality is quite the opposite, as concerned local banks tend to reallocate their loans toward larger companies. It just says that an important segment of the demand for the shares of prime companies fluctuates with international sentiment about emerging markets.

⁴ Nonetheless, Argentina has been given the benefit of the doubt regarding its ability and willingness to repay beyond that accorded to the typical emerging economy. See the discussion of this issue in the concluding section of this chapter.

Figure 3.4. Variance of Stock Returns in United States and Argentina



Source: Stock market data from Datastream Research Service.

investors, are more volatile than more comprehensive stock indices; and, finally, Argentine bonds pay a higher spread and are more volatile than U.S. corporate bonds of comparable credit rating. Although each piece of evidence is only circumstantial, they add up to a convincing case that Argentina has a weak connection with international financial markets.

Domestic Amplification Mechanisms

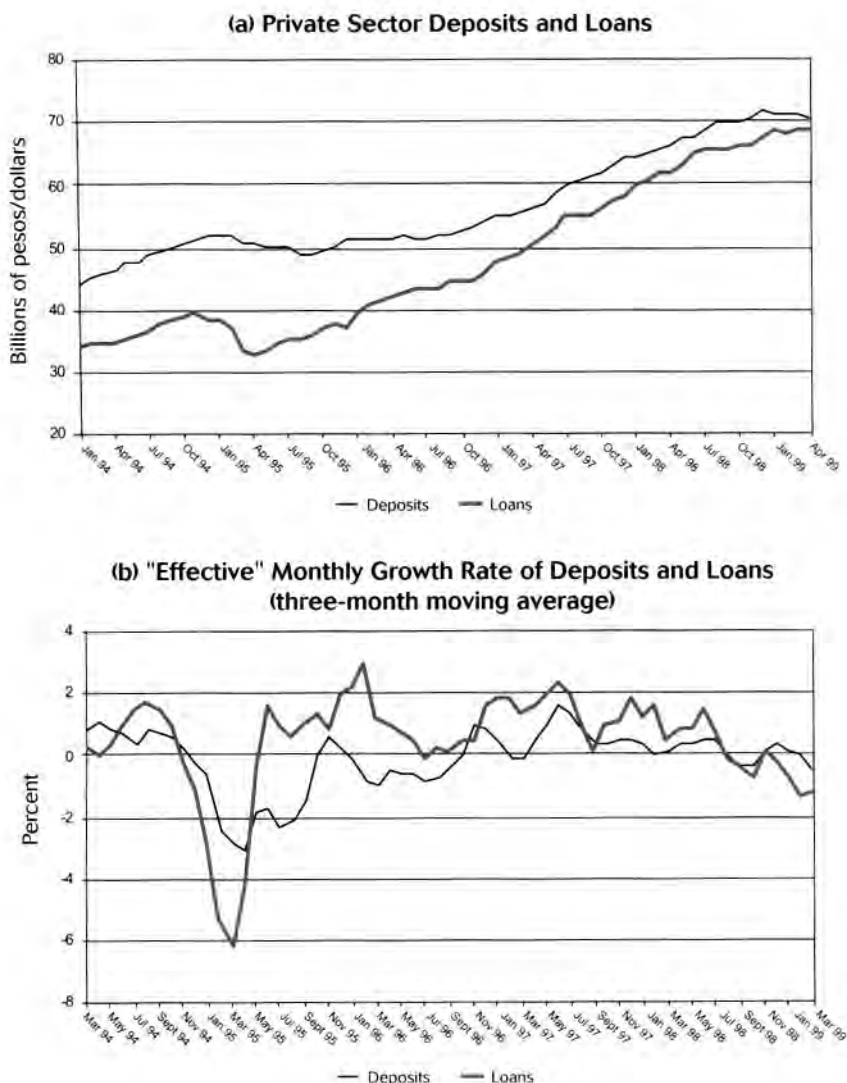
The credit crunch and financial underdevelopment problem. In general, the development of domestic financial markets is instrumental not only in fostering investment and growth but also in aggregating resources during distress. Underdeveloped financial markets limit the prompt reallocation of resources and, as a result, cause wasteful contractions in markets most affected by shocks or those less plugged into the financial pipelines. However, as financial development rises, so does leverage, and, with it, the financial system becomes more susceptible to shocks. Argentina suffered from both maladies during the 1990s.

Chapter 2 highlights Argentina's level problem. Regardless of how it is measured, and despite significant improvements over the 1990s, Argentina's financial markets and level of financial intermediation are substandard. M3, loans, and stock market capitalization—as a fraction of GDP—fare poorly, both within the region and certainly with respect to OECD economies.⁵

In one way or another, domestic financial markets played an important role during the two crises of the 1990s. Figure 3.5 highlights the cyclical problem. Panel a illustrates the path of deposits and loans, while panel b depicts the rate of growth of deposits minus the interest rate paid on deposits and the rate of growth of loans minus the lending rate. Albeit imperfect, these measures capture funds available to banks to make new loans (deposit growth less interest) and funds available to firms to make new investments (loan growth less interest). The story behind the tequila crisis is clear and well known: fears that the convertibility system would not survive led to a run on banks and on the monetary base. As a result, there was a massive credit crunch despite the astute use of the limited monetary policy allowed by the convertibility law.⁶ Loans, especially to the private sector, took longer to recover than deposits. This slow recovery of loans was caused by the

⁵ Although the comparison with Mexico may seem favorable, Mexico's banking sector was severely damaged by the tequila crisis.

⁶ The Banco Central de la República Argentina (BCRA) can buy Argentine treasury bonds denominated in dollars (which are counted as reserves), as long as this does not lead to a decline in the ratio of international reserves (net of these bonds) to a base below two-thirds. Government notes in the BCRA rose about 25 percent from 1994 to 1995 (from 1,901 billion pesos to 2,543 billion pesos), declining sharply after that.

Figure 3.5. Behavior of Private Sector Deposits and Loans

Note: In panel b, the term "effective" refers to the fact that corresponding interest rates are subtracted from growth rates. Certificate of deposit rates (30 to 59 days) are used as deposit rates. Credit line rates are used as loan rates.

Source: Banco Central de la República Argentina.

government's crowding out as it borrowed to pay back its monetary intervention and by the sharp consolidation of the Argentine banking sector following the crisis.

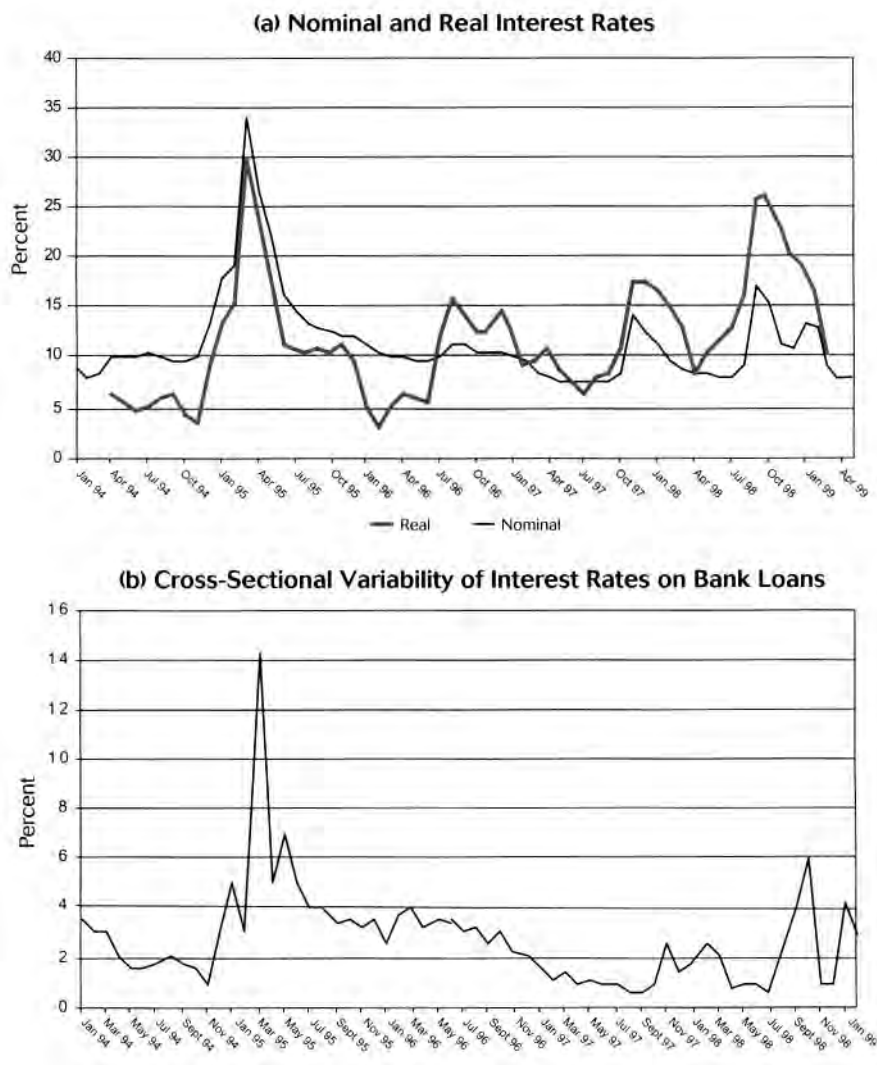
Prompted by the deep economic distress experienced during the tequila crisis, Argentina mounted a massive effort to improve the liquidity position of banks and the financial system as a whole. Not only were banks' liquidity requirements raised (self-insurance), but also insurance features were introduced through a series of domestic as well as international repo facilities. The effort paid off: there were no traces of systemic bank runs during the 1997-99 crisis, and lending slowed down, but not nearly as sharply as during the tequila crisis.⁷

The aggregate figure on loans is somewhat misleading for understanding how the reduction in domestic intermediation and financial distress may have contributed to the sharp decline in real activity. First, the increase in financial depth in all likelihood made the economy more dependent on credit. Second, the expected deflation required to adjust the real exchange rate within the context of the convertibility law points to a real interest rate that rose more than the nominal rates did. This is confirmed by panel a in figure 3.6, which reports the monthly path of the nominal rates on 30-day peso loans to prime firms and the same rate minus a measure of expected inflation in the producer price index, which is particularly significant. The surge in nominal rates during the 1997-99 crisis significantly underestimated the producers' perceived cost of credit.

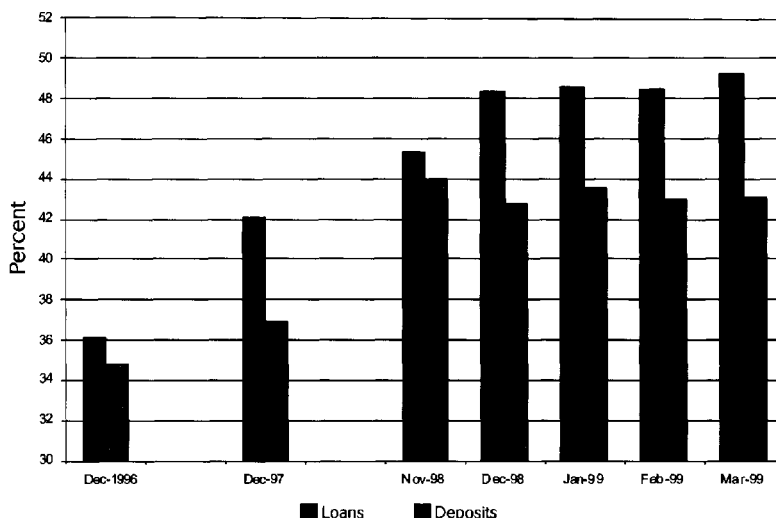
Third, the composition of borrowers and lenders may have changed significantly during the crisis. Panel b in figure 3.6 shows the increase in the cross-sectional dispersion of prime loan rates, which, although not nearly as large as that in the tequila crisis, probably reflects widespread local financial bottlenecks. Along the same lines, figure 3.7 reports the reallocation of deposits and loans within the banking sector toward the larger banks, resulting in a credit crunch for the clients of smaller banks, which are likely to be biased toward small and medium firms. This negative picture for small and medium firms is worsened by the fact that large firms, facing more difficult prospects in international financial markets, turned to domestic financial markets and banks for their financial needs. These two facts combined probably explain why the share of loans made by large banks continued to rise over the period.

⁷ See Powell (1999: fig. 3) for clear evidence of the improved systemic liquidity of the Argentine financial system. The liquidity requirement increased steadily from 10 percent of deposits in January 1996 to more than 15 percent by March 1999. Excess reserves added a more or less constant 10 percent, and the repo program added yet another 10 percent starting in January 1997.

Figure 3.6. Interest Rates



Note: Panel a: annualized 30-day peso loans to prime firms. The real interest rate is calculated by subtracting annualized, centered, six-month producer price index inflation from the nominal rate. Panel b: interquartile range, 75–25 percent of a cross section of nominal interest rates on 30-day peso loans. Source: Interest rates from Banco Central de la República Argentina; producer price index from Instituto Nacional de Estadísticas y Censo.

Figure 3.7. Share of Deposits and Loans in Top 10 Banks

Note: Size is determined by assets.

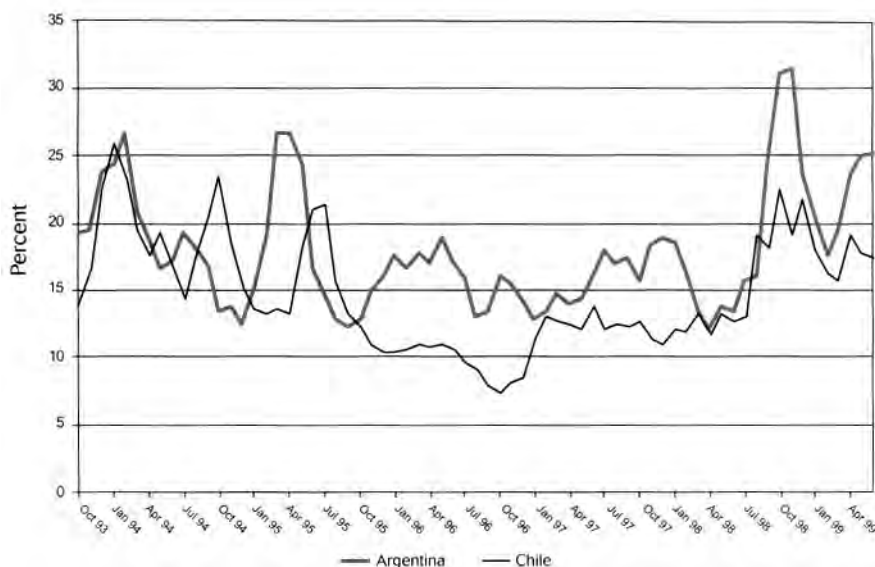
Source: Banco Central de la República Argentina. Data for December 1996 and November 1998 are obtained from an earlier report. The two sets of data should be compared with caution.

Figure 3.8 shows a measure of the cross-sectional dispersion of the stock market returns for a group of 20 industries (gray line).⁸ There was a dramatic surge in this cross-sectional dispersion during the crises.⁹ As a comparison, the thin line illustrates the same cross-sectional dispersion measure for Chile, which experienced the same external shocks responsible for Argentina's crisis. 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.¹⁰ Finding more direct evidence of

⁸ The industries correspond to the stock market subsectors at level of disaggregation five of the Datastream classification, which includes 116 potential entries. For Argentina and Chile, 26 and 20 sectors, respectively, were represented during the period considered. Similar results were obtained using different measures of dispersion.

⁹ 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 relative responsiveness to interest rates and credit variables during tranquil times.

¹⁰ Of course, the argument is somewhat circular. One could argue that the shocks were larger for Argentina, hence the larger increase in dispersion, although it is difficult to argue that by late 1998 Chile had been affected by a smaller terms-of-trade shock than Argentina. The implicit argument is that the shocks were of similar magnitude, but that the relative weaknesses of Argentina, including its sound (during the most recent crisis) but underdeveloped financial sector, were partly responsible for a larger response.

Figure 3.8. Cross-Sectional Variability of Sectoral Stock Returns

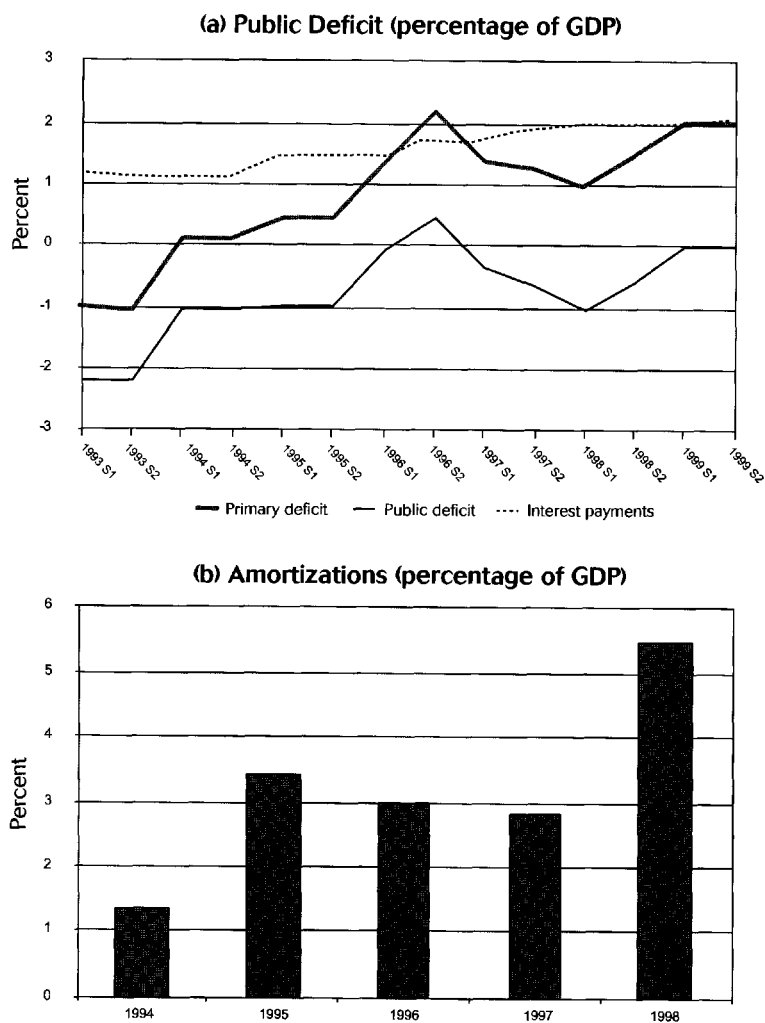
*Note: Interquantile range is 15–85 percent (three-month moving average). See footnote 8 in the text.
Source: Datastream Research Service.*

this mechanism is an important research theme, as is analyzing the effects of financial underdevelopment on the relative size and volatility of sectors that traditionally use credit.¹¹

Regardless of how it is measured, and despite significant progress that is likely to continue into the future, the depth of Argentina's financial markets and financial intermediation is significantly suboptimal. Banks were at the center of the problem during the tequila crisis—when a run on deposits generated a massive credit crunch—and their lending behavior, as well as the internal reallocation of deposits, did not help to smooth the 1997–99 crisis. Moreover, the increased dispersion of sectoral returns hints at the presence of significant problems with the aggregation and distribution of financial resources during crises. The crowding-out and collateral squeeze mechanisms described next reinforce this problem because they encourage a pronounced flight to quality during crises.

¹¹ See Rajan and Zingales (1998) for a comparison of relative sectoral size among OECD countries and for evidence of 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 countries—for example, 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?

Figure 3.9. Public Finance



Note: In panel a, semester quantities are annualized. In addition, semester data for 1993–95 are not available, and thus annual quantities are repeated for both semesters. 1999 data are predicted.
Source: Instituto Nacional de Estadística y Censo.

The crowding-out problem. Everywhere in the world, credit contractions cause the most damage to small- and medium-size firms, whose financing options are often limited to a bank or two. The severity of the crunch on these firms depends not only on the behavior of banks but also on the quality of the borrowers who become the primary target of overly concerned banks' lending activity. Thus crowding out involves not only the government but also the prime firms of the country.

Panel a in figure 3.9 illustrates the path of Argentina's fiscal deficit and its decomposition between the primary deficit and debt service. The fiscal side does not share in the adjustment. Panel b reports amortizations, which, while generating no new net demand for financing, add to the strain and uncertainty associated with large repayments due.

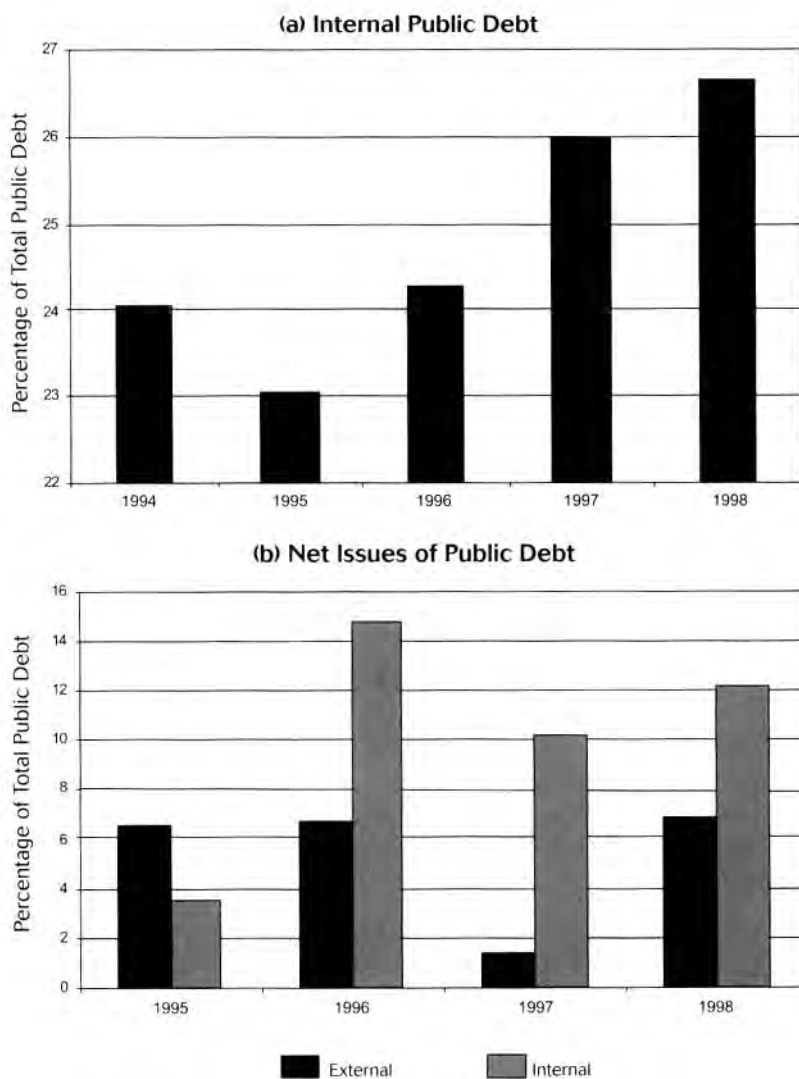
The lack of fiscal adjustment is not the only important dimension. One of the main features of financial crises is that funds lose their fungibility. The source of government funding becomes relevant. The first dimension to consider is whether the funding comes from domestic or foreign markets. Except for extreme cases of lack of fiscal discipline—which is not the case of Argentina today—the government normally has the most opportunity to access international financial markets. Thus the government should shift its financing away from domestic markets. Both the information on stocks (panel a) and the information on flows (panel b) in figure 3.10 reflect that the Argentine government did not do so during the 1997-99 crisis—except for a decline in the relative growth of domestic to external debt—and the positive numbers in 1995 probably reflect a general contraction of domestic financial markets rather than a voluntary retrenchment (figure 3.11, panel b, supports this conjecture).

International crowding out is probably not too important, especially, as panel a in figure 3.11 illustrates, because a significant share of government borrowing abroad during crises came from international organizations, which are probably more difficult to access directly by the private sector.¹² Conversely, domestic crowding out can be significant. Who buys the domestic debt, and whether these sources are available to the private sector as well, are important questions. In particular, does the government facilitate a process of flight-to-quality? Panel b illustrates the share of domestic resources that come from banks and other domestic financial institutions or from AFJPs. Panel c shows the percentage of AFJP assets allocated to government instruments (the maximum allowed is 50 percent).¹³

¹² It could go the other way during crises. The government's success in placing debt in international markets, as well as its road shows, may facilitate the private sector's access to these markets. Of course, it would have been better for the government to have borrowed those resources not to solve its own fiscal imbalances, but to support a financially distressed private sector.

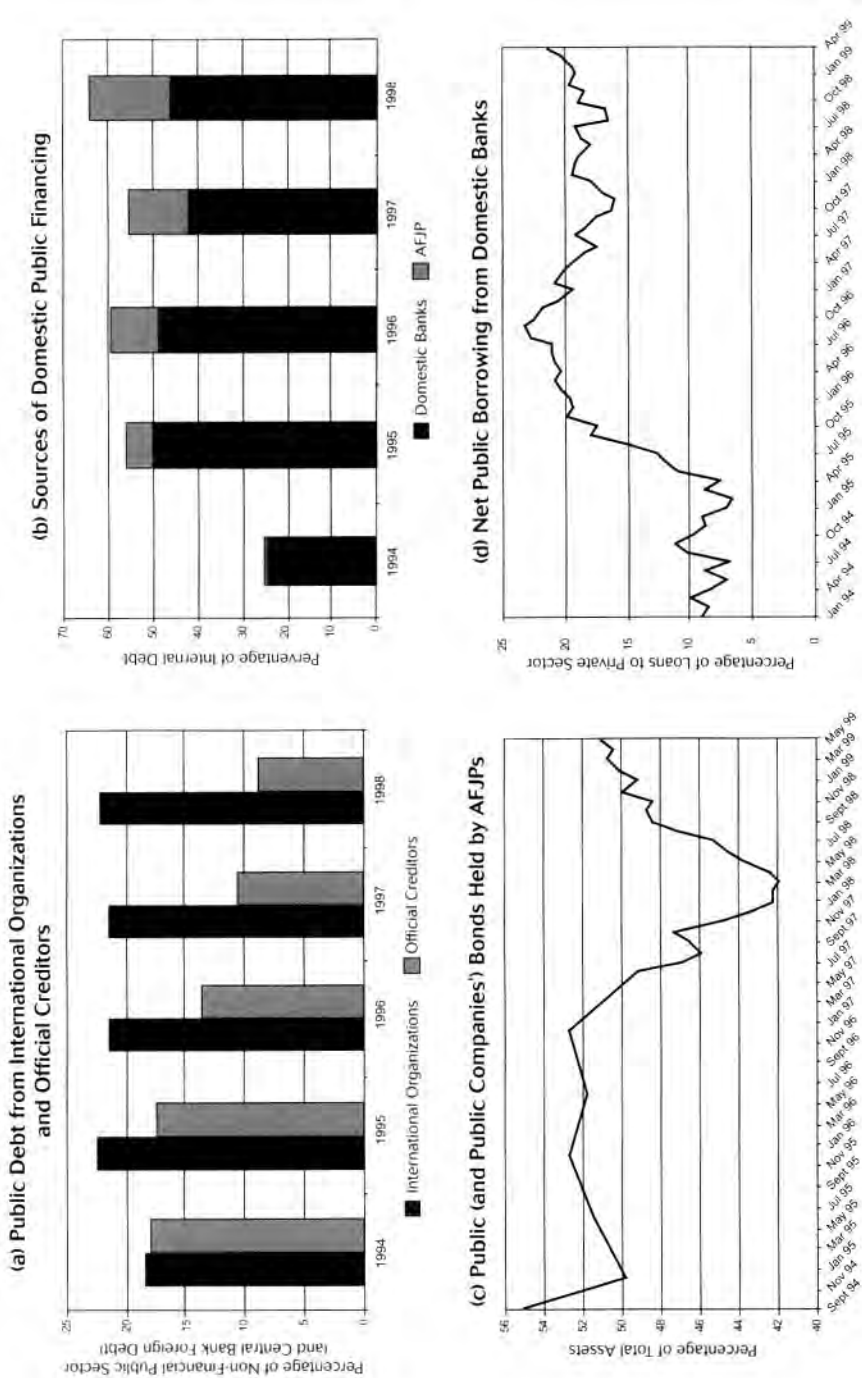
¹³ It is difficult to tell from this figure how much of the fluctuation in allocations is due to volumes and how much is due to prices.

Figure 3.10. Public Financing through Domestic Markets



Source: Instituto Nacional de Estadísticas y Censo.

Figure 3.11. Public Sector Crowding Out



Source: Panel a: Instituto Nacional de Estadísticas y Censo. Panel b: Instituto Nacional de Estadísticas y Censo and Asociación de Fondos de Jubilación y Pensiones. Panel c: Asociación de Fondos de Jubilación y Pensiones. After December 1998, only national government bonds are included. The two series are pasted. For early years, only data for June and December are available. Panel d: Banco Central de la República Argentina.

Panel d shows net public borrowing from banks as a percentage of bank credit to the private sector. During the tequila crisis the government turned to the domestic banks for financing, and much of the slow recovery of loans to the private sector—slower than that of deposits—can be attributed to this shift. However, during the 1997-99 crisis the government redirected its financing efforts toward the AFJPs, which can now absorb larger volumes of bonds than they did in 1995.

There are many dimensions along which large domestic firms play a role similar to that of the government. For example, their financial and productive health is important to the country's international image, a point discussed again in the policy section. The most significant similarity discussed here is the crowding out of small and medium firms from domestic financial markets. As external financing tightens for large firms, they turn to domestic markets as preferred customers, exacerbating the ongoing flight to quality. The social cost of this strategy is that small and medium firms generally do not have access to international financial markets, regardless of price.

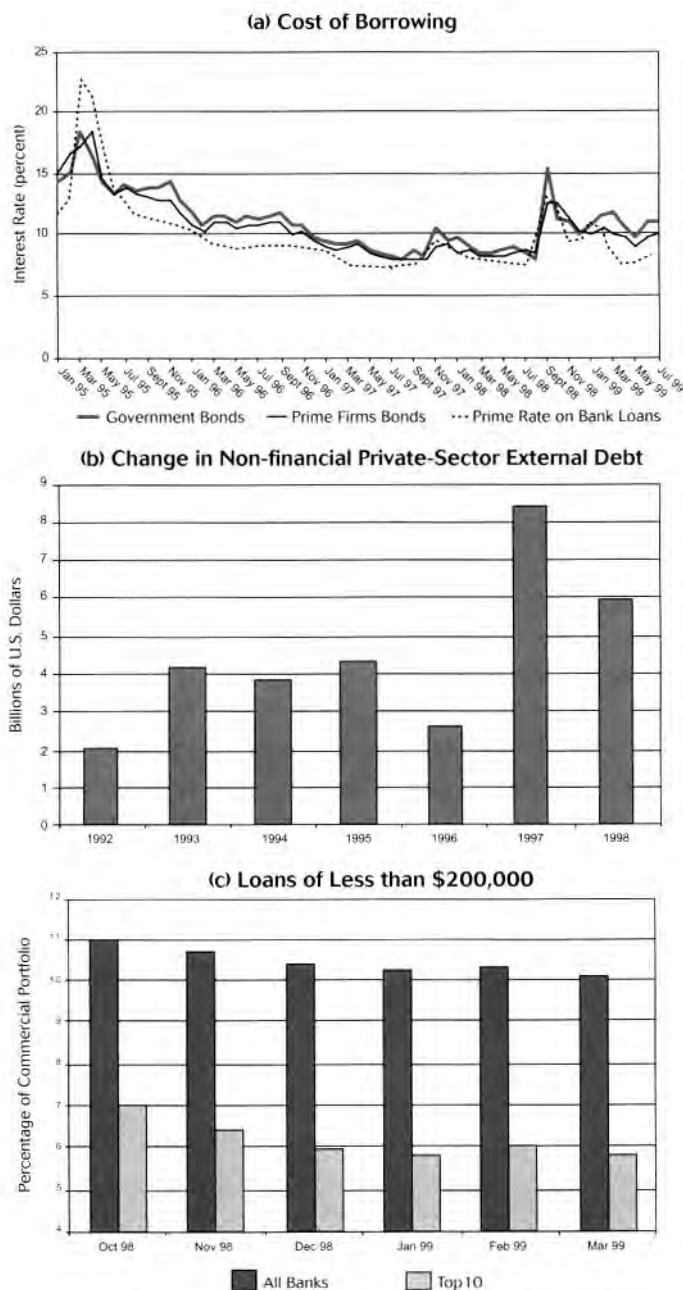
Panel a in figure 3.12 illustrates the path of several interest rates on dollar loans in order to capture, albeit imperfectly, the cost of credit for prime Argentine firms. The solid lines correspond to sovereign and corporate bond rates, while the dashed line represents a benchmark short-term rate, namely the domestic rate on 30-day bank loans in dollars. During the credit crunch of the early crisis the domestic cost of credit rose significantly for prime firms; however, in the later episode the opposite occurred, perhaps reflecting the unraveling of a considerable domestic flight to quality.¹⁴

Panel b shows the nonfinancial sector's foreign borrowing, while panel c portrays the share of commercial loans allocated to small loans. Panel b shows that, whereas during the 1995 crisis most of the decline in capital flows occurred in the financial private sector (see figure 3.3), during the 1997-99 crisis the nonfinancial private sector (in all likelihood, large corporations) experienced the largest decline in capital inflows. In contrast, the share of small loans declined during the crisis, particularly by large banks, which hints at the relative tightening for smaller firms.¹⁵

To summarize, although aware of the acute problems caused by domestic crowding out during crises, the government could not avoid it. During the crisis of 1995 and its recovery, the government tapped the domestic banks, while during the 1997-99 crisis it turned to the AFJPs and domestic financial markets. Large firms, at least during the later

¹⁴ Although the price of bonds in the secondary market may not reflect the cost of new financing, the qualitative feature of the figure, at least across the two crises, should be robust to these differences.

¹⁵ Another potentially interesting research theme is the behavior of large firms during crises and their role in smoothing or amplifying these.

Figure 3.12. Prime Firms Crowding Out

Note: Panel a: average implicit return on non-Brady sovereign bonds. Average implicit return on bonds of top Argentine companies (YPF Sociedad Anónima, 8 percent, 1994–2004; Banco de Galicia, 9 percent, 1993–2003; Banco Río de la Plata, 8.75 percent, 1993–2003).

Sources: Panel a: Datastream; prime rate for 30-day bank loans in U.S. dollars, Banco Central de la República Argentina. Panel b: Ministry of Economy. Panel c: Banco Central de la República Argentina.

crisis, behaved similarly, turning their demand for credit inward, perhaps aided by an all-too-willing and conservative domestic banking sector.

The inflexibility problem (claustrophobia). Although the credit crunch experienced by the Argentine economy during 1995 probably could not have been averted by a more flexible real wage, such rigidity probably enhanced the 1997-99 crisis by generating a collateral squeeze (that is, a decline in the appeal of the firm's outlook from the point of view of the banks).¹⁶

Although significant reforms are under way, Argentina has European-style labor market institutions and traditions. On the one hand, the faster growth of Argentina relative to Europe may make these institutions more bearable. More important, labor market rigidities combined with the problems just described generate a significantly more disturbing scenario. When dealing with large external shocks and unyielding fiscal pressure, firms are severely squeezed from two complementary ends: financial and labor markets.

There are many forms of labor market rigidities, not all of which have the same costs in terms of aggregate volatility. Ultimately, nonetheless, an inflexible labor market yields costs of labor—not all of which come in the form of wages—that are too slow to adapt to sharp downturns. Although in theory these frictions are mostly real, in practice nominal and real factors are easily confounded, particularly on the face of rapidly changing nominal events. In this context, allowing the currency to depreciate may generate some breathing space.¹⁷ Mexico's devaluation during the tequila crisis reduced the real unit costs of manufacturing nearly 25 percent in 1995, a gain that had not been undone even as late as 1998.

Although real wage rigidities are often the chief concern in a scenario with hard labor market institutions, the combination of extremely low world inflation and a fixed exchange rate built into the currency board poses a question that was almost unthinkable a decade ago in Argentina: Is it possible that the psychological zero wage-inflation floor became a chief constraint during this crisis?

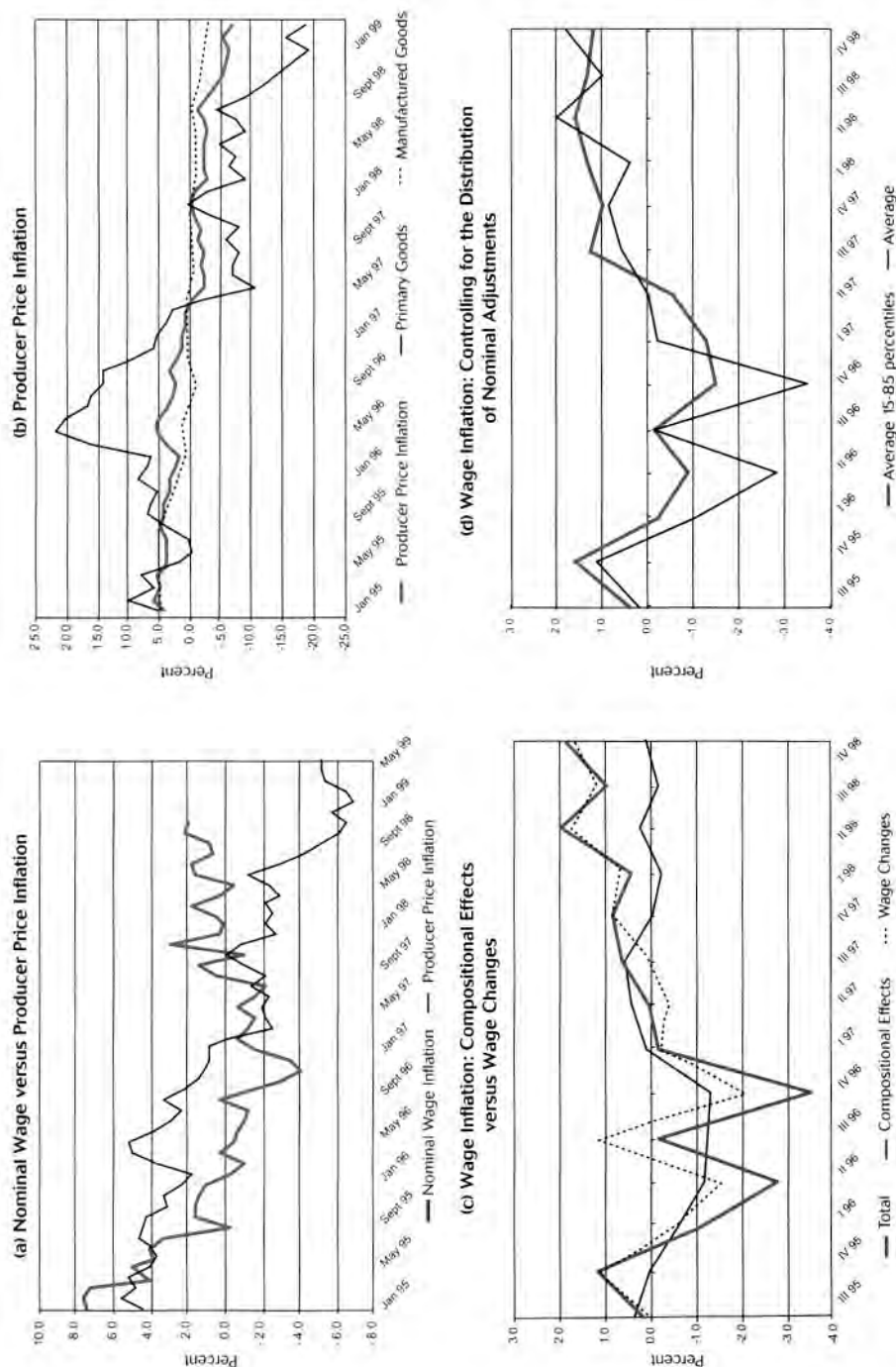
Figure 3.13 seems to support this nominal-rigidity conclusion. Panel a portrays the year-to-year rate of inflation in producer prices and nominal wages. With a little bit of imagination, one can see the price-inflation series as a straight downward-sloping line, crossing zero with no difficulty. Despite the conventional wisdom on the matter, this decline is not purely due to the sharp decline in the price of primary goods (see panel b).¹⁸

¹⁶ One could argue that with real wage flexibility—particularly through exchange rate flexibility—the run on deposits and the ensuing credit crunch perhaps would have been avoided altogether.

¹⁷ Costs are associated with a currency depreciation as well, particularly on the financial side, where a sudden change in the exchange rate may severely harm balance sheets and collateral (see Caballero and Krishnamurthy 2000a). In Argentina today these costs clearly overwhelm any potential benefits from a devaluation.

¹⁸ The consumer price index, in contrast, behaves much like wages. Why there is so much difference between the consumer and producer price indices is an important research question.

Figure 3.13. Wages and Inflation



Note: Panel a and b: yearly inflation for previous 12 months. Panel c: decomposition based on 24-sector disaggregated data. The compositional effect computed keeping previous-period sectoral wages constant; wage changes are computed keeping sectoral composition constant. Panel d: first average obtained by eliminating the top and bottom 15 percent of the distribution. Source: Ministry of Economy and Instituto Nacional de Estadísticas y Censo.

Going back to panel a, the wage-inflation series declines early on as well but then flattens at zero.

Indeed, this description does not require much imagination, but for the wage deflation of 1996. However, panels c and d account for most of the 1996 wage deflation in terms of a compositional effect and a few outliers.¹⁹ Panel c breaks down the path of wage inflation into a compositional effect (thin solid line)—where wages are kept fixed within each sector, but relative employment is allowed to change—and the complement, which captures the pure wage effect. The point worth noting is that compositional effects capture about a third of the wage deflation.

The thick solid line in panel d does the rest. It represents the mean of the distribution of cross-sectional wage inflation once 15 percent of the observations from each tail have been removed. The figure shows that sharp wage disinflation in a few sectors accounts for much of the overall wage deflation during 1996 that is left unexplained by compositional effects alone.²⁰

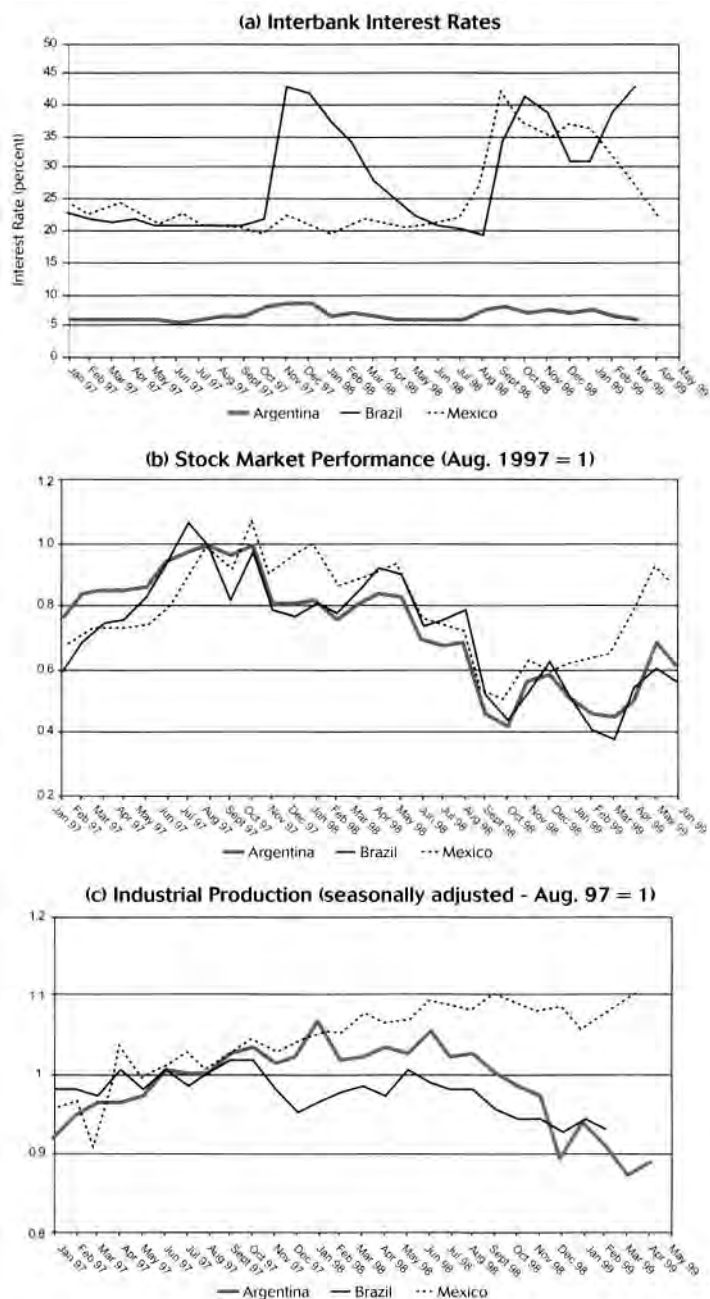
The relative rigidity of wages in Argentina during crises underestimates the rigidity of the Argentine system. On the one hand, countries with more flexible exchange rate systems may choose not to use this flexibility as much in the midst of a crisis, when controlled devaluations are risky.²¹ On the other hand, and more significant, in Argentina lack of real exchange rate adjustment today comes together with lack of adjustment in the near future as well. The perceived present value of overvaluations relative to crisis overvaluations is likely to be higher in the Argentine system. This concept is difficult to measure, although some information can be obtained from peso-dollar spreads, stock markets, and real activity.

Much has been said about the advantage of a fully credible exchange rate for the peso-dollar spread. This is supported by the top panel of figure 3.14, which illustrates nominal interest rates in Argentina, Mexico, and Brazil, most of which are indeed tied to the uncertainty surrounding the respective currencies. But there is another facet to this. The credibility of the exchange rate also means that the exchange rate is not expected to adjust in the near future, even if doing so would help during the recovery. That is, a crisis that brings about a perceived overvaluation—for example, as a result of a devaluation by neighbors or a large terms-of-trade shock—has no hope of a quick remedy to the problem. This depresses the effective demand for loans, both for purely neoclassical as well as for finan-

¹⁹ Outliers not in the sense of measurement error, but in the sense that nominal rigidities are not very relevant for sectors, such as construction, that are in deep distress and have high turnover rates.

²⁰ A potentially interesting research question for Argentina is how the path of the histogram of microeconomic wage changes varies as inflation is gradually brought down by the convertibility system. See Card and Hyslop (1995) for U.S. evidence on nominal-wage-decline resistance at the microeconomic level.

²¹ See Hausmann and others (1999) for preliminary, but suggestive, evidence on devaluation refrainment.

Figure 3.14. Relative Performance in Argentina, Brazil and Mexico

Source: Panel a: Interbank interest rates from Banco Central de la República Argentina, federal fund rates are from Banco Central do Brasil, and interbank interest rates are from Banco de México. Panel b: Datastream Research Service. Panel c: Instituto Nacional de Estadísticas y Censo, Banco Central do Brasil, and Banco de México.

cial constraint reasons, which may be part of the reason why it is not only the peso-dollar spread that does not rise as much in Argentina but also the level of the real interest rate.

Just comparing interest rates is not the proper measure of the relative distress across economies with different exchange rate systems and degrees of labor market rigidities; the relation between these rates and the real side of the economy *changes* across these systems.²² Panel b in figure 3.14 shows that, despite its better performance in terms of interest rates, the Argentine stock market did not perform as well as that of Brazil, which was the regional epicenter of the 1997-99 crisis. Panel c reinforces this conclusion, showing that industrial production did not fare well in Argentina either. Perhaps most significant, despite a sense that the other countries—especially Mexico—have left the worst behind, Argentina is still trapped in a highly uncertain scenario. The question arises whether the relative calm during the crisis came at the cost of a slower recovery and whether that was indeed anticipated by economic agents.²³

To summarize, not only does the real wage seem to accommodate shocks less in Argentina than in other similarly distressed economies, perhaps due to a combination of real rigidities and exchange rate inflexibility, but also a wage-deflation floor seems to be taking its toll as well. Finally, there is evidence to suggest that the relationship between interest rates and the real side changes significantly in the rigid Argentine system, which means that judging the success of the system by the reduced volatility of its rates may be misguided.

Taking Stock

The diagnosis contains four basic elements: (a) limited and fragile links with international financial markets, (b) domestic financial underdevelopment and recurrent credit crunches, (c) a public debt problem with a multiple-layer crowding-out mechanism, and (d) a claustrophobic system where real wage inflexibility is maximized by the combined effect of a rigid labor market, low world inflation, and the convertibility law.

In accordance with these elements, the general policy recommendations highlighted in the introduction to this chapter are grouped into four categories as well: (a) improve

²² This claim is similar to the covert rigidity result in Caballero and Hammour (1996). In that case, rigidities in the labor market were responsible for sharp spikes in unemployment during recessions, while leaving no traces on the path of the real wage. The hiring rate fell excessively, dragging the wage down as a result. The analog here is the sharp decline in investment and collateral (and resulting increase in credit rationing), which kept the interest rate subdued.

²³ Of course, the presidential political uncertainty has not helped Argentina either.

external financial links and their use during crises, (b) continue and accelerate the development of domestic financial markets and intermediation, (c) reduce the public debt burden, and (d) develop reforms geared toward adding flexibility to labor costs within the context of the current exchange rate system. All these need to be combined with an attitude of patience, as the passage of time—without a major disaster along the way—should ameliorate some of the problems. Perhaps most prominent, the wage-inflation floor should eventually subside as an institutional feature.

Although the connection between recommendations and diagnosis is apparent at a general level, specific aspects are worth developing further.

Improving the 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 pamphlets dealing with international financial architecture. These include norms of transparency and accountability; sound banking 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.

At a general level, these recommendations will have to be followed closely if international financial links are to be strengthened significantly. The Asian crisis brought this important issue to the fore. A recent example of the impact that standards of good corporate governance have on investors makes the point clearly: TIAA-CREF, one of the largest institutional investors in the United States, has made public that it simply does not invest in claims issued by companies with poor standards of corporate governance.²⁴ Among its requirements are that (a) the company's board consist of a substantial majority of independent directors (for example, with no significant personal ties, either current or past); (b) the company's board must obtain shareholders approval for actions that could alter the fundamental relationship between shareholders and the board; (c) the company must base executive compensation on a pay-for-performance system and provide full and clear disclosure of all significant compensation arrangements. Very few Latin American corporations would make it onto TIAA-CREF's list.

Importing and adapting to local conditions the corresponding laws and regulations from the industrialized world are probably the easiest steps of all. The real obstacle is in their enforcement, which requires not only competent and fair courts but in many instances also a deep cultural change.

²⁴ See pages 10-11 in the May 1999 issue of *Participant*, TIAA-CREF's quarterly news and performance magazine.

In the meantime, arguably less important but more traditional factors also offer significant room for improvement. These include all the other main policy recommendations in this chapter, because reduced aggregate volatility and enhanced liquidity are central ingredients in deepening financial markets and links, as well as others:

- Reducing the public debt problem would not only limit the volatility that stems from the perception of a fragile fiscal position but also improve Argentina's credit rating. Its below-investment-grade status represents a major cost in terms of spreads and reduced participation of foreign institutional investors. Moreover, by the sovereign principle, this low credit rating represents a major drag on the private sector's access to international financial markets as well. Table 3.1 illustrates this clearly, as Moody's rating sets most major Argentine corporations at the sovereign ceiling. Standard and Poor's is a bit more lenient in the case of highly dollarized economies, as it sees suspension of convertibility as an unlikely scenario; still it is apparent in this rating that the sovereign credit anchor weighs heavily.
- On a related point, large firms with access to international financial markets constitute one of the main sources of international collateral for an emerging country. Thus their credit ratings are systemically important as well, which means that there is an argument for promoting good performance along these lines.²⁵
- Developing the domestic financial system and strengthening the banks also would improve international financial links through two channels: first, by reducing overall volatility and, second, by increasing the country's capacity to intermediate foreign funds into small and medium firms.²⁶
- Naturally, making labor costs more flexible would also reduce real volatility and hence make Argentina's claims more attractive.
- The export sector needs to grow and diversify. Diversification helps directly by stabilizing the terms of trade. Growth improves the country's collateral. Although at the microeconomic level many international financial transactions can be collateralized (explicitly or implicitly) with claims on nontradables—as is often done with repos collateralized by mortgages—at the aggregate level the country's capacity to repay is an important consideration. Although Argentina's foreign in-

²⁵ Understanding the impact of large firms' health and performance on the international perception of the value of a country's international collateral seems, in many respects, as important as understanding the much more extensively studied role of government health in such perceptions. See Caballero and Krishnamurthy (2000a) for a model of corporate-based international collateral.

²⁶ During the 1990s, more than a third of Argentina's private sector international bonds were issued by the financial sector. This share fell to only 10 percent during the tequila crisis.

Table 3.1. Sovereign Credit Rating and Rating of Top Private Companies

Ratings	Sovereign	YPF	Metrogas	Telefónica	Edenor	Banco Rio	Perez Companc
Standard & Poor's	BB	BBB-	—	—	BBB-	BB+	—
Moody's	Ba3	Ba3	Ba3	Ba3	Ba3	Ba3	B1

— *Not available.*

Source: *Standard & Poor's and Moody's.*

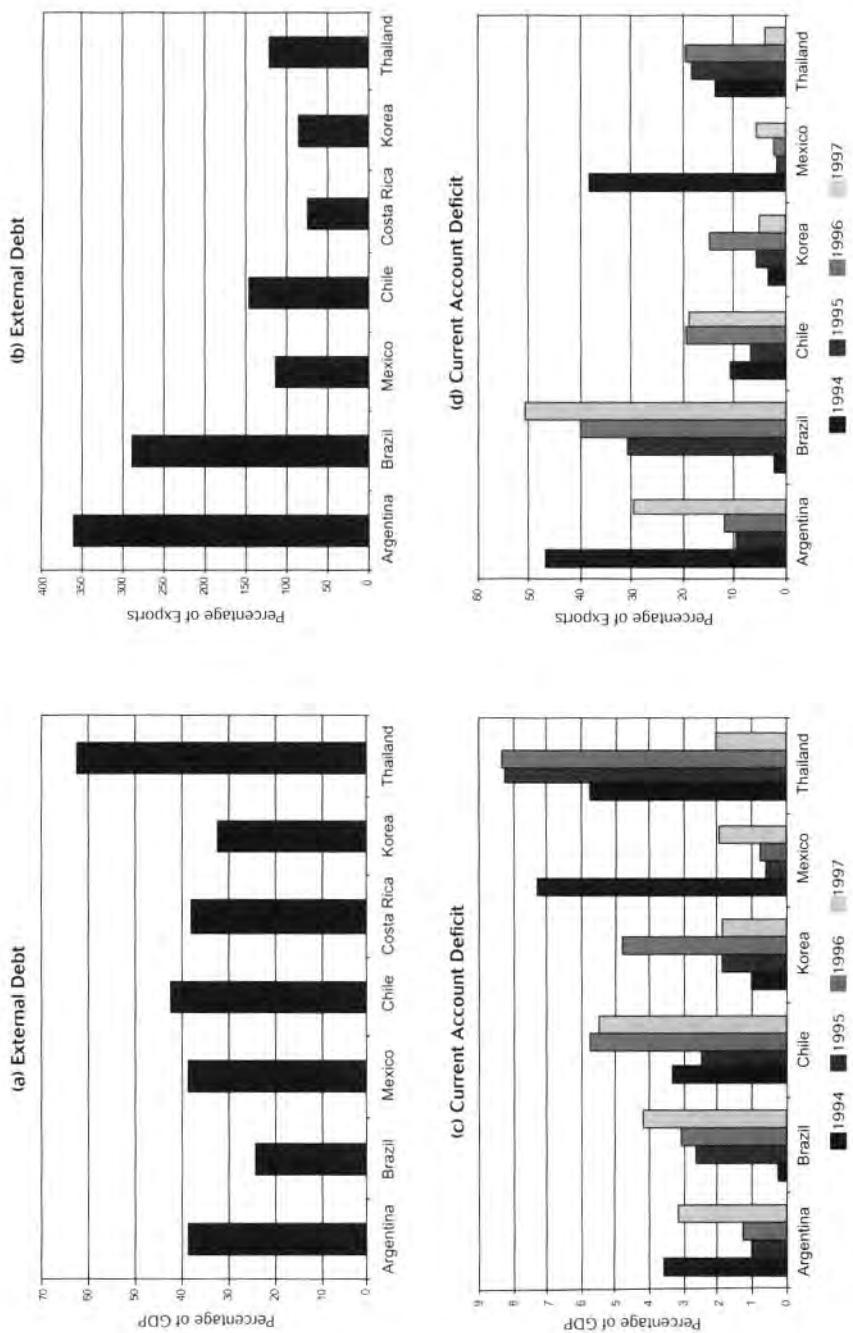
debtedness as a fraction of its GDP is very reasonable, it is not reasonable as a fraction of its exports. The same hold true for flows. Large ratios of debt and current account deficits over exports can be thought of as a very illiquid and leveraged position in front of the rest of the world. In light of this, figure 3.15 shows that the world's financial markets have certainly trusted Argentina more than they typically are willing to do with emerging economies. Although Argentine foreign debt and current account deficits are quite moderate when compared with those of other emerging economies (panels a and c), this is not the case once they are normalized by exports, as is done in panels b and d. Argentina's external debt is 3.5 times its exports, probably a world record among substantially developed economies.

The possibility of forming a Latin American market with homogeneous financial instruments should be considered. The additional liquidity that a larger market would bring is a significant enhancement from the point of view of large foreign investors.

In the meantime, the combination of weak international links, underdeveloped domestic financial markets, and intermediation offers a case for taxing capital flows and mandating liquidity provisions.²⁷ However, one of the major costs of such policies is that they may further reduce the liquidity of Argentine asset markets. Measures of this type should be considered only in conjunction with measures aimed at fostering the development of these markets.

²⁷ See Caballero and Krishnamurthy (2000a) for a formal argument justifying this recommendation. Weak international financial links alone are not enough to justify such intervention. Rather, the domestic markets problem leads to an undervaluation of international collateral provision.

Figure 3.15. External Debt Burden and Current Account Deficit



Note: Panels a and b: 1997 data.

Source: World Bank Global Development Finance (1999).

Fostering Domestic Financial Markets and Credit Flows

At a general level, institutional and contractual reforms, as well as stabilization measures, should have a direct impact on the development of domestic financial markets. In addition, a few considerations concern domestic markets and banks particularly.

Although the efficiency and direct costs of the Chilean private pension system are still a matter of debate, there is no doubt that the system has had an enormous and positive impact on the development of domestic equity markets. Market capitalization over GDP hovers around 100 percent today, whereas it was nonexistent two decades ago.²⁸ There is no reason why AFJPs could not do the same in Argentina, except perhaps for the large share of their resources that is being absorbed by public instruments.

More generally, institutional investors play a central role in the development of domestic financial markets. Both their participation and their willingness to bid for long-term instruments depends on macroeconomic stability, as well as on the existence of an appropriate regulatory environment for these institutions. Since they can average illiquidity risks better than individual investors can, institutional investors naturally exploit the longer end of the maturity structure. The development of markets for long-term debt is of vital importance to Argentina as well as the rest of Latin America. Moreover, institutional investors are likely to play a key role in promoting good corporate governance, as the TIAA-CREF example illustrates. This is an efficient mechanism for delegating part of the monitoring and enforcement of good business practices to the private sector. Needless to say, institutional investors themselves need to be appropriately regulated and monitored.²⁹

Perhaps as a result of the fire sales brought about by the tequila crisis, the lion's share of the banking sector is now in the hands of foreigners. For the most part, this has been hailed (if you cannot develop a good supervisory, import it!). Indeed, foreign banks in Argentina today have their headquarters in countries with solid banking regulation. But another aspect of the story receives less attention and is, in principle, a source of concern: In the event of a crisis, are their lending and investment practices similar to those of domestic banks? In particular, are they more inclined to halt lending at the first sight of systemic trouble? Do they lend mostly to prime firms, leaving small and medium firms more unprotected? Or do they, by offering a perceived safe haven, facilitate a run on domestic banks during crises? These key issues need to be sorted out and dealt with, not by limiting the participation of foreign banks, but by taking precautions against the potential side effects.

²⁸ See chapter 5 for an important caveat on the value of Chile's high capitalization based on its unusually low turnover ratio.

²⁹ See Blommestein (1997).

Controlling Fiscal Imbalances

In sharp contrast to the outstanding financial management of Argentina's public debt in recent years, the fiscal deficit has not been tamed. The situation is worse than it looks at first glance, since a series of accounting practices have underestimated the Argentine public deficits.³⁰ Moreover, the health of the net asset position of the government today is overestimated relative to its past, since it does not consider the decline in assets due to privatizations.³¹

Aside from the standard recommendation to improve tax collection, at least two types of measures, although clearly suboptimal in the long run, may prove helpful in attenuating the crowding-out and image problems in the short and medium run.

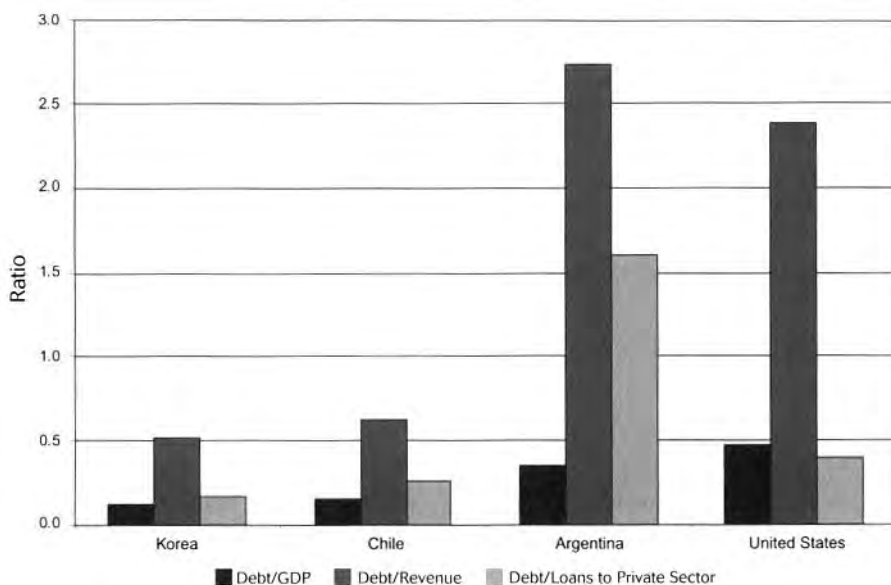
- Pass—perhaps temporarily, say, for the next five years—a fiscal convertibility law, as is being discussed today. Although the availability of countercyclical fiscal policies is a blessing in normal OECD-like circumstances, it is of little use when the nature of the crisis is mostly the loss of confidence by international financial markets. Thus the cost of losing this policy tool during a typical Argentine recession may not be large relative to the gains associated with a healthy fiscal stance during good times.
- Place limits on the collateralizability of the co-participation receipts of provinces. It is very difficult for the government to control flows at any point in time if the provinces can borrow around any federal tightening.

The level of public debt over GDP in Argentina is not high relative to that of many developed economies; certainly it is much lower than that of Italy and Belgium, for example. This seeming contradiction highlights the large synergies between the different ingredients discussed in this chapter. Indeed, the level of public debt over GDP is a misleading statistic when compared with that of more advanced economies precisely because the cost of servicing such debt is much higher in Argentina, especially during crises.³²

³⁰ Essentially, the public debt accumulated over the 1990s is too large for the deficits reported. The official explanation is that the difference is accounted for by under-the-line items.

³¹ This is just an accounting statement, not an argument against privatization.

³² However, Argentina's efforts to lengthen the maturity of public debt have paid off by lowering the costs of spikes. On the one hand, the amount of debt to be renewed in 1997 and 1998 was below 15 percent of the outstanding debt, which means that the interest rate spikes accounted for only a small fraction of the increase in the ratio of interest payments to total debt observed during 1995-98 (from 10 percent in 1995 to 13 percent in 1998). On the other hand, the longer maturity of debt (which went from 3.3 years in 1994 to 14.9 years in 1997) associated with a steep yield curve surely contributed to this worrying trend (another important cause of the increase in interest payments was the termination of a series of concessional loans available from international institutions). Apart from the clear advantages of having an evenly spaced schedule of payments that prevents a disorderly crisis of confidence, it is less clear what is the best maturity structure from the point of view of the level

Figure 3.16. Public Debt under Different Metrics

Note: All data are from 1997, with the exception of Argentina's ratio of debt to revenue, which is for 1996.
Source: IMF, International Financial Statistics (1996 and 1997).

Why is such a low level of debt charged such high spreads? And why should it be rated so low? There are at least two reasons.

First, more advanced economies have a higher tax yield than Argentina. Figure 3.16 shows that, while the ratio of public debt to GDP is significantly lower in Argentina than in the United States, for example, the ranking turns around once public debt is divided by fiscal revenue rather than GDP. Since tax yield is closely related to tax capacity, the Argentine government has access to a significantly lower share of GDP for repayments.

Second, and perhaps more interesting for its nearly self-fulfilling implications, Argentine public debt is more illiquid and subject to highly volatile spreads, reflecting many of the problems described in this chapter. One dimension of this illiquidity is illustrated in figure 3.17 by bars representing the size of public debt relative to an indicator of the depth

and variability of interest payments for a country facing highly variable international interest rates and a steep yield curve, which moreover appears to become steeper in times of crisis. Back-of-the-envelope calculations show that increases in the ratio of interest payments to debt from 1995 to 1998 may have accounted for 5 percent of the existing stock of debt in 1998.

of domestic financial markets. Argentina's fiscal position looks very weak along this dimension. This is important because domestic markets are likely to constitute the support market for such instruments (that is, the market stays even in bad times).

Dealing with Inflexibility

Traditionally rigid and unionized, Argentine labor markets are now facing an additional constraint brought about by the need for nominal wage *deflation* during crises. Besides the obvious volatility costs stemming from labor cost rigidities, indirect costs come from the induced capital deepening. This often brings about higher leverage ratios and more dependence on external financial flows, which are themselves important sources of volatility.³³

The ongoing process of labor reform should help to address the traditional real rigidities. Perhaps a step back in terms of these reforms is the elimination of temporary contracts. Although such a measure seems appropriate in light of the unsuccessful European experience with temporary contracts as a mechanism for fighting structural unemployment, it may not be so if the main goal is to fight bursts of cyclical unemployment during steep crises. The tension between structural damage and cyclical benefits can be dealt with by making temporary contracts contingent on aggregate conditions (for example, making them acceptable only during recessions).

In the short run, reforms aimed at reducing the nonwage component of labor costs should be fast-tracked, but this must come together with offsetting fiscal adjustments so as not to further weaken a fragile fiscal situation. At this time, supply incentives should have a higher payoff than demand ones, justifying the tradeoff.

As for nominal rigidity, little can be done without incurring great risks. Given the current system of exchange rates, nominal rigidities will fade away with the passage of time—and sustained low inflation—rather than with deregulation.³⁴ If it were not for the turmoil that discussing such a change would entail, it might be reasonable to add 2 to 3

³³ See Caballero and Hammour (1998a) for a discussion of the experience of France with capital deepening. Another interesting area of research for Argentina is the question of whether there is an ongoing process of capital deepening. Does it show up in industries and sectors where labor protection and regulation are most severe? Are firms in these sectors disproportionately responsible for Argentina's leverage? And so on. Also see Caballero and Hammour (1998b) for a discussion of elastification, the process by which regulated labor markets eventually increase the employment response to changes in aggregate conditions, particularly as capital is given new opportunities.

³⁴ After the Brazilian devaluation, the Argentine authorities tried to compensate by moving forward the reduction of employers' contributions. Unfortunately, opportunities like this cannot be included in a long-term strategy.

percent of rigidly automatic nominal depreciation to the peso over the dollar as insurance, at least while OECD countries insist on dangerously low levels of inflation as their target.³⁵ But for Argentina such an option is out of the question in the short and medium run. Any reversal in the exchange rate system should be announced with years of warning to prevent major collateral damage and disarray and should not happen until the fiscal situation is finally remedied if inflationary expectations are to be contained.

What about the other extreme, dollarization? When the decision seems to be driven by short-term panic rather than a long-term perspective, dollarization is probably a bad idea. Although it is wise to discuss the issue in the midst of the crisis, it is probably not a good idea to implement it. Given the near irreversibility of the decision, dollarization should not be adopted unless long-run considerations support it, and this is highly unlikely (at least as a unilateral measure). Moreover, the short- and medium-term advantages of dollarization may be exaggerated. First, the argument that dollarization will increase the appeal of Argentina's assets to foreign investors, while valid, is probably too optimistic. With sovereign debt rated as it is, there is not much room for improvement in corporate ratings either. Second, and related, the idea that future seigniorage could be used as public international collateral ignores the fact that current reserves—especially those in U.S. Treasury bills—could play a similar role as the current system. Third, while the other fundamental problems of Argentina are not fixed, the desired equilibrium real exchange is bound to exhibit large fluctuations. Thus it may not be the time for Argentina to resign itself permanently to nominal exchange rate flexibility. This is particularly the case if dollarization is perceived as a substitute for deep reforms, a mistake that politicians are likely to make. Why risk an otherwise transparent and promising development strategy?

Appendix: Trends and Chronology

Trends

1988-present: Argentina opens to trade.

1990s: Income distribution worsens. The percentage of families below the poverty line declines from 38 percent in October 1989 to 12 percent in May 1994, but rises to 19

³⁵ See chapter 6 for a discussion of the desirable properties of exchange rate systems that have strong long-term nominal anchors, cannot jump at high frequency, but allow some real flexibility at high to medium frequencies.

percent in October 1997. Real wages decline slightly in the period. The country experiences massive capital inflows and a corresponding increase in foreign reserves. Expansion before the tequila crisis is driven by a boom in consumption (until 1993), while expansion after the crisis is driven by a boom in investment (which starts in 1994 and continues after the crisis). Manufacturing growth is slower than GDP growth before the tequila crisis and is higher after it.

1991-93: The bulk of privatizations take place.

1991-present: The ratio of stock market capitalization to GDP increases from 2.4 percent in 1991 to 17 percent in 1997.

1995-present: The share of foreign banks grows to 40 percent. The number of banks falls from 168 to 113 (1997); pension funds are valued at \$9 billion.

1996-present: The value of investment funds grows from \$600 million to \$6 billion.

Chronology

1989: The foreign investment law is amended, and most investment barriers are lifted. In May, Menem is elected president. In July, Alfonsín leaves office six months early due to hyperinflation. From July to December, the stabilization attempt ends in another round of hyperinflation. In August, Congress passes the Economic Emergency Law and the Law for the Reform of the State, which allow the government, respectively, to take swift measures to stop hyperinflation (such as cuts in expenditure and price controls) and to start a privatization process. In September, an agreement is reached with the International Monetary Fund, which extends Argentina a \$1.5 billion stand-by loan. In October, the CGT (Congreso General de Trabajadores—National Workers' Congress) splits.

1990: The Tax Penalty Law is passed. In January, Argentina experiences a drastic liquidity squeeze, unilaterally rescheduling the internal debt (10-year bonds for certificates of deposit). In February, a value added tax is passed for goods. From March to December, the stabilization attempt ends in high inflation. In November, a value added tax is passed for services.

1991: The federal government starts decentralizing the provision of education and health services to the provinces. In February, a tax package eliminates export taxes and lowers

taxes on financial transactions. Mercosur is established in March. In April, convertibility starts, and all outstanding domestic public debt is consolidated in long-term bonds.

1992: CGT reunites, but the government is still able to keep labor movements divided and ineffective. In March, the International Monetary Fund approves the Extended Fund Facility. In September, a new Central Bank charter is passed ensuring the independence of monetary authorities, prohibiting financing of the public sector deficit, and removing lender-of-last-resort functions. In December, lower industrial promotion reform of the tax code makes that evasion more difficult, and foreign debt is restructured. Under the Brady Plan, \$27 billion of debt is exchanged for bonds. Banks regain access to international capital markets.

1993: From 1991 to 1993, provincial governments' aggregate spending grows 60 percent, and the wage bill grows 66 percent. Companies are allowed to access international capital markets through American Depositary Receipts (ADR). In August, the Federal Fiscal Pact is passed to strengthen fiscal adjustment in the provinces. In October, a pension reform law is enacted. In November, agreement is reached to reform the constitution.

1994: Argentina is unable to comply with International Monetary Fund fiscal targets due to overspending. International interest rates rise. In June, a private pension system is created (partly public pay-as-you-go with a complementary private capitalized system for supplementary pensions) and is expected to channel about \$3 billion a year to capital markets. In the transition period, payments shift to the private system, increasing the fiscal deficit by close to 1 percent of GDP. A new constitution is adopted in July. In November, all pending government spending is cut off for the year, reducing the 1995 budget by \$1 billion. Mexico devalues the peso in December.

1995: The Mexican crisis hits, resulting in an 18 percent loss in deposits (\$8 billion) and a 30 percent loss in reserves (\$4.8 billion). Recession follows, with unemployment reaching 18 percent. Net capital inflows fall from \$10.7 billion in 1994 to \$2.7 billion in 1995. The trade balance improves. In January, commercial banks are forced to convert reserve deposits at the Central Bank into dollars. In February-March, export subsidies decline, as do public wages. The value added tax increases. The terms of trade are good, and an increase in exports helps to soften the crisis. Argentina receives an international financial package of \$11 billion. The interest rate is raised to avoid a run on the currency, but measures are taken to avoid bank failures and increase liquidity. The Central Bank charter is modified to allow more flexibility in managing liquidity crises. Provinces are pressured to privatize provincial banks. In May, bank deposits start recovering, but bank credit remains depressed. Menem is reelected.

1996: Reforms are enacted in the banking sector, including creation of a safety net and imposition of higher reserves requirements and capital requirements. When the contingency safety net is taken into account, liquid reserves are 30 percent of deposits. A domestic public debt market is developed, and new peso instruments are introduced: short term and two to three years. Required liquidity holdings of banks are increased 2 percent. Compulsory labor risk insurance is enacted. Pension funds reach \$3.6 billion: 51 percent in public debt instruments, 25 percent in term deposits, and 17 percent in stocks and private sector debt instruments. In July, Cavallo steps down as minister of finance, and Fernández takes his place.

1997: The value added tax is 52 percent of tax revenue (excluding social security contributions). \$6.1 billion in repos are negotiated with international banks (contingency credit lines). Investment funds grow fast (reaching \$4 billion by mid-year). In September, foreign firms can be quoted in the stock exchange (*certificados de depósito argentino*) and may be included in pension fund portfolios. In October, Aliens wins congressional elections. The Asian crisis goes almost unnoticed except for the fall in the stock market and declining external balances due to a worsening terms of trade. The banking system remains solid (deposits keep rising).

1998: Argentina signs a three-year extended fund agreement with the International Monetary Fund (\$2.8 billion). No major tax reforms are enacted. The value added tax is extended to previously exempted activities. A single tax is passed for small businesses and the self-employed. No major changes are enacted in labor reform, although some existing flexible labor contracts are eliminated. A minimum level of co-participation funds are guaranteed. The common pool problem is still unresolved since half of provinces' revenues come from co-participation, which provides fewer incentives to fight evasion. As a result of the crisis in Russia, there is less foreign capital available, but no capital flight. The stock market falls. Prices of both exports and imports fall. Brazil enters a recession, and Argentina experiences an incipient recession.

1999: As a result of the Brazilian crisis, the peso becomes even more overvalued as Brazilian and other Latin American currencies fall. Exports fall dramatically, especially to Brazil. As recession puts pressure on imports, the trade balance starts to show surpluses. As interest payments start rising due to higher country risk (in turn due to political uncertainties), the current account does not improve much. Most analysts are surprised by the depth of the recession, as it is now predicted that the decline in GDP will be larger than it was during the tequila crisis.

The government introduces measures aimed at reducing labor costs (lower payroll

taxes), promoting exports, monitoring imports for evidence of dumping, easing access to credit, especially for small and medium firms, and passing measures for specific sectors such as automotive and agriculture. Although the Central Bank refuses to reduce liquidity requirements, a plan is under discussion to refinance loans of small and medium firms held by the Banco de la Nación.

Although the financial system is still very strong, a small number of institutions have to be closed down as a result of the Brazilian devaluation. Loans to the private sector are flat for the first semester, although nonfinancial public sector borrowing increases sharply.

The practice of covering government financing needs a few months in advance is kept in effect. Argentina returns to international capital markets shortly after Brazil's devaluation. However, political uncertainties regarding the impending presidential elections sharply increase the country's risk premium, which almost reaches Brazil's by mid-July.

In April, the International Monetary Fund agrees to increase the public deficit target by \$2 billion to \$4.95 billion, on the grounds that the higher deficit is due to external factors and not to excessive spending. The deficit is expected to grow. The tax reform of 1998, first thought to provide enough extra revenue to eliminate payroll taxes, only dampens the still-significant drop in revenue. As part of the accord, the government agrees to five pieces of legislation: fiscal convertibility, conversion of Banco de la Nación into a *sociedad anónima* (stock company), reforms of the Central Bank charter, reforms of the social security system, and overhaul of a scheme for sharing tax revenue with the provinces. But these changes do not seem likely to pass before the change of government (although the fiscal convertibility does pass the chamber of deputies).

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After following a rudderless path during much of the 1980s, Mexico embraced dramatic reforms in the 1990s. 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, the North American Free Trade Agreement (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 ended abruptly in the mid-1990s, when Mexico, as it had done in the early 1980s, was again at the epicenter of an emerging crisis. Mexico's relative success during the global crisis of the late 1990s surprised most, illustrating that the fear of yet another devastating crisis remains.

As with the other chapters in this part of the book, this chapter seeks not so much to describe the most directly observable culprit during crises—be it an overvaluation, a large current account deficit, or a preceding lending boom—as to identify and hint at potential remedies for the structural reasons behind these episodic bursts in uncertainty and systemic breakdowns.

Weak international financial links and external conditions played a central role in Mexico's vulnerability during the 1990s, as they did in the early 1980s both in Mexico and in most other emerging economies. But external factors alone were not responsible, as internal ones both invited and amplified the external ones. There are at least three domestic vulnerability factors, which are strongly complementary. The first, and most central, is a *recurrent credit crunch and financial underdevelopment problem, with particularly fragile banks*. Partly because of this and the external factors just mentioned, Mexico also has a *weak fiscal situation*—due not to chronic imbalances but to extreme vulnerability to internal and external shocks—and a *latent monetary policy credibility problem*.

This chapter is optimistic nonetheless. Mexico has recognized many of these shortcomings and is gradually making progress on them. Moreover, the performance of post-reform Mexico during the years preceding the 1994-95 crisis has been overly criticized.

The precarious initial conditions facing Mexican banks after years of financial repression and inflation, the sectoral and technological imbalances caused by a long period of protectionism and underinvestment, and the weak performance of Mexico's main trading partner and pull factor—the United States—during the early stages of the reform period did not offer Mexico much access to a riskless export-led transition.¹ Still, Mexico's dependence on the United States does raise concern about whether Mexico's success during the recent wave of crises is primarily due to a sounder structure or due to fast growth and low interest rates in the United States.

In a nutshell, and matching the deficiencies highlighted, this chapter contains policy recommendations on four general items.

The first item is to *improve external financial links and reduce direct exposure to external shocks*. In addition to dealing with Mexico's domestic problems, which are in themselves conducive to fragile international financial links, there are at least five slightly more specific recommendations and considerations. (a) International standards are needed on contractual enforcement, disclosure, and corporate governance. (b) A mechanism is needed 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) Self-insurance and contracted insurance mechanisms are needed to protect against external shocks. In order to build self-insurance, Mexico could consider establishing 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, Mexico could continue expanding the range of contracted credit lines. The costs could be reduced by making these contracts contingent on clearly verifiable and exogenous events (oil prices, U.S. shocks). (d) Along similar lines, the recently enacted credit line against political cycles is an excellent idea. However, to prevent abuses and limited availability, such contracts should be made contingent on the pre-election period, making them more expensive as the public deficit and other traditional indicators of political misconduct deteriorate. Finally, it is apparent that most of the volatility in capital flows comes from speculative flows (in contrast, foreign direct investment is very stable). Part of this volatility is due not to healthy speculation but to problems with the balance sheets of foreign investors during crises. (e) It may be prudent to require liquidity ratios (which could take the form of investment in prime foreign

¹ See Sachs, Tornell, and Velasco (1996) for a view that also lessens the blame put on Mexico's policymakers, recognizing a bad equilibrium among many possible factors. On the other end, see Dornbusch and Werner (1994) for one of the first—and pre-crisis—articles blaming the lack of growth primarily on overvaluation of the exchange rate.

assets) from foreign institutional investors or to favor closed over open-end funds. Since financial integration is a primary goal, every effort should be made to avoid costly net taxation of capital flows.

The second item is to *accelerate the path of domestic financial deepening and strengthen existing arrangements*. In particular, Mexico needs banks urgently. Thus (a) re-capitalizing the most viable domestic banks in a timely manner and importing the rest from countries with good supervision should be given high priority in the short-term agenda. In the medium term, one can be more subtle about tradeoffs. While foreign banks from G10 countries (the world's industrial and financial leaders) 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. (b) The solution to this potential problem lies not in limiting the participation of foreign banks but in ensuring that structurally important financial lines remain open when necessary. Most important, domestic collateral, such as 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 nontradable sectors. (c) This suggests the need to impose additional capital-adequacy requirements with respect to assets exposed to systemic risk and the need to foster the use of collateral that is more adequate to foreign investors.² Such measures would significantly strengthen Mexico's external financial links. Moreover, with the passage of time these processes should reinforce one another, 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 to monitor the off-balance-sheet activities of banks, for a significant fraction of the macro risk taken during the 1994-95 crisis took place through this channel. 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. (e) Thus there may be a need to regulate the participation in those markets until the rest of the financial system develops. After the tequila crisis, Mexico was able to finance substantial amounts of private investment and activity, despite a most severe credit crunch. This suggests the development of a wide array of informal lending channels. (f) An effort should be made to institutionalize and support these activities. As the case of Chile has shown, pension funds have great potential for developing domestic financial markets. (g) This potential should be one of the crite-

² For example, shares or claims on export-oriented companies, which may in turn hedge their own risks with claims from nontradables. Of course, these transactions may be done within the banking system, but the point is that the macro capital-adequacy ratio must take them into account.

ria considered when determining the constraints and possibilities of Mexico's Nuevo Sistema de Pensiones (New System of Pensions, or NSP). (h) More generally, fostering and nurturing the development of well-supervised institutional investors is an efficient mechanism for delegating the enforcement of good standards of corporate governance to the private sector, as these institutions often ponder such factors in their investment decisions.

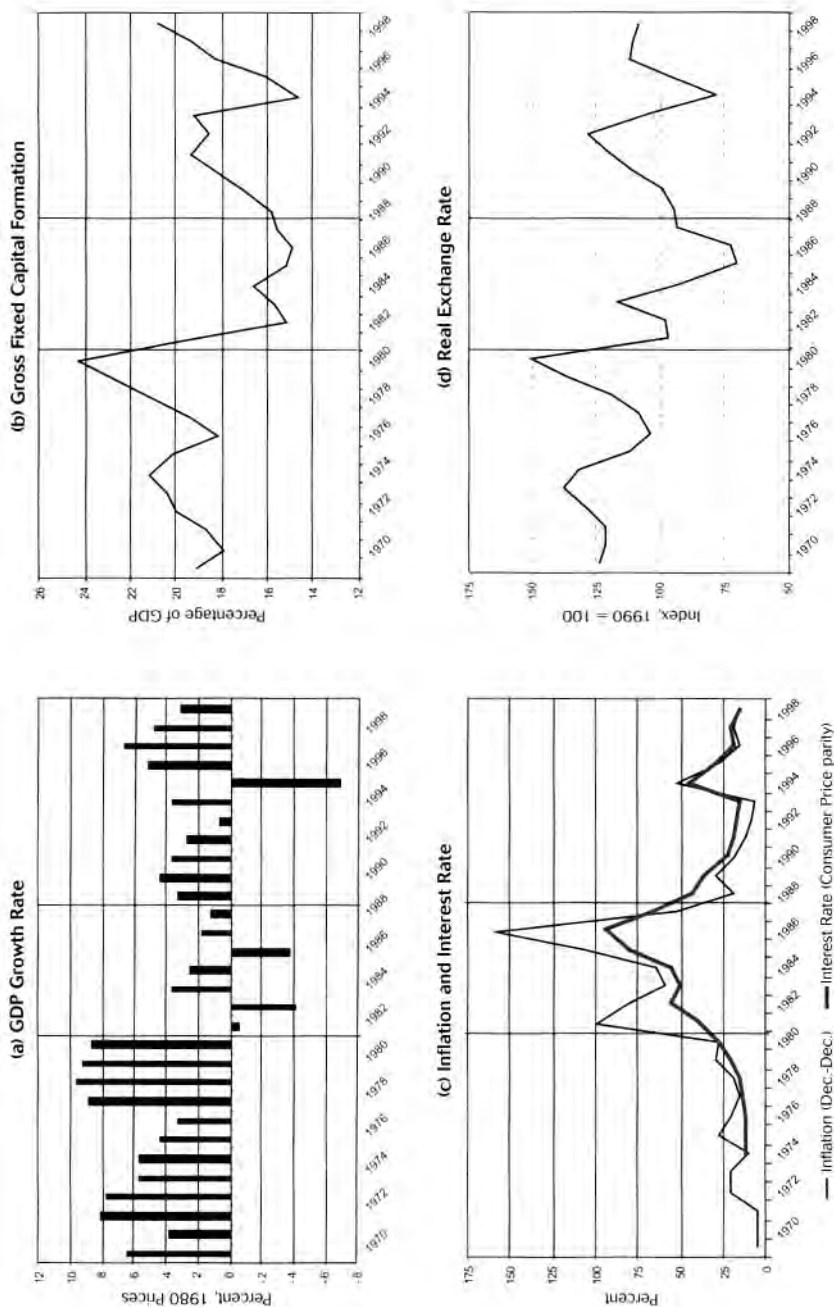
The third item is to *reduce the exposure of public accounts to internal and external shocks*. To this effect, Mexico could consider (a) implementing an oil-stabilization fund and (b) institutionalizing an explicit insurance system where fees and contributions are clearly established.³

The fourth item is to *stabilize very high- and very low-frequency movements in the nominal exchange rate*. Sudden jumps in the exchange rate are harmful to the domestic economy and the economies of neighbors, while very low-frequency movements are conducive to inflation. Fluctuations in the medium frequency of nominal exchange rates may facilitate adjustment in the presence of nominal rigidities. (a) Suppressing very high- and very low-frequency movements in the exchange rate system seems sound. This could be done with a simple partial adjustment model, where the driving force is largely predetermined (for example, the current account deficit or U.S. credit conditions) and the anchor is the unit parity to a strong currency. Over time—and quite rapidly if both domestic and external conditions permit it—moving toward a flexible exchange system with an active reserve management policy and a nontradables inflation targeting system may be enough to stabilize the exchange rate at both ends of the spectrum. (b) As mentioned, 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 costs associated with taxing and limiting the use of future markets. Stabilization is needed because investors seem to use the Mexican futures markets to hedge against the risk of other currencies correlated with Mexico's through financial contagion.

As with the previous chapter, this one supports these recommendations and diagnosis when possible given the available data, highlights their conjectural nature in others, and in some cases hints at further research needed to make these conjectures more precise. It starts by describing Mexico's recent volatility, documents the presence of core volatility factors and domestic amplification mechanisms, and elaborates on the policy proposals.

³ The new banking legislation and the creation of the *Instituto para la Protección al Ahorro Bancario* (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.

Figure 4.1. Growth and Volatility



Note: Preliminary data for 1998 and predicted data for 1999. In panel d, a decrease in the real exchange rate index means a depreciation.
 Sources: IMF, International Financial Statistics (various years); Instituto Nacional de Estadística; Geografía e Informática; and Banco de México.

The Facts and Mechanisms

Aggregate Volatility

Figure 4.1 divides the last three decades of the twentieth century into three subperiods, delimited by vertical lines: the pre-debt crisis, the distress that followed that crisis, and the post-reform period that began around 1989 and was consolidated by 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 following the debt crisis, it was still a far cry from the stability and overall performance of the economy during the 1970s.⁴ Panels a and b document this pattern for gross domestic product (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 level. This aspect is discussed again because it is often seen as connected to the deep crisis starting at the end of 1994. The 1997-99 crisis made it apparent that Mexico's reforms had not shielded the economy 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 for the real exchange rate (panel d).

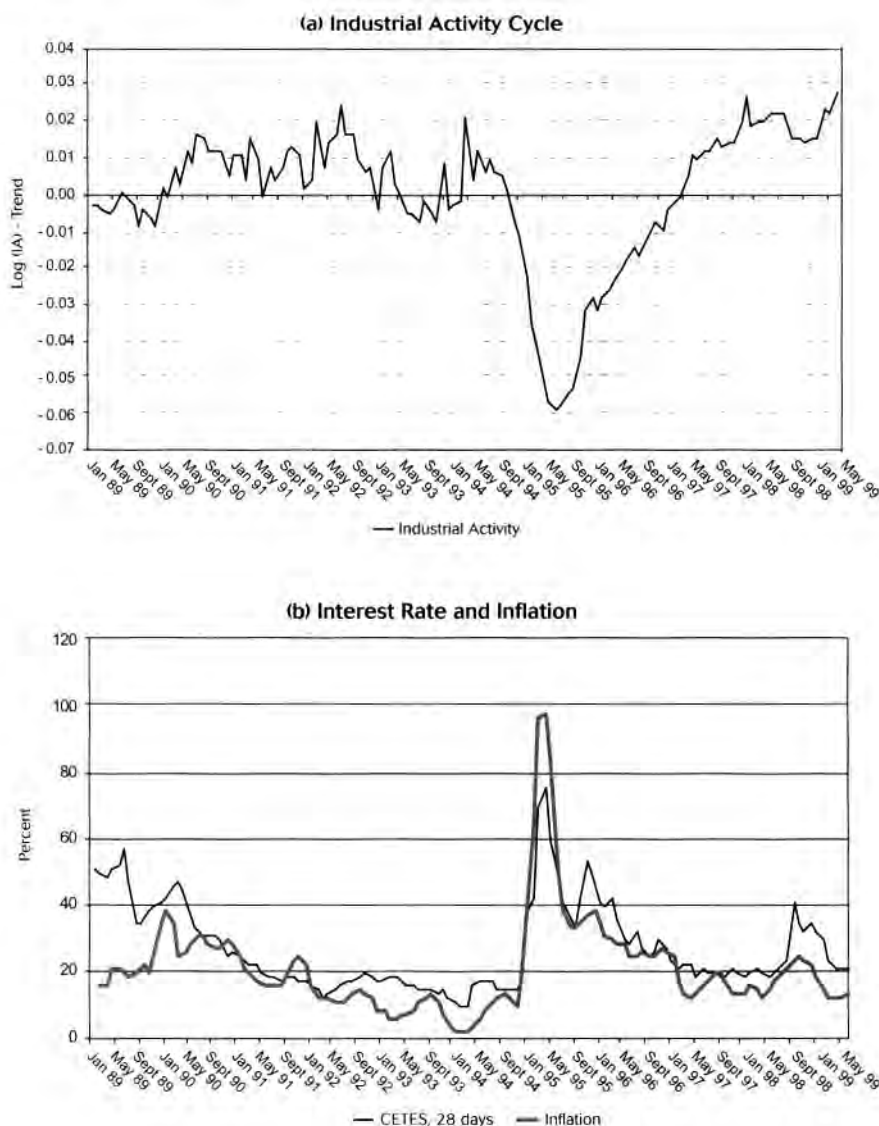
This chapter focuses on the post-reform period. The paths of the industrial production index, inflation, and nominal interest rate in figure 4.2 highlight two particularly interesting episodes within this period. The first and more dramatic one is the infamous tequila crisis occurring at the end of 1994.⁵ The second one, which is interesting for what happened as much as for what did not, is the crisis following the sequel of emerging-market crises that began with the 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 Russian crisis is perceptible in the industrial production index in panel a, the crisis was 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 of inflation control, showing that the costs of the recent episode are still not fully paid for.⁶

The next subsections describe the structural factors that are most likely to have generated these scenarios in post-reform Mexico.

⁴ The 1970s already represented a decline in aggregate performance relative to that of the 1960s.

⁵ The slowdown in growth in 1993 and the recovery attempt that followed it are, to a large extent, part of this episode.

⁶ Although by mid-1999, inflation seems to have regained its pre-crisis path.

Figure 4.2. Post-Reform Period

Note: Industrial activity is log of seasonally adjusted series without trend—three-month moving average. Inflation is seasonally adjusted three-month moving average, with annualized monthly variations. CETES are Certificados de la Tesorería de la Federación, a peso-denominated debt instrument.
Sources: Instituto Nacional de Estadística, Geografía e Informática and Banco de México.

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.⁷ From the point of view of aggregate volatility, however, it is not only the level but also the fragility of this limited access that counts.

Panel a in figure 4.3 illustrates the path of capital flows into Mexico and their close connection with Mexico's business cycle during the 1990s, especially during the deep crisis in 1994-95. As both residents and foreigners became aware of the dollar illiquidity of the government and country, and confidence vanished, the annual inflow of private capital, which was well above 5 percent of GDP, turned rapidly into outflow.⁸ No country can withstand such a turnaround, and Mexico experienced a deep recession despite the rapid response of the United States and the International Monetary Fund, as can be seen in the temporary rise in public capital inflows.

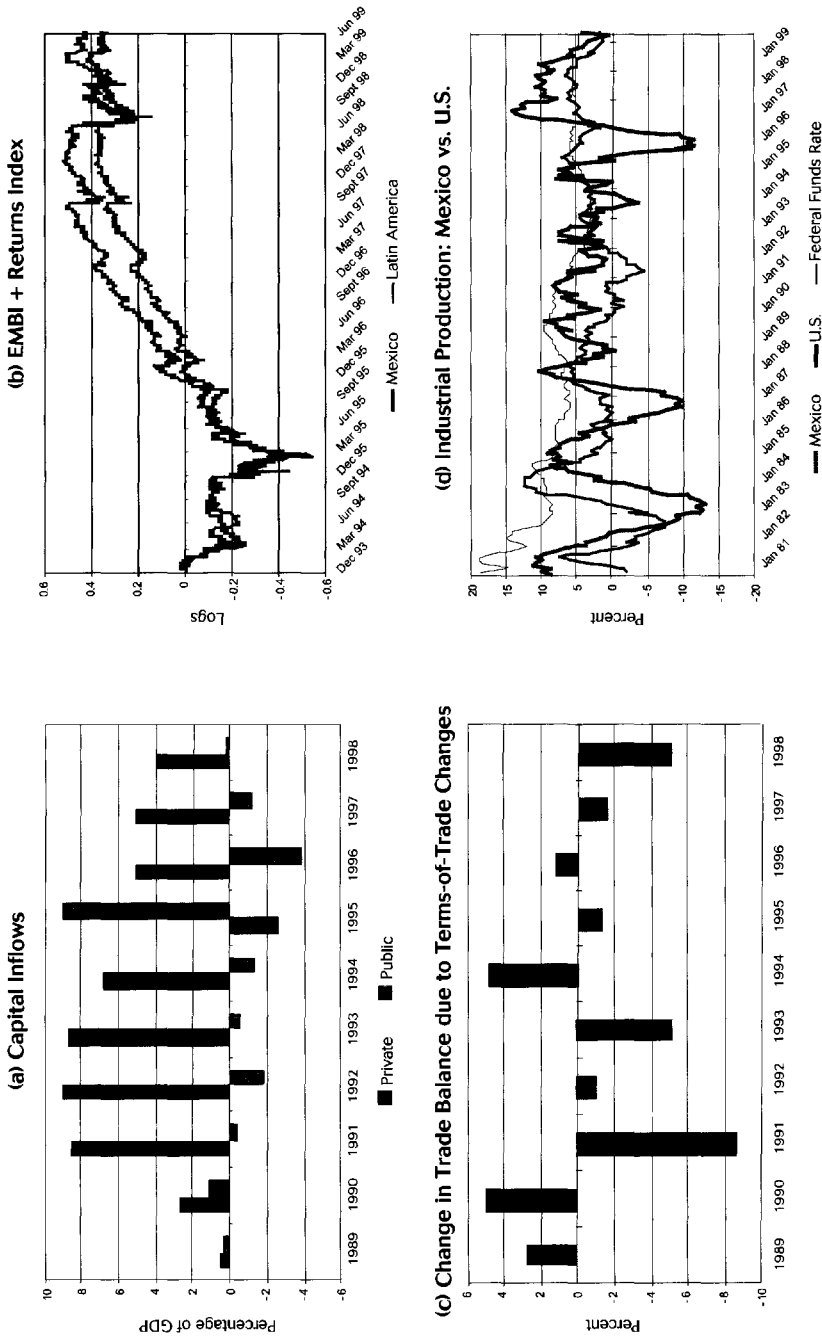
Stark as it is, this figure underestimates the severity of the external constraints during crises since it ignores strained renegotiations and other mechanisms that smooth observed—relative to latent—movements of capital flow. Some of this underestimation can be gauged from price data; the gray line in panel b shows the return index of Mexico's sovereign debt, which exhibits dramatic drops around the crises dates. The black line in the same panel portrays the return index of Latin American sovereign debt. As with Argentina, the high correlation between this series and Mexico's does not absolve Mexico of responsibility for the weakness of its international financial links, especially during the 1994-95 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. Many second-best considerations arise from such scenarios—for example, whether short-term capital flows and large current account deficits should be avoided—as well as the more fundamental concern of why emerging economies are subject to these tests of resilience. These concerns are addressed in the policy section.

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 oil is volatile and represents a large share of the country's exports, Mexico experiences large terms-of-trade shocks. Nonetheless, it was not a terms-of-trade shock that negatively affected Mexico at

⁷ Although much has been said about the unsustainable deficits in the current account experienced by Mexico before 1995, the argument for 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.

⁸ It is inaccurate to blame foreigners exclusively for the outflows. See, for example, Garber (1998) for a discussion of the role of the off-balance-sheet activities of domestic banks before the 1994-95 crisis. These activities inflated capital inflows before the crisis and automatically reversed them after it.

Figure 4.3. External Conditions during Crisis in the 1990s



Note: In panel a, public sector capital flows include general government and monetary authorities, excluding reserves and related items. Private sector corresponds to total capital flows minus public sector. In panel c, the change is calculated using the following relation: $dP_x/P_{x,t-1} - a \cdot dP_m/P_{m,t-1}$, where $a = P_{m,t-1}/P_{x,t-1}$. Source: IMF, International Financial Statistics (various years), except panel b, which uses EMBI + J.P. Morgan emerging markets bonds index from Datastream Research Service.

the end of 1994, and Mexico's performance during the 1997-99 global crisis was relatively good *despite* its weak terms of trade. Although 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 in the volatility experienced during the post-reform period.⁹

Panel d plots better statistics for Mexico's good fortune: U.S. growth in industrial production and the federal funds rate. Much has been said about the positive role that the U.S. expansion had in insulating Mexico from a large share of the global turmoil in the late 1990s. There probably is plenty of truth behind that assertion. By the same token, however, it seems unreasonable to blame Mexico alone for its poor growth performance—particularly in exports—during the early 1990s, since the United States 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 United States expands, it pulls Mexican exports and activity, but as soon as the Federal Reserve tightens interest rates, capital flows reverse, complicating the Mexican scenario.¹⁰ Normally, the financial U.S. factor has proved stronger than the real U.S. factor; in the 1997-99 crisis the reverse occurred, since the U.S. interest rate response was subdued when compared with the prolonged nature of its expansion.

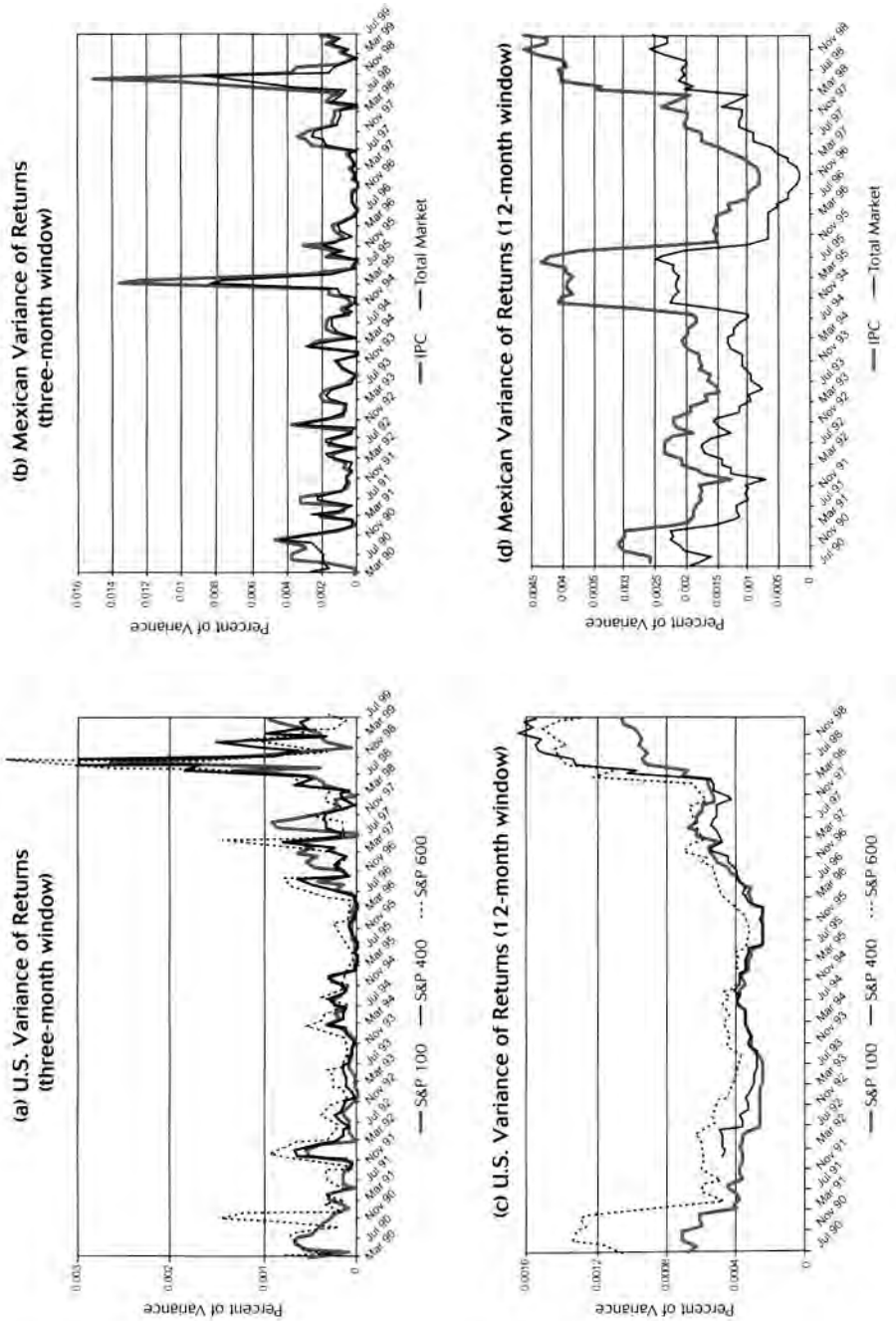
Figure 4.4 illustrates yet another, albeit more conjectural, dimension of the weak and volatile international financial links. Panel a uses data on U.S. stock returns to illustrate the variance of returns over a three-month window centered at the indicated date. The thick line corresponds to a prime firms' index (S&P100), while the other two correspond to 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 United States, 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

⁹ However, since oil is largely publicly owned, its price fluctuations have significant impact on the fiscal side. 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.

¹⁰ See Calvo, Leiderman, and Reinhart (1993) for the classical reference on the impact of U.S. monetary policy on capital flows to Latin America. Of course, as the United States tightens, the end of its expansion also appears on the horizon, further complicating the outlook for Mexico.

Figure 4.4. Variance of Stock Returns in United States and Mexico



Note: IPC is an index of prime companies.
Source: Datastream Research Service.

Table 4.1 Mexican Sovereign Bonds and U.S. Corporate Bonds of Similar Rating

Type of Bond	S&P Rating	Moody's Rating	Spread Average	Spread Variance	Variance of Spread Changes
<i>Mexican sovereign bonds</i>					
	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
<i>U.S. corporate bonds</i>					
	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

Note: Spread average means average over bond lifetime (or starting at earliest date available in Datastream). Mexican sovereign bonds: MEXICO-PAR (B-Q) 6 1/4% 90-19, MEXICO 8 1/2% 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 1/2% 92-04, NAVISTAR INTL. TRANS. 9% 85-04, ROWAN COS. INCO. 11 7/8% 91-01, STANDARD PACIFIC 10 1/2% 93-00, TIME WARNER INCO. 8 3/4% 98-17.

Source: Bond data from Datastream Research Service.

line the variance series for the IPC (an index of prime companies) and with a black line that of a more comprehensive index (Total Market). As with Argentina, this reversed volatility ranking is interpreted as evidence that foreign investors focus mainly on firms whose stocks are in the IPC, and hence it is mainly these stocks that reflect large swings in capital flows.¹¹

Finally, table 4.1 compares the performance of several Mexican sovereign bonds with that of several U.S. corporate bonds of equivalent credit rating—similar to the sample

¹¹ Another interpretation is that the finding is spurious, because the more comprehensive series is polluted by too many no-trades. Although this remains a possibility, a similar pattern is observed in Argentina (chapter 3), where aggregate data on volume do not seem to support this alternative interpretation. The relative-volatility claim does not say that the financing of large firms 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 of prime companies fluctuates with international sentiment about emerging markets and Mexico's financial strength.

of Argentine bonds illustrated in table 2.1 of chapter 2. 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.¹² 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 4.3 has demonstrated, much of this volatility stems from episodes where financial markets tighten for emerging markets. Mexican bonds look illiquid 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.

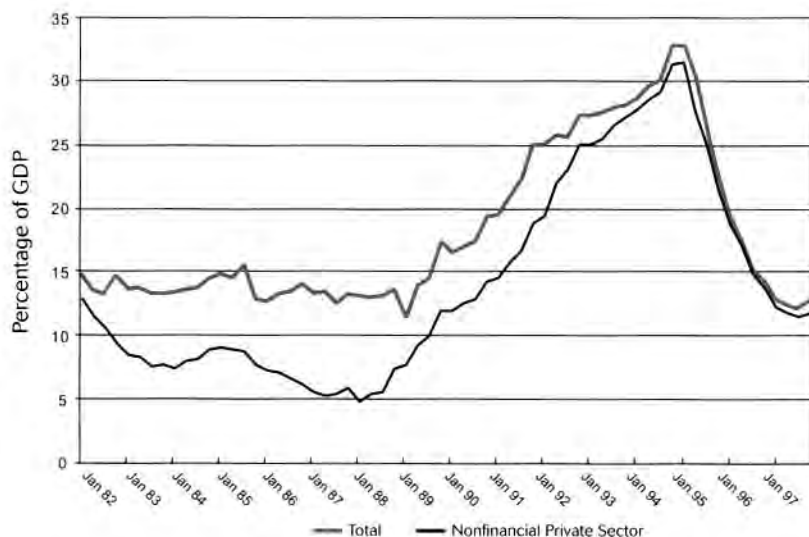
To summarize, the level of capital flows is low; the volatility of terms of trade does not seem large enough to justify the volatility of these flows and their prices; unlike the United States, prime firms' stocks, which are the target of foreign investors, are more volatile than more comprehensive stock indices; and 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, they add up to a convincing case that Mexico's connection to international financial markets is fragile.

Domestic Shocks and Amplification Mechanisms

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. However, as financial development rises, so does leverage and, with it, the fragility of the system itself to shocks. As the next paragraphs suggest, Mexico has suffered both from chronic financial repression and underdevelopment and, when moving away from that, from large collapse of the banking system.

Chapter 2 highlights Mexico's level problem. Similar to Argentina, Mexico's financial markets and level of financial intermediation are substandard. M3, loans, and stock market capitalization—as a fraction of GDP—fare poorly with respect to the economies of the Organisation for Economic Co-operation and Development (OECD) and leading countries within the region. But the level of financial intermediation hides important dynamic

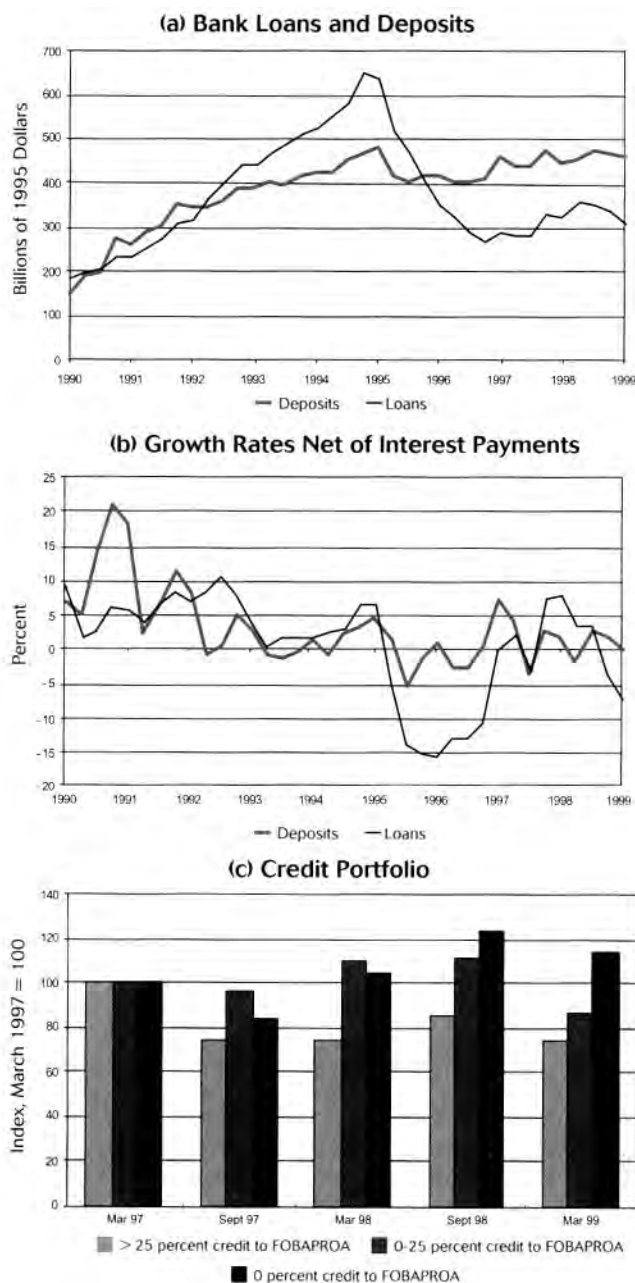
¹² It is important to raise a couple of warnings with respect to these comparisons. First, it is difficult to assess the relative diversification features of these different bonds and spreads. And, second, the volatility of junk bonds varies substantially over time.

Figure 4.5. Bank Credit

Source: IMF, International Financial Statistics (various years).

and cyclical aspects of Mexico's financial markets and of banks in particular. After the crisis of the early 1980s, banks were nationalized, and Mexico experienced a period of severe financial repression, with bank 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 is often blamed for the deep crisis at the end of 1994, a point qualified below. Regardless of who is to blame, the crisis was followed by a severe credit crunch that has yet to be fully worked out. Figure 4.5 highlights these broad patterns. The gray line portrays total bank credit as a fraction of GDP, while the black line represents credit to the nonfinancial private sector. Both the increase in the share of nonfinancial private sector loans in total loans as well as the rise and abrupt turnaround of bank credit are clear.

There is no doubt that the severe credit crunch significantly leveraged the 1994-95 crisis and that the collapse in the banking system will impose costs on the economy and the 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 4.6 offers some clues. Panels a and b show that, unlike the case of Argentina during the same period, the problem was primarily on the loan rather than on the

Figure 4.6. Behavior of Private Sector Deposits and Loans

Note: In 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: IMF, International Financial Statistics (1997–1999) and Banco de México.

deposit side of the balance sheet.¹³ Although there was a mild decline in deposits, it was far from an outright run and certainly not enough to explain the sharp collapse in loans. Indeed, new loans imploded early in the crisis, especially as the currency went into free fall, dragging with it the already weak balance sheets of Mexican banks.

Panel c reinforces that point for the current, and by now chronic, credit crunch. It shows that the decline in credit was 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, the deposit insurance institution that bought a portion of the bad loans of banks as part of the post-1995 intervention package. The data in this panel represent 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. However, the data also highlight the severity and persistence of the credit crunch that followed the 1995 banking crisis.

But did the banks' reckless behavior cause the crisis? Or were the banks victims of the crisis itself? The majority of opinions support the former.¹⁴ But it probably also is true that the consensus view was influenced by the outcome: *ex post* the loans did not perform, hence they must have been bad loans.¹⁵

Figure 4.7 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 nonfinancial 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 many of the events that triggered the recent Asian crisis. It is apparent in these panels that, although 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. Although the significant fraction of nonperforming loans was well recognized—and perhaps the main factor behind the loose monetary policy during 1994—it did not particularly discourage investments in bank stocks.¹⁶

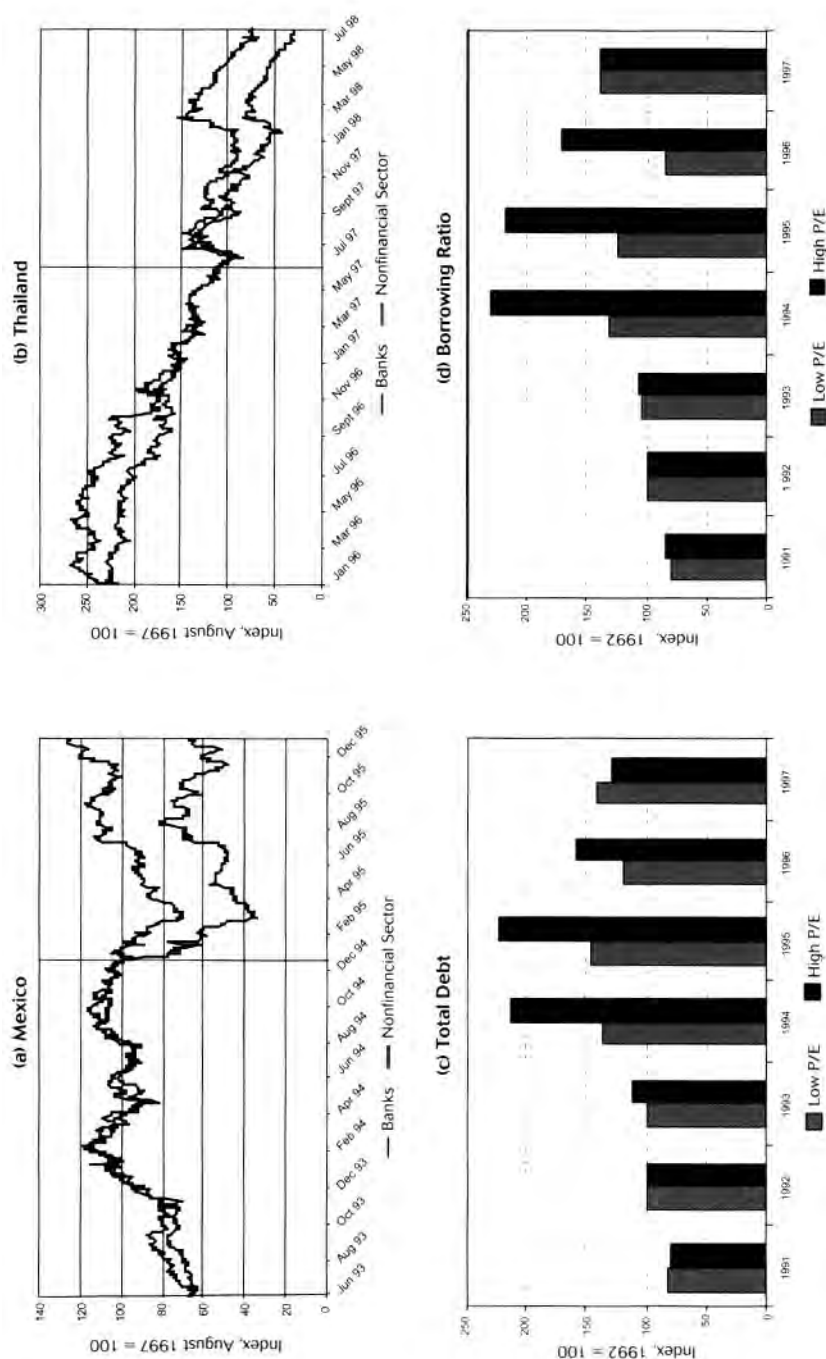
¹³ In Argentina the sharp run on deposits probably had to do not so much with the health of banks as with the survival of the convertibility system.

¹⁴ See Caballero and Krishnamurthy (2000a) 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.

¹⁵ Of course, this is not to deny that Mexican banks were vulnerable and already had shown an increasing trend of nonperforming loans before the crisis.

¹⁶ To argue that the reason for this is that investors expected a bailout is to take the moral hazard argument too seriously. Although expected bailouts surely can add a few points to expected returns, it is highly unlikely that they will be enough to attract investors aware of the fragile condition of the institution potentially bailed out.

Figure 4.7. Credit Allocation



Note: Group 1: Price/earnings ratios (P/E) < 11 includes 11 companies: two in transport, two in building materials, one in metal manufacturing, one in tourism, one in merchandising, three in multi-industry, and one in telecommunications. Group 2: P/E > 11 includes 11 companies: two in building materials, one in construction, one in beverages, one in paper, one in tourism, three in merchandising, and two in multi-industry.

Source: Datastream Research Service.

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, bank lending seems to have been directed to firms that the stock market perceived to be profitable. These panels illustrate indices of the degree of leverage (total debt) and the borrowing ratio (total debt over total assets) for firms with different price/earnings (P/E) ratios at the end of 1992, where the borrowing ratio is a raw measure of how the stock market evaluated the growth prospects of these firms. It is apparent that the firms with higher P/E ratios were on the receiving end of the 1992-94 credit boom.¹⁷

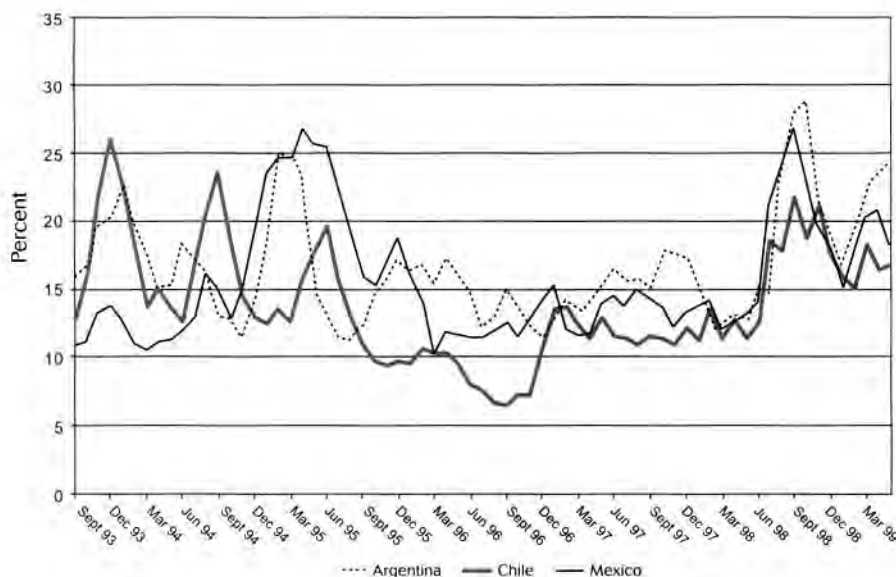
If not only misbehavior and corruption, what else? A distinct possibility is the combination of the weak initial conditions faced by banks and their overexposure to macroeconomic shocks. After a period of deep financial repression during the 1980s, banks were privatized at the same time that the economy 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.¹⁸ 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 United States was subdued at best through much of the late 1980s and early 1990s.¹⁹

The banks also made an error in 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 apparently had bet on the exchange rate system on the off-balance-sheet side as well. In sum, it appears that the

¹⁷ 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. The firms considered are large firms quoted on the stock market, so it is still possible that banks were misallocating credit in the small- and medium-firm sector for which stock market data are not available.

¹⁸ The proportion of loans larger than 20 million pesos that were collateralized right after the crisis was around 70 percent of the total for most banks. Gelos and Werner (1999) document that banks increased their use of collateral after privatization.

¹⁹ In the literature, deep restructuring 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 the 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 made possible largely by the low U.S. interest rates. Of course, when these flows turned around abruptly, the exchange rate became overvalued.

Figure 4.8. Cross-Sectional Variability of Sectoral Stock Returns

Note: Interquartile range, 15–85 percent (three-month moving average). The number of sectors used for Argentina, Chile, and Mexico is 26, 20, and 24, respectively.

Source: Datastream Research Service.

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.

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 4.8 reports the path of a measure of the cross-sectional dispersion of the stock market returns for a group of approximately 20 Mexican industries (black line).²⁰ The figure shows the dramatic surge in this cross-sectional dispersion during the 1994-95 crisis and during the recent global turmoil. As a comparison, the gray 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,

²⁰ The industries correspond to the stock market subsectors at level of disaggregation five 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 using different measures of dispersion.

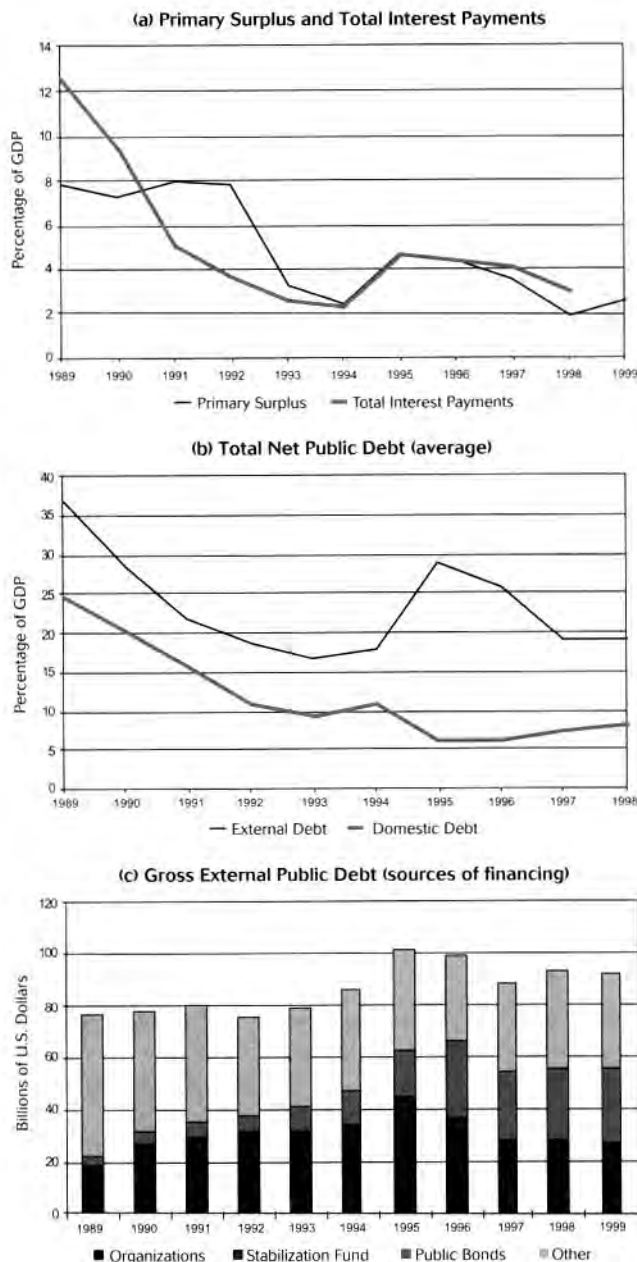
exhibited a much milder increase in dispersion, suggesting that resource aggregation does play an important role in limiting the damage caused by crises.²¹ Argentina, in contrast, has responses closer to those of Mexico, which is consistent with the fact that its financial markets are also very underdeveloped (see chapter 3). Finding more direct evidence of this mechanism is an important research theme, as is analyzing the effects of financial underdevelopment on the relative size and volatility of sectors that traditionally use credit.

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 1994-95 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.

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 the private sector's imbalances. The black line in panel a of figure 4.9 illustrates a consistent primary surplus over the post-reform period, often matching the significant interest payments on the existing stock of public debt (gray line). But it is panel b that 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 1980s. This trend was abruptly interrupted during the 1994-95 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 International Monetary Fund in 1995.

Many have argued that this systematic bailout practice is responsible for some of the private sector excesses. However, as was true in the context of the banking sector, the importance of this form of moral hazard, while significant, is often vastly exaggerated. Regardless of whether this is the case or not, 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 cor-

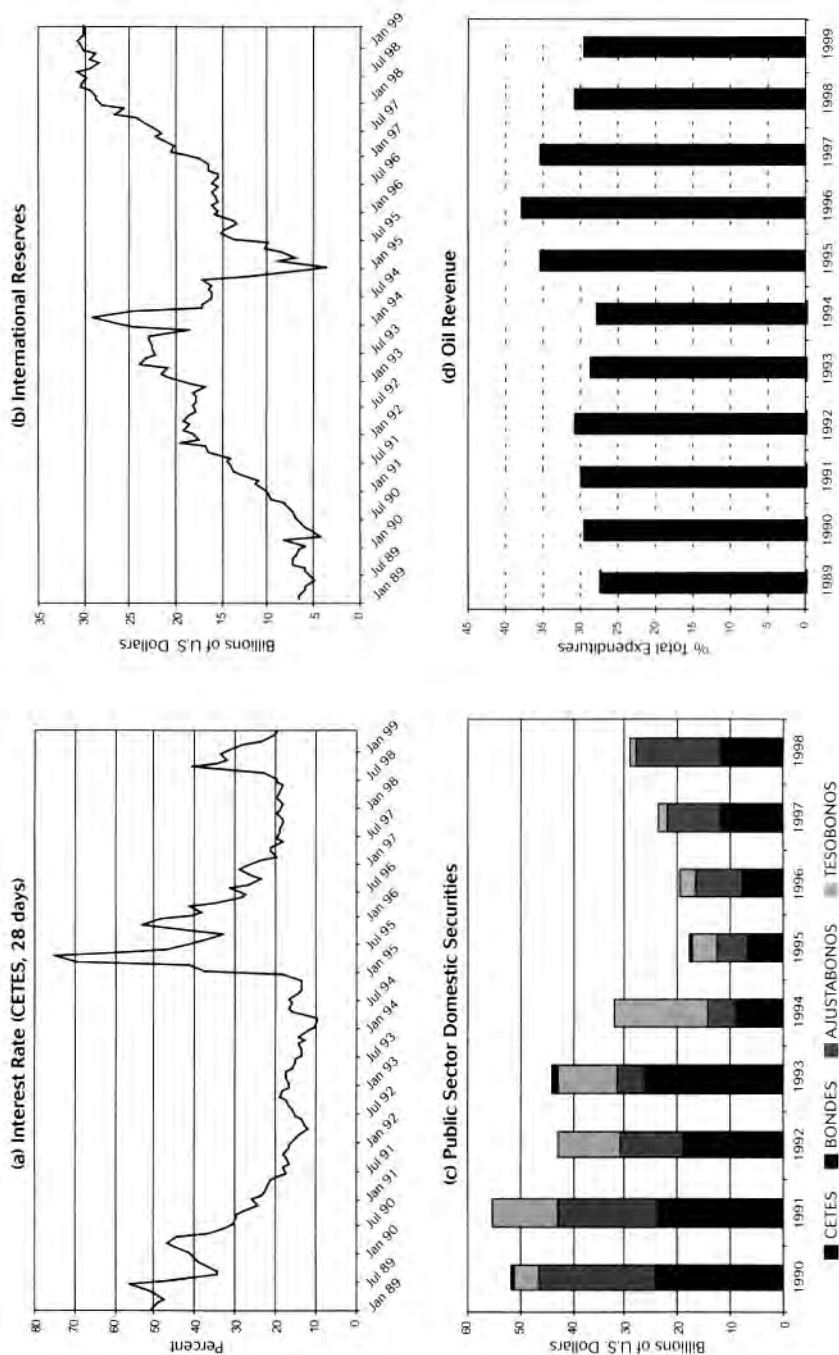
²¹ The argument is somewhat circular. One could argue that the shocks were larger for Mexico, creating the larger increase in dispersion, although it seems difficult to argue that by late 1998 Chile had been affected by a smaller terms-of-trade shock than Mexico. Under the metric of figure 4.8 Mexico appears more stable and developed than Argentina and Chile before the 1994-95 crisis. Thus the evidence is ambiguous. 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, Mexico's financial system was more developed—or at least bank loans were more readily available—before the 1994-95 crisis.

Figure 4.9. Public Finance

Note: Panel c: Data at end of period, except for 1999 (March). Organizations include bilateral and multilateral organizations; other includes suppliers, reprivatizations bonds, restructured, nonrestructured, and base money, 1990–92.

Source: Banco de México and Ministry of Finance.

Figure 4.10. Interest Rate, International Reserves, and Composition of Domestic Public Debt



Note: 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 consumer price index (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 pesos to the U.S. dollar.

Source: Ministry of Finance.

ner, which means that both real and nominal interest rates are ready to jump at any sign of distress anywhere in the economy, creating further distress.²² This feature probably compounded with the large dollar amortizations coming due in early 1995 to trigger the crisis. Figure 4.10 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 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 the shift away from peso-denominated *certificados de la tesorería de la federación* (CETES—treasury bonds) and *ajustabonos* (instruments indexed to the consumer price index) and toward cheaper short-term dollar-denominated *tesobonos* (instruments indexed to the free market exchange rate). 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. This issue is discussed further in the context of the lack of credibility of Mexico's monetary policy.

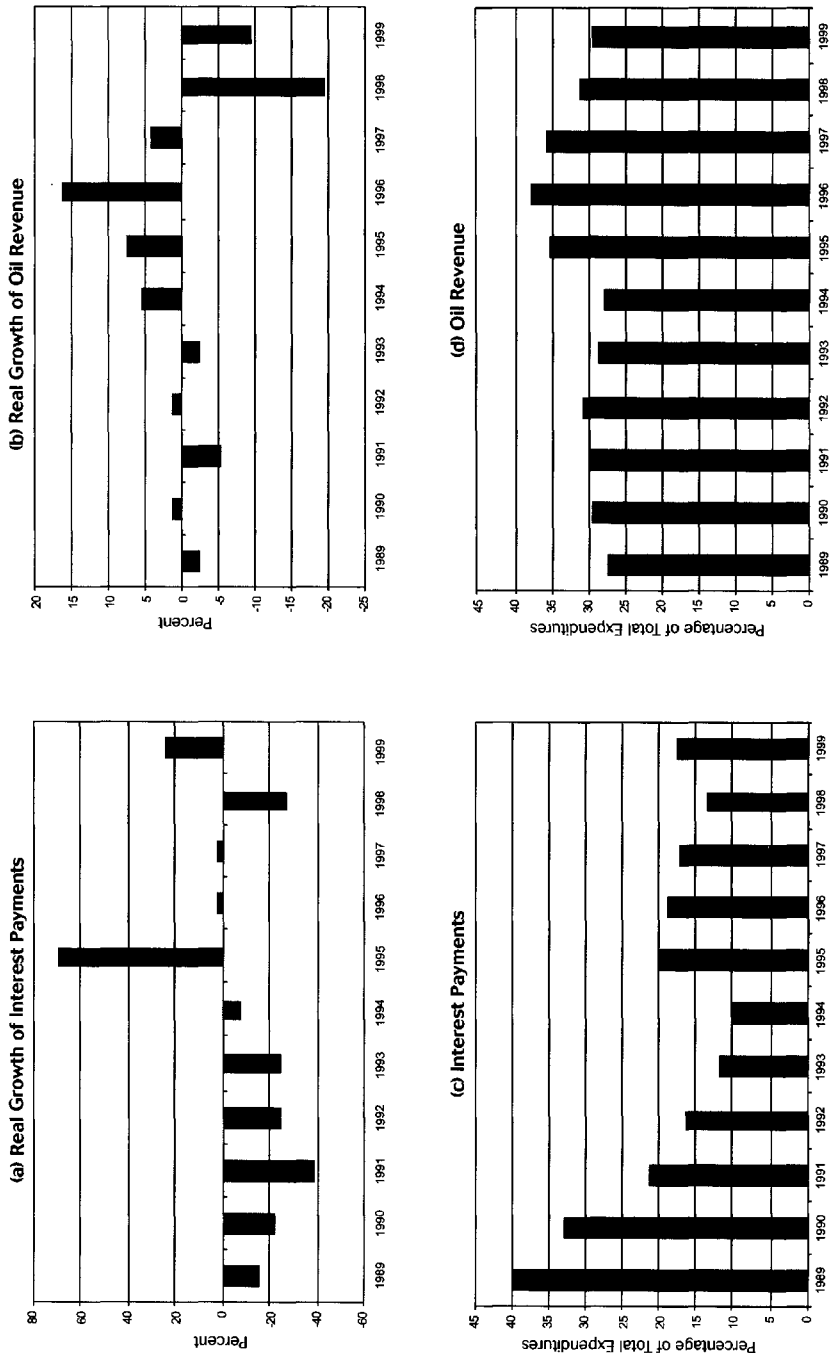
Regardless of whether the crisis materializes or not, these increases in interest rates put enormous pressure on fiscal targets, which often triggers offsetting contractionary forces on the primary surplus. Panels a and c in figure 4.11 plot the large impact of interest rate spikes on the budget. Furthermore, these flows probably underestimate the present value consequences of a period of high rates, as not all debt is contracted at variable rates. Panels b and d plot the contribution of changes in the price of oil to revenues. The absence of a stabilization fund makes these shocks equally harmful.

Crowding out by the government has not been a major problem in the post-reform period, although it was very extreme in the financial repression period preceding it. In the current episode, nonetheless, the government has turned inward for its financial needs as foreign markets have closed (see panels c in figure 4.9 and figure 4.10). Large firms are probably doing the same, facilitating a domestic flight to quality. Such a mechanism can have devastating consequences for the small and medium firms, which seldom have direct access to external financing. Although this mechanism is probably not yet at the center of Mexico's post-reform volatility, it may come to that, as the segmentation of sectors and firms accelerates with the never-ending credit crunch and the government chooses to tap the relatively friendlier domestic markets at times of distress. See chapter 3 for a more extensive discussion of this issue with regard to Argentina.

In sum, during the post-reform period the fragility of the government accounts 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

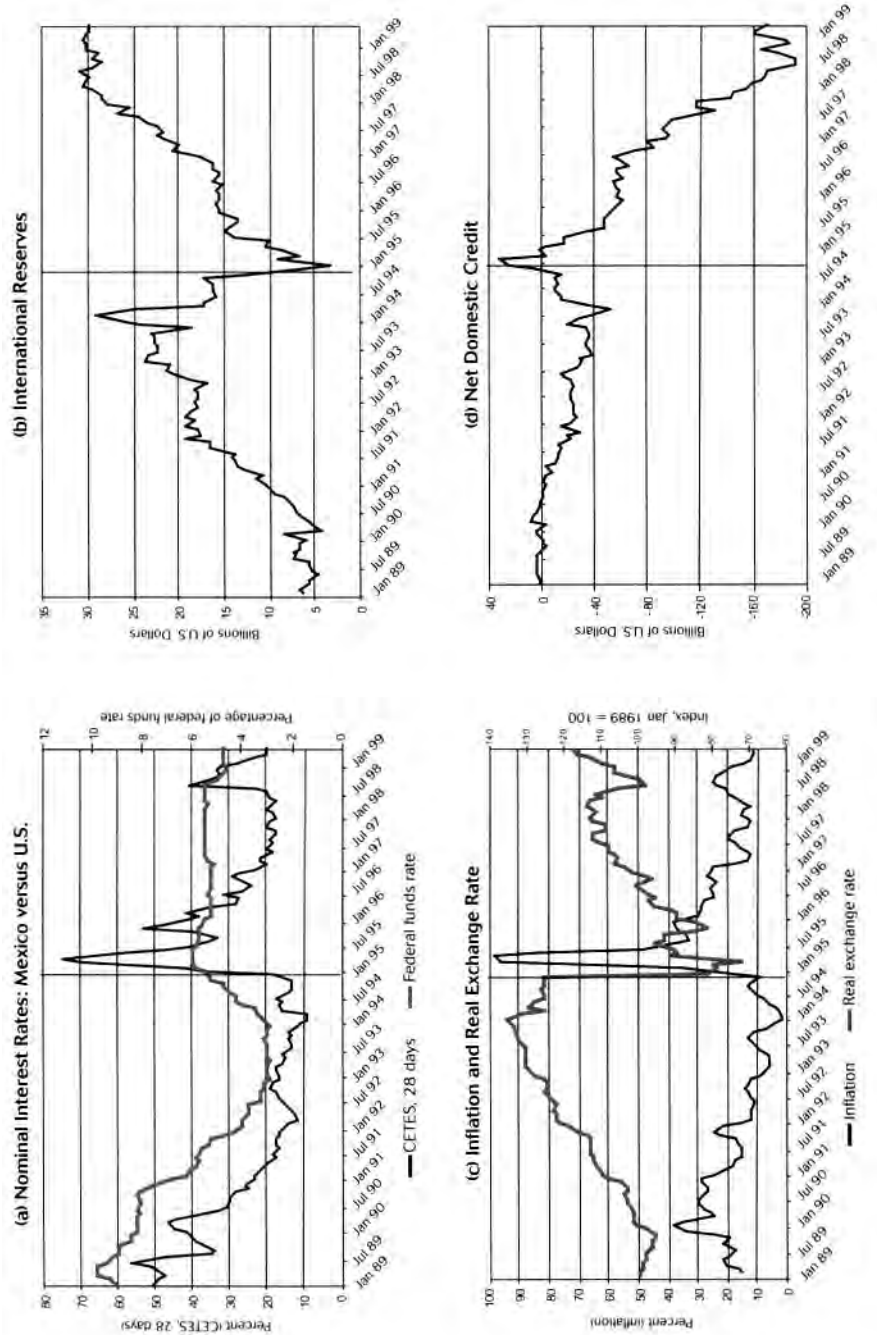
²² It is not at all clear whether a hands-off policy would bring about more economy-wide stability.

Figure 4.11. Public Debt Financial Cost and Oil Revenues



Note: Data at end of period. Preliminary data for 1998 and predicted data for 1999.
Source: Ministry of Finance, Instituto Nacional de Estadística, Geografía e Informática, and Banco de México.

Figure 4.12. Monetary Policy



Source: Instituto Nacional de Estadística, Geografía e Informática and Banco de México.

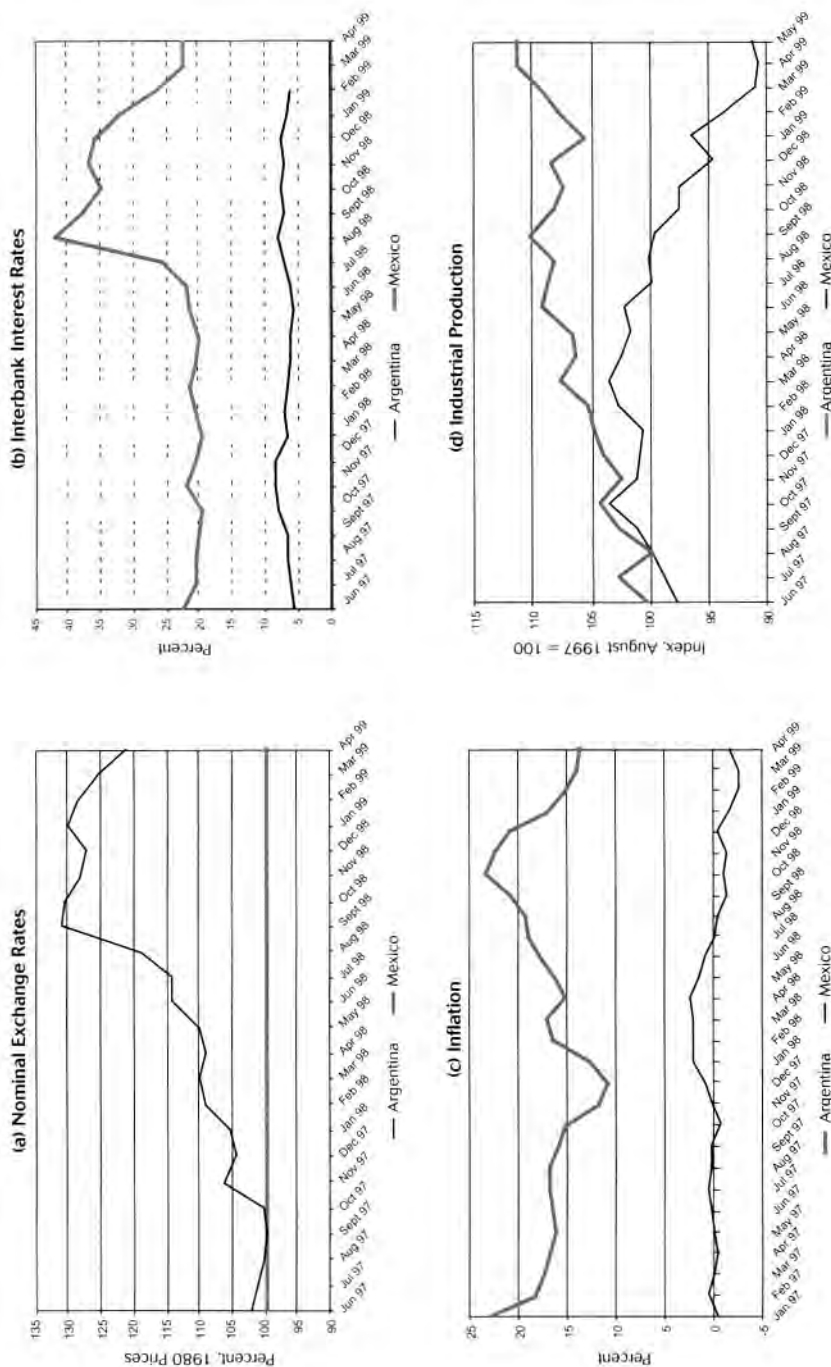
interest rates probably derives from this mechanism, especially once filtered through the closely related problem of monetary policy credibility, an issue discussed next.

The credibility and monetary policy problems. The conduct of monetary policy is extremely difficult in emerging economies. Not only is it subject to many political pressures and constrained by the fragility of the 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 inflows of capital. Foreign reserves accumulated rapidly, and the real exchange rate appreciated steadily. This pattern is most apparent in the tightening that occurred in 1993 (see figure 4.12). By 1994 the opposite, and much harder, fight took place. As the international perception of the health of the Mexican economy began to change, and the United States tightened credit, the Bank of Mexico, worried about the health of its banks, chose to keep interest rates low (panel a in figure 4.12). The result was a massive loss of reserves (panel b) and confidence, matched by further expansion in domestic credit to support the banks (panel d) and the eventual collapse of the exchange rate system at the end of the year (panel c). Bank balance sheets, for which it had all been done, collapsed, leveraging the recession and depositing on the government a large amount of future commitments.

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 4.13 compares the experience of Mexico with that of 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 country suffered much more dearly on the real side (panel d).

Although the float and good health of the U.S. economy seem to have served Mexico well during this round of international crises, lack of monetary credibility took a toll on both interest rates and inflation. Figure 4.14 compares the experience of Mexico with that of Australia and Canada, more advanced economies with flexible exchange rate systems. Although all these countries experienced large and comparable nominal depreciations during this period, Mexico had much less to show for it, 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 as a very high pass-through. The problem results from the lack of a credible monetary anchor that drives both the exchange rate and domestic inflation up at the first sign of trouble. Thus Mexico gets the real exchange rate depreciation it needs, but it also gets a rise in expected inflation.

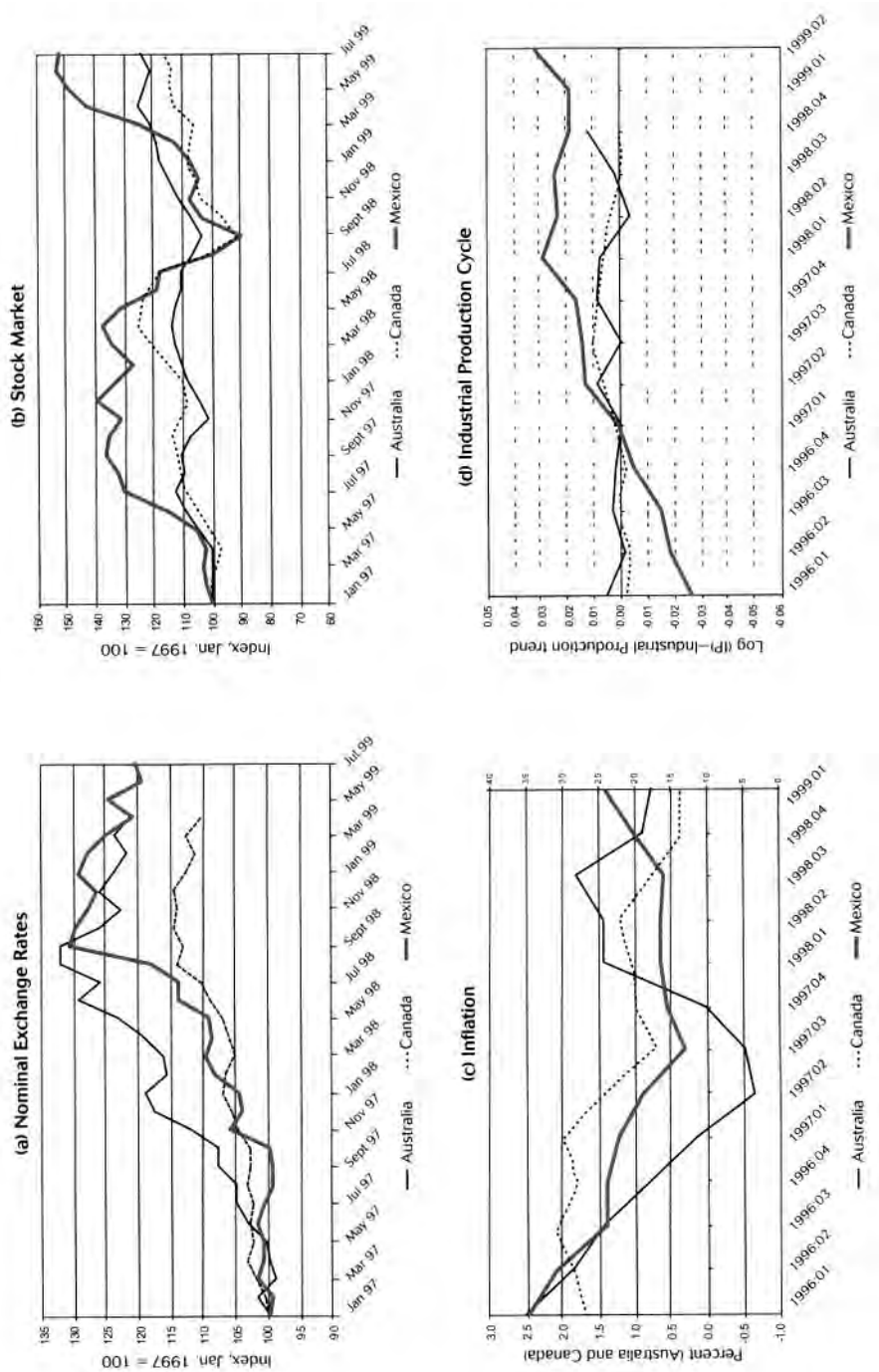
Figure 4.13. Relative Performance of Argentina and Mexico



Note: Panel a: Argentina has a fixed exchange rate, represented by the flat line. Panel c: inflation is seasonally adjusted three-month moving average, with annualized monthly variations. Panel d: industrial production is seasonally adjusted.

Source: IMF, International Financial Statistics (various years).

Figure 4.1.4. Relative Performance of Australia, Canada, and Mexico



Note: Panel b: Share prices for Australia, All Ordinaries (AORD); for Canada, TSE 300 Index (TSE); and for Mexico, MXSE IPC (MXX). Source: IMF, International Financial Statistics (various years) and Commodity Systems, Inc.

Mexico's monetary policy cannot depart too much from what the United States and the world conditions dictate without incurring serious risks. It seems that the flexible exchange rate system helped Mexico to follow this dictum in a smoother way, but it also made expected inflation and interest rates very volatile.

Taking Stock

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

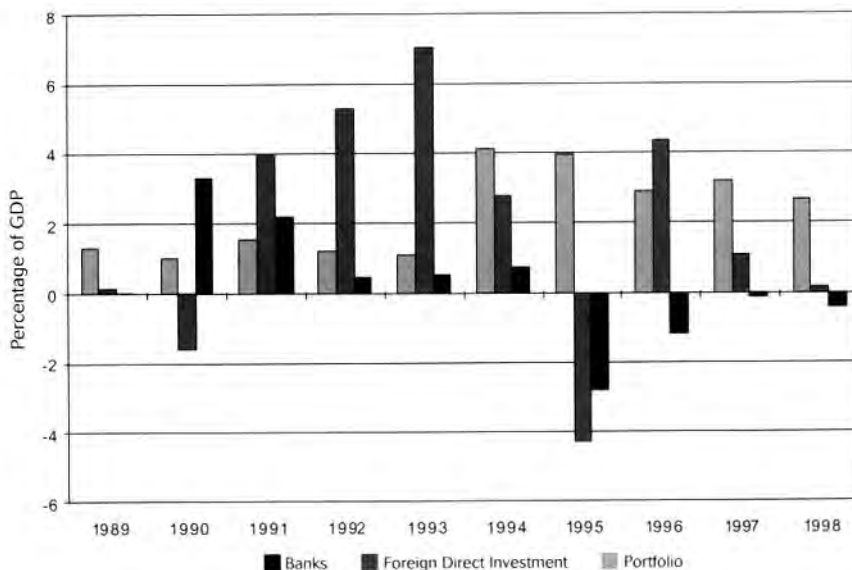
Reflecting these elements, the general policy recommendations highlighted in the introduction are grouped into four categories as well: (a) improve external financial links and their use during crises and reduce direct exposure to external shocks; (b) accelerate the development of domestic financial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

At a general level the connection between recommendations and diagnosis is apparent, but specific aspects are worth developing further.

Improving the 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 pamphlets dealing with international financial architecture. These recommendations were described in detail in the policy section for Argentina in chapter 3. Aside from the policies aimed at solving other problems highlighted in this report but that offer significant synergies with respect to international financial links, Mexico could consider the following recommendations:

- 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.
- Build self-insurance 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

Figure 4.15. Capital Inflows

Source: IMF, International Financial Statistics (various years).

and charging the private sector for their opportunity cost). To build external insurance, continue expanding the range of contracted credit lines. To reduce the associated costs, these contracts should be made contingent on clearly verifiable and exogenous events (such as oil prices and U.S. shocks).

- Along similar lines, the credit line against political cycles is an excellent idea. However, to prevent abuses and the limited availability that the anticipation of these would generate, the contract should be made contingent on the pre-election period, making it more expensive as the public deficit and other traditional indicators of misconduct in a political cycle deteriorate.
- Finally, it is apparent in figure 4.15 that most of the volatility in capital flows comes from speculative flows (in contrast, foreign direct investment is very stable). Part of this volatility is due not to healthy speculation but to problems with the balance sheets of foreign investors during crises. It may be prudent to require liquidity ratios (which 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, every effort must be made to avoid costly net taxation of capital flows.

Although their implementability and possibilities are less clear, two additional considerations and remarks relate to the strengthening of links with international financial markets:

- The possibility of forming a Latin American market with homogeneous financial instruments should be considered. The additional liquidity that a larger market would bring is a significant enhancement from the point of view of large foreign investors. Such a system must come with mechanisms designed to prevent free-riding problems.
- 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.²³ However, such policies may further reduce the liquidity of Mexican asset markets. Measures of this type probably should only be considered in conjunction with measures aimed at fostering the development of these markets. If such measures are not possible, it may be better to stay away from these obstacles to financial integration.

Fostering Domestic Financial Markets and Credit Flows

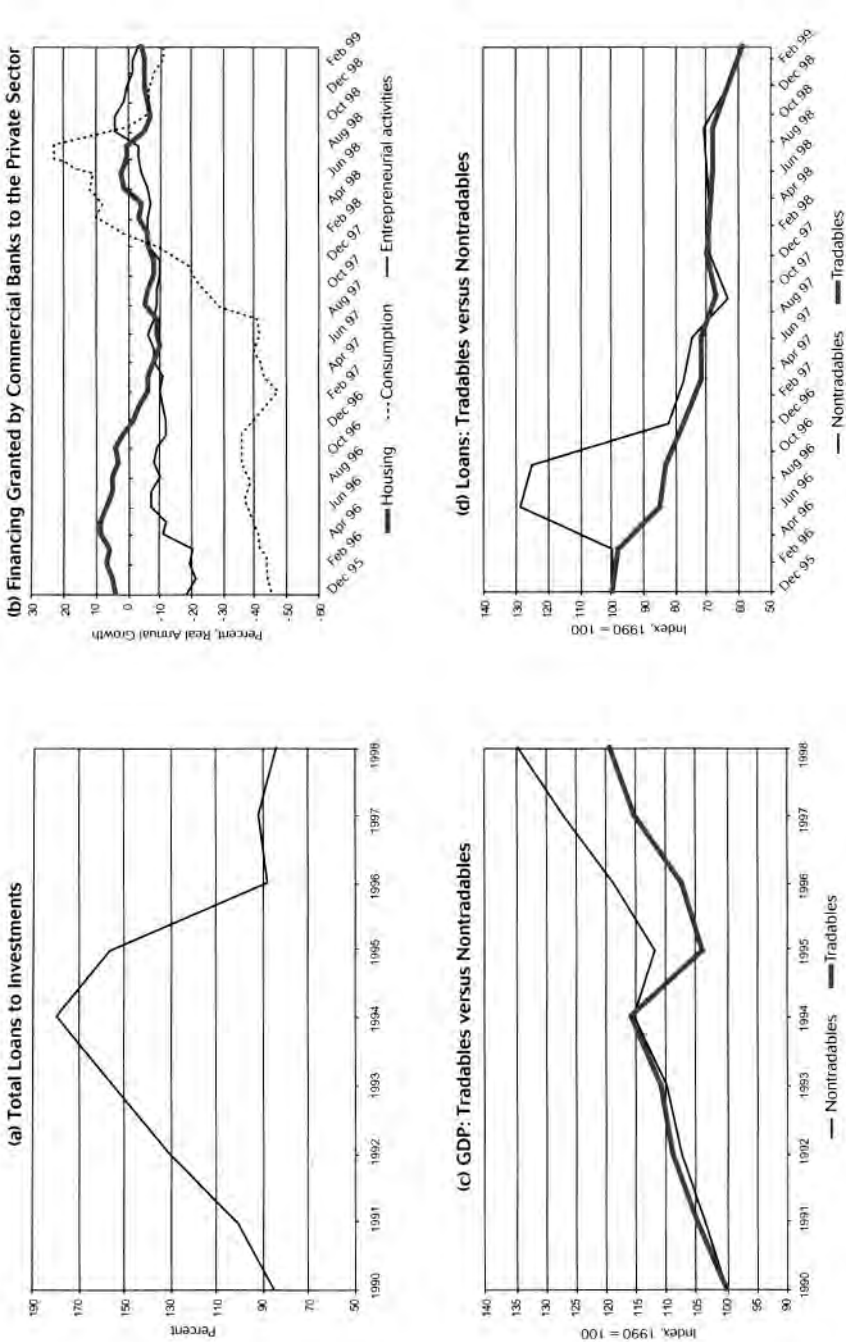
At a general level, the institutional and contractual reforms, as well as the stabilization measures described, should have a direct impact on the development of domestic financial markets. In addition to these, a few considerations are particularly concerned with domestic markets and banks.

First, Mexico needs banks urgently. Figure 4.16 reinforces the conclusions in the previous section by portraying the deep and widespread credit crunch that followed the 1994-95 crisis. Recapitalizing the most viable domestic banks swiftly and importing the rest from countries with good supervision should be given high priority on the short-term agenda.

Second, in the medium term, one can be more subtle about tradeoffs. Although 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. The solution to this potential problem lies not in

²³ See Caballero and Krishnamurthy (2000a) for a formal argument justifying this recommendation. Weak international financial links alone are not enough to justify such intervention. It is the domestic markets problem that leads to undervaluation of international collateral provision.

Figure 4.16. Credit Crunch



Note: Panels a, c, and d: Tradables include agriculture, mining, manufacturing, transportation, and financial services; nontradables include construction, utilities, commerce, and social services.
Source: IMF, International Financial Statistics, (various years) Instituto Nacional de Estadística, Geografía e Informática, and Banco de México.

limiting the participation of foreign banks, but in ensuring that structurally important financial lines remain open when necessary.²⁴

Third, and most important, domestic collateral, such as real estate, is often inadequate for crises, particularly those triggered by the sudden scarcity of capital inflows. The same holds true for loans to some nontradable sectors. This suggests the need to impose additional capital-adequacy requirements with respect to assets exposed to systemic risk and the need to foster the use of collateral that is more adequate to foreign investors.²⁵ Such measures would significantly 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.

Fourth, in order to compute these macro capital-adequacy ratios it is imperative to monitor the off-balance-sheet activities of banks, because a significant fraction of the macro risk taken during the 1994-95 crisis apparently took place through this channel.²⁶

Fifth, 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, 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 the participation in those markets until the rest of the financial system develops.

Sixth, after the tequila crisis, Mexico was able to finance substantial amounts of private investment and activity, despite a severe credit crunch (figure 4.16). Although retained earnings probably contributed, a wide array of informal lending channels was developed. It would be prudent to consider the possibility of institutionalizing them.

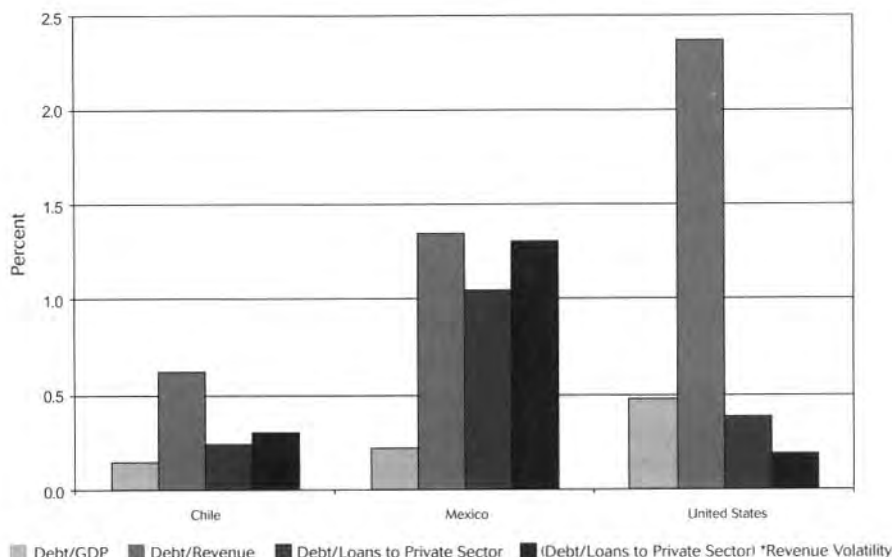
Seventh, as the case of Chile has shown, pension funds have great potential for developing domestic financial markets. This should be one of the criteria considered when determining the constraints and possibilities of Mexico's *Nuevo Sistema de Pensiones*.

Eighth, more generally, fostering and nurturing the development of well-supervised institutional investors are efficient mechanisms for delegating the enforcement of standards of good corporate governance to the private sector, as these institutions often ponder such factors in their investment decisions.

²⁴ In Chile, for example, Citicorp has 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 is that it probably did so because it faced fierce competition in the prime market from other foreign banks.

²⁵ For example, shares or claims on export-oriented companies, which may in turn hedge their own risks with claims from nontradables. Of course, these transactions may be done within the banking system, but the point is that the macro capital-adequacy ratio must take these into account.

²⁶ See Garber (1998).

Figure 4.17. 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: IMF, International Financial Statistics (various years) and Banco de México.

Strengthening Fiscal Resilience

Mexico's fiscal fragility is particularly clear once one looks for metrics for its public debt other than GDP. Figure 4.17 compares the situation of Mexico to that of Chile and the United States, 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 United States. The real difference, however, arises when that debt is compared to the size of domestic financial markets, here indexed by claims on the nonfinancial 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.²⁷

²⁷ And this is an underestimate since expenditures (including those below the line) are much more volatile in Mexico as a result of the recurrent bailouts.

In addition to measures to deepen domestic financial markets, the other required ingredient is to reduce the volatility of public revenues and expenditures. With this purpose, Mexico could consider (a) implementing an oil-stabilization fund and (b) reducing the implicit bailout strategy by institutionalizing an explicit insurance system with clearly established and appropriate fees and contributions.

Limiting High- and Low-Frequency Fluctuations in the Nominal Exchange Rate

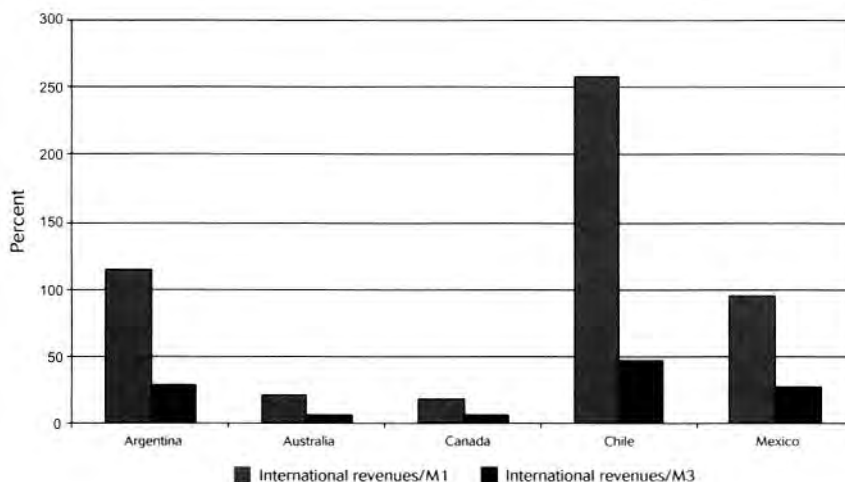
After the 1994-95 crisis Mexico opted for floating its exchange rate. Although the experience was largely successful, when combined with its fiscal fragility, it left Mexico with volatile interest rates, inflation, and nominal exchange rates. Partly as a result of the latter, Mexico had to develop futures markets for its exchange, which brought additional volatility problems. Several recommendations should be considered for dealing with these issues.

First, sudden jumps in the exchange rate are harmful to the domestic economy and to the economies 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 in the exchange rate system seems sound. This could be done with a simple partial adjustment model, where the driving force is largely predetermined (for example, the current account deficit or U.S. credit conditions) and the anchor is the unit parity to a strong currency. For the long-run anchor to work, the driving forces selected have to 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 long-term credibility and stability of an otherwise weak currency.²⁸ Figure 4.18 highlights the importance of credibility for interest rate volatility. It shows that the large volatility in rates observed for Mexico relative to Argentina (figure 4.13) cannot be traced to the ratio of reserves holdings to monetary aggregates (often thought of as the foundation of Argentina's solid currency board system).²⁹ Instead the difference is in the degree of commitment made by each country to a nominal anchor: it is the words (commitment) not the war chest!³⁰ This mes-

²⁸ See Hausmann and others (1999) for a discussion of some of the costs of such weaknesses for financial development. In principle, it is 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.

²⁹ Moreover, Argentina's reserves include about 7 percent of Argentine public instruments denominated in dollars (which are not international reserves in the conventional sense).

³⁰ This is not meant to claim that the rigid currency board system of Argentina is preferable to the flexible system of Mexico, but the figure certainly highlights the value of a solid nominal anchor.

Figure 4.18. International Revenues to Monetary Aggregates, 1998

Note: M1 and M3 correspond to money and money plus quasi-money in International Financial Statistics, respectively.

Source: IMF, International Financial Statistics (various years).

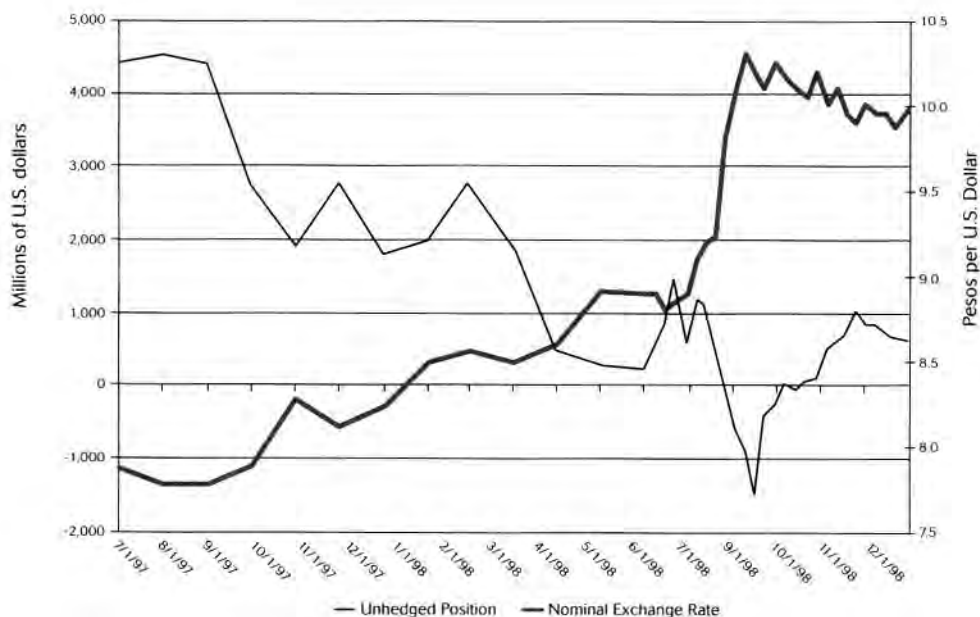
sage is even more apparent when one looks at this ratio for Australia and Canada, for example.³¹ Over time—and quite rapidly if both domestic and external conditions permit it—moving toward a flexible exchange rate system with an active reserve management policy and a nontradables inflation targeting system may be enough to stabilize the exchange rate at both ends of the spectrum.

Second, of course, it is not only the commitments that matter, but also the shocks. It is important to create explicit stabilization funds and other mechanisms that reduce the fiscal impact of private sector imbalances.

Finally, stabilizing the exchange rate facilitates the implementation of other policies as well. In particular, it reduces the costs associated with taxing and limiting the use of future peso markets. The latter is needed 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.³² This can be seen clearly in figure 4.19, which shows the strong negative contemporaneous correlation, particularly

³¹ 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 chapter 5.

³² See Banco de México (1999).

Figure 4.19. Exchange Rate and Foreign-Held, Fixed-Income Unhedged Securities

Note: Including government securities and bank notes. From July 1998 data are weekly.

Source: Banco de México, The Mexican Economy 1999 (1999: Chart 46, p. 95).

during times of emerging-market crises, between the spot exchange rate and the net position of foreigners in future markets.³³

The overall outlook for Mexico seems promising from the point of view of the issues addressed in this chapter. Many of the relevant reforms are either taking place or are under discussion, and the rest seem well within the reach of a country on the right track of its second-stage reforms. This does not mean that complacency would not be costly. Quite the opposite. Mexico still exhibits enough weaknesses to consider itself extremely fortunate that the United States was experiencing one of its very best moments in the post-war period when the recent emerging-market crisis hit the world.

³³ Thus Banco de México (1999) argues that the sharp depreciation in the exchange rate during the Russian crisis was influenced by international investors' concern with a possible devaluation in Brazil. The peso-dollar future contracts provided a good hedge against that risk.

Appendix: Trends and Chronology

Trends

1988-92: Public sector borrowing requirement falls from 12.5 percent of GDP to a surplus of 0.5 percent of GDP.

1988-94: Inflation falls from 52 to 7 percent.

1989-94: Mexico has a fixed exchange rate, trade liberalization, and a deteriorating trade and current account (the current account moves from a \$405 million surplus in 1989 to an \$18.5 billion deficit in 1994).

1995-present: Mexico has a floating peso. A large real depreciation occurs in 1995, but is partly undone after that. A \$7.1 billion trade surplus turns into a deficit by mid-1997.

Throughout the period: Mexico pursues trade liberalization, deregulation, and privatization and signs free trade pacts such as NAFTA. Foreign investment rules become more attractive. The financial sector is liberalized (including liberalization of interest rates and credit terms, elimination of obligatory lending to the public sector, privatization of government-controlled banks, and establishment of new domestic banks and subsidiaries of banks operating in the United States and Canada). Manufactures exports increase significantly (*maquiladora*; metal products, machinery, and equipment; automotive). Exports increase from \$40.7 billion in 1990 to \$110 billion in 1997 (including *maquiladoras*). The share of manufactures in exports increases from 68 to 86 percent and that of crude oil and minerals decreases from 25 to 11 percent. The United States takes 85 percent of exports and provides 75 percent of imports. Public indebtedness increases substantially. The ratio of public debt to GDP at the end of 1998 is 30 percent, but the former *Fondo Bancario de Protección al Ahorro* (FOBAPROA), a deposit-guarantee fund, has extra liabilities equal to 17 percent of GDP.

Chronology

Late 1970s: Large oil fields are discovered, and Mexico enjoys unprecedented economic growth.

1976-82: Growth is magnified by a massive inflow of foreign loans during the presidency of

José López Portillo. The country pursues an expansionary fiscal policy (during 1982, the public sector deficit amounts to 18 percent of GDP, and public expenditure amounts to 47 percent of GDP, up from 30 percent five years earlier). Repeated attempts are made to defend an increasingly overvalued peso.

1982: A debt crisis brings an abrupt end to growth. The commercial banking system is nationalized, and dual exchange rates are introduced: controlled (official) and free (crawling peg).

1982-88: During the presidency of Miguel de la Madrid, Mexico has no reserves, no international financing, and a large debt. Exports rise, and imports fall, at the expense of consumption and investment. The economy grows at an average of 0.1 percent during 1983-88, and inflation is high. 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: Mexico City suffers a devastating earthquake. In August, the free exchange rate (crawling peg) is replaced by a controlled float.

1986: Mexico joins the General Agreement on Tariffs and Trade. Oil prices fall sharply. The current account turns into a deficit for the first time since the debt crisis. The capital account records its first surplus (due to a debt-for-equity swap and high interest rates). Mexico begins to negotiate with commercial banks to renegotiate the debt.

1987: With the recovery in oil prices, the current account goes back into surplus. The disbursement of a new commercial bank loan and capital repatriations also help to improve the reserve position. In December, Mexico is forced to devalue the free rate (which is a controlled float exchange rate). The *Pacto de Solidaridad Económica* (an anti-inflationary program) is introduced. Prices and wages are frozen, import tariffs are cut, and inflation declines from 159 percent in 1987 to 52 percent in 1988.

1988: Carlos Salinas de Gortari is elected president (at the end of the year). A public sector deficit of almost 11 percent of GDP in 1988 is turned into a surplus of less than 2 percent by 1992. The process of bank reforms is initiated, allowing banks to compete with other financial entities (free interest rates, effective reserve requirements down to 30 percent from 90 percent). Private sector borrowing recovers in 1989 and 1990. In February, the peso is devalued again. The peso is fixed for the rest of the year in support of the anti-inflationary drive.

1989: After years of post-debt-crisis stagnation, the economy starts moving again (in 1989-91, GDP growth averages 4.5 percent, and inflation and interest rates decline sharply). New legislation allows foreigners to purchase stocks, although they have no 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 less than 6 percent of GDP. In January, the *Pacto de Solidaridad Económica* is replaced by the *Pacto para la Estabilidad y el Crecimiento Económico* (a stability and growth program). Daily devaluation of the peso is allowed, as are periodic adjustments in prices and the minimum wage. The public sector deficit is reduced. Inflation declines to 20 percent from 52 percent the previous year.

1990: Foreigners are allowed to purchase Mexican Treasury bills. The Brady Plan is implemented. Inflation surges to almost 27 percent due to the relaxation of credit conditions, the removal of subsidies, and the realignment of public sector prices.

1991-92: The 18 banks in which the government has a majority shareholding (those nationalized in 1982) are returned to the private sector. Privatized banks have poor-quality assets.

1991: 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. In November, exchange controls are abolished. The two exchange rates—free and controlled—are unified.

1992: GDP growth slows down to less than 4 percent, and exports growth slows to 5 percent, but imports and investments soar 20 and 15 percent, respectively.

1993: Mexico is admitted as a full member of the Asia-Pacific Economic Cooperation grouping. Government allows the establishment of new domestic banks. Amid doubts about NAFTA, investment declines 3 percent. Interest rates rise. Banks start restricting lending. As the United States pulls out of recession, exports start increasing faster. GDP growth slows to 2 percent. Fiscal policy is restrictive as well.

1994: Mexico becomes a member of the OECD and signs free trade agreements with Bolivia, Colombia, Costa Rica, and Venezuela. The government allows the establishment of foreign banks (with operations in the United States or Canada). The percentage of bad loans is high even during the boom, reaching 8 percent by the end of 1994. The 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 about the current account deficit erode foreign investor confidence. In the first half of the year, government spending increases significantly. Exports grow 17 percent. Employment and wages recover. In January, Mexico joins NAFTA. A political uprising occurs in Chiapas. In March, presidential candidate Luis Colosio is assassinated. In April, Banco de México becomes independent, although the finance ministry retains control over exchange rate policy. In August, Ernesto Zedillo is elected president. In September, Secretary General of the *Partido Revolucionario Institucional* (PRI) Francisco Ruiz Massieu is assassinated. In December, Zedillo takes office. The peso is devalued.

1995: The peso continues to plunge, as investors fear the government will not have enough resources to pay \$29 billion of *tesobonos* due in 1995. The capital account surplus increases marginally from 1994 (to \$15.4 billion), but a reduction in the current account deficit allows the rebuilding of reserves. The banking system is hit by devaluation and high interest rates. Bad loans reach 17 percent by September. The economy goes into a huge recession, with GDP falling 6 percent. A nonfinancial public sector surplus of 0.7 percent is achieved. Several programs are created to deal with bad loans. To help borrowers, loans are converted into *unidades de inversión*, linked to the consumer price index; programs are targeted to mortgage, consumer, small business, and agricultural loans; a program is instituted in 1997 to support state and local governments. To help banks, the *Programa de Capitalización Temporal* (Temporary Capitalization Program) is created to meet capital provisions; a fund is created to take over bad debts in exchange for the injection of new capital by shareholders; the government takes control of some institutions. The cost of the bailout, estimated at \$60 billion, or 17 percent of 1997 GDP, will be written down over a 30-year period. The peso is floated, and there is a large drop in private investment and in public investment and spending. In January, the government agrees with labor and the business community on an emergency economic plan, which consists of a tighter fiscal and monetary stance and wage restraint. An international salvage plan is conceived (United States, \$20 billion; Bank for International Settlements, \$10 billion; International Monetary Fund, \$17.8 billion). In March, the government is forced to boost the adjustment effort. The value added tax is raised from 10 to 15 percent. There are an increase in public prices, a cut in public spending, and containment of wage increases. In October, Mexico signs the *Alianza para la Recuperación Económica* (Alliance for Economic Recovery). For the first time, it does not have the anchor of the crawling-peg exchange rate. Although free float was considered a transitional phase (while confidence was restored and reserves accumulated), it remains in place. During 1996 and 1997, the peso remains fairly stable.

1996: The capital account surplus is down to \$4.1 billion. The accumulation of reserves stalls. Fiscal and monetary austerity is imposed. Inflation is cut from 52 percent at the end of 1995 to 28 percent a year later. The nonfinancial public sector deficit is kept at 0.1 percent of GDP. Spending is cut due to the cost of supporting the banking system and defaults on tax payments. Exports start pulling the economy out of recession, with GDP growth at 2 percent. Private consumption and spending do not pick up, mainly due to the credit crunch (and low real wages and unemployment). Electoral reform is enacted in July.

1997: The capital account surplus is back up to \$15.4 billion. The current account deficit also grows, but by less. International reserves increase from \$6.3 billion to \$19.8 billion (much more than expected). Mexico receives large inflows of foreign direct investment. Economic recovery is broadened and strengthened, helped, in large part, by the strength of the U.S. economy. Private consumption also picks up. In February, the exchange rate stabilization mechanism is established: when the peso depreciates more than 2 percent against the dollar in a single day, a maximum of \$200 million is auctioned at a price at least 2 percent higher than the one prevailing the previous day. National elections are held in July. The PRI loses control of the house of representatives for the first time in 70 years and also loses important governorships, including Mexico City. A new capitalization pension system starts operating in an effort to increase the saving rate. From October to November, after stabilization of the exchange rate, the Asian crisis brings about a devaluation of almost 10 percent.

1998: Oil prices start collapsing in December 1997. Pemex accounts for 37 percent (1997) of federal government revenue. Three budget cuts, in January, March, and July, total 1 percent of GDP. Central government and state-owned enterprises post a deficit of 1.24 percent of GDP (coinciding with the target), even though the price of oil falls and the economy slows down. The economy starts slowing down, but a strong U.S. economy keeps it growing much faster than those of the rest of Latin America. Private sector investment increases 17 percent, while public investment falls 20 percent. Private consumption grows 6.4 percent, while government consumption shrinks 1 percent. The capital account surplus of \$16.2 billion is the highest since 1993. In March, monetary policy moves from neutral to restrictive.

1999: The GDP growth rate is expected to slow to 2.5 percent. In January, in the aftermath of the Brazilian devaluation, the exchange rate stabilization mechanism is used twice, and monetary policy is tightened. The *maquiladora* sector increases 10 percent with respect to January 1998, while other manufacturing industries increase 0.3 percent. Unemployment is stable. In February, limited fiscal restraint measures are announced (with savings of around \$200

million). Remaining restrictions are removed on foreign ownership of Mexican banks. The partial employment rate (people working fewer than thirty-five hours a week, as published by INEGI, the *Instituto Nacional de Estadística, Geografía e Informática*, Mexico's statistical bureaus), declines from 23 percent in February 1998 to 21 percent in February 1999. The trade deficit is narrowing, due to the weak peso and slowing economy. Exports of manufactures in February are 10 percent above the previous year. Mexico keeps access to international capital markets, paying reasonable yields. In March, the peso recuperates from its fall in January, even as interest rates decline. In April, a bill on credit guarantees is sent to congress, giving greater scope for seizing assets. It is not expected to be approved for a few months. A deal reached with oil-producing countries substantially increases the price of oil.

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CHILE

In many respects, Chile is a prototype for Latin America's next economic stage. An early reformer, Chile has left behind the most traditional macroeconomic maladies of the emerging world. It has made significant progress in its regulatory and supervisory framework and, at times, has been a leader beyond the Latin American boundaries in allowing private sector co-participation in a wide array of ex-public sector activities. Its good lessons for the region are plentiful, many of which are scattered throughout the other country-specific chapters and in the concluding chapter of this book. This chapter, however, is concerned with the structural sources of volatility that remain present in the Chilean economy.

The sudden and sharp crisis experienced by Chile in 1997–99, after a decade of stellar performance, has brought great anxiety not only to Chileans but also to regional policymakers used to seeing in Chile's stability the eventual reward of their own reformist efforts. But the truth is that the reward of successful reforms need not come in the form of a dramatic decline in economic fluctuations, at least in the short to medium run.¹ An advanced developing economy is still *fragile*, as Asia has demonstrated so vividly and as Chile is demonstrating today in a less dramatic, but still costly, fashion. The combination of the fast pace required by dynamic growth and restructuring, the unbalanced degree of development of different institutions and markets, and the still-limited range of precautionary options makes for a delicate and potentially volatile scenario.² One of the main goals of this chapter is to identify some of these imbalances and shortages.

¹ See Caballero and Krishnamurthy (2000a) and Aghion, Banerjee, and Piketty (1999) for models where the correlation between financial development and economic stability is not monotonic. However, welfare is monotonically increasing with respect to institutional and financial development.

² The rewards of successful reforms seem to come in the form of high average growth, a decline in the frequency of crises (although these can be deep), and an increase in the speed with which the economy recovers from such crises. For example, the recent serious decline in the provision of electricity in Chile, primarily due to a severe drought, symbolizes the lack of precautionary options. Shocks that compromise the single "pipeline"—be it electricity distribution, financial services, or a road—have deep impact. Precautionary options and the ability to handle complex scenarios are luxury goods, whose rewards come precisely in the form of tamed volatility.

The other main goal is to propose remedies to these problems. Unfortunately, even if these problems are identified correctly, fixing them is not an easy task in an advanced developing economy. Although the institutional underdevelopment in certain areas typically leads to distortions that justify second-best policies, the distance from efficiency is short enough that it may be worthwhile to avoid such policies if they are to retard the institutional developments required to achieve the first-best solution.³ This chapter tries to take this constraint into consideration.

Although ahead of the Latin American pack, Chile still suffers from (a) *weak international financial links and excess sensitivity to external conditions*. Closing this gap ought to have top priority. But this is not the only structural problem behind Chile's vulnerability. At least three domestic factors also leverage external shocks: (b) *a Central Bank mandate that, while reasonable on average, is ill-designed to deal with terms-of-trade shocks and their impact on external financial conditions*; (c) *a propensity to waste scarce liquidity in the banking system*; and (d) *limited development of financial markets, particularly for medium- and small-size firms*.⁴

In a nutshell, and in conjunction with the deficiencies highlighted above, this chapter contains policy recommendations on four general items.

The first item is to *improve external financial links and reduce direct exposure to external shocks*. In addition to dealing with the domestic problems mentioned in this chapter, which are in themselves conducive to fragile international financial links, there are at least seven slightly more specific recommendations and considerations.

- Continue the adoption of international standards on contractual enforcement, disclosure, corporate governance, and financial supervision. Chile has made substantial progress on most of these aspects, but structural problems make it very hard to improve much on corporate governance (especially on concentration of ownership) without further integration with international financial markets. The (two-way) synergies between corporate governance and integration are substantial.
- Contract international insurance and credit lines on terms-of-trade shocks, although this requires countries exposed to these risks and potential insurers to create the appropriate markets.⁵

³ This is less of a dilemma for less-advanced economies, since avoiding these second-best policies leaves the economy too exposed, for far too long, to justify such actions on the grounds of their potential long-run contribution to institutional development.

⁴ See Caballero and Krishnamurthy (2000a) for a model of the negative dynamic interactions between weak international financial links and underdeveloped domestic financial markets.

⁵ The similarities with "catastrophe risk" insurance are worth exploring.

- Foster the direct relationship between in-home foreign banks and small and medium firms.
- Facilitate the residence of firms recognized as international market makers. This may require liberalizing further the short-term capital account.
- Make taxes on short-term capital movements contingent (procyclical) on the terms of trade if the short-term capital account is not liberalized.
- Homogenize domestic and foreign corporate and public bonds and provide incentives to place unhedged U.F. (*unidad de fomento*)-denominated bonds abroad.⁶
- Further relax the rating constraints on companies placing American Depository Receipts (ADRs) and other instruments abroad, while seeking an alternative reward for the achievement of a high international credit rating.

The second item is to *mold terms-of-trade contingencies into anti-cyclical policies*. In particular,

- Design an automatic fiscal policy component that behaves procyclically with respect to terms of trade.⁷ This is yet another reason to contract the insurance and credit lines mentioned above.
- Have the Central Bank supplement its new, flexible exchange-rate system with an explicit (mostly nondiscretionary) and aggressive reserve management policy contingent on terms of trade. Exceptionally low terms of trade should automatically lead to substantial use of reserves by the Central Bank; otherwise there is no need to accumulate costly reserves.
- Make the mandate of the Central Bank contingent on the terms of trade. During times of depressed terms of trade, the current account should be net of the income effect of terms of trade, and the inflationary target should be made on nontradables inflation alone.⁸
- Have the Central Bank consider appointing an international supervisory board if credibility is perceived to be a serious problem, which it does not appear to be.

The third recommendation is to *improve liquidity aggregation through and within the banking sector during crises*. To this effect,

⁶ Unhedged means that no domestic counterpart is selling the hedge to foreigners, with the exception, perhaps, of export companies. As of 1998, Chilean companies are permitted to do so. The point here is to go beyond that and foster it.

⁷ It is important to think of this policy as one in a broader policy package that also involves the Central Bank and other institutions. It is better to decide these issues *ex ante* rather than in the middle of a crisis, when “prisoner’s dilemma” outcomes are highly likely. Chile suffered from some of this problem during the 1997-99 crisis.

⁸ The Central Bank’s mandate considers the current account at “normal” terms of trade, but it is not clear whether the Central Bank is willing to tolerate large transitory current account deficits even when the source behind them is a transitory decline in terms of trade. It is not clear either whether it could do so given external conditions. This is the reason to think of this as one measure within a broader package.

- Allow for contingent capital-adequacy and reserves ratios. These should be lowered, possibly with a lag to match the systemic rise in nonperforming loans, as terms of trade deteriorate.⁹ More specifically, loans to small and medium firms could be penalized less in the calculation of these ratios, while the opposite could apply to consumption loans.
- Improve the functioning of the interbank market and the banks' access to short-term resources. Opening the capital account for very short-term repo operations should help.

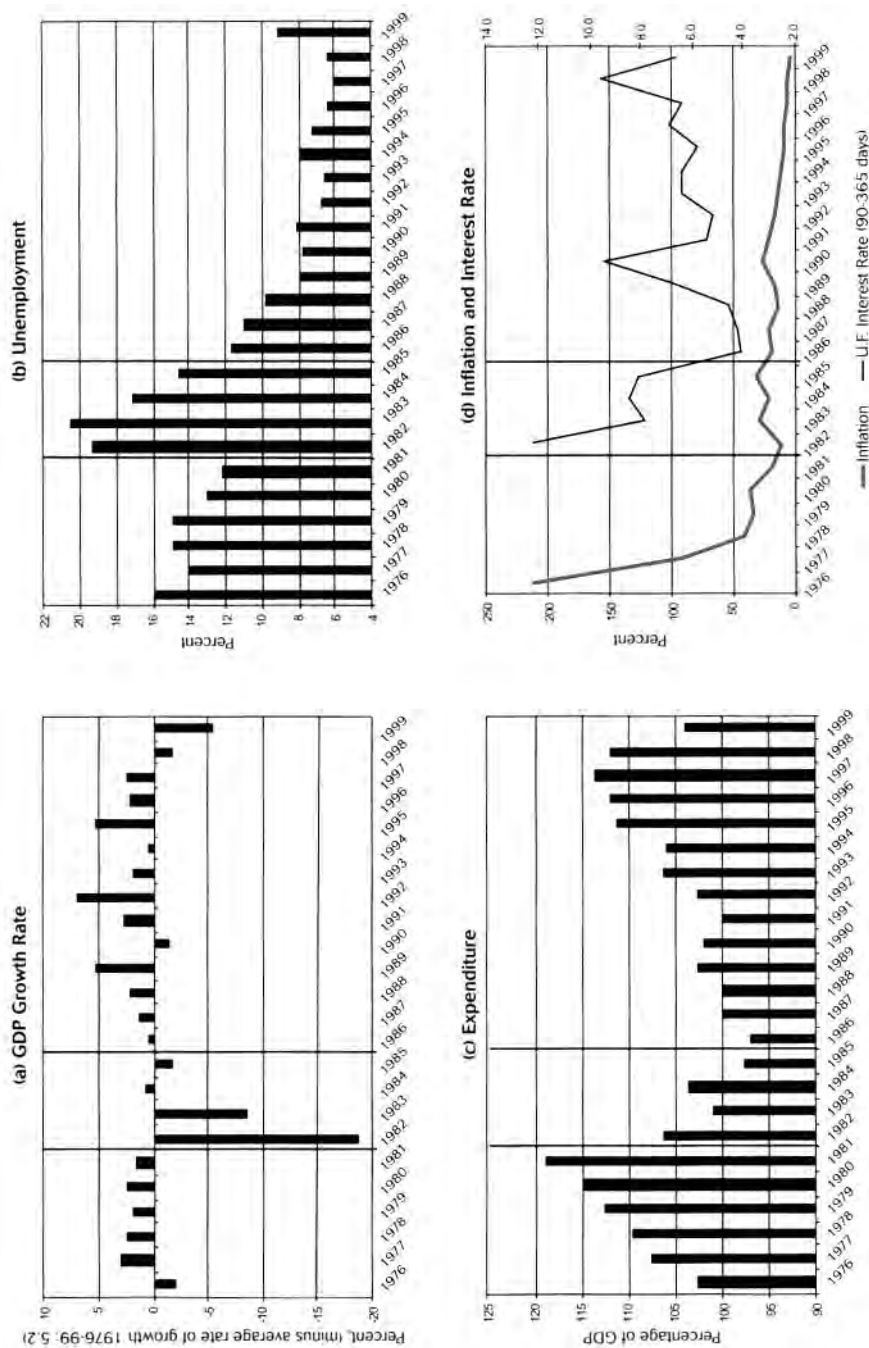
The final recommendation is to *improve the liquidity and immediacy of domestic financial instruments*. There are at least four measures that, in conjunction with many of the measures mentioned above, should help to achieve this goal:

- Foster the residence of international market makers. Since the Chilean market is small, it may be necessary to allow trades of good-quality instruments from other emerging markets in the Chilean stock and debt markets.
- Conversely, facilitate the placement of ADRs or their equivalent. In order to make these more liquid, it may be necessary to bundle several small- and medium-size companies on each issuance. If this is so, a mechanism is needed to limit free-riding problems among the bundled companies.
- Similarly, develop a domestic corporate debt market with homogeneous instruments.
- Allow the *Asociación de Fondos de Pensiones* (AFPs—Associations of Pension Funds) to invest in lower-rated domestic instruments, especially at times when foreign financial markets tighten.

The rest of this chapter supports these recommendations and diagnosis when possible given the available data, it highlights their conjectural nature in others, and in some cases it hints at the research needed to make these conjectures more precise.

⁹ Any additional risk of a run that could arise from such a strategy could be explicitly insured by, for example, the Central Bank. Moreover, during the 1997-99 crisis banks increased rather than decreased their capital-adequacy ratios. This seems to have been particularly pronounced in foreign banks. It is important to identify the structural factors accounting for such a difference and, if needed, to establish mechanisms to offset its systemic consequences.

Figure 5.1. Growth and Volatility



Note: Preliminary data for 1998; predicted data for 1999. Panel a: the average rate of growth was 2.1 percent for 1982-85 and 6.8 percent for 1976-81 and 1986-99.

Source: Instituto Nacional de Estadísticas and Banco Central de Chile.

The Facts and Mechanisms

Aggregate Volatility

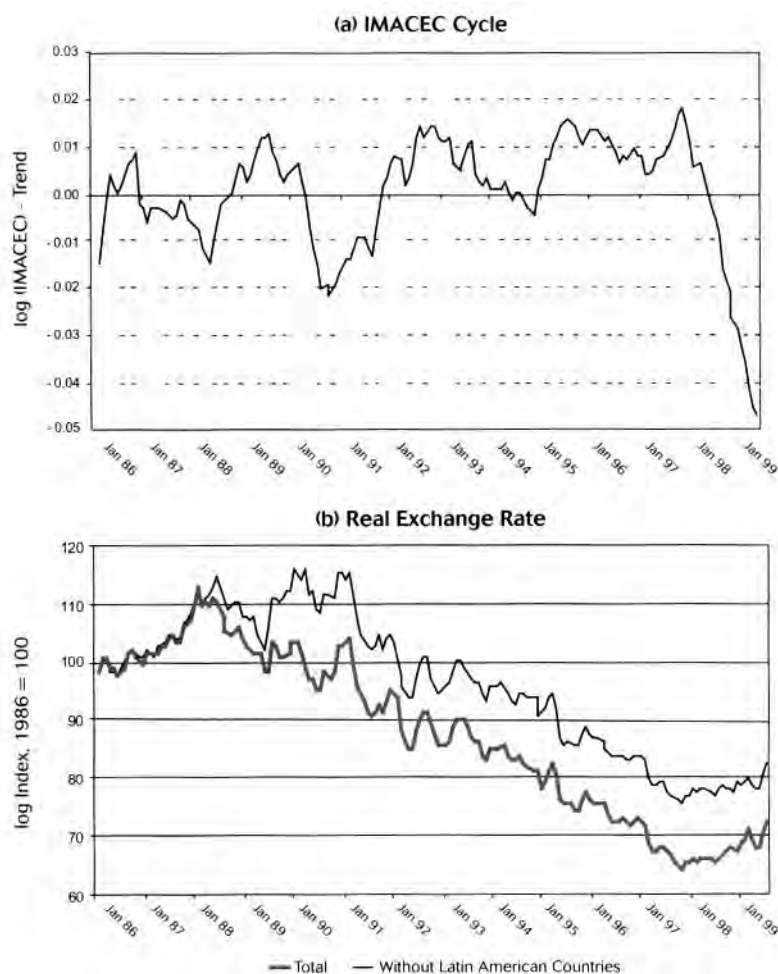
Figure 5.1 divides the last three decades of the twentieth century into three subperiods, delimited by vertical lines. The pre-debt crisis, the distress following that crisis, and the period following the new wave of reforms that began in 1986. The last coincided with a sustained recovery in copper prices and was bolstered further by implementation of the Brady Plan at the end of the decade and the ensuing return of capital flows to Latin America.

Panel a reports the growth rate of gross domestic product (GDP) in Chile over the three periods, in deviation from its average rate of growth for the whole period, 5.2 percent. The success of the post-1986 period, occasionally referred to as the “Chilean miracle,” is apparent. Not only were the pre-debt-crisis growth rates recovered and even exceeded at times, but unemployment fell steadily (panel b). By the 1990s, aggregate expenditure was in full recovery, outpacing GDP growth (panel c). Inflation, which was never fully tamed before the debt crisis and which had regained strength during the crisis, declined steadily throughout the post-1986 period, with the exception of the inflationary pressure resulting from the political cycle at the end of the military regime (panel d). Real volatility did not vanish, however, a phenomenon expressed most dramatically during the severe current crisis (see all panels) and in the occasional surges in real interest rates (panel d).

Figure 5.2 focuses on the post-1986 period, which is the main concern of this chapter. Panel a reports the detrended IMACEC, a comprehensive cyclical indicator for the Chilean economy.¹⁰ This series highlights three periods of interest: the growth recession of 1990 that followed the contractionary policies aimed at halting the inflationary rebirth inherited from the political cycle, the 1995 recession that did *not* happen while the region was being battered by the tequila crisis, and the sharp current recession.

These three episodes generate most of the information used in this chapter. Panel b depicts the path of the real exchange rate throughout this period (a decline represents an appreciation). After an initial phase of planned real depreciations, and faced with large capital inflows and expanding domestic expenditure, the original competitiveness-maintenance goal became difficult to sustain without paying large inflationary costs; hence a real appreciation ensued until the 1997-99 crisis, when it slowed down and eventually began turning around.

¹⁰ IMACEC is the Indicador Mensual de Actividad Económica, a Laspeyres index of monthly production including all sectors of activity, weighted according to the input-output matrix of 1986.

Figure 5.2. Post-1986 Period

Note: Panel a: log of seasonally adjusted series without trend (three-month moving average).

Source: Instituto Nacional de Estadísticas and Banco Central de Chile.

The next subsections describe and document the main structural factors behind the Chilean business cycle.

Weak International Financial Links and Excess Sensitivity to Terms-of-Trade Shocks

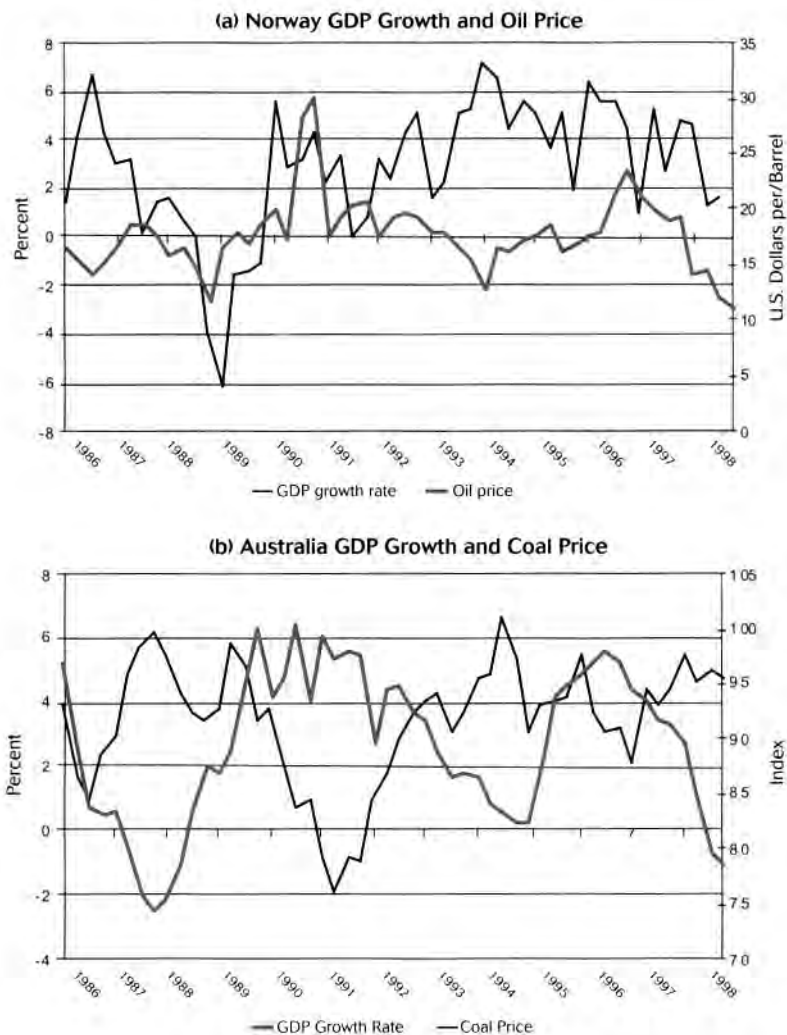
The relatively small size of the current account deficit of emerging economies is a perennial symptom of their limited access to international capital markets. In some cases, international financial constraints are binding most of the time, determining the current account directly. In others, as is often the case with Chile, although the international constraint is not binding, domestic policies are undertaken to prevent that from happening in an abrupt and uncontrolled fashion. Actual or latent, however, the first-order observable implication is similar: international borrowing is limited.

From the point of view of aggregate volatility, however, it is not only the level but also the fragility of this limited access that is important. Fragility arises primarily from changes in the attitudes of international financial markets toward emerging markets (justified or not) and from declines in the perceptions about economic conditions in the country itself. The decline in perceptions seems to dominate, although it interacts with the former. As documented in chapter 2, the Chilean business cycle has strong connections to the price of copper, it's the country's main export product, violating basic principles of smoothing through international financial markets.¹¹

Figure 5.3 offers a cross-sectional dimension to the excess-sensitivity problem. Panels a and b report the paths of GDP growth and the price of their primary export for Norway and Australia, respectively. These countries, although more advanced than Chile, also have their exports concentrated in a few commodities.¹² They do not experience nearly as much correlation between the price of their primary exports and their respective rates of growth as Chile does, further emphasizing the excessive nature of Chile's response to copper prices.

¹¹ During the late 1990s, copper exports accounted for about 40 percent of Chilean exports, or about 9 percent of GDP. Chile has a copper stabilization fund aimed primarily at stabilizing fiscal revenues. At the beginning of each year the Budget Office sets a "reference" price; withdrawals or deposits are made quarterly as a step function of the deviation between actual and reference prices. In practice, the largest yearly net deposit to the fund occurred in 1995 and amounted to 5 percent of fiscal revenues, when the price of copper exceeded by 22 percent its average in the 1985-99 period. The largest yearly net withdrawal occurred in 1998 and amounted to around 1.5 percent of revenue when the copper price was 36 percent below the average.

¹² For Australia, coal represents a bit more than 10 percent of exports; the share of coal, wheat, and wool together rises to around 20 percent. All of these countries' terms of trade were severely hurt by the sequel of crises starting in mid-1997.

Figure 5.3. Terms-of-Trade Shock in Norway and Australia

Sources: IMF, International Financial Statistics (various years). Oil price (Brent) from Datastream Research Service.

Why does Chilean economic activity respond so strongly to the price of copper? The fundamental problem is one of weak links to international financial markets, which the rest of this section helps to document. Domestic factors are present as well; they amplify the impact of external constraints and, through policies aimed at preventing an abrupt encounter with these constraints, lead to precautionary recessions. These domestic factors are discussed in the next sections.

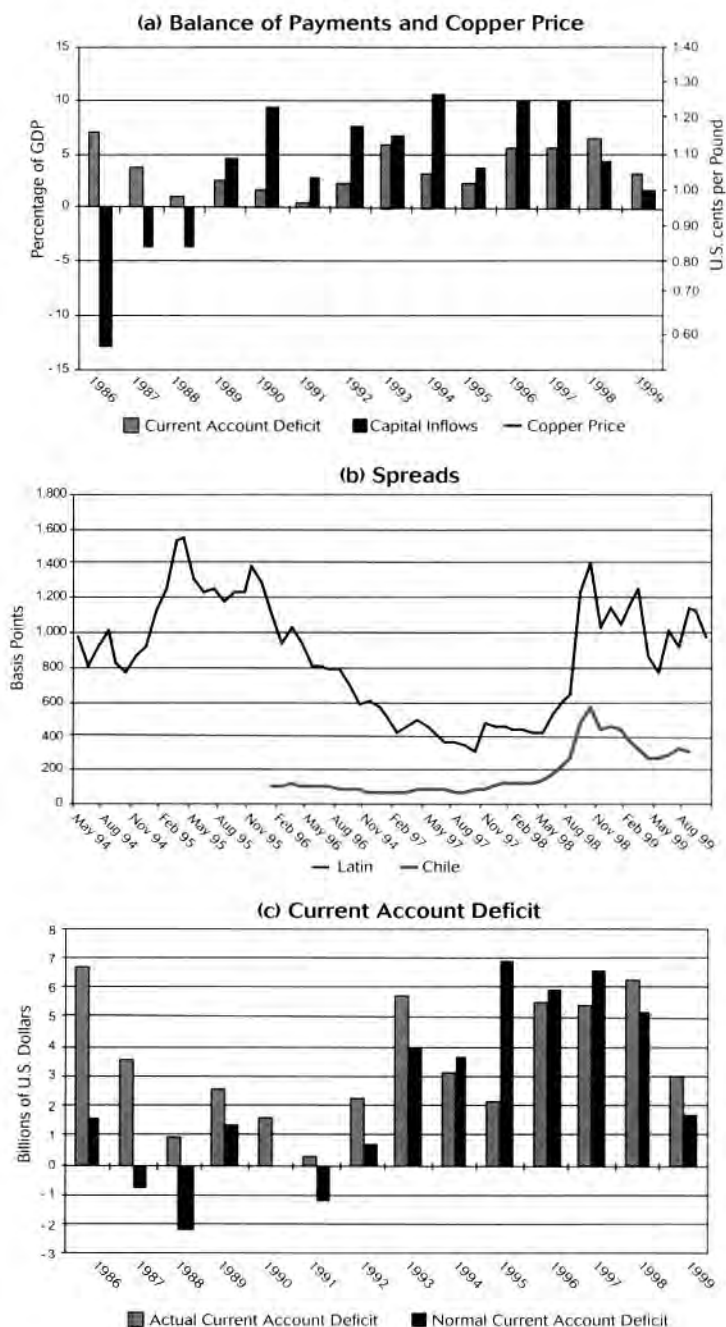
Panel a in figure 5.4 shows in bars the current account deficit and capital flows. Unlike what one would expect from standard smoothing arguments, the *positive* correlation between these and the price of copper is clear. There are two interesting exceptions to these correlations. The first one was during the recession of 1990, when capital flows were high, matching the high price of copper, but the current account was not. The second one was during the tequila crisis in 1995, when the price of copper was high, but neither the current account deficit nor the capital flow was high. The first of these reflects a domestically induced recession, as it resulted from the monetary tightening implemented at the beginning of the new government to offset the inflationary pressures of the preceding political cycle. Capital flows remained high but ultimately led to the accumulation of international reserves rather than to financing a current account deficit. The second episode, that of 1995, is interesting because it shows how, despite the large international credit crunch experienced by emerging economies (see the spreads in panel b), the high price of copper gave the Chilean economy enough liquidity to ride the crisis and experience fast domestic growth. In fact, panel c, which plots not only the current account but also the current account net of the income effect of terms of trade, shows that during 1995 the economy used a large fraction of the liquidity given by the high price of copper to offset the decline in capital inflows; the current account deficit at normal prices reached its highest level during that year.

Most important, exactly the opposite occurred during the 1997-99 crisis. The price of copper plummeted (erasing Chile's liquidity) at the precise time that international financial markets tightened. The Asian crisis and its sequels hit Chile with a difficult combination of low copper liquidity and limited external financial resources (which triggered a precautionary response by the Central Bank as well).¹³

Figure 5.5 illustrates yet another, albeit more conjectural, dimension of the weak and volatile international financial links. Panel a uses data on U.S. stock returns to illustrate the variance of returns over a three-month window centered at the indicated date. The gray line corresponds to a prime firms' index (S&P100), while the other two are more

¹³ Terms of trades also were bad in 1993, and growth slowed down that year as well (figure 5.1). However, international financial markets were buoyant at the time, so this decline did not coincide with a severe international credit crunch.

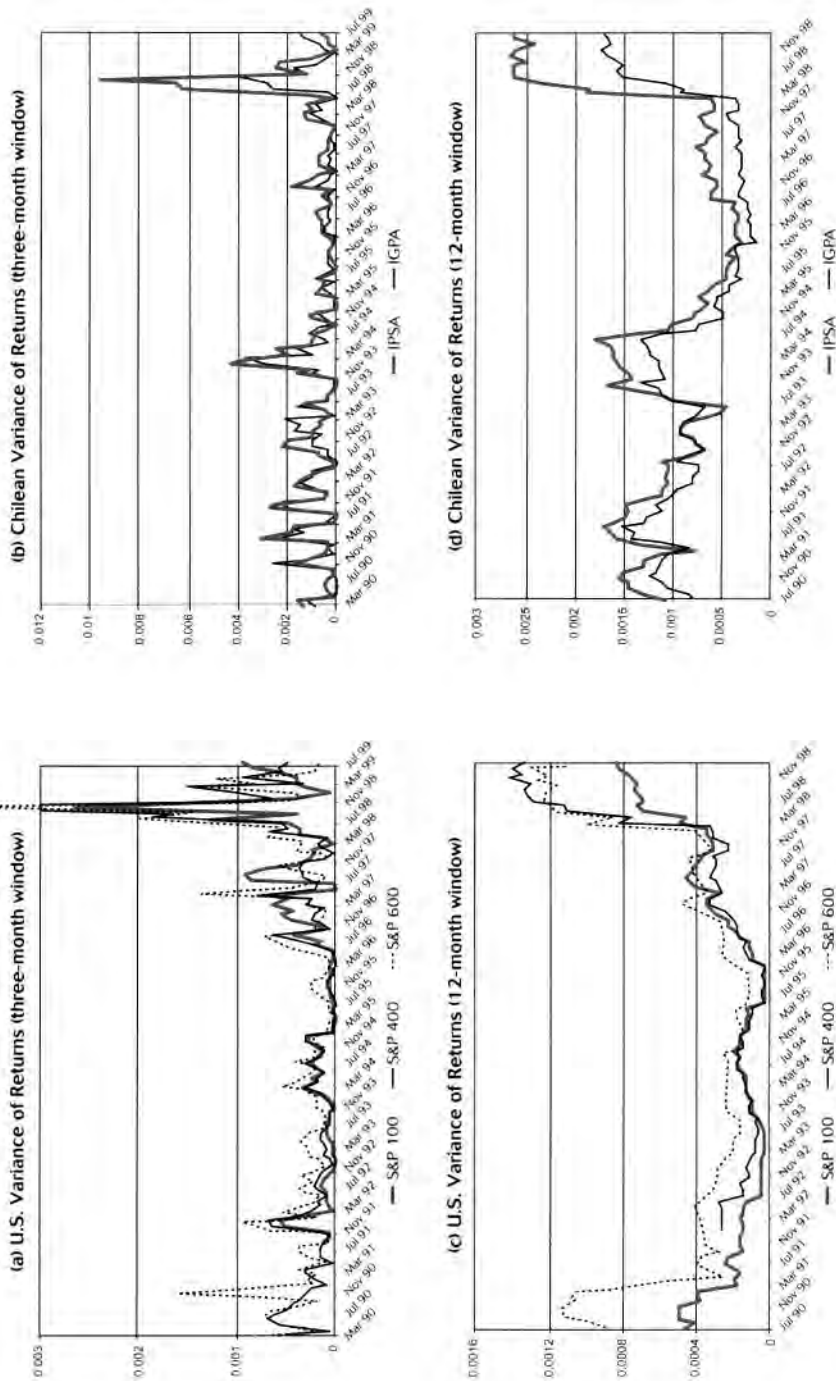
Figure 5.4. External Conditions



Note: Panel b: Latin is average of Argentina, Brazil, Mexico, and Venezuela spreads on Brady bonds sovereign debt. For Chile, spreads are the spread on corporate debt (Enersis).

Source: Instituto Nacional de Estadísticas and Banco Central de Chile.

Figure 5.5. Variance of Stock Returns in United States and Chile



Note: In panels (b) and (d) IPSA is an index for prime companies in Chile and IGPA is a more comprehensive index.

Source: Datastream Research Service.

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.

As with Argentina and Mexico, this sensible volatility ranking is in sharp contrast to that found in Chile, especially during the 1997-99 crisis. Despite the fact that the relative vulnerability of small firms is at least as large in Chile as in the United States, the pattern of relative volatility portrayed in panels a and c is reversed for Chile. This can be seen in panels b and d, which plot the variance series for the IPSA (an index for prime companies) with a gray line and that of the IGPA, a more comprehensive index, with a black line. Again, one interpretation of this reversed volatility ranking is that foreign investors focus mainly on firms whose stocks are in the selective IPSA, and hence it is mainly those stocks that reflect large swings in capital flows.¹⁴ This hypothesis is supported by the fact that most of the disparity in volatility arose during the 1997-99 crisis, which was clearly related to external financial factors (see figure 5.4).

To summarize, although Chile is ahead of the region in its ability to tap international markets—as reflected by its investment-grade status—it still exhibits significant symptoms of an imperfect and incomplete integration into international financial markets. Either by fear or by actual constraint, the fragility of this relation makes the country excessively responsive to terms-of-trade shocks. This response is exacerbated by domestic factors, as described next.

Domestic Shocks and Amplification Mechanisms

What makes the Chilean case more subtle than that of most other economies in the region is that, although the correlation between external factors and domestic business cycles is indeed very high, the external constraint has not come to a point recently where severe and immediate adjustment was the only option available. During the 1997-99 episode, as external conditions (and the rebalance of domestic bank portfolios toward foreign assets) deteriorated, the Central Bank chose to act preemptively. Inevitably, this raises the question of whether the adjustment—and its extent—was indeed unavoidable. Could Chile have,

¹⁴ Another interpretation is that the finding is spurious, as the more comprehensive series is polluted by too many no-trades. Although this remains a possibility, a similar pattern was observed in Argentina (see chapter 3), where data on aggregate volume do not seem to support this alternative interpretation. The relative-volatility claim does not say that the financing of large firms 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 of prime companies fluctuates with international sentiment about emerging markets and Chile in particular.

with its now much improved and praised institutions, borrowed its way out of this recession and run a transitory but very large current account deficit? We will probably never know. However, two semi-structural aspects of the Chilean economy complicate its handling of external shocks. The first one is a mandate on the Central Bank that, while appropriate on average, is ill-designed to deal with terms-of-trade shocks. The second one is a financial structure that is not prepared to smooth the normal rough edges of monetary policy and is prone to waste liquidity. The discussion of the second feature is split into two sets of issues: those that relate to banks and those that have to do with problems in the financial system at-large.

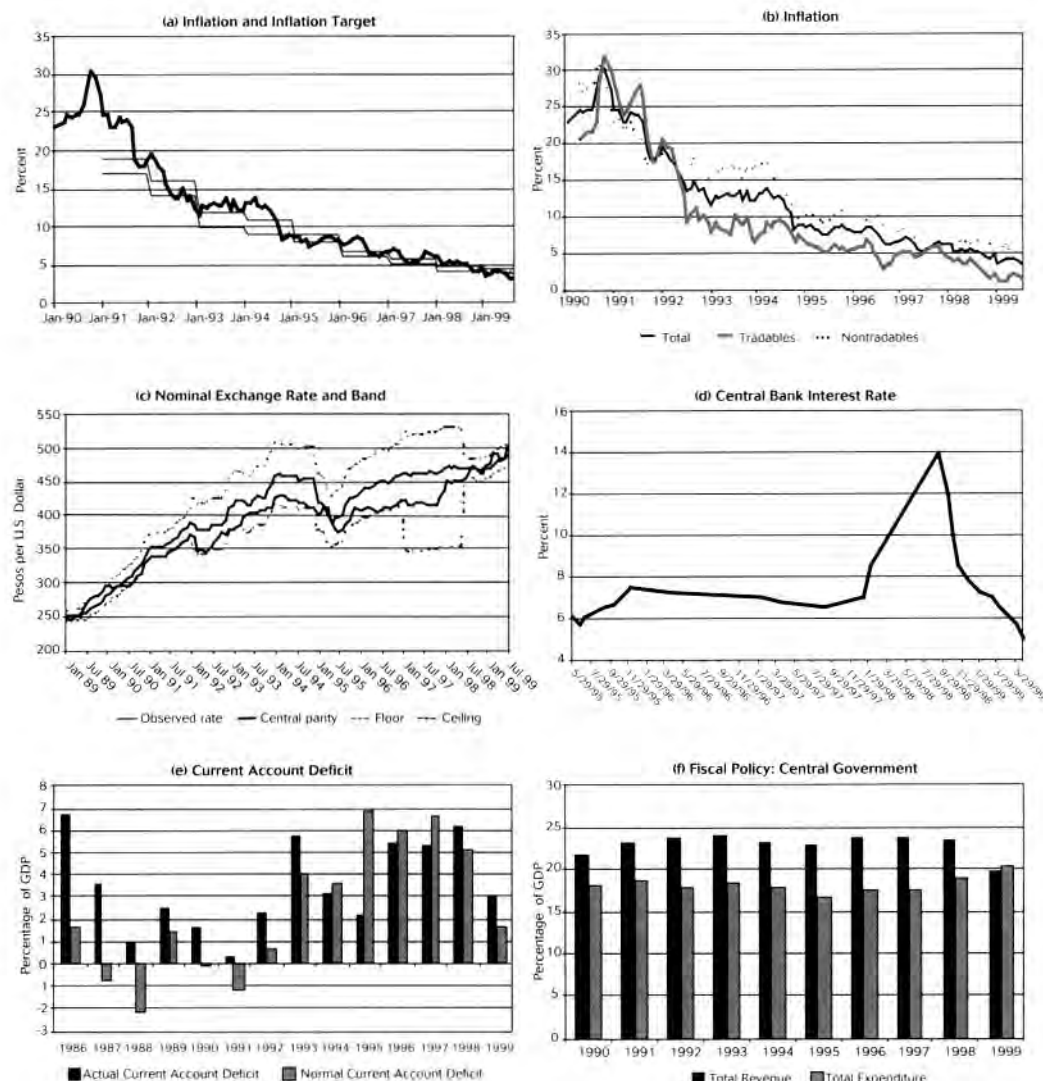
A Central Bank mandate that is inconsistent with terms-of-trade shocks. The mandate—or its interpretation—of the Central Bank of Chile has two basic components: to meet a declining inflation target and to prevent the current account deficit (at normal terms of trade) from going too much beyond 4 percent. It obviously becomes more sensitive toward the latter when external financial conditions tighten. Under this mandate, the 1997-99 scenario represented the Central Bank's worst scenario. The sharp decline in terms of trade put pressure on the peso, and hence on inflation, and directly worsened the current account via its income effect. All of this happened in the middle of a very difficult external financial markets scenario. It was in the interpretation of its mandate—optimal or not, correctly interpreted or not—to do what the Central Bank did; a sharp tightening of monetary policy was the outcome.

Panel a in figure 5.6 shows the path of inflation and the targets. The rise in inflation during 1990 fully explains the tightening and recession of that year, which was a classic domestic recession with no significant external factors at play. More important is the failure to meet targets at the end of 1997 and through most of 1998. A significant part of the explanation has to do with the pressure that tighter external conditions and a decline in the terms of trade began having on the exchange rate. Indeed, panel b shows that the low inflation on the tradables component of the consumer price index was essential in bringing inflation down through the period.¹⁵ As a result of the pressures following the Asian crisis, that contribution subsided, although later on the direct effect of the decline in the international price of imports pulled down tradables inflation despite the depreciation of the peso. Panel c illustrates the path of the exchange rate throughout this period, together with the target zone bands. As the pressure on the peso rose, these bands were narrowed significantly as one of the measures used to deter speculative attacks.

In 1999, inflation was expected to end below target (see panel a), which is one of the reasons critics of the Central Bank argue that the medicine was far stronger than the

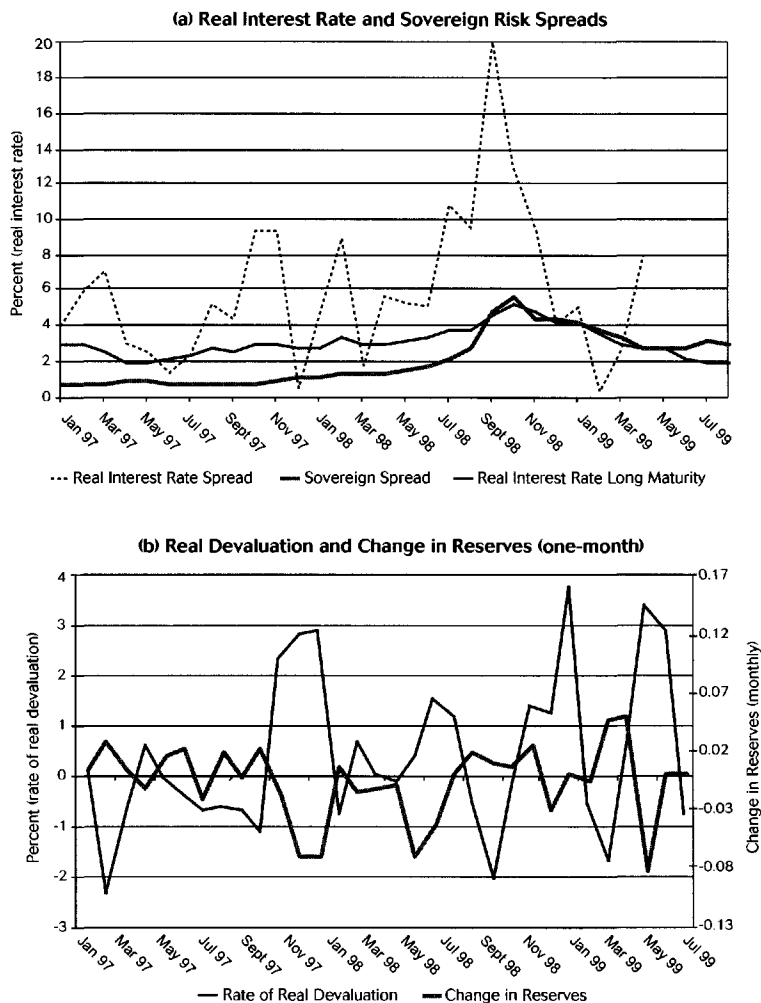
¹⁵ See Calvo and Mendoza (1998) and Spilimbergo (1999).

Figure 5.6. Targets and Policies



Note: Preliminary data for 1998 and predicted data for 1999. Panel d: the Central Bank interest rate corresponds to the so-called *tasa de instancia monetaria*. Panel e: the normal current account deficit is calculated using the average terms of trade of the whole period. Specifically, the normal current account is calculated as the difference between the actual current account and $dPx \cdot X - dPm \cdot M$, where $dPx = (Px - Pxn) / Pxn$, $dPm = (Pm - Pmn) / Pmn$, and Pxn and Pmn are the normal average prices for exports and imports, respectively, for the period.

Source: Banco Central de Chile and Ministerio de Hacienda.

Figure 5.7. Policy Response

Note: Panel a: real interest rate spread is the difference between average loans and deposits interest rates (IMF International Financial Statistics) and U.S. federal funds rate, both minus the respective inflation rate. Real interest rate spread (long maturity) uses real rates on seven- and eight-year government bonds. Sovereign risk spread is the difference between the average of two corporate Chilean bonds (Enersis and Endesa) and the U.S. Treasury bills. From April 21, 1999, the sovereign risk corresponds to the sovereign Chilean bond. Panel b: the rate of real devaluation is computed as the monthly changes of the nominal exchange rate, adjusted by the difference between U.S. and domestic inflation. Changes in reserves are monthly changes of an international reserves indicator computed as the ratio of international reserves to an openness indicator. The openness indicator is average imports in the past three years. Sources: Banco Central de Chile, IMF International Financial Statistics (various years), and Datastream Research Service.

patient needed (panel d). Perhaps, but panel e shows the additional pressures on the Central Bank, as its second target, the current account, deteriorated sharply in 1998 (especially during the first half). Moreover, the entire decline in the current account from 1997 to 1998, and more, can be attributed to the direct impact of terms of trade (while the actual current account was rising, that at fixed normal prices was declining). Part of the problem was not the Central Bank's fault, but a by-product of its mandate. Finally, panel f shows that the fiscal side followed a mildly countercyclical strategy during the episode.

The Central Bank's situation was further complicated by a sequence of attacks on the peso, which reached its apex during the Russian crisis. Figure 5.7 shows both the attack and the instrument chosen to deal with it, the choice of which was probably constrained by the Central Bank's mandate. Panel a highlights the sharp hike in domestic short-term interest rates, well above the increase in the country's risk spread (which is tracked more closely by long real rates). Panel b shows the impact of these attacks on the other escape valves: the exchange rate and international reserves (here measured as a fraction of annual imports). Neither of these alternative mechanisms was used to the extent that the interest rate was. This is seen more clearly in figure 5.8, which compares the response of Chile to that of more advanced economies that were affected by the turmoil through more or less similar mechanisms (although to a lesser extent). Clearly the sharp use of the interest rate is what makes Chile the outlier.

In summary, the mandate of the Central Bank makes expenditure reduction, rather than export-led recovery or international reserves management, the tool of choice for responding to a negative terms-of-trade shock. The result is a further breakdown in intertemporal smoothing. The fact that the private sector perceives the presence of other options further complicates the objectives of the Central Bank.

Wasted liquidity and banks. The large fluctuations in the Chilean nominal interest rates have significant consequences for Chile's real side. Panels a and b in figure 5.9 show the relation between the output gap, measured as the deviation of output from a deterministic trend, and the nominal and ex post real interest rates, respectively.¹⁶ This is done for Chile, Mexico, representing a country with less-developed financial markets, as well as Australia and Norway. In both panels, it is apparent that not only are Chile's interest rates very volatile, but its output gap moves more for a given change in interest rates than that of any of the other countries.

Part of the reason for this additional responsiveness to interest rates, at least when compared with Mexico, may have to do with financial development. As figure 5.10 shows,

¹⁶ Although in principle only the real interest rate should matter, in practice several factors justify plotting the relationship with respect to nominal interest rates as well. For example, a sudden rise in the flow payment associated with a sharp increase in the nominal rate may induce financial distress in a constrained firm.

Figure 5.8. Policy Response, International Comparisons

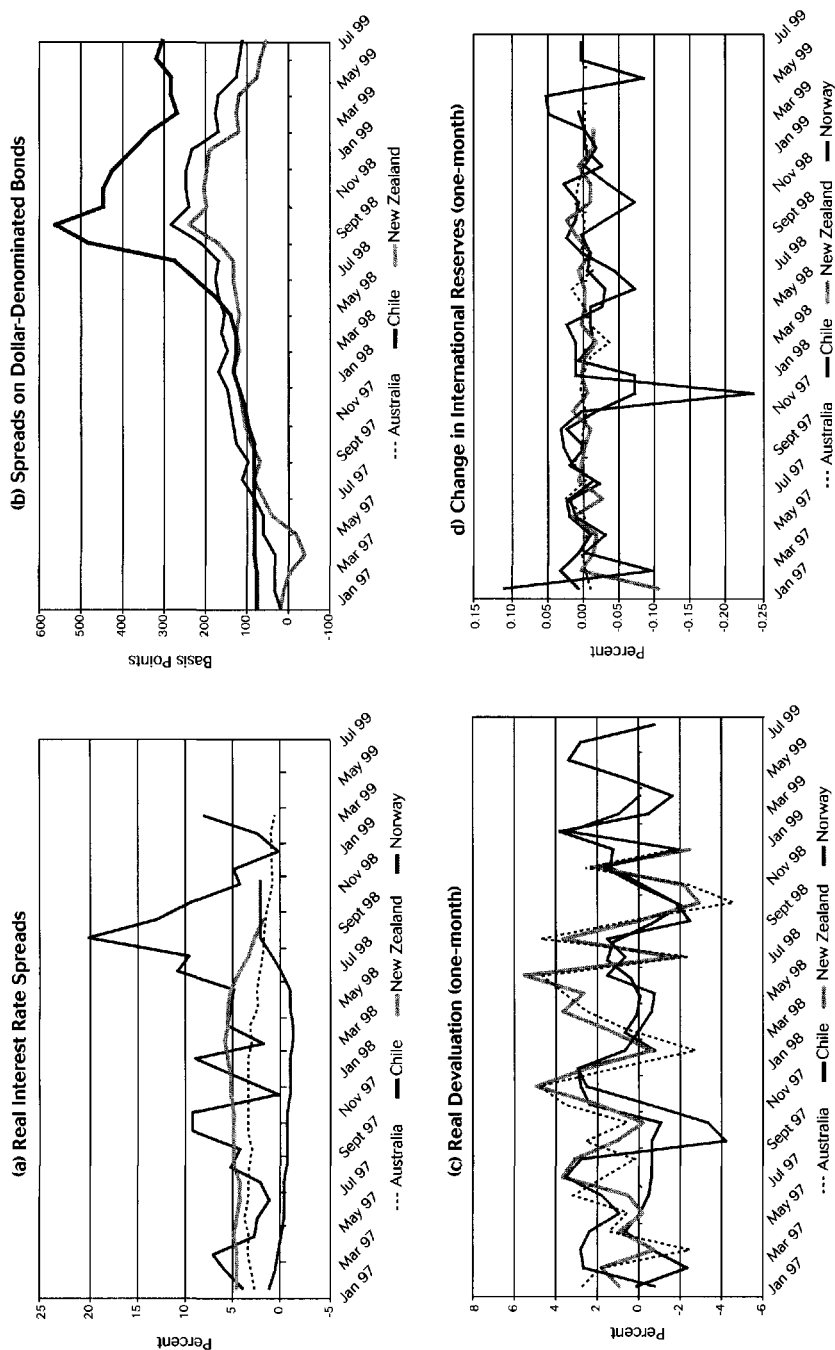
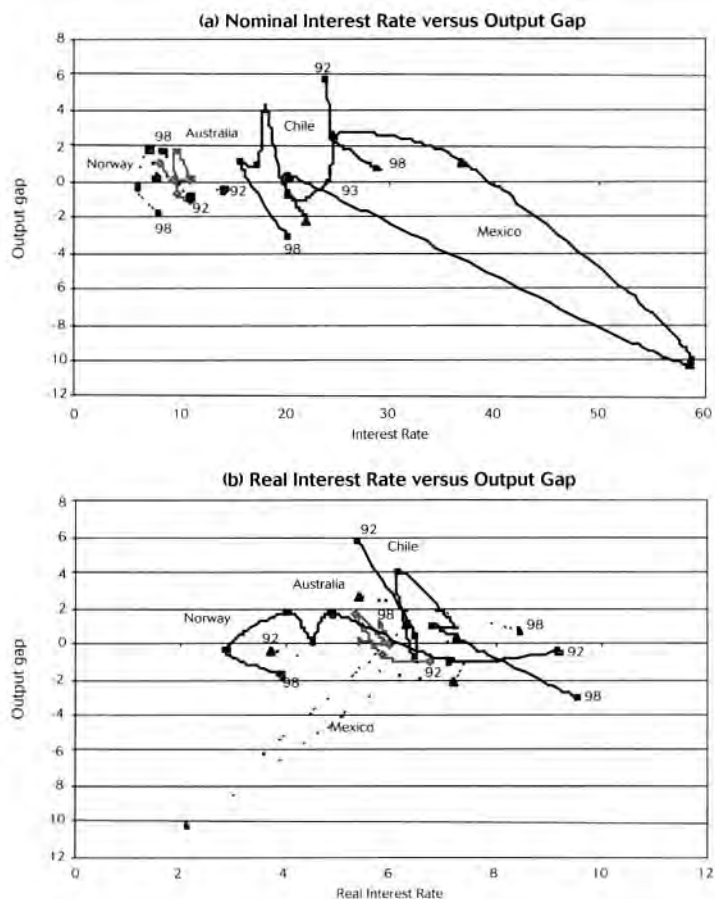


Figure 5.9. The Output Gap and Interest Rates— I



Note: The interest rate is the lending rate published by the IMF in International Financial Statistics (various years).

Chile's degree of financial development seems closer to that of the advanced economies than to that of the rest of Latin America. Although financial development is undoubtedly a positive feature in that it facilitates an adequate reallocation of resources, it also builds the leverage for a larger impact of an interest rate hike.

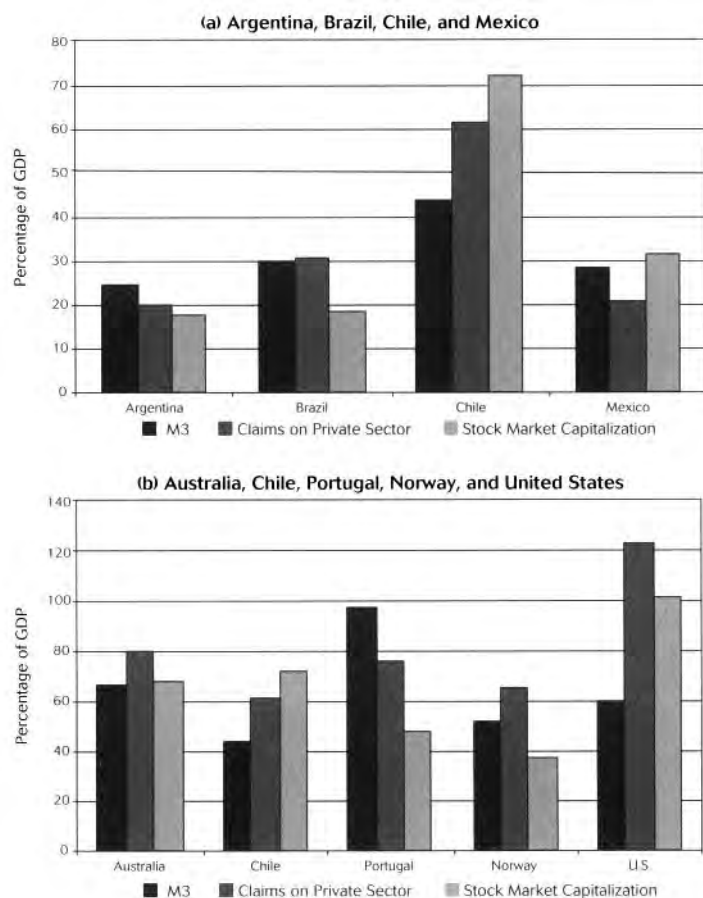
Figure 5.11 thus multiplies the change in interest rates by a measure of financial depth (average ratio of loans over GDP). The basic message remains unchanged: Chile has both a relatively volatile interest rate and relatively volatile output, and these are distinctly negatively correlated. The rest of this section and the next one try to understand not the source of interest rate volatility, but why the real side is so responsive to it.

A central factor behind this large sensitivity is that the financial sector at-large is not as developed as it may seem at first glance. The domestic banking system has few good ways to muffle the direct and rough impact of monetary policy. Panel a in figure 5.12 shows the daily volatility of changes in the interbank market rate. It is apparent that Chile is very volatile along this dimension. Although several institutional factors complicate the comparison of very short-term interest rates across countries, such volatility probably reflects the illiquidity of that market. This is one of the reasons why removing controls on short-term capital flows may be justified. Panel b highlights the sharp liquidity droughts that took place when the Chilean peso was attacked (particularly during the first and third quarters of 1998), as well as the prudence exhibited by banks after the episode.

The banks, in turn, squeeze borrowers. Panel a in figure 5.13 shows loans and deposits, while panel b portrays net deposit and loan flows, measured as the rate of change in these variables minus their respective interest rates. It is apparent that hikes in interest rates are soon followed by credit crunches.¹⁷

As always, the firms most directly affected by credit crunches are the small and medium firms. In the case of Chile perhaps there is an additional twist. As the perception that the crises had passed and that the contraction was more severe than expected began to emerge, interest rates were lowered sharply, so much that large firms began to turn to domestic financial markets to obtain financing, which was still difficult to obtain abroad. Despite the lack of information on loans by size of recipient, domestic banks seem to have taken advantage of this opportunity for flight to quality, choking the recovery hopes of small and medium firms, which have no direct links to international financial markets.

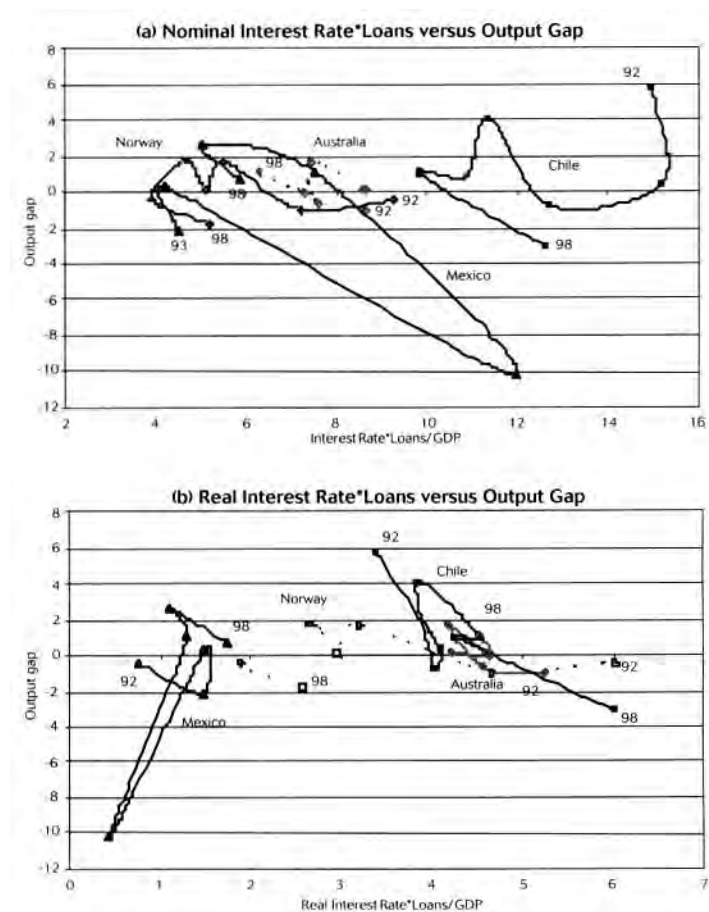
¹⁷ Banks also played a more indirect, but significant, role in the initial rise in interest rates, as they seem to have been one of the main forces behind the "attack" on the Chilean peso during 1998. Although there is no public information on the subject, the presumption is that they do so not for speculative reasons, but to bridge currency mismatches. If this is indeed the case, the Central Bank would have done better to "rent" the reserves to the banks than to hike interest rates. Decentralizing reserves holdings, while markets can still do it, seems to be a reasonable component of an efficient arrangement for managing international liquidity.

Figure 5.10. Financial Market Development

Note: Data as of end of 1997.

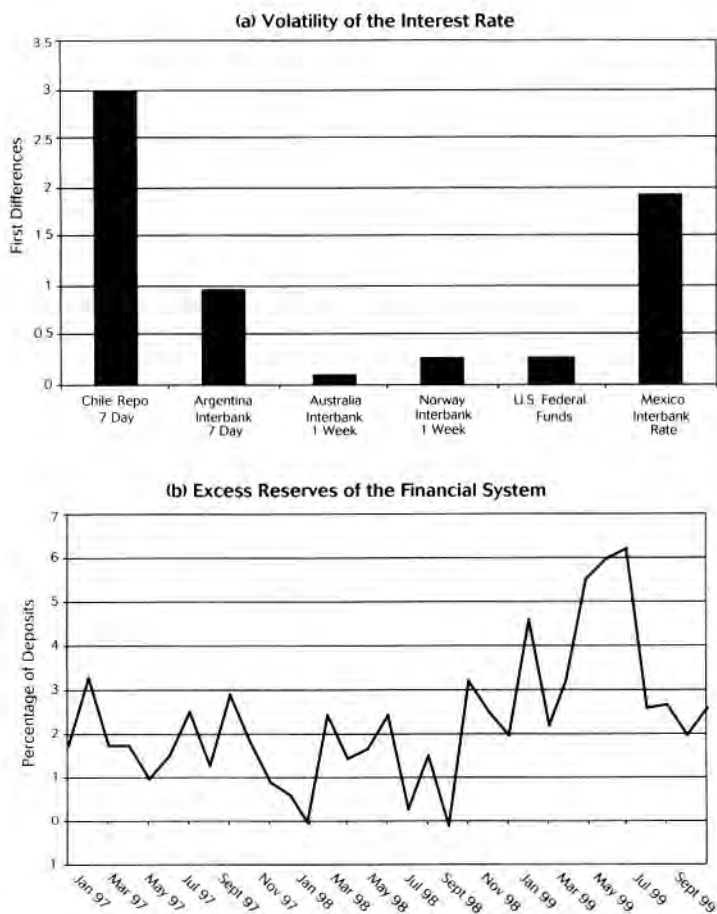
Source: IMF, International Financial Statistics (various years) and Datastream Research Service.

Figure 5.11. The Output Gap and Interest Rates—II



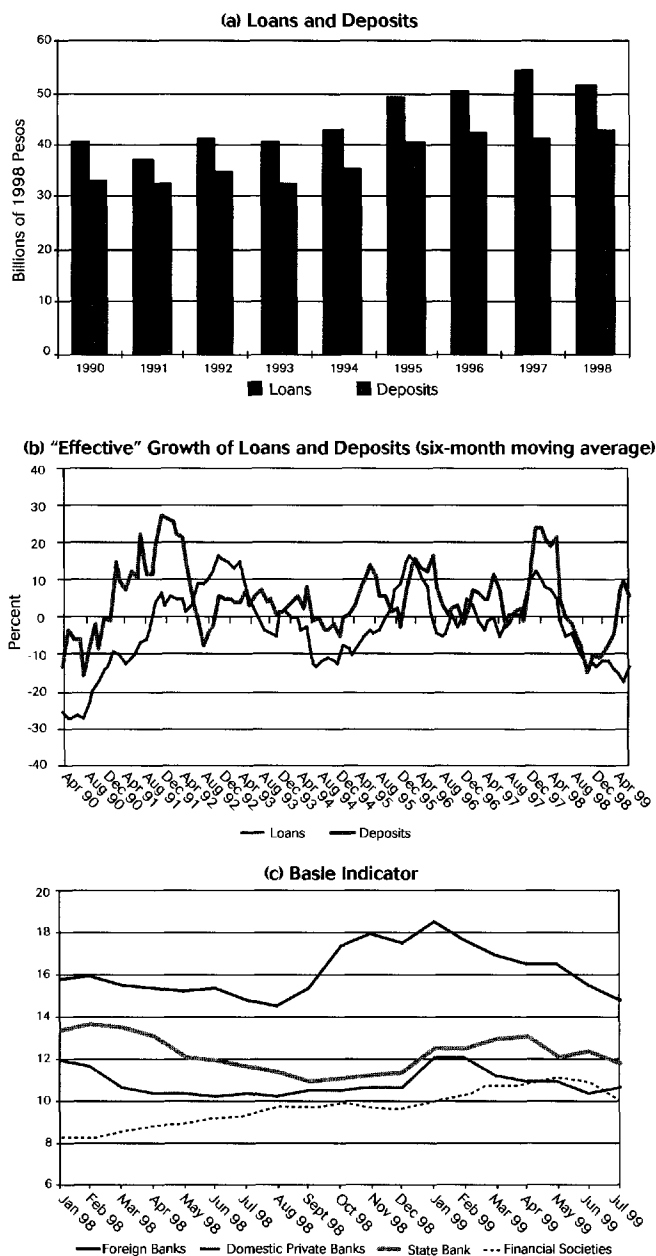
Note: Loans data as of end of 1997. The interest rate corresponds to the lending rate; loans correspond to credit to the private sector as published in International Financial Statistics. The pivot year is 1997.

Source: IMF, International Financial Statistics (various years) and Datastream Research Service.

Figure 5.12. Bank Liquidity

Sources : Panel a: Datastream. Panel b: Banco Central de Chile.

Figure 5.13. Loans and Deposits



Note: Panel b: The "effective" growth rate is a measure of net financial flows. It is computed as the rate of growth of the nominal stock minus the nominal interest rate.

Source: Asociación de Bancos e Instituciones Financieras de Chile, Superintendencia de Bancos e Instituciones Financieras de Chile, and Ministerio de Hacienda.

Figure 5.14 shows, for a prime Chilean firm, approximate measures of the cost of borrowing abroad (U.S. prime rate plus a measure of the international spread on Chilean corporate debt plus two measures of the peso's real devaluation) and the cost of borrowing from domestic banks. The line in between represents the cost of borrowing in dollars. It is apparent that, while before and during the crises borrowing abroad was probably much cheaper for these firms (especially given the real appreciation of the peso), the opposite held after the crisis.¹⁸

To summarize, Chile's interest rates not only are volatile but also have a large impact on (or at least are highly correlated with) real activity. Part of this large sensitivity is rooted in the Central Bank's behavior and constraints, which in turn reflect some of the remaining imbalances in Chile's financial development. The next subsection extends this discussion further.

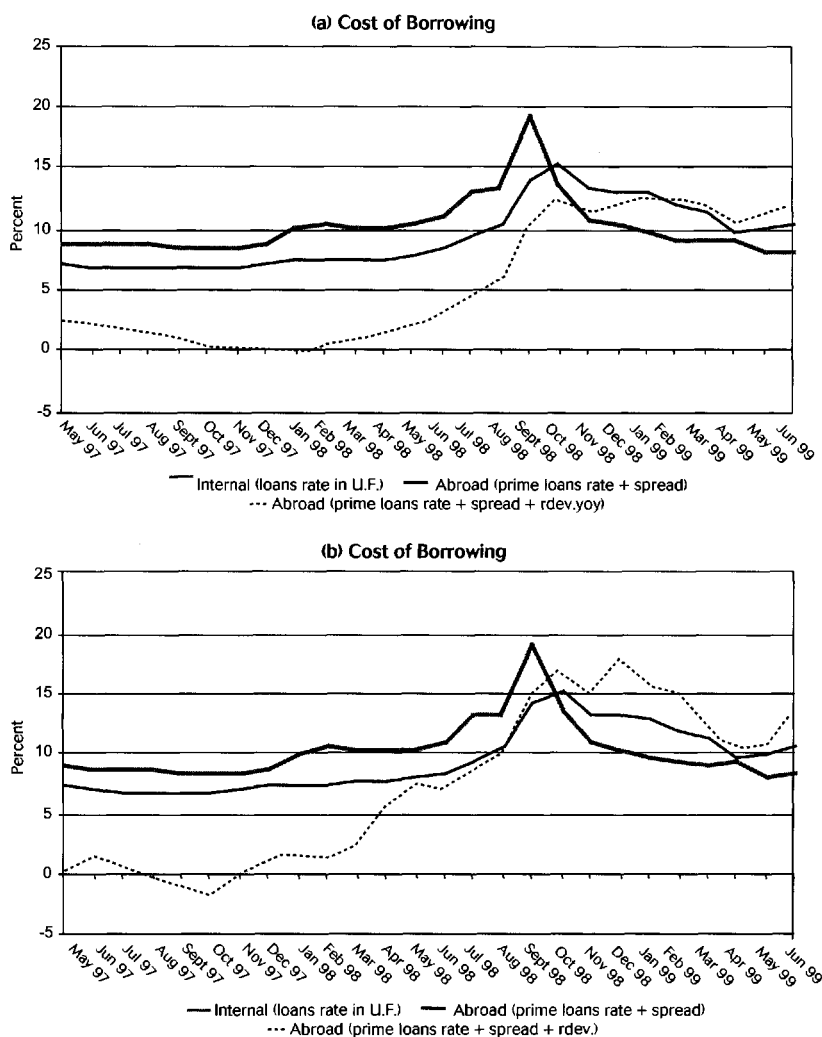
Limited Development of Financial Markets. Although a leader in the region, Chile still has only partially developed financial markets. The domestic corporate bonds market is negligible, and the equity market, while large in terms of capitalization ratio, is both selective and fairly illiquid. Dependence on banks, especially by small firms, is high, which makes the problems discussed above even more serious.¹⁹ When banks squeeze, firms have few other options.

The consequences of underdeveloped domestic financial markets are ultimately reflected in the economy's failure to reallocate resources in an expedient manner, especially at times of crises. Figure 5.15 represents a measure of the cross-sectional dispersion of the stock market returns for a group of approximately 24 Chilean industries (thick line).²⁰ Although Chile fares better than other regional economies, represented by Argentina here, it does not have the stability of more developed economies, represented by Australia. Finding more direct evidence of this mechanism, controlling adequately for the size of exogenous shocks, is an important research theme, as is analysis of the effects of financial underdevelopment on the relative size and volatility of sectors that traditionally use credit.

¹⁸ With time, if the situation persists, local banks probably will borrow abroad to lend to small and medium firms. But in the short run, given uncertainty and the conservative attitude of banks, this mechanism is limited. In fact, one may think of the crowding-out mechanism in reverse: the sharp increase in the banks' appetite for quality is what lowers the equilibrium rate and exacerbates the rationing mechanism.

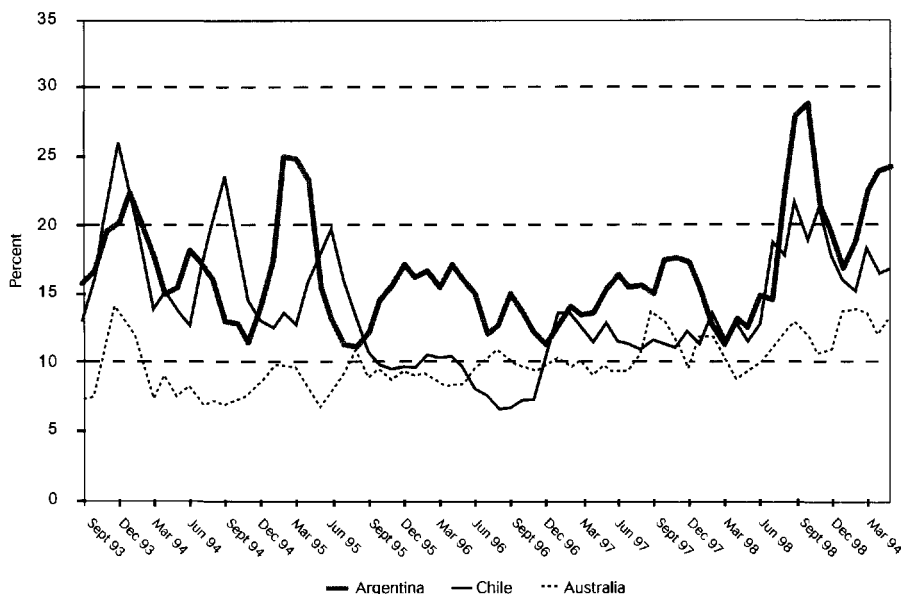
¹⁹ These features need not be a problem for, as many European economies have demonstrated, bank credit can do most of the job. This seems less likely to be the case in a scenario where banks are often subject to credit crunches.

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

Figure 5.14. Cost of Borrowing for Prime Firms

Note: Domestic interest rate corresponds to the financial system average rate for loans with maturity 90 to 365 days adjustable in unidades de fomento (U.F.). The sovereign spread is the cost of borrowing abroad of a prime company (Enersis) minus the U.S. Treasury bill. The terms "rdev." and "rdev. yoy" correspond to the annualized monthly real devaluation and year-to-year real devaluation, respectively.

Source: Banco Central de Chile, Ministerio de Hacienda, and U.S. Federal Reserve.

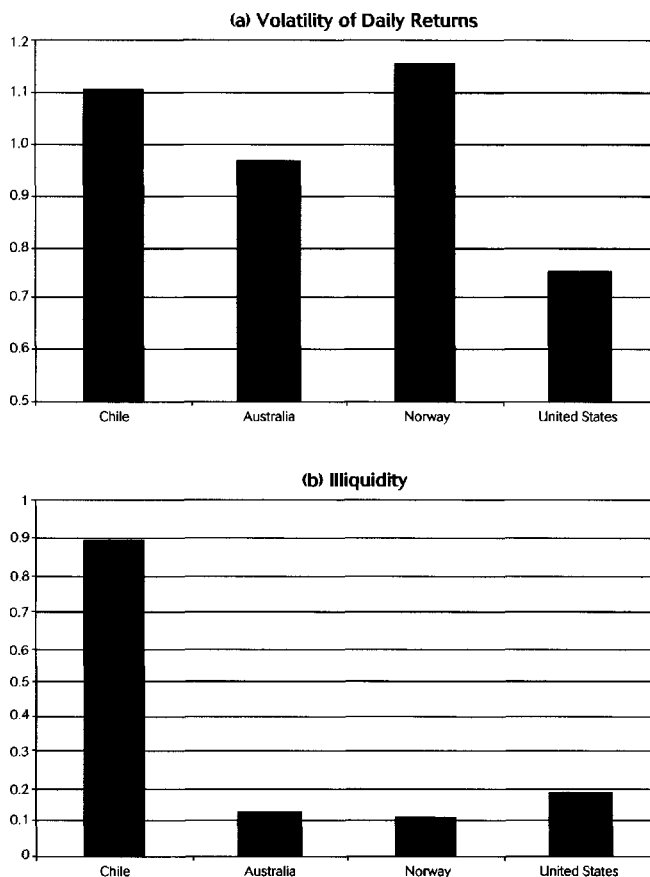
Figure 5.15. Cross-Sectional Variability of Sectoral Stock Returns

Note: Interquartile range, 15–85 percent (three-month moving average). The number of sectors used for Argentina, Chile, and Australia is 20, 26, and 24, respectively.

Source: Datastream Research Service.

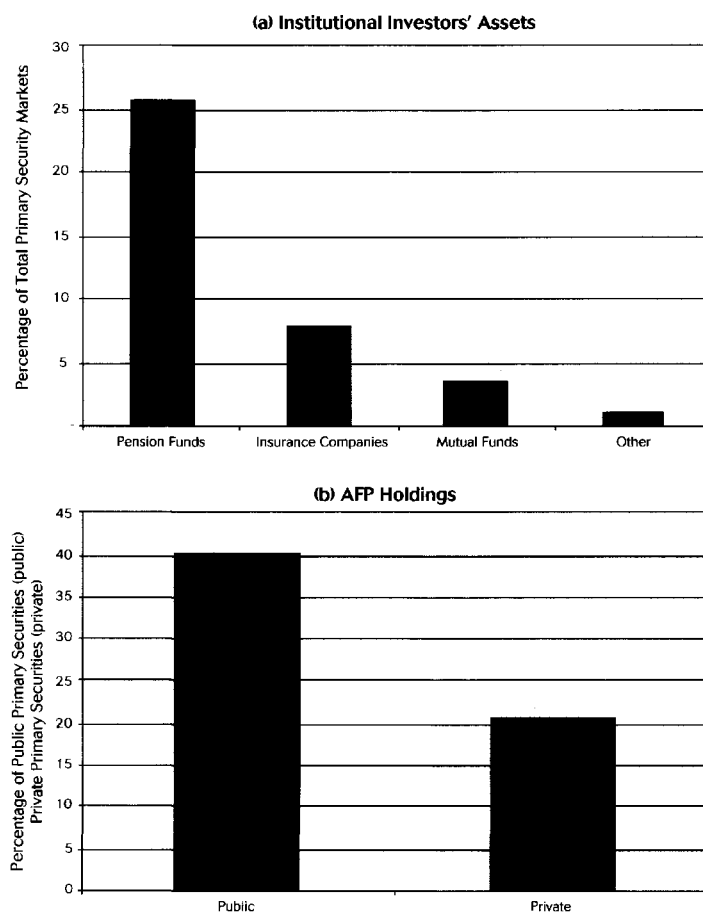
This underdevelopment is reflected even in places where one would not expect to find it, as is the case of the stock market. Thanks to investments of the pension funds (AFPs), the Chilean stock market has world-level capitalization values. Figure 2.2 from chapter 2 shows that, although, in terms of capitalization values, Chile is an outlier in the region and fares well with more advanced economies, it also has a substandard turnover ratio. Although excessive churn can be wasteful, it is highly unlikely that Chile's depressed levels are enough to support a solid infrastructure of market makers, able to provide optimal levels of immediacy and liquidity. Moreover, one could argue that the wastes associated with normal churn are a cost worth paying to reduce the extent of systemic liquidity crises when these arise. This is another theme worth researching further in the context of emerging economies.

Figure 5.16 reinforces the concern about the ability of the Chilean financial system to handle abrupt changes in the demand for its services. Panel a shows the high volatility of Chilean returns, matched only by that of Norway, which has less than half of the capitalization value of Chile and is subject to similar types of shocks. A more direct, while

Figure 5.16. Volatility and Illiquidity of the Chilean Stock Market

Note: Period, January 1990–September 1999. Panel a: Volatility is the standard deviation of daily price changes. Panel b: Illiquidity measured by the coefficient of the regression of daily absolute value price changes on daily volume over market capitalization.

Source: Datastream Research Service global indices.

Figure 5.17. Institutional Investors

Note: Panel a: "Other" corresponds to investment funds plus foreign capital investment funds. Panel b: "Private" considers both financial and corporate sectors.

Source: Superintendencia de Bancos e Instituciones Financieras de Chile and Superintendencia de Valores y Seguros.

still imperfect, measure of illiquidity is shown in panel b, which reports the results of running a simple regression of the absolute value of daily price changes (a measure of volatility) on the change in the fraction of total capitalization traded. Literally interpreted, it reveals that on average an increase in the volume traded, in terms of total capitalization value, is associated with an increase in price volatility that is about 10 times larger in Chile than in the other countries.

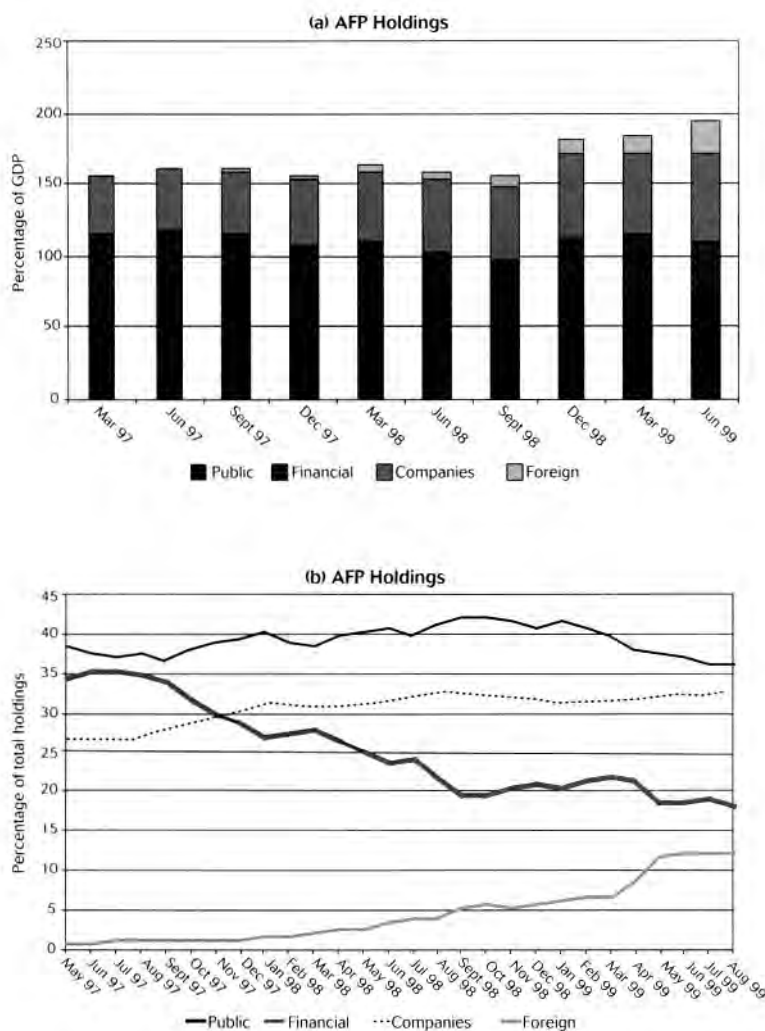
What is behind this illiquidity? Two components are important here. The first one is the high concentration ratio of ownership. In an average top-10 traded Chilean company, more than 45 percent of the shares are held by the top three shareholders (excluding the government), as compared with a much lower percentage for economies like the United States (20 percent), the United Kingdom (19 percent), Australia (28 percent), or Japan (18 percent).²¹ These large control holdings are not part of the daily market.

As for the rest, a large share is held by the AFPs, with a still-limited role for other institutional investors. This pattern can be seen in figure 5.17, which shows the value of the assets held by each of these investors over the ratio of private and public financial assets. Although many benefits are associated with the sound practices of AFPs for the development of good corporate governance and the stock market itself, they do not improve turnover or attract liquidity providers, since they also tend to buy and hold rather than churn assets.

This problem was further compounded when limits on the investments of AFPs abroad were relaxed in mid-1997, right before the onset of the sequence of crises. Although it is certainly reasonable to argue that such measures helped the AFPs and their members—at least in conditions of partial equilibrium—these measures came at the worst of times from the point of view of domestic liquidity provision. Figure 5.18 shows clearly that the AFPs indeed used this new margin actively throughout the crisis.

To summarize, the Chilean financial markets are fairly illiquid and highly sensitive to the withdrawal of foreign investors, which closes yet another channel with which to aggregate scarce resources during distress. One of the main features of a developed economy is its ability to handle complexity, in the sense that precautionary and alternative options are always available. Emerging economies, even if advanced as in the case of Chile, do not have this luxury. This closes the loop. External shocks make the Central Bank impatient; the hike in interest rates is absorbed without mufflers by the banks. And firms, especially small ones, are hit by the credit crunch without (financial) mufflers either.

²¹ See La Porta and others (1997).

Figure 5.18. Asociación de Fondos de Pensiones (AFP)

Note: Panel a: denominator corresponds to quarterly gross domestic product.

Sources: Panel a: Superintendencia de Bancos e Instituciones Financieras de Chile. Panel b: Superintendencia de Bancos e Instituciones Financieras and Banco Central.

Taking Stock

The diagnosis contains four basic elements: (a) weak international financial links and excess sensitivity with respect to terms-of-trade shocks, (b) a Central Bank mandate that is inconsistent with terms-of-trade shocks, (c) a banking system prone to waste liquidity, and (d) limited development of financial markets.

In accordance with these elements, the general policy recommendations highlighted in the introduction are grouped into four categories as well: (a) improve external financial links and their use during crises, (b) mold significant terms-of-trade contingencies into anti-cyclical policies, (c) improve liquidity aggregation, especially within and through the banks, and (d) accelerate the path of domestic financial deepening.

At a general level the connection between recommendations and diagnosis is apparent, but some specific aspects are worth developing further. Moreover, not only are there plenty of synergies between the different recommendations, but also they share common ingredients, as many of them stem from the need to take the next step toward financial development, within the constraints imposed by the small size of the Chilean economy.

Improving External Financial Links

By now, there is widespread consensus on a series of general recommendations to improve external financial links, which can be found in most pamphlets on international financial architecture. These recommendations are discussed in Argentina's policy section in chapter 3 and are revisited in chapter 6. Aside from these general areas of improvement and those brought about by the recommendations in the next subsections, there are a few more specific suggestions to improve both the links with international financial markets as well as their use during distress.

Chile has opted mostly for self-insurance with respect to terms-of-trade shocks. In principle, since these shocks are mostly exogenous to Chile, it should not be difficult for the country to insure against part of them abroad. In practice, these markets are very limited. Perhaps this is the time for a concerted effort by both the countries exposed to these risks and the potential insurers to create the appropriate markets. The similarities with catastrophe risk insurance, a market that is beginning to develop in the United States and involves risks of comparable magnitude, are worth exploring.

Chile needs to find ways to foster the direct relationship between in-home foreign banks and small and medium firms.²² Along similar lines, it is important to facilitate the

²² Citicorp has announced its intention to penetrate that market in Chile.

residence of recognized international market makers. This may require permanently liberalizing constraints on short-term capital flows. Indeed, figure 5.19 illustrates clearly the small relative role played by portfolio capital flows in Chile. Although the country may gain stability in targeting foreign direct investment and more stable capital flows in general, the cost may be quite large once the underdevelopment of financial markets and Chile's structural lack of alternative remedies are taken into consideration.

If the short-term capital account is not fully liberalized, which would be the preferred option, at the very least taxes on it should be made contingent (procyclical) on terms of trade.²³

Efforts should be made to homogenize domestic and foreign corporate and public bonds. In particular, incentives are needed for domestic firms (or banks) to place U.F.-denominated debt abroad.²⁴ It is important to make sure that the position cannot be fully offset through domestic hedging markets, unless the counterpart has direct access to foreign credit and currency during times of systemic distress (for example, export companies). This process may require a transitional period with government-backed enhancements.

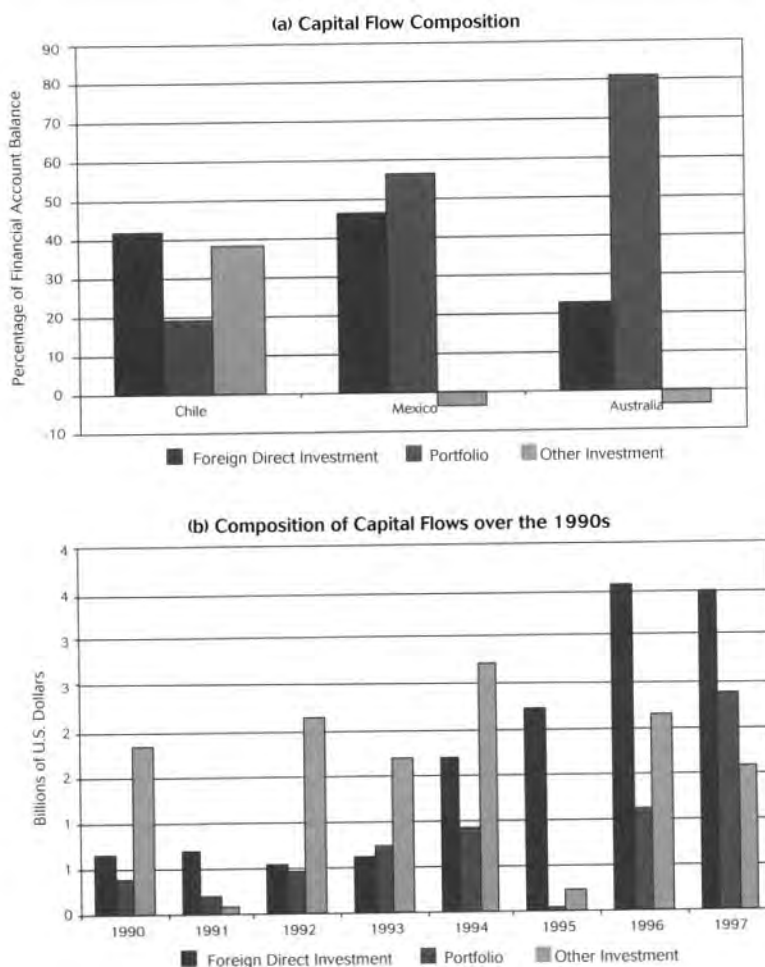
Relaxing the constraints on the minimum rating required to issue American Depositary Receipts (ADRs) and place external debt, as has recently been done, is appropriate. Nevertheless, the externality that the previous prohibition tried to minimize does exist. The idea is to replace the stick with a carrot by subsidizing firms for achieving high international credit rates.

Molding Terms-of-Trade Contingencies into Anti-Cyclical Policies

The two main Central Bank mandates—keep inflation close to its target and prevent the current account deficit from reaching dangerously high levels—are simultaneously challenged by significant terms-of-trade shocks. The current account looks instantly worse, and, through its pressure on the nominal exchange rate, inflation increases. Moreover, either because of the direct impact that such a decline in terms of trade has on the country's international collateral or because commodity prices and tight international financial conditions for emerging markets often come together, the scenario is further complicated by financial factors. All of a sudden, the current account deficit looks more dangerous, and the exchange rate less sustainable, and hence it is attacked. The Central Bank is cornered and acts with its most direct instrument: a sharp hike in domestic interest rates. This is very

²³ Chile lowered taxes on short capital inflows during the 1997-99 crisis. The point is to make it a contingent (automatic) rule.

²⁴ As of 1998, Chilean companies are permitted to do so. The point here is to go beyond that and foster it.

Figure 5.19. Capital Controls and Composition of Capital Flows

Note: Panel a: 1990–97 average.

Source: IMF, International Financial Statistics (various years).

costly for the Chilean economy; thus the policy recommendations below aim to achieve two complementary goals: to reduce the pressure put on the Central Bank by terms-of-trade shocks and to improve the alignment between the implications of such shocks and the policy response.

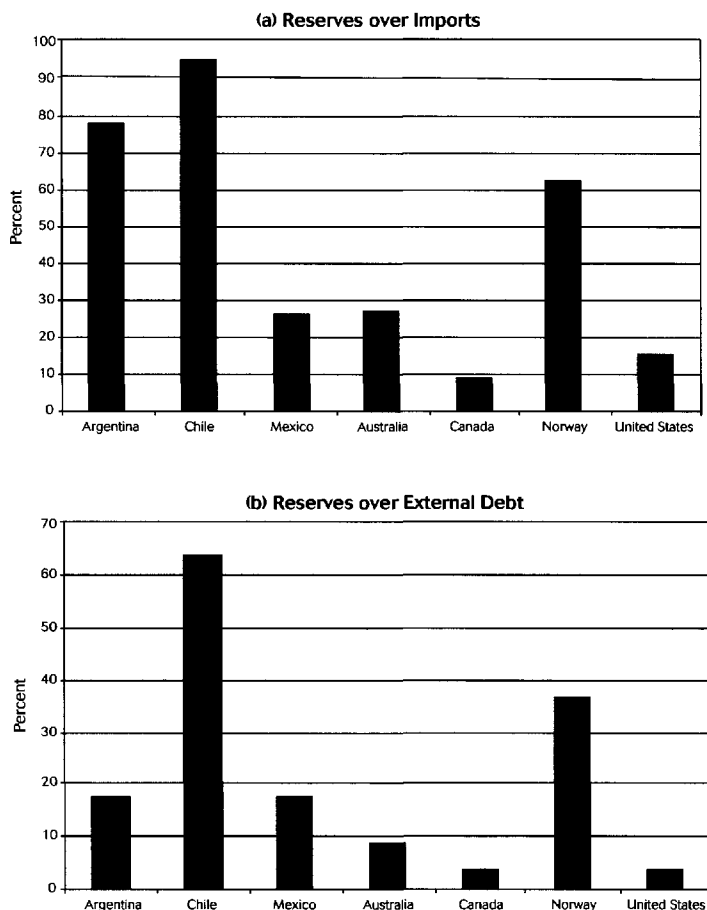
All things being equal, a fiscal contraction is better designed to handle a terms-of-trade shock. Not only does it reduce expenditure directly and free scarce financing to the private sector, but it also facilitates expenditure switching and an export-led offsetting of the decline in terms of trade. The impact on inflation brought about by tradables inflation is partially offset by less inflationary pressure from the nontradable side (more on this below). Thus the fiscal side ought to have a built-in automatic mechanism indexed to the terms of trade. When the terms of trade are low, expenses that do not suffer much from non-smooth behavior should be adjusted downward according to some pre-established rule.²⁵ Even with these contingencies built in, it is unrealistic to think that the Central Bank will be able to remain uninvolved, as it is the policy institution in charge of the short run. Fiscal contingencies are better than nothing, but some response will still be needed in specific circumstances. The suggestions below are aimed at further reducing the shock that needs to be absorbed by the Central Bank as well as at improving the transparency of its actions and hence reducing the costs associated with speculative attacks.

As mentioned, helping in the development of, and eventually contracting, international insurance and credit lines contingent on terms of trade should be pondered. The goal is not so much to reduce the wealth effect of these shocks as to reduce the financial strain they generate, which is the dominant and potentially more damaging problem.

Closely related to this is the reserves management strategy. Chile recently decided to fully float its exchange rate. It is not clear what this means for times of crisis, because it is unreasonable to assume that there will be no intervention of any sort.²⁶ When facing the forces triggered by a decline in terms of trade, the Central Bank may again choose to sharply raise interest rates or may choose to use its reserves and credit lines to limit exchange rate depreciation. The latter is the appropriate action, and the adoption of a flexible exchange rate should facilitate that strategy. Chile has an enormous amount of precautionary reserves (see figure 5.20). Further improved by the measures highlighted above, these reserves should be used much more freely when external credit becomes tight for the economy. Otherwise, why bother accumulating reserves? Again, a big element

²⁵ It is important that the rule be pre-determined. Indeed part of the most recent Chilean crisis arguably owes to the initial bickering between the Treasury and the Central Bank over who should make the first move on the impending adjustment.

²⁶ In fact, the Central Bank has announced that it will intervene in “special” circumstances.

Figure 5.20. Precautionary Reserves, International Comparison

Note: Data for 1997, except Norway data in panel b, which are for 1993. External debt for developed countries is from the International Monetary Fund (IMF). External debt for emerging economies is the sum of debt securities issued abroad, Brady bonds, bank loans, trade credit, and multilateral claims. External debt for developed countries is the sum of debt securities and other investment (including loans, deposits, and trade credits) according to the IMF classification.

Sources: Reserves and imports: IMF, International Financial Statistics (various years). External debt for developing countries: joint statistics from Bank for International Settlement, International Monetary Fund, Organisation for Economic Co-operation and Development, and World Bank.

of contingency (automatic and out of the Central Bank's discretion) on terms of trade should be built in.²⁷

As a complementary policy, it seems reasonable to allow for an explicit contingency in the Central Bank's mandate as well. Under poor terms-of-trade conditions, nontradables rather than overall inflation should be used to assess the performance of the Central Bank. Removing the contingent element and targeting nontradables inflation at all times should render similar results.

Finally, it is often said that the reason to peg a currency is to inherit the credibility of reputable international central bankers. The cost, of course, is that the country then imports monetary policies aimed at the problems of the other country, which may bear little relation to those of the country whose currency is pegged. A strictly dominant arrangement would be to keep the exchange rate flexible but appoint some of those reputable international central bankers to a supervisory board, which may verify the goals and actions of the domestic central bank. Chile may be beyond this stage, but others, especially international investors, may not feel that this is the case. On accountability and credibility of the Central Bank, it is worth playing conservatively, especially when Chile has nothing to hide.

Improving Liquidity Aggregation through and within the Banking Sector

Chile has succeeded in creating a well-monitored and supervised banking sector, where both foreign and domestic banks have sound practices and are by now well capitalized. Even in the midst of the recent crisis, banks were not a source of special concern. Without risking this soundness, and complemented by the reserve management strategy and the furthering of links between foreign banks and small and medium firms, it appears that the banks may be used more actively during crises.²⁸

One approach to consider is allowing for contingent capital-adequacy and reserves ratios. These should be lowered as terms of trade deteriorate. More specifically,

²⁷ Another policy to reduce the extent of crises is to mandate individual international liquidity requirements to corporations. This policy has advantages and disadvantages over centralized reserves holding. Chile's inefficiencies in international leverage are not large enough to justify the high costs of implementing such a policy. See Caballero and Krishnamurthy (2000b) for a model and discussion of policies for managing aggregate liquidity in emerging economies.

²⁸ In general, it is important to consider the policies suggested here as a package. Indeed, some policies that are advisable in a particular setting may not be when considered in isolation.

loans to small and medium firms could be penalized less in calculating these ratios, while the opposite may be done with consumption loans.²⁹

In the 1997-99 crisis banks increased rather than reduced their capital-adequacy ratios. This was particularly the case with foreign banks. It is important to identify whether this pattern was structural in any sense, for in that case there may be a need to constitute further financial stabilization funds whenever a domestic bank is acquired by foreigners.

To improve the functioning of the interbank market and the banks' access to short-term resources, opening the capital account for very short-term repo operations would help.³⁰

Improving the Liquidity and Immediacy of Domestic Financial Markets

Although capitalization values are high in Chile relative to the region, they are a misleading proxy for the liquidity and immediacy that Chilean equity markets provide. The situation is worse in the domestic corporate debt markets, which are negligible. Given the good progress that Chile has made on the quality of its supervisory and legal institutions, it is very likely that what lies behind the illiquidity of Chilean financial markets is the limited size of the Chilean economy, further compounded by the unequal distribution of wealth. Indeed, panel a in figure 5.21 shows that Chile does consistently worse than more advanced economies along the income distribution dimension, while panel b shows the large concentration of sales in the top Chilean conglomerates.

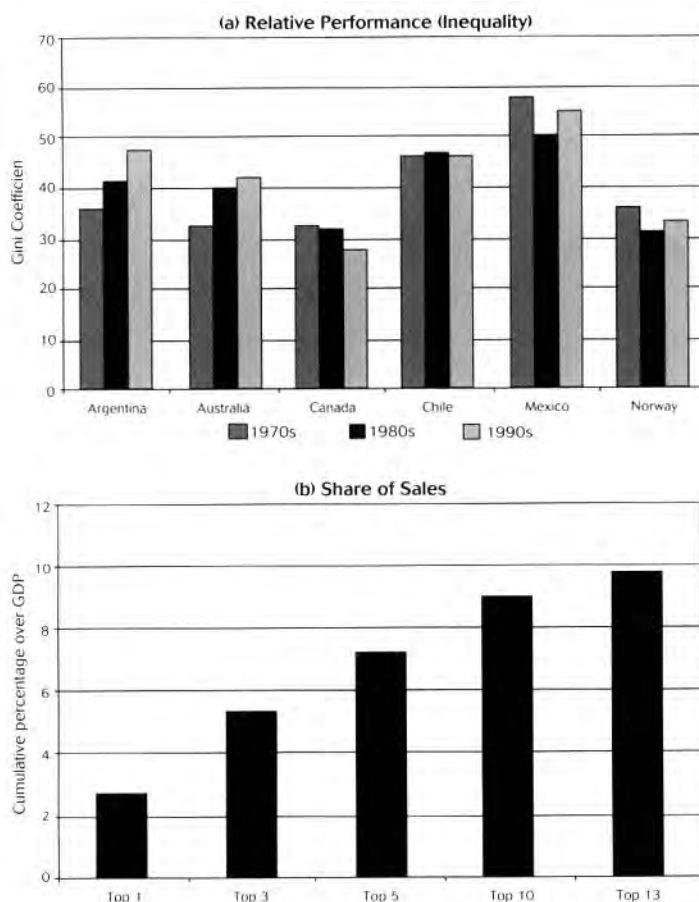
Since there is no obvious way to solve these problems in the short run—certainly not the problem of size, and the problem of wealth distribution has no short-term solution without unreasonably high costs in terms of efficiency—they must be taken as part of Chile's structure. Within the constraints of this structure, any solution must look for investors abroad and for institutional investors at home.

One approach is to attract international market makers to Chile. Since the size of the Chilean market is small, this may require allowing trades of good-quality instruments from other emerging markets in the Chilean stock and debt markets.

Conversely, it would be good to facilitate and subsidize the placement of ADRs or the equivalent. In order to make these more liquid, several small- and medium-size compa-

²⁹ During the 1997-99 crisis banks reallocated some of their credit from consumption to commercial loans. The idea was to facilitate this reallocation further.

³⁰ It does not make much sense to ban these transactions, especially when the goal is to fight a speculative attack on the currency. The fact that the Central Bank may find its monetary policy less effective in such circumstances is a plus, not a minus, for it comes from the possibility of a large supply of the scarce "commodity": capital inflows.

Figure 5.21. Wealth Distribution and Cumulative Sales

Note: Panel a: For each decade the figure was taken for one year that sometimes differs among countries. The recipient is household equivalent. Panel b: Economic groups are Luksic, Angelini, Matte, Errazuriz, Del Rio, Said, Larrain, Sigdo Koppers, Pathfinder, Hurtado Vicuna, Bofill, Fernandez Leon, Abumohor.
Source: Instituto Nacional de Estadísticas and Banco Central de Chile.

nies may need to be bundled on each issuance. If this is done, a mechanism is needed to limit free-riding problems among the bundled companies.

Similarly, a domestic corporate debt market should be developed with homogeneous instruments.

And, finally, the AFPs should be allowed to invest in lower-rated domestic instruments, especially during times of tight foreign financial markets.³¹

Appendix: Trends and Chronology

Trends

Mid-1970s-present: The export sector, one of the main engines of growth, is concentrated in commodities and primary industries (mining, small manufacturing, fruit, wine, fishing). There is a dramatic trade liberalization, including free trade agreements with Mexico, Colombia, Canada, and Mercosur. Exports are diversified in terms of markets (Asia, Europe, Latin America, United States). The mining sector represents 8 percent of GDP and 50 percent of merchandise exports. Investment and saving rates are very high by Latin American standards.

1981-present: Private pension funds are created, but it is not clear whether they are helping to increase saving rates, as households' savings do not increase. These funds are fundamental in the development of the local capital market. They manage around \$30 billion, including 11 percent of stock market capitalization. In 1996, 41 percent of resources are invested in Central Bank papers, 35 percent in private shares and bonds, 24 percent in financial institutions, and less than 1 percent abroad. (Funds are allowed to invest 9 percent abroad.) With the latest crisis, these funds start investing more abroad. The ratio of stock market capitalization to GDP is close to 1 (which is very high by Latin American standards).

1982-present: After the debt crisis (and ensuing bailouts), the government runs a budget surplus. Public external debt declines from \$15 billion in 1985 to \$5 billion in 1997. Private

³¹ Chile liberalized its investment options with respect to foreign instruments precisely as the country began experiencing the effects of the external crisis. This was a bad idea. It is not a matter of making pensioners absorb the risk; quite the contrary, these are scenarios of fire sales that yield high returns to medium-term investors. See the informal remarks on a related matter in Caballero (1998).

external debt grows from \$5 billion in 1985 to \$22 billion in 1997. The budget surplus is around 2 percent of GDP. Current savings (including capital expenditure and capital earnings) are 5 percent of GDP.

1990s: Chilean investment abroad increases significantly, reaching \$20 billion in 1997. Although mostly in Latin America, more than half is in Argentina.

There is a large consensus across the political spectrum over the need to maintain a liberal market economy and prudent monetary and fiscal policies. The political environment is stable, supporting strong property rights. Increasing investments are made in human capital and infrastructure. Poverty declines, but income distribution remains very unequal.

Monetary policy is in the hands of the independent Central Bank. There is a gradual, but sustained, reduction in inflation. In the third quarter of each year, the bank sets an inflation target for the next year, which the country has consistently achieved. The foreign exchange market for foreign trade is liberalized, but restrictions are maintained on short-term capital movements (inflows are subject to the *encaje*, a one-year non-interest-bearing reserve requirement). These controls tilt the composition of external debt toward longer maturities, but the real exchange rate appreciates considerably. In addition, only blue-chip firms with excellent credit risk ratings are allowed to borrow abroad (this begins to change in 1998). The dirty peg is the reference rate and flotation band. The reference rate varies with the basket of currencies. Allowance is made for 2 percent yearly appreciation due to high productivity growth. Foreign reserves increase significantly, due to the Central Bank's effort to sterilize massive inflows of capital and the ensuing appreciation and growth in money stocks (this implies high costs to the bank due to interest rate differentials). Starting in September 1999, the exchange rate is no longer targeted. The Chilean economy is fully indexed (wages, real estate contracts, financial contracts).

Fiscal management is prudent: the country experiences budget surpluses and falling public debt. The public sector is small, generally honest, and relatively efficient. Labor market restrictions increase, and minimum import prices are placed on basic food items.

Despite controls on capital inflows and sterilization policy, the real exchange rate appreciates 35 percent by February 1998, before depreciating close to 10 percent during the Asian crisis.

Chronology

1974-76: In December 1974, Pinochet becomes president. During this period, the government institutes radical reforms, a stabilization plan, trade liberalization, and the elimination of subsidies and price controls. Export-led policies are based on free markets. Social costs are high. The labor code is reformed to reduce payroll taxes and restrictive practices. Tax reform shifts taxes from production to consumption (the value added tax is 16 percent) and cuts income taxes.

1975: In September, Chile adopts a new currency, with the peso replacing the escudo.

1976: Chile abandons the Andean Pact.

Late 1970s: Chile experiences an economic recovery, partly due to a foreign-financed consumer boom. Unemployment and inflation fall; real wages begin to recover. Mini devaluations are announced in advance.

1977: A foreign investment law is passed.

1979: Import tariffs are reduced to 10 percent. The exchange rate is fixed to help bring inflation down.

1981: Social security reform is enacted.

1979-82: Chile experiences real appreciation and inappropriate bank regulations, with economic groups using banks for self-lending. Current account deficits are high, as is the external debt. Consumption and investment increase significantly.

1980: A new constitution is passed, providing for presidential elections and re-establishment of a bicameral legislature in 1989, with designated senators, a weak legislature, and an independent judiciary.

1982: The economic expansion ends. The number of bankruptcies grows as local firms are unable to compete with cheap imports. Copper prices collapse. Foreign loans dry up. The country enters a recession, with unemployment reaching 25 percent and GDP falling 14 percent. A major devaluation occurs. The government rescues banks and takes responsibility for massive foreign debts. Entrepreneurial empires that were built around these banks are liquidated. In June 1982, a maxi devaluation is announced.

1983: The popularity of the regime is at an all-time low. A protest movement begins to take shape. More civilians are in the cabinet. Economic liberalization is scaled back. The government is forced to suspend and renegotiate foreign debt service. Government takes charge of the largest private sector conglomerates.

1984: The Chicago boys are replaced by a more traditionalist economic team. The value added tax is raised to 20 percent. Import tariffs are raised to 35 percent.

1985: Agreement is reached with the International Monetary Fund (IMF), and Chile is granted full IMF conditionality. The government begins targeting real interest rates. As economic growth resumes and public protests cool down, the Chicago boys are brought back, led by Buchi. The slogan is "popular capitalism." A mini devaluation of almost 8 percent takes place in June. In July, import tariffs are reduced to 20 percent. In November, the foreign investment law is reformed, opening up further possibilities for foreign investment.

1986: In September, a new banking law is passed, giving wider powers to the Superintendency of Banks and Financial Institutions. Banks have to pass a whiteness test at the end of each year, demonstrating that they have adequate capital provisions.

1987: The economy is growing strongly again. The opposition ends the boycott of the 1980 constitution. Banks and companies rescued in 1982-83 are reprivatized. A new privatization program is launched, including telecommunications and electricity companies. The terms of trade improve.

1988: A debt-for-equity scheme is introduced to stimulate foreign investment and reduce foreign debt. Bank's debt to the Central Bank from the debt crisis rescue is turned into subordinated debt. Expansionary monetary policy is aimed at achieving high growth during the plebiscite. In January, import tariffs are reduced to 15 percent. A mini-devaluation of almost 4 percent occurs. In June, the value added tax is reduced from 20 to 16 percent. In October, Pinochet loses the plebiscite to remain in power.

1989: The economy overheats. In May, the constitution is reformed, increasing the number of elected senators and the level of civilian participation in the National Security Council and subordinating military authorities to the elected government. In May, the Central Bank is made autonomous. In December, Aylwin, the candidate of Concertación, the center-left party, is elected for a four-year term, winning 55 percent of the vote.

1990: In January, monetary policy is tightened. Real interest rates are increased 2 percent. In March, Aylwin assumes the presidency. He makes no major changes in economic policy. Also in March, the Central Bank starts relaxing monetary policy, bringing rates to pre-January levels by March 1991. In July, the value added tax is raised from 16 to 18 percent. Corporate and personal income taxes also are raised. The tax increases are used to finance greater expenditure on public health, education, and housing.

1991: The peso is stuck at the bottom of the band. The Central Bank is forced to accumulate large reserves. Growth in the money supply prompts a rise in interest rates, which makes the peso even more attractive for foreign investors. Massive Central Bank losses occur due to high interest rates and the need to sterilize capital inflows. In June, import tariffs are reduced to 11 percent. In August, Aylwin and Menem sign a treaty ending most territorial disputes between Chile and Argentina.

1992: In January, the Central Bank accepts that the trend toward revaluation is structural, reducing the reference rate 5 percent and doubling the fluctuation band to 10 percent each way. In March–October, monetary policy is tightened.

1993: Monetary policy remains tight. An economic cooperation agreement is signed with Bolivia. In December, Concertación's candidate Frei is elected for a six-year term (with 55 percent of the vote).

1994: The growth of government consumption slows down. The terms of trade and export growth improve, helping to reduce the current account deficit. Frei assumes the presidency in March. In June, Chile enters talks to join the North American Free Trade Agreement. In October, the government starts easing monetary policy. In November, the Central Bank purchases \$1 billion to keep the peso from appreciating, without success. It is forced to lower the official reference rate by 9.5 percent. Also in November, Chile becomes a member of the Asia Pacific Economic Cooperation forum.

1995: The minimum risk rating required for firms to issue bonds abroad is reduced from "A" to "B." The minimum amount for a foreign bond issue is cut from \$50 million to \$25 million. In April, the remaining exchange controls governing export earnings are eliminated. In May, the maximum an AFP can invest in stocks is raised from 30 to 37 percent, and the maximum it can invest abroad is raised from 6 to 9 percent. Private consumption grows almost 12 percent.

1996: In August–April, in the face of high domestic spending growth, the Central Bank

tightens monetary policy. Annual interbank rates are increased from 5 percent to between 7 and 7.5 percent. In October, Chile becomes an associate member of Mercosur. (The nonexport agricultural sector opposes the move because price supports will eventually disappear.) Also in October, foreign credit associated with direct foreign investment is made subject to *encaje*.

1997: From February to September, interbank rates are reduced from 7.5 to 6.5 percent. In April, the maximum amount an AFP can invest abroad is raised from 9 to 12 percent. In October, the Central Bank starts intervening heavily in the foreign exchange market to halt the peso's slide. In December, Concertación's share of the vote falls to 50 percent in congressional elections.

1998: A new banking law eliminates most of the remaining restrictions on capital outflows. Foreign banks account for 20 percent of total assets. Total government expenditure is 7 percent higher in real terms than in 1997. The government cuts spending \$685 million in response to lower-than-expected growth. Tight monetary policy is instituted to prevent depreciation and respond to lax fiscal policy. (The interbank rate reaches 50 percent for several days in September.) The economy goes into a recession in the second semester, experiencing a big terms-of-trade shock as the price of copper plummets and recession settles in Asia. There is a negative shock to national income of 3.5-4 percent of GDP. The peso declines, but the effect on the real exchange rate is limited due to foreign deflation. As real interest rates fall in Chile (with low nominal rates and expected devaluation), AFPs start investing abroad. In June, the *encaje* is reduced from 30 to 10 percent in an effort to attract foreign capital and support the currency. The flotation band is tightened from 12.5 to 5.5 percent. In September, the *encaje* is further lowered to 0 percent.

1999: The real exchange rate starts depreciating; it is no longer targeted. Import tariffs are expected to be cut to 8 percent.

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PART THREE

Policy Conclusions

There is an underlying structure behind the analysis of the three case studies, so it should come as no surprise that many of the remedial recommendations are similar in essence. In this, the concluding part of the book, the country-specific aspects of these recommendations are stripped down to highlight their common root and their link to the view portrayed in the first part of the book. While discussing policy options, this part also updates several policies adopted since the chapters contained in part II were written.

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GENERAL POLICY IMPLICATIONS: A PROPOSAL

Advanced Latin American economies are weak along two central dimensions: links with international financial markets and stage of development of domestic financial markets. As most primitive forms of macroeconomic volatility lose their importance as a result of reforms and regained fiscal and monetary discipline, these two ingredients, either directly or by leveraging a variety of standard shocks, probably account for much of fluctuations and crises in modern Latin America. Although conventional advice for conventional maladies remains, focusing on these two primitive and ingrained features offers a clear and potentially rewarding policy target.

Weak links to international financial markets are simply financial constraints, possibly time-varying, that limit the public and private international borrowing of emerging countries. These constraints limit the smoothing of shocks over time and are themselves a source of shocks. The small size of Latin American current account deficits relative to a neoclassical benchmark and the procyclical behavior of fiscal policy suggest the presence of an international borrowing constraint. Large swings in capital flows and sovereign spreads that seem to bear little relation—at least in magnitude—to economic fundamentals in Mexico and Argentina illustrate the fragility of this constraint. The crowding out of small firms by the government in Argentina and by large firms in Chile along with the inverted volatility ranking of Latin America's prime-firm equity markets illustrate some of the mechanisms through which external financial shocks affect the private sector. Excessive sensitivity of the Chilean economy to the price of copper and the volatility premium on Mexican and Argentine corporate debt issues further support the fragility of these links.

With regard to the second ingredient, financial markets are key not only in fostering investment and growth but also in allowing adequate aggregation of resources during distress. In the presence of weak international links, financial development affects an emerging economy's ability and incentive to aggregate its international collateral in order to intermediate funds to firms in need of international liquidity. The level problems in Mexico and Argentina as well as the illiquidity of Chilean stocks illustrate that Latin American financial markets still require further development. Nevertheless, as financial development rises, so does leverage and, with it, the vulnerability of the system to shocks. While Mexico in

1994-95 offered an extreme example of this, the excessive sensitivity of the relatively more financially developed Chilean economy to changes in interest rates also supports this hypothesis.

Underdeveloped financial markets ultimately limit the prompt reallocation of resources, creating wasteful contractions in those markets most affected by shocks or less plugged into the financial system. The negative correlation between financial development and cross-sectional dispersion in industry stock returns, discussed in each of the three cases, is evidence that the development of financial markets is an important factor in explaining aggregate volatility.

Structural Solutions for the Long Run

Dealing with these weaknesses requires two types of policies: (a) structural policies aimed at deepening domestic financial markets and foreign participation in them, and (b) macro policies aimed at dealing with and preventing crises during the transition toward a sounder financial system. The first type of policy is the subject of this subsection, while the second type is discussed more extensively in the next.

There are three basic and general points to be made here:

- *Aim right.* There is currently a widespread consensus on a series of general recommendations to improve external financial links, which can be found in most pamphlets on international financial architecture. These recommendations include norms of transparency and accountability; sound bank practices for supervision, settlement, accounting, and disclosure; aggregate risk management; and a series of related measures and practices aimed at improving a country's contractual environment and corporate governance.
- *Use the private sector.* Fostering the development of well-supervised institutional investors is an efficient mechanism for delegating the enforcement of standards of good corporate governance to the private sector, as these institutions often consider such factors in their investment decisions. For example, TIAA-CREF, one of the largest institutional investors in the United States, has made public that it does not invest in claims issued by companies with poor standards of corporate governance. Among its requirements are that (a) a company's board must consist of a substantial majority of independent directors (individuals with no significant personal ties, current or past); (b) a company's board must obtain shareholder approval for actions that could alter the fundamental relationship between shareholders and the board; (c) companies must base executive compensation on a pay-for-performance system and should provide full and clear

disclosure of all significant compensation arrangements. Few Latin American corporations would make it onto TIAA-CREF's list of institutions with good corporate governance. And as an example of the impact of institutional investors on market development, the Chilean stock market owes much of its relatively large capitalization value to the investments and monitoring of its pension funds.

- *Be wary of short-run measures.* Since doing so entails a tension between the short and long term, the imposition or removal of capital controls should be considered. Capital controls can supplement sterilization or, in principle, slow down capital inflows of a targeted maturity by themselves. Although these controls may be justifiable in terms of static second-best arguments, they may hurt in the medium term, once the endogenous arrival of international market makers and improvements in corporate governance are considered. This hints at an important synergy in fostering a deeper integration with international financial markets: not only is good corporate governance needed to achieve integration, but integration may be an essential ingredient to achieve good corporate governance as well. A reasonable recipe is that if the country's institutions are so far off the ideal ones that the decentralized equilibrium is very unstable, taxing capital inflows contingently (removing them during times of external distress) may be justified. If that is not the case, however, it may well pay to bear the additional risk in exchange for faster development of financial links and markets.¹

Macro Policy in the Short and Medium Run

As structural change in emerging economies will certainly take several years, the role of macroeconomic policy in the short term is to take steps to prevent and manage crises. Since underdeveloped domestic financial markets typically lead to a situation where, *ex ante*, international liquidity provision is undervalued, the goal of macroeconomic policy is to reallocate the use and availability of international liquidity from booms to crises. During crises, the goal is to reallocate liquidity to those economic agents that need it the most, but this must be done with care not to affect significantly and perversely *ex ante* incentives to hoard and create international liquidity. The following subsections highlight a few features of policies that appear desirable from the perspective adopted here as well as some caveats to standard advice.

¹ In May 2000, Chile opted for permanent removal of capital controls together with a series of measures aimed at improving corporate governance, integration with international financial markets, and the development of domestic financial markets.

International Liquidity Management

Monetary policy. The quintessential monetary policy to deal with this problem of international liquidity management is a sterilized intervention—essentially, the central bank sells public bonds for international reserves—during the boom in capital flows. The counterpart ought to be the selling back of these reserves during external crises. Experience and theory suggest that the first half of this policy—the sterilized intervention—is hard and expensive to implement for prolonged periods, and it may even backfire as the private sector reacts perversely to the quasi-fiscal deficit, appreciation, and accumulation of reserves at the central bank.² This probably is not an instrument that can be used for medium-term prevention.

Fiscal policy. Grounded on Keynesian mechanisms, *optimal* fiscal policy over the business cycle is traditionally thought of as being countercyclical. The pattern of procyclical fiscal deficits in Latin America thus has been interpreted as a seriously suboptimal policy and most likely the result of the financial constraints faced by the governments themselves. However, when external financial shocks are an important source of fluctuations, the economy should optimally distribute the scarce available international resources across domestic economic agents so as to smooth differences in financial distress. It is highly unlikely that government expenditure, unless used very selectively to solve financial distress in the private sector, is the right place to allocate the marginal dollar.³ *Fiscal policy may need to be procyclical after all.* This is an optimal policy argument, as opposed to the more standard one that explains the fiscal pattern in terms of the financial constraints faced by the government itself. Which effect dominates depends on whether the private sector (perhaps a specific sector within it) or the government faces the tightest financial constraints during the crisis.

Labor markets. Most countries in the region are in need of a modern labor code, and the pervasive problem of income inequality makes such reform more complicated. The main point to emphasize here is that, leveraged by financial problems, Latin American economies are exposed to much larger short-term adjustment needs. These needs are highly unlikely to be accommodated fully—to a different degree in different countries—by exchange rate movements. A new labor code should allow for a more or less automatic recession/crisis package. For example, following the advice of those who argue that tem-

² See Calvo (1991) and Caballero and Krishnamurthy (2000b).

³ This also suggests that fiscal adjustments during crises ought to be done on the expenditure rather than the taxes side. And if taxes are unavoidable, they probably should be targeted away from the supply side of the economy.

porary contracts have not been effective in Europe is misguided.⁴ While the European problem is primarily one of lowering structural unemployment, Latin American economies also need to deal with sharp short-term crises. Thus the Latin American solution at the very least should allow for a contingent relaxation of constraints on temporary contracts, fostering this form of hiring during crises.

Debt management. Since the government itself may trigger a crisis in the face of large debt renewal or payment, it has become a common practice to advocate a debt management strategy that avoids lumps. Although this is sound advice, as the government rightly reduces its own bottleneck, the private sector probably will undo part of the smoothing. It is not simply the public debt schedule that matters, and the private sector may undervalue the benefits of smoothness in the repayment of aggregate debt.

Exchange rate system. Since the optimal policy is to reallocate international reserves from states of high to low capital flow, it clearly has an element of real exchange rate stabilization. Reserves management must be active and transparent.

Liquidity ratios and banks. Active management of bank reserves, capital-adequacy ratios, and possibly international liquidity ratios also can affect the aggregation of international collateral. The level of these ratios should decline as the degree of financial development improves and should be made procyclical. However, there are two practical problems with procyclical ratios. First, for those countries where the health of the banking system is suspect, weakening standards may make a run more likely; this was a concern in Argentina during the recent crisis. Second, the policy may be ineffective during crises since the constraint may not be binding. This appears to be especially true when foreign banks have large market shares. For example, in Chile the capital-adequacy ratios of foreign banks rose significantly vis-à-vis those of domestic banks during the recent crisis.⁵ Although there is no doubt that importing solid international banks is a must, it also is important to understand the implications for aggregate liquidity management.

International Insurance

Without the core weaknesses described above, an emerging economy could easily smooth external shocks. As long as these structural problems are present, however, a significant component of the aggregate risk associated with external shocks should be insured away

⁴ The argument against temporary contracts is not that they do not create employment, but that they separate even further insiders from outsiders by reducing the pressure on insiders and creating a class of temporary—unskilled—workers.

⁵ Refer to the policy section of Caballero (2000b).

when feasible. Aside from controversial taxation of short-term capital inflows, governments often resort to stabilization funds and other self-insurance mechanisms. Industrial policy aimed at export diversification is another approach.⁶ The macroeconomic measures discussed above are also forms of aggregate self-insurance. All of these policies are generally expensive and inefficient methods of insurance, but unfortunately the incomplete nature of the corresponding insurance and hedging markets often makes them the most viable option.⁷

Why these markets are so incomplete is a key research question that probably should be linked to the emerging literature on underdeveloped catastrophe risk markets in more developed economies. Aside from incentive problems affecting countries, the high correlation of commodity prices with global activity probably makes the capital required to insure that risk very expensive and too large for insurance companies to mobilize the capital. It is here where a market-making role by the international financial institutions may represent a significant aid.

Contingent Policies

Because much of the modern Latin America's volatility problems ultimately can be linked to external financial factors and terms-of-trade shocks, themselves important only due to weak international financial links, the basis for designing a solid contingent policy is clearly outlined. While most macroeconomists would agree in principle on the cyclical features of the policies described above, much more disagreement would arise in practice. Opposition often comes from those who put credibility issues ahead of the rest. Most prominent is the example of the exchange rate system, where the main argument in favor of dollarization and other strong fixed systems is their credibility.

However, the most credible policy is that which is most suited to the scenario faced by the country. Not only the *cost* but also the *benefits* of abandoning a system are what make a policy credible or not. Speculative behavior that is created by discretion can

⁶ Yet another is to sell domestic assets to foreigners (see, for example, Inter-American Development Bank 1995). The issues here are when to sell and, closely related, whether the perceived agency problems (for example, risk of expropriation) are low enough to prevent a steep price discount.

⁷ The need for intervention is motivated by another manifestation of the underprovision of international liquidity: international insurance is undervalued by the private sector. Since long-term external debt is simply short-term debt plus a rollover insurance contract, the private sector will, on average, borrow at maturities that are shorter than socially optimal. From the point of view of the aggregate economy, the private sector will underinsure with respect to terms-of-trade and external financial shocks.

be largely eliminated by making the contingent rule explicit. This rule must be simple, easily verifiable, and a function of variables not directly controlled by the authorities. Terms of trade (in most cases) and some index of the tightness in international financial markets (such as the emerging market bond index spread) would probably suffice. Some important examples of state-contingent policies include, but are not limited to, the following.

Monetary policy and the exchange rate. If the locally preferred exchange rate system is fixed, for example, it may be allowed to depart transitorily from its long-run parity as a function of the state, with care being taken to eliminate any arbitrage opportunities. If the choice is flexible, the rule must control the release of central bank reserves to the open market. The best system is probably a flexible exchange rate system coupled with a very active—but explicit and contingent—reserves management strategy and a nontradables inflation target. Reserves management is aimed at reallocating international liquidity. A nontradables inflation target provides an anchor that is not directly affected by short-run fluctuations in the exchange rate, especially those that are needed on the face of an external shock. When credibility problems are severe, however, a fixed regime may be preferable, while still preserving the reserves management strategy. As this case requires potentially costly mandatory international liquidity requirements or taxes on capital flows, a close eye must be kept on the consequences of these policies for the private sector's incentive to hoard and produce international liquidity.

Fiscal Policy. All things being equal, a fiscal contraction is better designed to handle a terms-of-trade shock than a monetary tightening. Not only does it reduce expenditure directly, free up financing to the private sector, and facilitate expenditure switching, but by allowing the real depreciation to take place it improves the outlook for exports and hence for international collateral. It seems reasonable that fiscal policy ought to have a component indexed to the terms of trade. When the terms of trade are low, expenses that do not suffer from non-smooth behavior should be reduced according to some pre-established rule.

Labor Markets. Similarly, although in normal circumstances firms should insure workers, rather than the other way around, when crises have severe financial implications for firms, the insurance may have to be turned around quickly (at least from employed workers). Indexing labor costs—for example, contributions to unemployment insurance and (future) severance accounts—to the terms of trade and external financial conditions may be sound as well.

This book has highlighted domestic—as opposed to international—reforms and policies to overcome chronic volatility. This focus reflects both views on what is most immediately feasible and limitations of space. It does not absolve the international financial system of blame: the system will have to solidify its relation with advanced emerging economies. These economies have already undergone substantial changes and, in many ways, exhibit more prudent and responsible conduct than many developed economies. It is not

reasonable, as a medium- and long-term outcome, that these emerging economies have to do so much expensive self-insurance and be deprived of the advantages of short-term and own-currency borrowing, just to name a few constraints. It is perhaps here that the international financial institutions can play a major role by helping to deepen financial markets and integration. On this account, the World Bank's recent issuance of bonds denominated in Chilean pesos (*unidades de fomento*) represents a significant step forward in the development of an important missing market. With the same goal in mind, advanced Latin American economies may also want to integrate and homogenize their financial markets.

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ECONOMIC DEVELOPMENT

What are the sources of structural volatility in Latin America? To address this question, *Macroeconomic Volatility in Reformed Latin America* focuses on the factors responsible for macroeconomic instability in three Latin American economies: Argentina, Mexico, and Chile. It finds that volatility in these countries can largely be traced to two critical weaknesses: weak links with international financial markets and underdeveloped domestic financial markets. Using the case studies, Ricardo J. Caballero outlines a framework that serves not only to explain aggregate volatility in other parts of the world, but is also relevant in designing policy to reduce the frequency and magnitude of new shocks.

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