



*Inter-American Development Bank  
Banco Interamericano de Desarrollo (BID)  
Research department  
Departamento de investigación  
Working Paper #421*

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

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August 2000

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

Caballero, Ricardo J.

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

p. cm. (Research Dept. Working paper series ; 421)

Includes bibliographical references.

1. Structural adjustment (Economic policy)--Chile. 2. Chile--Economic policy. 3. Chile--Economic conditions--1988-. 4. Economic stabilization--Chile.  
I. Inter-American Development Bank. Research Dept. II. Title. III. Series.

338.543 S474--dc21

82000

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

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## **Acknowledgments**

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

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## 1. Summary and General Recommendations

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, it has been a leader beyond 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 discussed in the companion papers in this project (see Caballero 2000a, 2000b, and 2000c). This report, however, is concerned with the structural sources of volatility that remain in the Chilean economy.

The sudden and sharp crisis experienced by Chile at the end of 1990s, after a decade of stellar performance, has brought about great anxiety not only to Chileans but also to regional policymakers who used to see in Chile's stability the eventual reward for their respective 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.<sup>1</sup> An *advanced developing economy* is still fragile, as Asia has so vividly shown recently, 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.<sup>2,3</sup> One of the main goals of this report is to identify some of these imbalances and shortages.

The other main goal is to propose remedies to these problems. Unfortunately, even if these problems are correctly identified, fixing them is not an easy task in an

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<sup>1</sup> See Caballero and Krishnamurthy (1999) and Aghion *et al.* (1999) for models where the correlation between financial development and economic stability is non-monotonic. Importantly, however, welfare is monotonically increasing with respect to institutional and financial development.

<sup>2</sup> It does seem, however, that the rewards of successful reforms do 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 at which the economy recovers from such crises.

<sup>3</sup> The serious decline in electricity provision in Chile during the last year, primarily due to a severe drought, is a symbolic example of the lack of precautionary options. Shocks that compromise a single "pipeline"—be it electricity distribution, financial services, or a road—have deep impacts. Precautionary options and the ability to handle complex scenarios are luxury goods whose rewards come precisely on the form of tamed volatility.

advanced developing economy. While institutional underdevelopment in certain areas typically leads to distortions which justify second best policies, the distance from “efficiency” is short enough that it may be worthwhile to avoid them if they are to slow down significantly the institutional developments that are required to achieve the “first best.”<sup>4</sup> This report 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. There are at least three domestic factors which 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) *a still limited development of financial markets, particularly for medium and small size firms (PYMES as they are known by their acronym in Spanish)*.<sup>5</sup>

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

- 1) *Improve external financial links and reduce direct exposure to external shocks*. In addition to dealing with the domestic problems mentioned in this report, which are in themselves conducive to fragile international financial links, there are at least seven slightly more specific recommendations and considerations:
  - a) Continue the process of 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 concentration of ownership) without further integration with international

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<sup>4</sup> This is less of a dilemma for less advanced economies, since avoiding these second best policies leaves the economy too exposed, and for far too long, to justify such action on the grounds of its potential long run contribution to institutional development.

<sup>5</sup> See Caballero and Krishnamurthy (1999a) for a model of the negative dynamic interactions between weak international financial links and underdeveloped domestic financial markets.

- financial markets. The (two-way) synergies between corporate governance and integration are substantial.
- b) Contract international insurance and credit lines on terms of trade shocks, although this requires a concerted effort by countries exposed to these risks and potential insurers to create the appropriate markets.<sup>6</sup>
  - c) Foster the direct relationship between in-home foreign banks and the PYMEs.
  - d) Facilitate the residence of recognized international market makers. This may require liberalizing further the short-term capital account.
  - e) If the short-term capital account is not liberalized, at the very least taxes on short-term capital movements should be made contingent (procyclical) on terms of trade.
  - f) Homogenize domestic and foreign corporate and public bonds, and provide incentives to place unhedged *unidad de fomento* (UF) denominated bonds abroad.<sup>7, 8</sup>
  - g) Further relax the rating constraints on the companies placing American Depositary Receipts (ADRs) and other instruments abroad, but seek an alternative reward for the achievement of a high international credit rating.
- 2) *Mold terms of trade contingencies into anti-cyclical policies.* In particular, consider:
- a) Design an automatic fiscal policy component that behaves *procyclically* with respect to terms of trade.<sup>9</sup>
  - b) This is yet another reason to contract the insurance and credit lines mentioned above.
  - c) The Central Bank should supplement its new flexible exchange rates system with an explicit (mostly non-discretionary) and aggressive reserve management policy contingent on terms of trade. Exceptionally low terms of trade should

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<sup>6</sup> The similarities with “catastrophe risk” insurance are worth exploring.

<sup>7</sup> Unhedged means that there is no domestic counterpart selling the hedge to foreigners, with the exception, perhaps, of export companies.

<sup>8</sup> As of 1998, Chilean companies are permitted to do so. The point here is to go beyond that and foster it.

<sup>9</sup> 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. Arguably, Chile suffered from some of this problem during the current crisis.

- automatically lead to substantial reserves use by the Central Bank; otherwise there is no need to accumulate costly reserves.
- d) The mandate of the Central Bank should also be contingent on terms of trade: During times of depressed terms of trade, the current account should be the net of the income effect of terms of trade and the inflationary target should be made on nontradables inflation alone.<sup>10</sup>
  - e) If credibility is perceived to be a serious problem, which I do not perceive it to be, the Central Bank could consider appointing an international supervisory board.
- 3) *Improve liquidity aggregation through and within the banking sector during crises.* To this effect, consider:
- a) Allowing for contingent capital adequacy and reserves ratios. These should be lowered, possibly with a lag to match the systemic rise in non-performing loans, as terms of trade deteriorate.<sup>11</sup> More specifically, loans to PYMES could be penalized less in these ratios' calculations, while the opposite could apply to consumption loans.
  - b) Improving 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.
- 4) *Improve the liquidity and immediacy of domestic financial instruments.* There are least four measures that, in conjunction with many of the measures mentioned above, should help achieve this goal:
- a) 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.

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<sup>10</sup> In fact, currently the Central Bank's mandate does consider the current account at "normal" terms of trade, but it is not clear at all from the Central Bank's behavior whether it indeed 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, again, to think of this as one measure within a broader package.

<sup>11</sup> Any additional risk of a run that could arise from such strategy could be explicitly insured by, e.g., the Central Bank. It is also important to highlight that during the current 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 differences and, if needed, establish mechanisms to offset their systemic consequences.



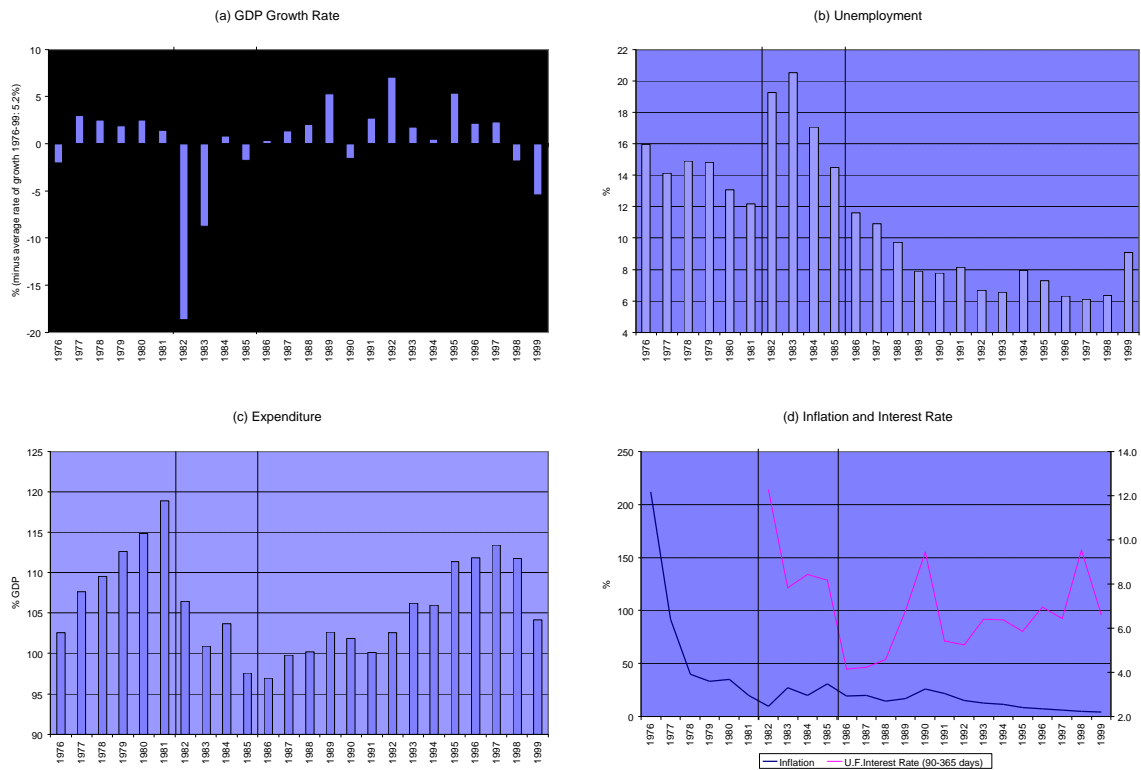
- b) Conversely, facilitate and subsidize the placement of ADRs or their equivalent. In order to make these more liquid, it may be necessary to bundle several small and medium size companies on each issuance. If this is so, there must be a mechanism in place to limit free-riding problems among the bundled companies.
- c) Similarly, develop a domestic corporate debt market with homogeneous instruments.
- d) Allow pension fund administrators (abbreviated to AFPs in Spanish) to invest in lower rated domestic instruments, especially at times when foreign financial markets tighten.

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

## 2. The Facts and Mechanisms

### 2.1 Aggregate Volatility

Figure 1: Growth and Volatility



Notes: preliminary data used for 1998 and predicted data for 1999. Panel (a): For the 1982-85, the average rate of growth was 2.1%, while from 1976 to 1981 and from 1986 to 1999 was 6.8%.

Source: INE and Banco Central de Chile.

Figure 1 divides the last three decades into three sub-periods, delimited by vertical lines: the pre-debt crisis, the distress following that crisis, and the period that followed the new wave of reforms begun in 1986. The last coincided with a sustained recovery in copper prices and was further bolstered by the 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 rate of GDP growth in Chile over the three periods, in deviation from its average rate of growth for the whole period, 5.2%. The success of the post-1986 period, occasionally referred 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, indeed 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, nonetheless, a phenomenon expressed most dramatically during the severe current crisis (see all panels) and in occasional real interest rate surges (panel d).

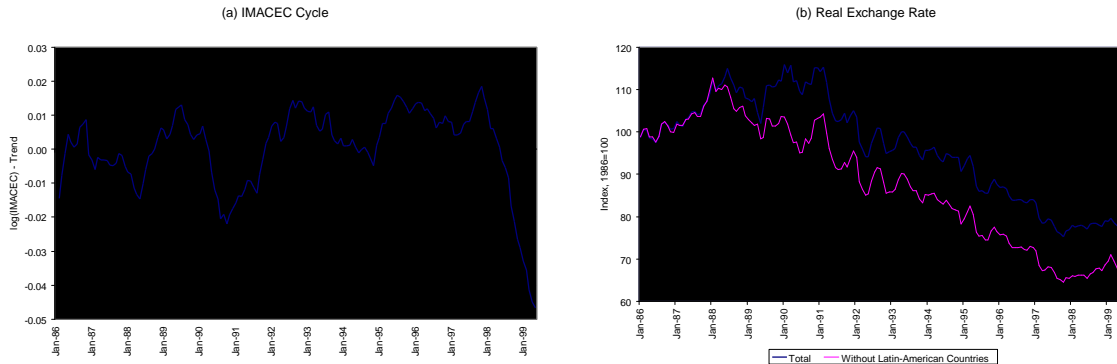
Figure 2 focuses on the post-1986 period, which is the main concern of this report. Panel (a) reports the detrended IMACEC, a comprehensive cyclical indicator for the Chilean economy.<sup>12</sup> There are three periods of interest highlighted by this series: the growth recession of 1990 that followed 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 are the episodes that generate most of the information used in this report. 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 recent crisis, when appreciation slowed down and eventually began turning around.

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<sup>12</sup> 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 2: Post 1986 Period



Notes: Panel (a): log of seasonally adjusted series without trend (3-month MA).

Source: INE and Banco Central de Chile.

The next subsections describe and document what I view as the main structural factors behind the Chilean business cycle.

## ***2.2 Weak International Financial Links and Excess Sensitivity with Respect to Terms of Trade Shocks***

The relatively small size of emerging economies' current account deficits 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, while the international constraint is not binding, domestic policies are undertaken to prevent changes 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 in this limited access that is important. Fragility arises primarily from changes in international financial markets attitudes toward emerging markets (justified or not), and from declines in the perceptions about the economic conditions in the country itself. It is the latter which seems to dominate—although it interacts with the former (see below)—in modern-Chile, as its business cycle has strikingly strong connections to the

price of copper, its main export product, violating basic principles of smoothing through international financial markets.<sup>13</sup>

Panel (a) in Figure 3 plots the paths of the spot price of copper (London Metal Exchange) and quarterly GDP growth. The resemblance is stark, with the only important exception being the 1990 growth slowdown and its recovery episode, which had a purely domestic origin (see below). 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.<sup>14</sup> 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.<sup>15</sup> Panel (c) reinforces this conclusion by plotting the mildly volatile annuity volatile next to the much more volatile pure flow-income effect (as a fraction of GDP) of price fluctuations. Moreover, it is the latter that has fluctuations of more or less the same order of magnitude as those of GDP. Finally, the loop in panel (d) summarizes the figure. It confirms both the strong positive correlation between growth and copper innovations, as well as the "excessive" response of the former.

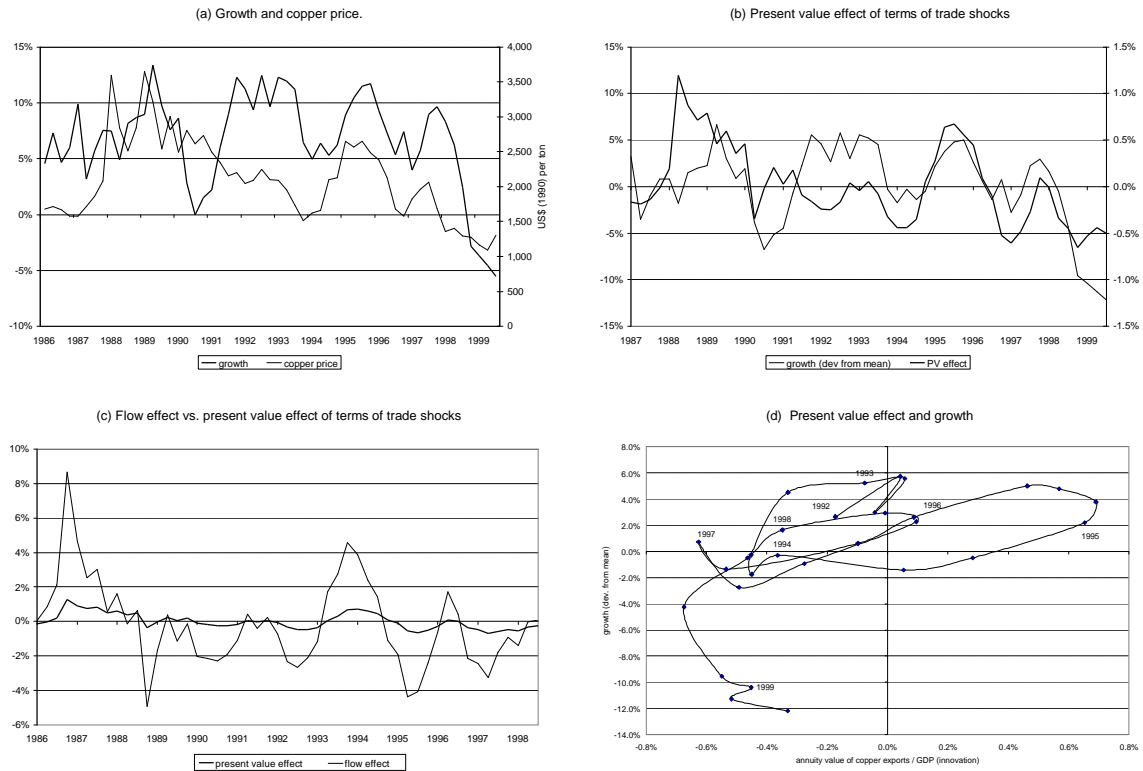
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<sup>13</sup> During the late 1990s, Copper exports accounted for about 40 percent of Chilean exports, which is equivalent to about 9 percent of its GDP. Chile has a Copper Stabilization Fund (FEC in Spanish) aimed primarily at stabilizing fiscal revenues: 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% 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% below the average.

<sup>14</sup> The present value effect is computed assuming an autoregressive process of the fourth order-AR(4)-process for the spot price of copper, a constant growth rate for copper production (7%) and a fixed discount rate (7.5%).

<sup>15</sup> The price of copper has trends and cycles at different frequencies, some of which are persistent (see Marshall and Silva, 1998). But there seems to be no doubt that the sharp decline in the price of copper during the current crisis was mostly the result of a transitory demand shock brought about by the Asian crisis. As the latter economies have begun recovering, so has the price of copper. I would argue that conditional on the information that the current 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 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-months-forward futures prices. Moreover, the expectations computed from the AR process track reasonably well the expectations implicit in futures markets, except at the very end, when liquidity premia considerations may have come into play.

Figure 3: Excess Sensitivity

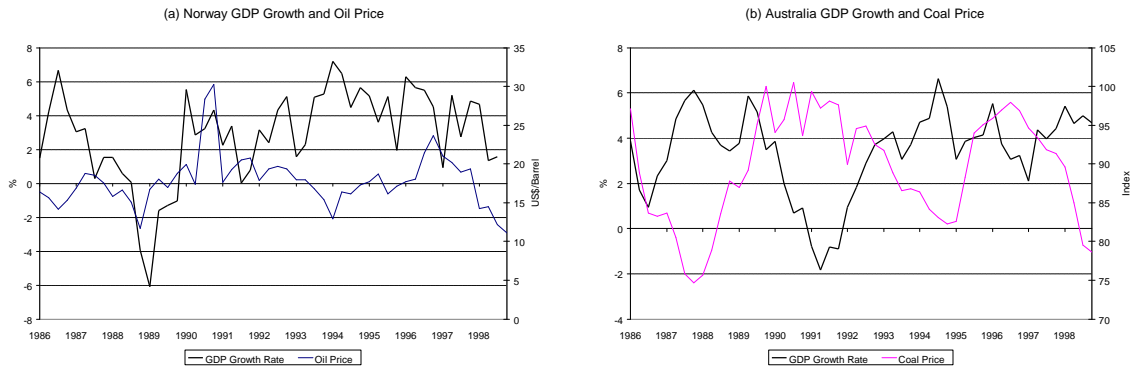


Sources: growth from IFS, copper prices (London Metal Exchange) from Datastream, copper exports from Min. de Hacienda.  
 Panel b construction: see notes 14 and 15.

Figure 4 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 are countries that, while more advanced than Chile, also have their exports concentrated in a few commodities.<sup>16</sup> It is apparent from this figure that they do not experience nearly as much correlation between the price of their primary exports and their respective rates of growth as Chile does. This further emphasizes the “excessive” nature of Chile’s response to copper prices.

<sup>16</sup> For Australia, coal represents a bit more than 10 percent of exports and, together with wheat and wool, this share rises to around 20 percent. Very significantly for this report’s comparisons, all these countries’ terms of trade were severely hurt by the sequel of crises starting in mid-1997.

Figure 4: Terms of Trade Shocks in Australia and Norway



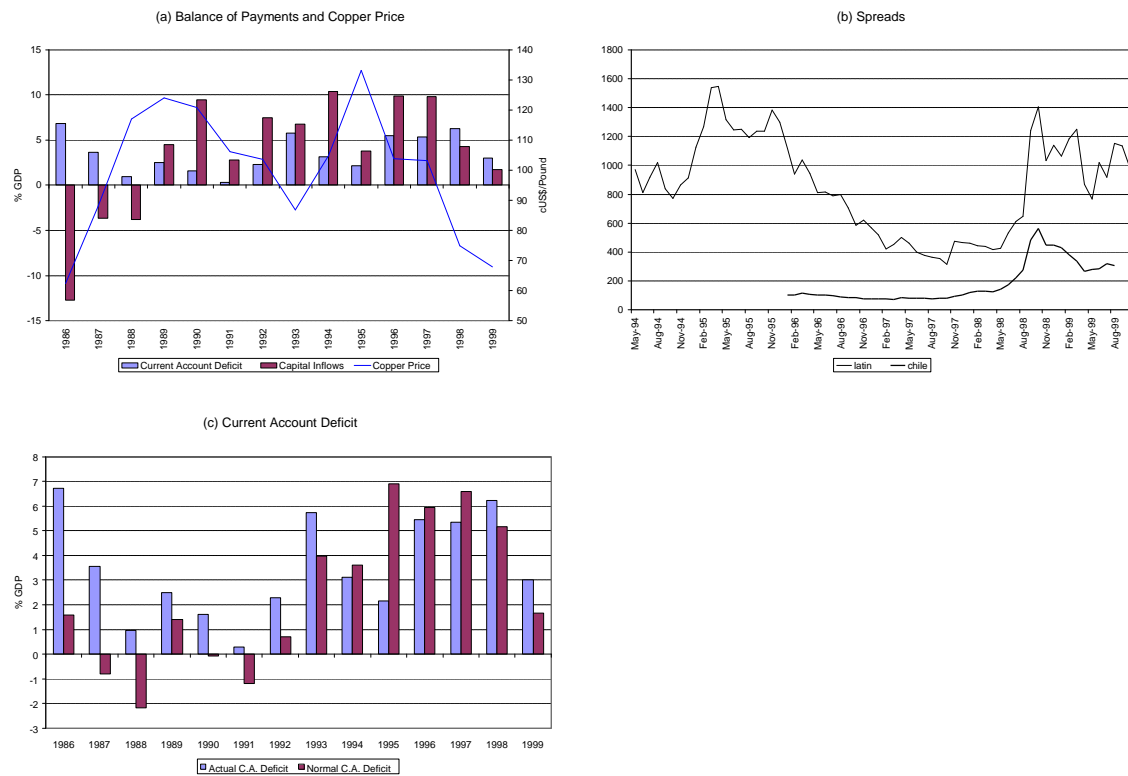
Source: IFS. Oil Price (Brent) from Datastream.

Why does Chilean economic activity respond so strongly to the price of copper? In my view, the fundamental problem is one of weak links to international financial markets, which the rest of this section helps document. Domestic factors are not absent either, as these 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 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 copper price, 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 flows were. 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 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—indicated by the spreads

reported in panel (b)—the high copper price gave the Chilean economy enough “liquidity” to ride out 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.

Figure 5: External Conditions



Source: INE and Banco Central de Chile. Panel (b): Latin is average of Argentina, Brazil, Mexico and Venezuela spreads on Brady bonds sovereign debt. For Chile spread on corporate debt (Enersis).

Most importantly, exactly the opposite has occurred during the current 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 dreadful



combination of low liquidity and limited external financial resources (which triggered a precautionary response by the Central Bank as well; see below).<sup>17</sup>

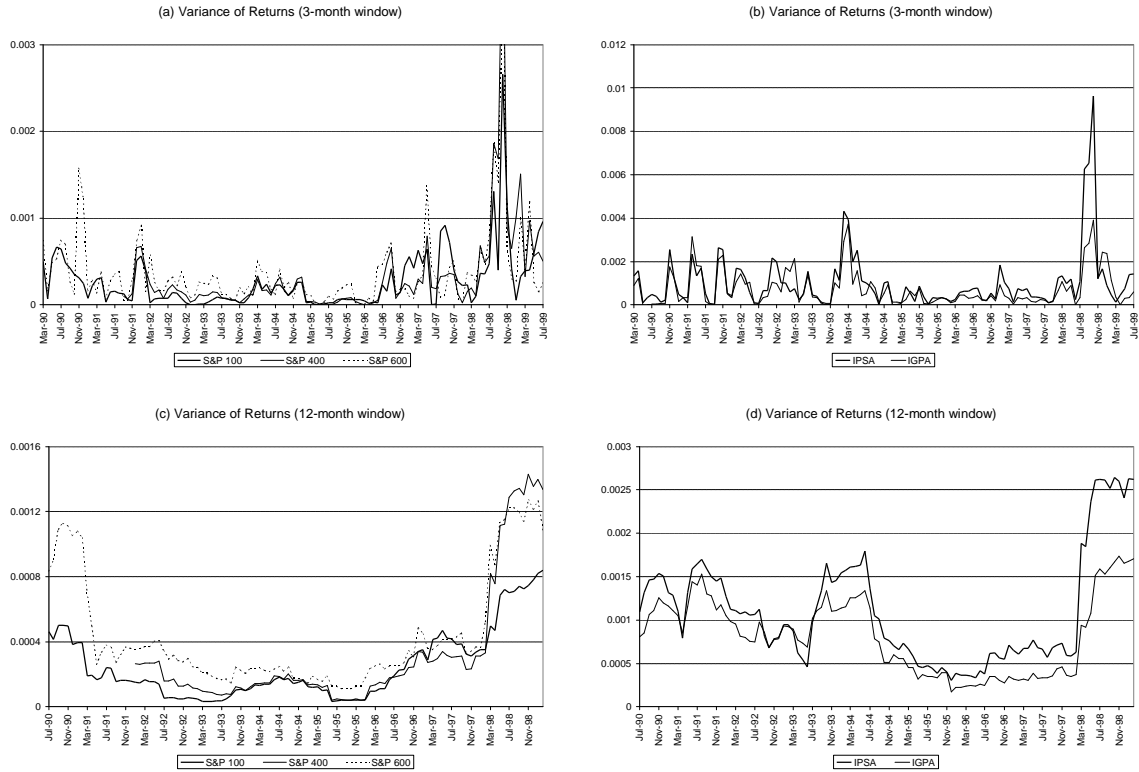
Figure 6 illustrates yet another, albeit more conjectural, dimension of the weak and volatile international financial links. Panel (a) uses U.S. stock returns data to illustrate the variance of returns over a 3-month-window centered at the indicated date. The thick line corresponds to a prime-firms' index (S&P100), while the other two are more inclusive indices (S&P400 and S&P600). As one would expect, the more inclusive indices are more volatile, especially at times of aggregate turbulence and distress, reflecting the greater vulnerability of smaller firms. Panel (c) is similar but with a 12-month window. This sensible volatility ranking is in sharp contrast to that found in Chile, especially during the current crisis. Despite the fact that the relative vulnerability of small firms is at least as large in Chile as in the U.S., 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 (a prime-companies index) with a thick line, and that of the IGPA, a more comprehensive index, with a thin line. 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 capital flow swings.<sup>18</sup> This hypothesis is supported by the fact that most of the disparity in volatility arises during the current crisis, which is clearly related to external financial factors (see Figure 5).

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<sup>17</sup> Note that terms of trades were also bad in 1993 and that, consistently, growth slowed down that year as well (see figure 1). However, international financial markets were buoyant at the time so this decline was not come accompanied by a severe credit crunch.

<sup>18</sup> Another interpretation is that the finding is spurious, as the more comprehensive series is polluted by too many no-trades. Although this remains as a possibility, a similar pattern was observed in Argentina (see companion report) where aggregate volume data did not seem to support this alternative interpretation. It is also important to realize what the relative-volatility claim in the text is not about: it does not say that large firms' financing is more distressed than that of smaller firms during crises. Indeed reality is quite the opposite, as concerned local banks reallocate their loans toward larger companies. It just says that an important segment of the demand for the shares on prime companies fluctuates with international sentiment about emerging markets and Chile in particular.

Figure 6: Variance of Stock Returns. United States vs. Chile



Source: Datastream.

To summarize, while Chile is ahead of the region in terms of its ability to tap international markets—as is 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 the terms of trade shocks it experiences. This response is exacerbated by domestic factors, as described in the following sections.

### 2.3 Domestic Shocks and Amplification Mechanisms

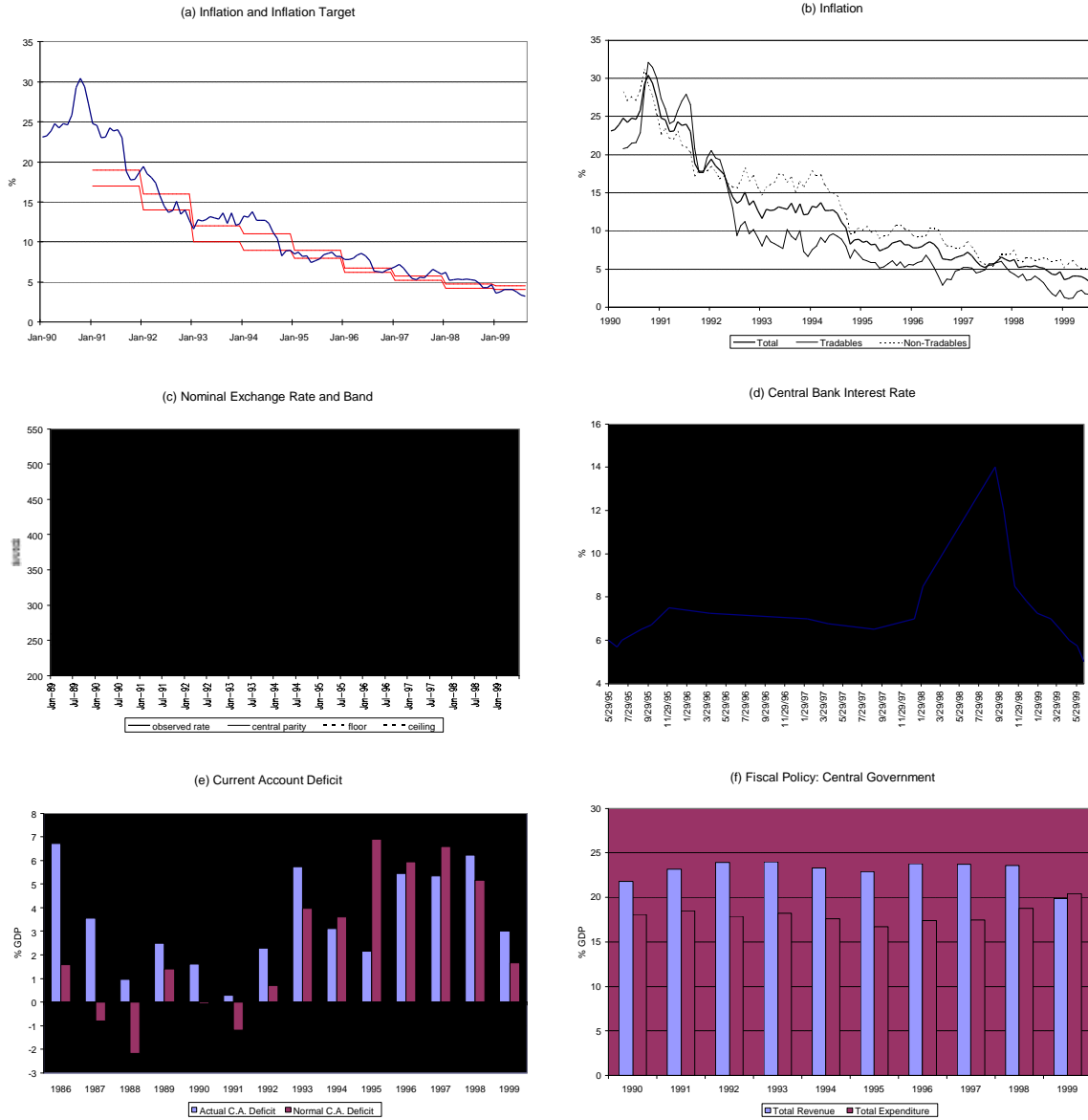
What makes the Chilean case more subtle than that of most other economies in the region is that, while the correlation between external factors and domestic business cycles is indeed very high, there has been no episode in recent times where the external constraint has come to a point where severe and immediate adjustment was the only option

available. During the current episode, as external conditions 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, 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'll probably never know. However, here I highlight two semi-structural aspects of the Chilean economy that complicate its handling of external shocks. The first is a mandate on the Central Bank which, while appropriate on average, is ill-designed to deal with terms of trade shocks. The second is a financial structure that is not prepared to smooth the normal rough edges of monetary policy and is prone to “waste” liquidity. I further split the discussion of the second feature into two sets of issues: those that relate to banks, and those that have to do with problems in the financial system at large.

### *2.3.1 A Central Bank Mandate that is Inconsistent with Terms of Trade Shocks*

The mandate 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 four percent—it obviously becomes more sensitive toward the latter when external financial conditions tighten. Under this mandate, the current scenario represented the Central Bank’s “worst nightmare.” 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. What the Central Bank did, however—optimal or not—was within its mandate; a sharp tightening of monetary policy was the outcome.

Figure 7: Targets and Policies



Notes: Used 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 we calculate the "normal" C.A. as the difference between the actual C.A. and  $dPx * X - dPm * M$ , where  $dPx = (Px - Pxn) / Pxn$ ,  $dPm = (Pm - Pmn) / Pmn$ , and  $Pxn$  and  $Pmn$  are the exports and imports "normal" average prices for the period. Sources: Banco Central de Chile and Ministerio de Hacienda.

Panel (a) in Figure 7 shows the path of inflation and the targets. The rise in inflation explains the tightening and recession of that year, 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 had to do with the pressure that tighter external conditions and a decline in the terms of trade began to exert on the exchange rate. Indeed, panel (b) shows that the low inflation on the tradables component of CPI had been essential in bringing inflation down through the period.<sup>19</sup> As a result of the pressures that followed the Asian crisis, that contribution subsided, although later on the direct effect of the decline in the international price of imports pulled tradables inflation down despite the depreciation of the peso. Panel (c) illustrates the path of the exchange rate through 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, as indicated in panel (a), which is one of the reasons critics of the Central Bank argue that the medicine was far stronger than the patient needed, according to 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). Later in this report, I will argue that part of the problem is not the Central Bank’s fault, but a byproduct of its mandate. Finally, panel (f) shows that the fiscal side followed a mildly counter-cyclical strategy during the episode, which will be discussed further in the policy section.

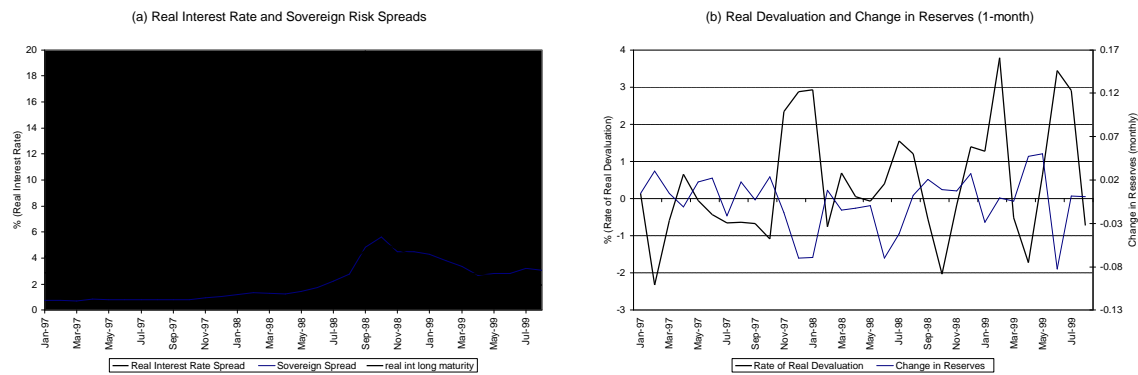
The Central Bank’s situation was further complicated by a sequel of attacks on the peso, which reached its apex during the Russian crisis. Figure 8 shows both the attack and the instrument chosen to deal with it, the choice of which was probably constrained by the Central Bank’s mandate as discussed above. Panel (a) highlights the sharp hike in domestic short-term interest rates, well above the increase in the country’s risk spread

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<sup>19</sup> See Calvo and Mendoza (1998) and Spilimbergo (1999).

(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 9, which compares the response of Chile to that of more advanced economies that were affected by the recent turmoil through more or less similar mechanisms (although to a lesser extent). It is clearly the sharp use of the interest rate that makes Chile the outlier.

Figure 8: Policy Response

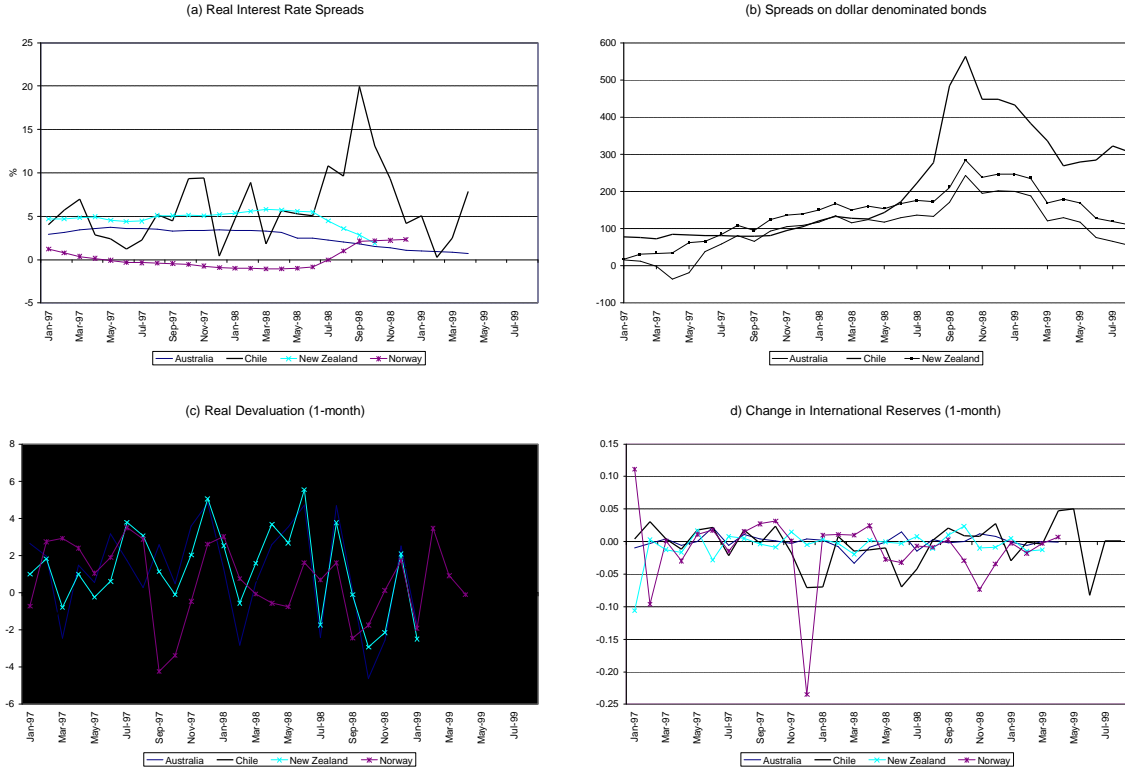


Notes: Panel (a): Real Interest Rate Spread is the difference between average loans and deposits interest rates (IFS) and U.S. Federal Funds Rate, both minus the respective inflation rate. Real Interest Rate Spread (long maturity) uses real rates on 7/8 year government bonds. Sovereign Risk Spread is 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 3 years.

Sources: Banco Central de Chile, IFS, Datastream.

In summary, the mandate of the Central Bank makes expenditure reduction, rather than export-led recovery or international reserves management, its tool of choice in response 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 current objectives of the Central Bank.

Figure 9: Policy Response, International Comparisons



Notes: Variables definition and sources as in figure 8.

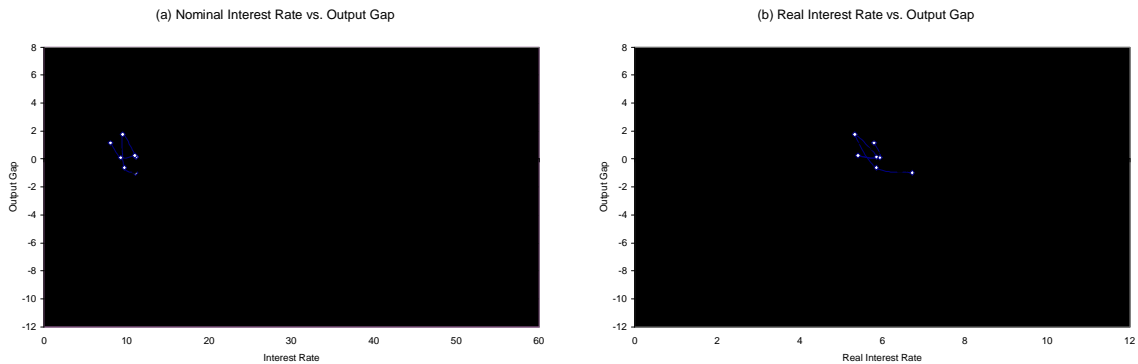
### 2.3.2 Wasted Liquidity and Banks

The large fluctuations in the Chilean nominal interest rates have significant consequences for the real interest rate. Panels (a) and (b) in figure 10 show the paths of 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.<sup>20</sup> This is done for Chile and Mexico (a country with less developed financial markets), as well as Australia and

<sup>20</sup> While in principle only the real interest rate should matter, in practice there are several factors that justify plotting the relationship with respect to nominal interest rates as well. For example, a sudden rise in the flow payment associated to a sharp increase in the nominal rate may induce financial distress on a constrained firm.

Norway. In both panels, it is apparent that not only are Chile's interest rates very volatile, but that its output gap moves more for a given change in interest rates than in any of the other countries.

Figure 10: The Output Gap and Interest Rates I

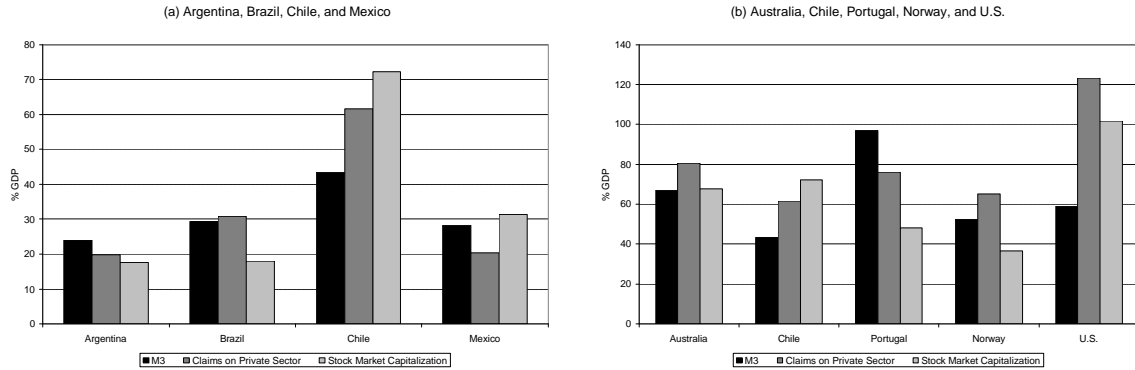


Notes: the interest rate is the lending rate published by the IFS. Source: IFS.

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 11 shows, Chile's degree of financial development seems closer to that of the advanced economies than to that of the rest of Latin America. While 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.



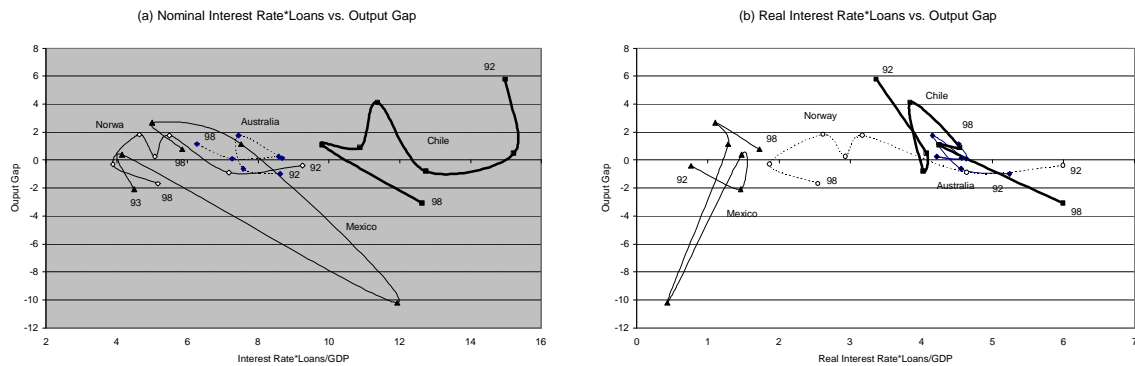
Figure 11: Financial Market Development



Notes: Data as of end of 1997. Source: IFS and Datastream.

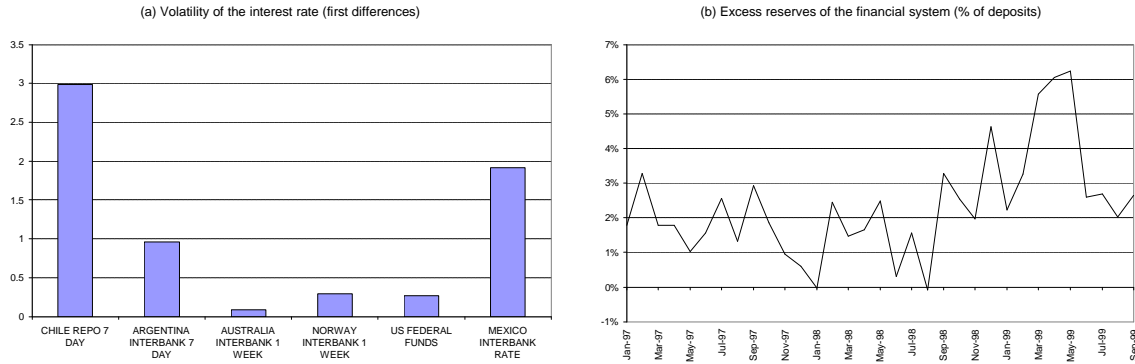
Figure 12 thus multiplies the change in interest rates by a measure of financial depth (average ratio of loans over GDP). The basic message remains unchanged: Chile has both a relatively volatile interest rate and output, and these are distinctly negatively correlated. The rest of this section and the next one tries to understand not the source of interest rate volatility, as this has already been discussed, but why the real side is so responsive to it.

Figure 12: The Output Gap and Interest Rates II



Notes: Loans data as of end of 1997. The interest rate corresponds to the lending rate, loans correspond to credit to private sector as published in IFS. The pivot year is 1997. Source: IFS and Datastream

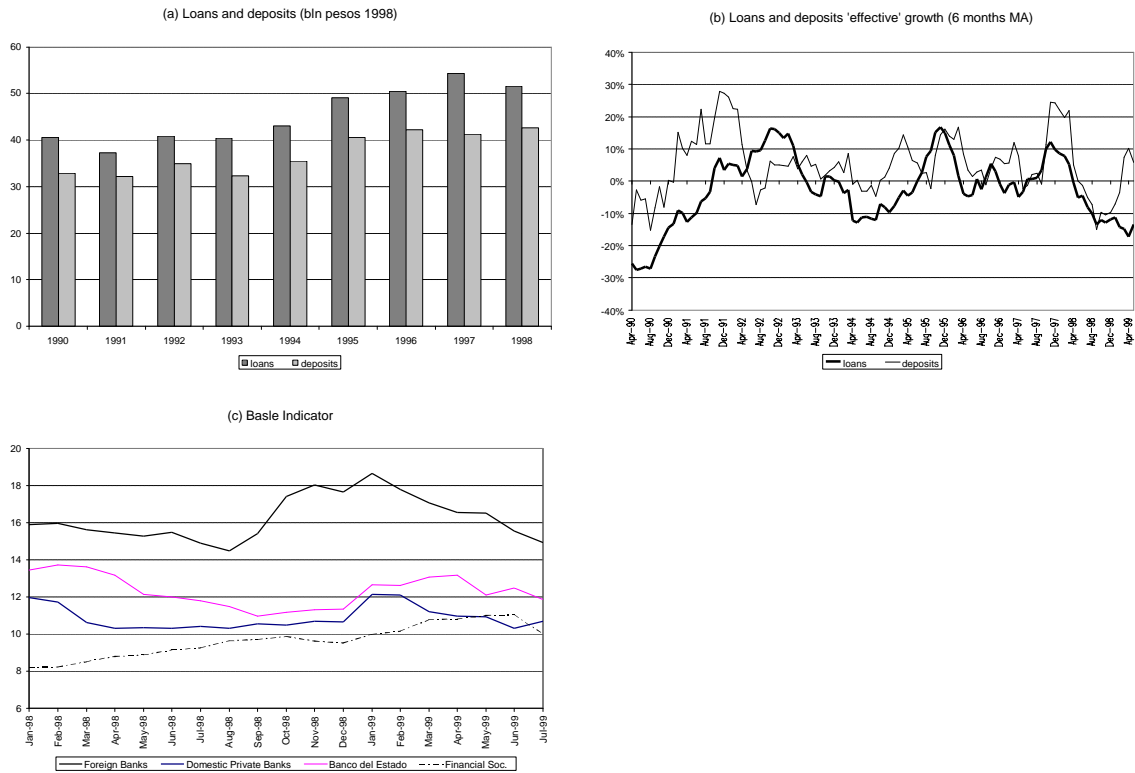
Figure 13: Banks Liquidity



Notes: (a) Source: Datastream. (b) Source: Banco Central de Chile.

I believe 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. Starting with the domestic banking system, it appears that it does not have many good ways to muffle the direct and rough impact of monetary policy. Panel (a) in Figure 13 shows the daily volatility of the changes in the interbank market rate. It is apparent that Chile is very volatile along this dimension. While there are several institutional factors that complicate the comparison of very short term interest rate data across countries, it is probably the case that such volatility reflects the illiquidity of that market. Later in this report I conjecture that 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 the banks after the episode.

Figure 14: Loans and Deposits



Sources: ABIF, SBIF and Ministerio de Hacienda.

Notes. 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.

The banks, in turn, squeeze borrowers. Panel (a) in Figure 14 shows the path of loans and deposits, while panel (b) portrays the path of 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.<sup>21</sup>

<sup>21</sup> Banks have 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 the latter is indeed the case, the appropriate response by the Central Bank should have been not to hike interest rates but to "rent" the reserves to the banks (as will be discussed in the policy section). Decentralizing reserves holdings, while markets can still do it, seems to be a reasonable component of an efficient international liquidity management arrangement.

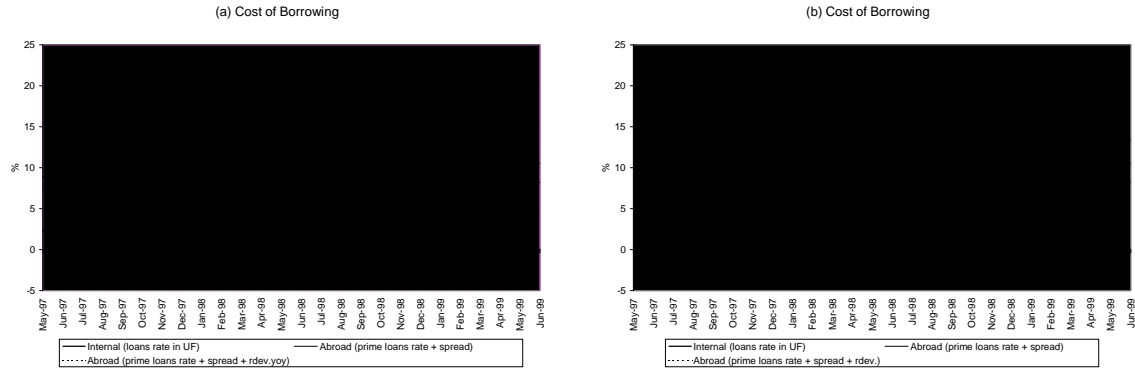
As always, the firms most directly affected by credit crunches are PYMES. In the case of Chile perhaps there is an additional twist. As the perception that the crises had passed and that the contraction was more severe than expected began to emerge, interest rates were lowered sharply, to the extent that large firms may have found it advantageous to turn to domestic financial markets to obtain financing which was still difficult abroad. While I have no information on loans by size of recipient, it is probably the case that domestic banks gladly took advantage of this flight-to-quality opportunity, choking the recovery hopes of the PYMES, which have no direct links to international financial markets. Figure 15 shows 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 different measures of the peso's real devaluation) versus the cost of doing so from domestic banks, for a prime Chilean firm. 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 holds after the crisis.<sup>22</sup>

To summarize, Chile's interest rates are not only volatile but they have a large impact on (or are at least highly correlated with) real activity. Part of this large sensitivity is rooted in the 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.

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<sup>22</sup> With time, if the situation persists, probably local banks will borrow abroad to lend to the PYMEs. 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: it is the sharp increase in the banks' appetite for quality that lowers the equilibrium rate and exacerbates the rationing mechanism.

Figure 15: Cost of Borrowing for Prime Firms



Notes: 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). The sovereign spread is the cost of borrowing abroad of a prime company (Enersis) minus the US 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, Ministerio de Hacienda, and Federal Reserve.

### 2.3.3 Limited Development of Financial Markets

While a leader in the region, Chile still has only limited development of its 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. Bank dependence, especially by small firms, is large, which makes the problems discussed above even more serious.<sup>23</sup> When banks squeeze, firms have few options.

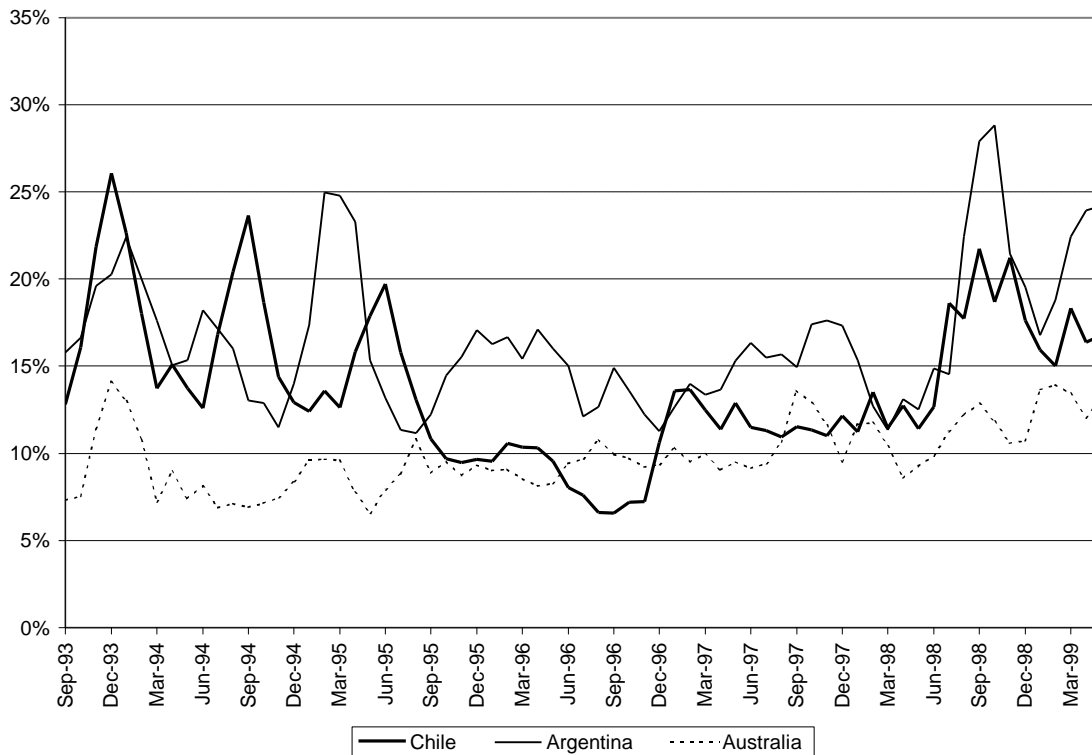
The consequences of underdeveloped domestic financial markets are ultimately reflected in the economy's failure to reallocate resources in an expedient manner, especially at times of crises. Figure 16 represents the path of a measure of the cross-sectional dispersion of the stock market returns for a group of approximately 24 Chilean industries (thick line).<sup>24</sup> While Chile fares better than other regional economies, represented by Argentina here, it does not have the stability of more developed

<sup>23</sup> These features need not be a problem for, as many European economies have demonstrated, banks' credit can do most of the job. But this seems less likely to be the case in a scenario where banks are often subject to credit crunches.

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

economies, as represented by Australia. Finding more direct evidence on this mechanism, controlling adequately for the size of the exogenous shocks, is an important research theme, as is the analysis of the effects of financial underdevelopment on the relative size and volatility of traditionally credit-using sectors.<sup>25</sup>

Figure 16: Cross Sectional Variability of Sectoral Stock Returns



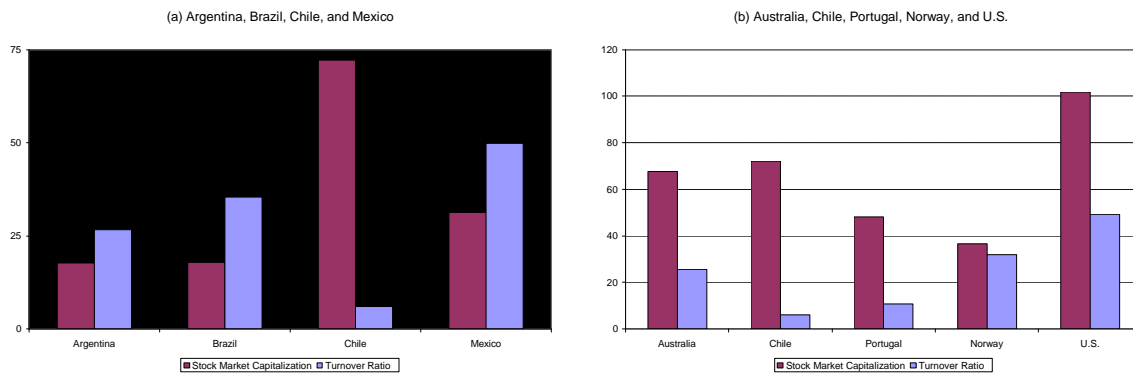
Notes: Interquartile range 15%-85% (3-month MA). The number of sectors used for Argentina, Chile, and Australia is 20, 26, and 24 respectively. Source Datastream.

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 by AFPs, the Chilean

<sup>25</sup> See Rajan and Zingales (1998) for a comparison of relative sectoral size among OECDs, and for evidence on the connection between this and the degree of development of local financial markets. A related theme worth exploring is that of the composition, as opposed to the level, of available domestic financial instruments. Is this composition very different from that of OECD's—e.g., in terms of the ratio of short and long term loans and bonds—and if so, which sectors and firms are most likely to suffer from such bias?

stock market has world-level capitalization values. The dark bars in panels (a) and (b) of Figure 17 make it clear that in terms of capitalization values Chile is an outlier in the region and fares well in comparison to more advanced economies. The light bars, on the other hand, reflect a less rosy scenario. Chile has a very substandard turnover ratio. While 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 17: Stock Market Illiquidity

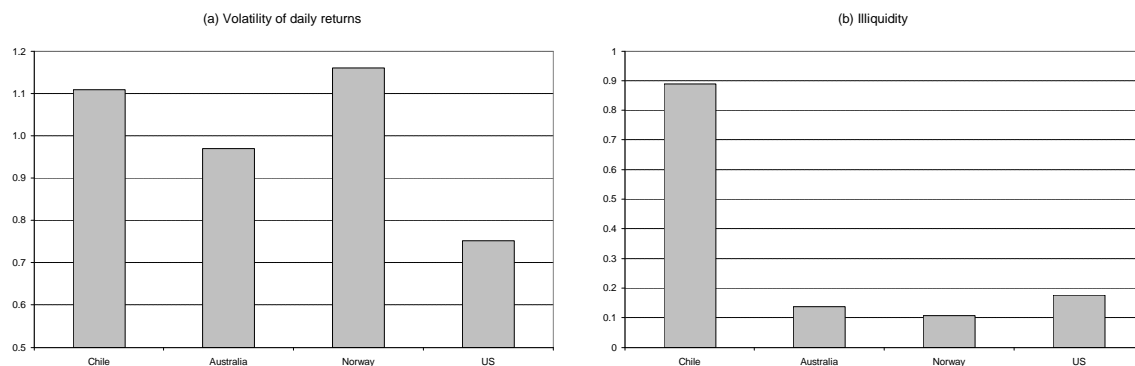


Source: Banco Central de Chile. Stock market capitalization in % of GDP. Turnover ratio is turnover over market capitalization (in %).

Figure 18 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 shocks. A more direct, while 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 to an increase in price volatility that is about ten times larger in Chile than in the other countries.

Figure 18: Volatility and Illiquidity of the Chilean Stock Market



Notes: Source: Datastream global indices. Period 1/90-9/99. 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.

With an eye on the policy-recommendations section, it is worthwhile to begin asking what is behind this illiquidity. There are two important components. The first one is the high concentration ratio of ownership. In an average top-10 traded Chilean company, over 45 percent of the shares are held by the top 3 shareholders (excluding the government), as compared with a much lower percentage for economies like the U.S. (20%), the U.K. (19%), Australia (28%) or Japan (18%).<sup>26</sup> Moreover, as I discuss in the policy section, in many cases the top shareholders are identical in several important companies, especially within economic conglomerates. These large control-holdings are not part of the daily market.

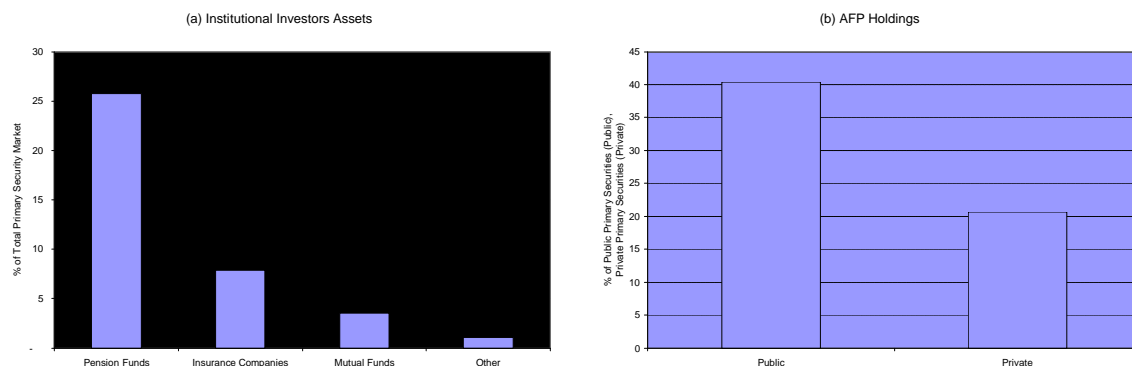
As for the rest, a large share is held by the AFPs, with a still limited role for other institutional investors. This pattern can be seen in Figure 19, which shows the value of the assets held by each of these investors over the ratio of private and public financial assets. While there are many benefits associated with the sound practices of AFPs for the

<sup>26</sup> See La Porta *et al.* (1997).



development of good corporate governance and the stock market itself, they do not help with turnover and in attracting liquidity providers, since they also tend to buy-and-hold rather than churn assets (see the policy section).

Figure 19: Institutional Investors

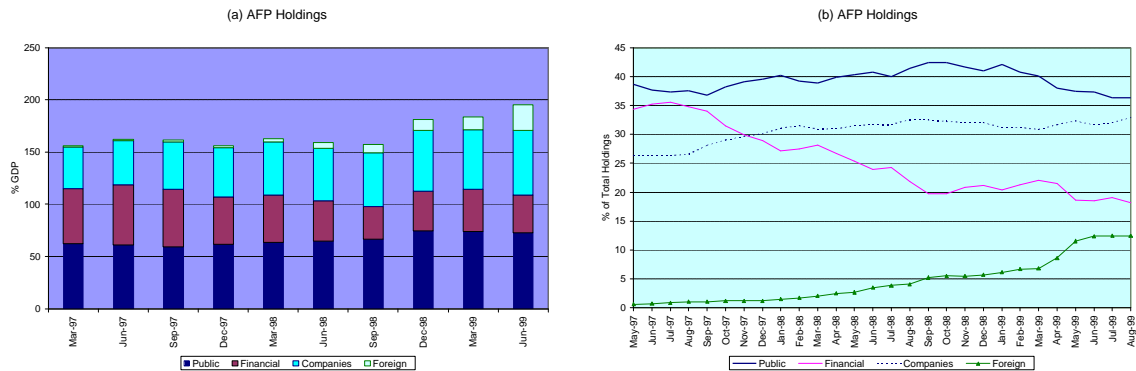


Notes: Panel (a): "Other" corresponds to investment funds plus FICES (Foreign Capital Investment Funds). Panel (b): Private considers both financial and corporate sectors. Source: Superintendencia de AFPs and Superintendencia de Valores y Seguros.

This problem was further compounded in the current episode when the AFPs' limits on their investments abroad were relaxed in mid-1997, right before the onset of the sequence of crises. While it is certainly reasonable to argue, at least in partial equilibrium, that such measures helped the AFPs and their members, it came at the worst of times from the point of view of domestic liquidity provision. Figure 20 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 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, don't 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.

Figure 20: AFPs



Source: Superintendencia de AFPs.. Source: Superintendencia de Bancos e Instituciones Financieras and Banco Central.

### 3. Taking Stock and Policy Recommendations

The diagnostic contains four basic elements: (i) weak international financial links and excess sensitivity with respect to terms of trade shocks; (ii) a Central Bank mandate that is inconsistent with terms of trade shocks; (iii) a banking system prone to waste liquidity; and (iv) limited development of financial markets.

In accordance with these elements, the general policy recommendations highlighted in the introduction were grouped into four categories as well: (i) improving external financial links and their use during crises; (ii) molding significant terms of trade contingencies into anti-cyclical policies; (iii) improving liquidity aggregation, especially within and through the banks; and (iv) accelerating the path of domestic financial deepening.

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

### ***3.1 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 “international financial architecture” pamphlets. These recommendations include norms of transparency and accountability; banks’ sound practices for supervision, settlement, accounting and disclosure; aggregate risk management; and a series of related measures and practices aimed at improving the country’s contractual environment and corporate governance.<sup>27</sup> While Chile has made and continues to make substantial progress in ensuring an appropriate legal environment as it relates to businesses, its limited size and very unequal wealth distribution makes progress on the corporate governance front difficult, especially when considering its natural or “structural” ownership concentration. This hints at an important synergy in fostering a much deeper integration with international financial markets: not only is good corporate governance needed to succeed in integration, but integration may also be an essential ingredient for achieving good corporate governance.

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 the links with international financial markets as well as their use during distress:

- 1) 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 part of it 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

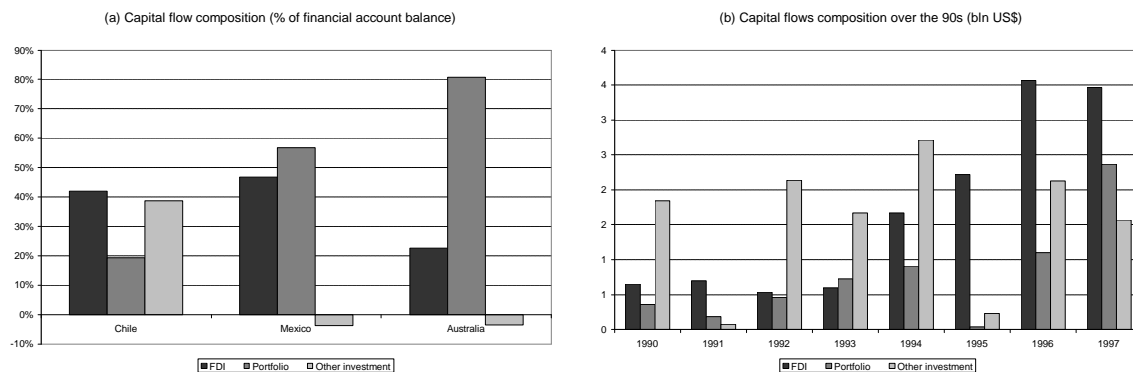
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<sup>27</sup> The Teachers Insurance and Annuity Association-College Retirement Equities Fund (TIAA-CREF), one of the largest institutional investors in the U.S., has made public that it simply does not invest in claims issued by companies with poor corporate governance standards. (See pages 10-11 in the May 1999 issue of *Participant*, TIAA-CREF’s quarterly news and performance magazine.) Among its requirements are that: (i) a company’s board consist of a substantial majority of independent directors (i.e., no significant personal ties, current or past); (ii) a company’s board must obtain shareholders approval for actions that could alter the fundamental relationship between shareholders and the board; (iii) companies must base executive compensations on a “pay for performance” system and should provide full and clear disclosure of all significant compensation arrangements. It does not take an in-depth knowledge of Latin American corporations to realize that very few of them would make it into TIAA-CREF’s good corporate governance list.

the appropriate markets. The similarities with “catastrophe risk” insurance, a market that is beginning to develop in the U.S. and involves risks of comparable magnitude, are worth exploring.

- 2) Foster the direct relationship between in-home foreign banks and the PYMEs.<sup>28</sup>
- 3) Along similar lines, facilitate the residence of recognized international market makers. This may require liberalizing constraints on short-term capital flows on a permanent basis. Indeed, Figure 21 illustrates clearly the small relative role played by portfolio capital flows in Chile. While indeed there is a benefit in terms of 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 alternatives remedies, are taken into consideration.

Figure 21: Capital Controls and Composition of Capital Flows



Source: IFS. Panel (a): 1990-1997 average.

- 4) If the short-term capital account is not fully liberalized, at the very least taxes on it should be made contingent (pro-cyclical) on terms of trade.<sup>29</sup>

<sup>28</sup> Citicorp has just announced its intention to penetrate that market in Chile.

<sup>29</sup> Chile indeed lowered taxes on short-term capital inflows during the current crisis. The point is to make it a contingent (automatic) rule.

- 5) Make efforts to homogenize domestic and foreign corporate and public bonds. In particular, provide incentives for domestic firms (or banks) to place U.F.-denominated debt abroad.<sup>30</sup> 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 at times of systemic distress (e.g., export companies). This process may require a transitional period with government-backed enhancements.
- 6) Relaxing the constraints on the minimum rating required to issue ADRs and place external debt (as has recently been done) is appropriate. This said, the externality that the previous prohibition tried to minimize does exist. The idea, however, is to replace the “stick” by a “carrot”: subsidizing firms for achieving high international credit ratings.

### *3.2 Molding Terms of Trade Contingencies into Anti-cyclical Policies*

The two main Central Bank mandates—keeping inflation close to its target and preventing 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. As this is very costly for the Chilean economy, the policy recommendations below are aimed at two complementary goals: reducing the pressure put on the Central Bank by terms of trade shocks and improving the alignment between the implications of these shocks and the policy response.

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<sup>30</sup> As of 1998, Chilean companies are permitted to do so. The point here is to go beyond that and foster it.

- 1) 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 frees 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 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.<sup>31</sup> 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 there still will be some response needed to specific circumstances. The suggestions below are aimed at further reducing the shock that needs to be absorbed by the Central Bank, as well as improving the transparency of its actions and hence reducing the costs associated with speculative attacks.
  
- 2) As mentioned above, helping in the developments, and eventually contracting international insurance and credit lines contingent on terms of trade, should be considered. The goal is not so much to reduce the wealth effect of these shocks, but to reduce the financial strain they generate, which is, in my view, the dominant and potentially more damaging problem.
  
- 3) Closely related to this is the reserve management strategy. Toward the end of October 1999, Chile decided to fully float its exchange rate. It is not clear what this means for times of crisis, for it is unreasonable to assume that there will be no intervention of any sort.<sup>32</sup> 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

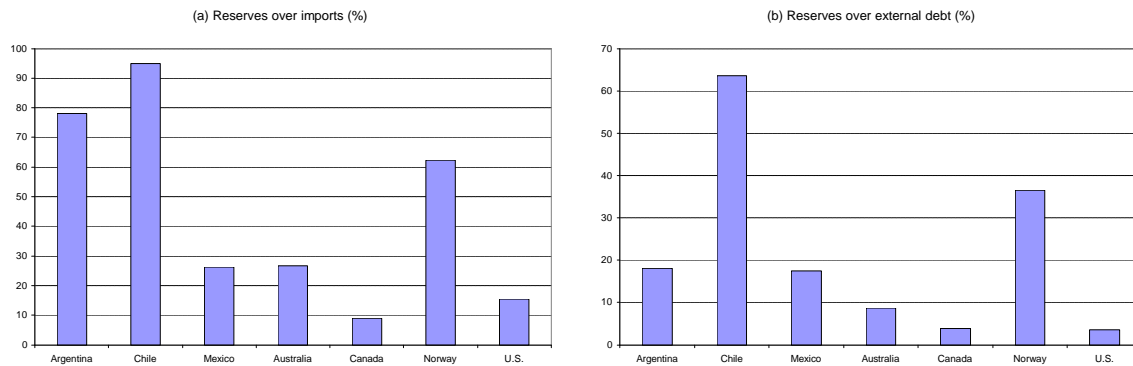
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<sup>31</sup> It is important that the rule be pre-determined. Indeed, part of the current Chilean crisis is arguably due to the initial bickering between the Treasury and the Central Bank on who should take the first move on the impending adjustment.

<sup>32</sup> In fact, the Central Bank has announced that it will intervene in “special” circumstances.

reserves and credit lines to limit exchange rate depreciation. I believe 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 22). 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 of contingency (i.e., automatic and out of the Central Banks' discretion) on terms of trade should be built in.<sup>33</sup>

Figure 22: Precautionary Reserves, International Comparison



Notes: Data for 1997, except Norway data in panel (b) (1993). External debt for developed countries: BPS(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: IFS. External Debt for developing countries: joint BIS, IMF, OECD, World Bank Statistics.

- 4) 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, it is nontradables rather than overall inflation that should be used to assess the

<sup>33</sup> 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. In my view, Chile does not have inefficiencies in international leverage which are large enough to justify the high implementation costs of such a policy. See Caballero and Krishnamurthy (1999b) for a model and discussion of aggregate liquidity management policies for emerging economies.

performance of the Central Bank. Removing the contingent element and targeting nontradables inflation at all times should render similar results.

- 5) Finally, a somewhat esoteric remark. 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 “pegee.” 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.<sup>34</sup> I suspect that Chile is beyond this stage, but there may be others—especially international investors—that do not feel that this is the case, and on accountability and credibility of the Central Bank it is worth playing conservatively, especially when Chile has nothing to hide.

### *3.3 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 current crisis, they have not been 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 the PYMES highlighted above, it appears that the banks may be used more actively during crises.<sup>35</sup> To this effect, consider:

- 1) Allowing for contingent capital adequacy and reserve ratios. These should be lowered as terms of trade deteriorate. More specifically, loans to PYMES could be penalized less in these ratios’ calculations, while the opposite may be done with consumption loans.<sup>36</sup>

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<sup>34</sup>The cost should not be an issue, for it must be several orders of magnitude cheaper than having to follow the other country’s monetary policy.

<sup>35</sup> In general, it is important to consider the policies suggested here as a package. Indeed, some policies which are advisable in that setting, may be not once considered in isolation.

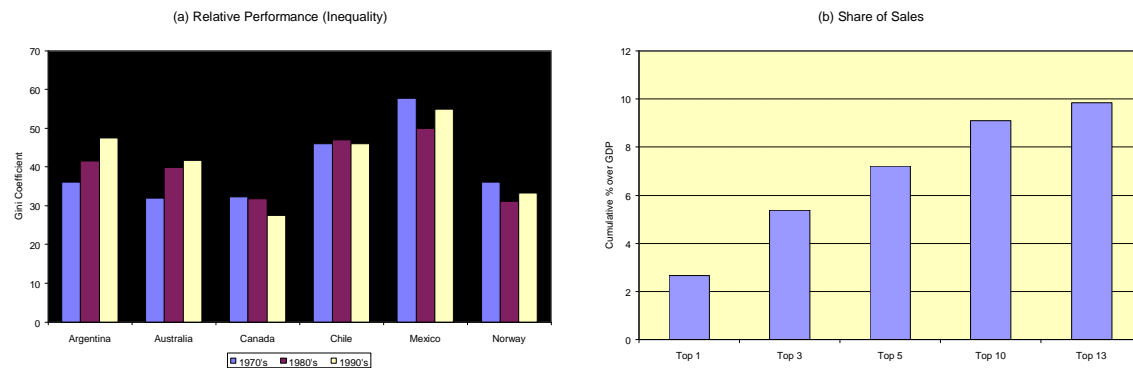
<sup>36</sup> During the current crisis banks reallocated some of its credit from consumption to commercial loans. The idea is to facilitate this reallocation further.



- 2) It is worth noting that in the current episode banks increased rather than reduced their capital adequacy ratios. This is particularly the case with foreign banks. It is important to identify whether this pattern is 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.
- 3) 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.<sup>37</sup>

### 3.4 Improving the Liquidity and Immediacy of Domestic Financial Markets

Figure 23: Wealth Distribution and Cumulative Sales



Notes: Panel (a): For each decade it was taken one year that sometimes differ among countries (clarify more later). The recipient is household equivalent. Panel (b) Economic Groups: Luksic, Angelini, Matte, Errazuriz, Del Rio, Said, Larrain, Sigdo Koppers, Pathfinder, Hurtado Vicuna, Bofill, Fernandez Leon, Abumohor.

Source: INE and Banco Central de Chile.

As discussed in the previous section, while capitalization values are high in Chile relative to the region, it is a misleading statistic as a proxy to the liquidity and immediacy

<sup>37</sup> As long as the round-trip starts at home, 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” of capital inflows

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 23 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 size problem, nor the wealth distribution problem, 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 institutional investors at home. Along these lines consider:

- 1) Fostering the residence of international market makers. 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.
- 2) Conversely, facilitating and subsidizing the placement of ADRs or the equivalent. In order to make these more liquid, several small and medium size companies may need to be bundled in each issuance. If this is done, there must be a mechanism in place to limit free-riding problems among the bundled companies (see the discussion in Section 3.1).
- 3) Similarly, developing a domestic corporate debt market with homogeneous instruments.
- 4) Allowing the AFPs to invest in lower-rated instruments, especially at times when foreign financial markets tighten.<sup>38</sup>

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<sup>38</sup> Chile liberalized investment options with respect to foreign instruments precisely as the country began experiencing the effects of the external crisis. I believe 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, which yield high returns to medium-term investors (see my informal remarks on a related matter in Caballero, 1998).

## **Appendix: Chronology**

### ***Trends:***

*Mid 1970s-present:* Export sector drives growth, though the sector is concentrated in commodities and primary industries (mining, small manufacturing sector, largest fruit exporter in the world, wine, fishing). Dramatic trade liberalization takes place, including free-trade agreements with Mexico, Colombia, Canada, and Mercosur. Exports diversify exports in terms of markets (Asia, Europe, Latin America, U.S.) The mining sector represents 8.2% of GDP and 50% of merchandise exports. Investment and saving rates are very high by Latin American standards.

*1981-present:* Private pension funds become important. It is not clear whether they have helped to increase saving rates, as households' savings have not increased. These funds have nonetheless been fundamental in the development of local capital market, managing around US\$30 billions, including 11% of stock market capitalization. In 1996, 41% of resources are invested in Central Bank papers, 35% in private shares and bonds, 23.6% in financial institutions, and 0.4% abroad. (A maximum of 9% abroad is permitted.) With the latest crisis, funds begin to increase investment abroad. The ratio of stock market capitalization over GDP is close to 1 (very high by Latin American standards).

*1990's:* Chilean investment abroad increase significantly, reaching 20 billions in 1997. (Mostly in Latin America, more than half of it in Argentina.)

*1982-present:* After debt crisis (and ensuing bailouts), the government runs budget surpluses. Public external debt declines from US\$15 billion in 1985 to US\$5 billion in 1997, while private external debt rises from \$5billion in 1985 to US\$22 billion in 1997. Budget surpluses in the 1990s are around 2% of GDP. Current savings, including capital expenditure and capital earnings, are 4.8% of GDP.

*1990-present:* A consensus arises across the political spectrum over need to maintain a liberal market economy and prudent monetary and fiscal policies. This period is characterized by political stability and strong property rights, as well as increasing

investments in human capital and infrastructure. Poverty declines, but income distribution remains highly unequal.

*1989-present:* Monetary policy is controlled by an independent Central Bank, which has resulted in a gradual but sustained reduction of inflation. In the third quarter of each year, the Bank sets an inflation target for the next year; it has consistently achieved the annual goal. The foreign-exchange market for foreign trade is liberalized, but restrictions are maintained on short-term capital movements, as inflows are subject to a one-year non-interest-bearing reserve requirement, or *encaje*. These controls are effective in tilting the composition of external debt toward longer maturities, but the real exchange rate appreciates considerably during the 1990s. In addition, only blue-chip firms with excellent credit risk rating are allowed to borrow abroad, though this has begun to change since 1998. Exchange rate policy is characterized by a dirty peg, with a reference rate, varying with a basket of currencies, and a flotation band. This policy allows for 2% yearly appreciation due to high productivity growth. Foreign reserves increase significantly because of Central Bank efforts to sterilize massive capital inflows, with ensuing appreciation and growth in money stocks. This implies high costs to the Bank, however, due to interest rate differentials. As of September 1999, the exchange rate is no longer targeted. The Chilean economy is fully indexed (wages, real estate contracts, financial contracts).

Prudent fiscal management produces budget surpluses and falling public debt. The public sector is small, generally honest and relatively efficient. Labor-market restrictions increase, and there are minimum import prices restrictions for basic food items.

*1990s:* Despite control on capital inflows and sterilization policy, the real exchange rate appreciates 35% by February 1998, then depreciates nearly 10% thereafter as a result of the Asian crisis.

## *Developments and Events*

*1974:*

*December:* Pinochet becomes president.

*1974-1976:*

Radical economic reforms take place. These include a stabilization plan, trade liberalization, the elimination of subsidies and price controls, and export-led policies based on free markets. Labor code reforms reduce payroll taxes and restrictive practices. Tax reforms shift taxes from production to consumption (16% VAT), and income taxes are cut. This period is characterized by high social costs.

*1975:*

*September:* A new currency, the peso, replaces the escudo.

*1976:*

Chile withdraws from the Andean Pact.

*Late 1970s:*

An economic recovery occurs, partly due to a foreign-financed consumer boom. Unemployment and inflation fall, and real wages begin to recover. Exchange rate policy includes pre-announced mini-devaluations.

*1977:*

A new foreign investment law comes into effect.

*1979:*

Import tariffs are brought down to 10%.

The exchange rate is fixed to help bring inflation down.

*1981:*

Social security reform takes place.

*1979-1982:*

Real appreciation occurs. In an atmosphere of inappropriate bank regulations, economic groups use banks for “self-lending.” High current account deficits arise, with large increases in consumption and investment, and high external debt.

*1980:*

A new constitution provides for presidential elections and re-establishment of bicameral legislature in 1989, with designated senators. Additional features include a weak legislature and an independent judiciary.

*1982:*

*Overall:* Expansion ends, with a large number of bankruptcies among local firms unable to compete with cheap imports. Copper prices collapse, and foreign loans dry up. A huge recession occurs, as unemployment rises to 25% and GDP falls by 14%. A major devaluation occurs. Government rescues banks and takes responsibility for massive foreign debts. Entrepreneurial empires built around these banks are liquidated.

*June:* A maxi-devaluation takes place.

*1983:*

The regime’s popularity is at an all-time low, and a protest movement begins to take shape. Government responses include appointing more civilians to the cabinet and backtracking on economic liberalization. The government is forced to suspend and renegotiate foreign debt service, and takes charge of the largest private sector conglomerates.

*1984:*

“Chicago boys” are replaced by more traditionalist economic team. The VAT is raised to 20%, and import tariffs are raised to 35%.

*1985:*

The government reaches an agreement with IMF, including full IMF conditionality, and begins to target real interest rates.

As economic growth resumes and public protests subside, the Chicago boys are brought back, led by Buchi. The new policy is “popular capitalism.”

*June:* The peso undergoes a mini-devaluation of 7.8%.

*July:* Import tariffs are reduced to 20%.

*November:* The foreign investment law is reformed, with further opening to foreign investment.

*1986:*

*September:* A new banking law expands the powers of the Superintendency of Banks and Financial Institutions. Banks are required to pass a “whiteness” test, demonstrating adequate capital provisions, at the end of each year.

*1987:*

Strong economic growth resumes. Opposition ends boycott of 1980 constitution. Banks and companies rescued in 1982-83 are reprivatized, and a new privatization program includes telecommunications and electricity companies. Terms of trade improve.

*1988:*

*Overall:* A debt-for-equity scheme is introduced to stimulate foreign investment and reduce foreign debt. Banks’ debt to the Central Bank from earlier debt crisis rescue is converted to subordinated debt. An expansionary monetary policy is undertaken to achieve high growth in time for October plebiscite on Pinochet.

*January:* Import tariffs are reduced to 15%, and a mini-devaluation of 3.9% occurs.

*June:* VAT is reduced from 20% to 16%.

*October:* Pinochet loses plebiscite to remain in power eight more years.

*1989:*

*Overall:* Economy overheats.

*May:* The constitution is reformed. Changes include increasing the number of elected senators, increasing civilian participation in the National Security Council, and subordinating military authorities to elected government.

*May:* The Central Bank is made autonomous.

*December:* Aylwin, the candidate of the center-left Concertación party, is elected for a four-year term with 55% of the vote.

*1990:*

*January:* Monetary policy tightens, and real interest rates increase by 1.9%.

*March:* Aylwin assumes presidency. No major changes occur in economic policy.

Central Bank begins to relax monetary policy, bringing rates to pre-January levels by March 1991.

*July:* VAT is raised from 16% to 18%. Corporate and personal income taxes are also raised. These increases are undertaken to finance greater expenditure on public health, education, and housing.

*1991:*

*Overall:* The peso is stuck at the bottom of its band, and the Central Bank forced to accumulate large reserves. Money supply growth prompts an increase in interest rates, which make 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.

*June:* Import tariffs are reduced to 11%.

*August:* Aylwin and Argentine president Menem sign a treaty ending most territorial disputes.

*1992:*

*January:* Acknowledging that the revaluation trend is structural, the Central Bank reduces the reference rate by 5% and doubles fluctuation band to 10% each way.

*March-October:* Tightened monetary policy tightens.

*1993:*

*Overall:* Tight monetary policy is maintained. An economic cooperation agreement is signed with Bolivia.

*December:* Concertación's Frei is elected for a six-year term, with 55% of the vote.



*1994:*

*Overall:* Government consumption growth slows. Improved terms of trade and export growth help reduce current account deficit.

*March:* Frei assumes presidency.

*June:* Chile begins talks to join NAFTA.

*October:* Government begins to ease monetary policy.

*November:* Central Bank purchases US\$1 billion to keep peso from appreciating, a measure which does not succeed, and is forced to lower official reference rate by 9.5%.

Chile becomes a member of the Asia Pacific Economic Cooperation forum.

*1995:*

*Overall:* 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 US\$50 million to US\$25 million.

*April:* Remaining exchange controls governing export earnings are eliminated.

*May:* The ceiling on AFP investment in stocks is raised from 30% to 37%, and the ceiling on investment abroad is raised from 6% to 9%.

*August:* Faced with high domestic spending growth (private consumption grows 11.7% in 1995), the Central Bank tightens monetary policy from August 1995 until April 1996. Annual interbank rates increase from 5.2% to between 7% and 7.5%.

*1996:*

*Oct.:* Chile becomes an associate member of Mercosur, a move opposed by the non-export agricultural sector because price supports will eventually disappear. Foreign credit associated with foreign direct investment is made subject to *encaje*.

*1997:*

*February-September:* Interbank rates are reduced from 7.5% to 6.5%.

*April:* The ceiling on AFP investment abroad is raised from 9% to 12%.

*October:* The Central Bank starts intervening heavily in foreign-exchange market to halt the peso's slide.

*December:* Concertación's share of the vote falls to 50% in congressional elections.

*1998:*

*Overall:* A new banking law eliminates most remaining restrictions on capital outflows. Foreign banks account for 20% of total assets. Total government expenditure is 7.4% higher in real terms than in 1997, and the government is forced to make spending cuts of \$685m in response to lower than expected growth. A tight monetary policy is undertaken to prevent depreciation and in response to lax fiscal policy; for several days in September the interbank rate reaches 50%.) A recession begins in the second semester, accompanied by a major terms of trade shock as the price of copper plummets and Asia enters recession. The resulting negative shock to national income is 3.5-4% of GDP. The peso declines, but this decline's 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 begin to invest abroad.

*June:* The *encaje* is reduced from 30% to 10% to attract foreign capital and support the currency. The flotation band is reduced from 12.5% to 5.5%.

*September:* The *encaje* is eliminated.

*1999:*

The real exchange rate, no longer targeted, begins to depreciate. Import tariffs are expected to be reduced to 8%.

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