Policy Responses to External Shocks: The Experience of Australia, Brazil and Chile*

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I. Introduction

Open economies, particularly emerging markets and commodity-intensive economies, deal with large external shocks. These are typically of a financial nature in the case of the former, and real —affecting the terms of trade— in the latter. Evidently, these shocks have consequences for economic performance but, interestingly enough, alternative policy reactions and policy set-ups may dampen or amplify the consequences of these shocks, even affecting the very magnitude of the shock. Considering that most probably globalisation is here to stay, it appears very important to analyse and evaluate alternative policy set-ups and policy reactions from different angles in order to draw lessons for the macroeconomic management of open economies.

This paper takes one specific angle by revisiting the recent experience of policy frameworks and reactions in three countries: Australia, Brazil and Chile. The objective of the paper is twofold: to describe the recent experience of these countries by providing an account of the macro policy framework and the policy reactions against the major shocks of the past eight years, and to draw some policy lessons.

Taken together, the three cases are interesting for many reasons. First, the three economies have recently faced important external shocks, derived from the Asian crisis in the period 1997-98, and the lower world growth and higher risk aversion in 2001-2002. Second, they all had some kind of inflation-targeting (IT) regime in place at the moment they faced the shocks we analyse, although at rather different stages of maturity. Third, although they show significant differences in their levels of development, it is possible to think of them as different phases of not-so-dissimilar development patterns. And finally, each chose quite different policy reactions, which enables us to analyse what could be important lessons.

The stage of maturity of the IT regime in the three countries was different in several dimensions (see table I.1). Australia and Chile 2002 were already on a steady-state inflation level, Chile 1998 was about to converge to that level and Brazil was still in a transition. Both the Brazilian and Chilean 1998 framework had annual targets, whereas Australia and Chile 2002 had longer horizons. Chile 1998 did not have a floating exchange rate regime, Brazil intervened the foreign exchange market, while in Chile 2002 interventions were limited, and more so in Australia.

Development heterogeneity is more marked than policy framework differences in these three countries (see table I.2). While Australia has an industrialised per capita income, Brazil and Chile still classify as emerging economies. Financial market deepness is also substantially different, with Australia having a more developed market, followed by Chile at some distance. Openness to trade is substantially lower in Brazil, with Chile ranking as the most open economy. Finally, two relevant features of these economies were the rather large public debt of Brazil and the issuance of external debt in local currency in the case of Australia.

Macroeconomic performance has also been different in the three countries (see tables I.3 to I.5). Over the past ten years, Australia has shown fairly stable growth, low

inflation and a sizeable current account (CA) deficit. Brazilian growth has been slower, with significant volatility and declining inflation up to 1998 and varying current-account deficits. Chile showed strong growth performance up to 1997, with declining inflation and a quite volatile current-account deficit.

The diverse policy reactions at the different junctures are noticeable in the tables. In Australia, in 1998 (and 2000) the real exchange rate (RER) depreciated, inflation increased and the CA deficit (and GDP growth) moved little (although more markedly in 2000). The real exchange rate in Chile in 1998 did not move significantly, inflation continued to decline, and the CA deficit, the investment rate and the growth rate all dropped considerably. In 2002, the Chilean economy's reaction was more similar to what happened in Australia in the previous episodes. Brazil in 2002 suffered a RER depreciation, an increase in inflation, with an important drop in the CA deficit and, in 2003, a GDP growth deceleration. Interestingly, the investment rate did not change as much. Of course, these accomplishments are not comparable because each economy faced quite different shocks. For example, the risk premium increased substantially in Chile 1998, increased only modestly in 2002 (from already higher levels) and mounted in Brazil 2002. However, they do tell that these countries had quite different policy reactions.

The paper is organised as follows: Section II presents a description of the Australian case; section III describes the Brazilian experience, while section IV describes the Chilean episodes of 1998 and 2002. Finally, section V derives some policy lessons.

II. Australia: Policy response to external shocks

A. The policy framework

Australia operates a flexible inflation-targeting regime with the objective of ensuring that consumer price inflation averages between two and three per cent over the business cycle. This regime was put in place informally in 1993 and was formalised in 1996 with the release of a joint statement on the *Conduct of Monetary Policy* by the Governor of the Reserve Bank of Australia (RBA) and the Australian Treasurer.

The adoption of this regime followed two decades of poor inflation performance with CPI inflation averaging around 10 per cent in the 1970s and 8 per cent in the 1980s. Its adoption, however, was not part of a strategy of inflation reduction, with inflation already having fallen to around 2 per cent in 1993, largely as a result of a severe recession (Figure II.1; panel 2). Rather, the inflation target was seen as a way of ensuring that the hard-won reduction in inflation was sustained.[1]

From the outset, Australia's inflation targeting framework has been more flexible than those of some other countries; there has never been an explicit annual target, or formal sanctions on the RBA and/or Governor for missing the target. In the initial years, this was sometimes seen by observers as a lack of commitment to the regime, although more

[1] For a review of Australia's experience with inflation targeting see Stevens (1999) and (2003).

recently, a number of countries have implemented similar frameworks. The adoption of a flexible, as opposed to a strict, inflation target largely reflected the recognition that while monetary policy's primary responsibility is medium-term price stability, it is also appropriate for policy to take into account the trade-off between inflation and output variability. This flexibility can be useful for responding to supply shocks, movements in the exchange rate, and developments in asset markets.

At the operational level, monetary policy is set in terms of a target for the rate at which banks lend to one another in the overnight money market (the so-called "cash rate"). Most bank loans to the business and household sectors have variable interest rates, and these variable rates move closely with the target cash rate. The RBA influences the cash rate through its daily open market operations which affect the supply of balances that financial institutions maintain at the RBA to settle inter-bank obligations. The actual cash rate is typically within 1 basis point of the target. Australia does not have any reserve requirements.

The monetary framework operates within the context of a floating exchange rate and free movement of capital. The Australian dollar was floated and capital flows were liberalised in late 1983, almost a decade before the adoption of an inflation target. In the three years after the float, the Australian dollar depreciated by over 30 per cent in trade-weighted terms, but thereafter has broadly cycled around a relatively flat trend. Over that time there have been three major cycles, with the exchange rate against the US dollar troughing as low as US48 cents and peaking as high as US87 cents. These cycles have largely, although not exclusively, reflected movements in commodity prices, and hence Australia's terms of trade (Figure II.2). The main exception to this was during the period 2000-2002 when the currency was unusually weak given movements in the terms of trade (see below).

Notwithstanding the generally stabilising role played by the exchange rate, the RBA has on occasions intervened heavily in the foreign exchange market. Such intervention is, however, relatively rare and is undertaken in response to movements in the exchange rate that seem excessive relative to changes in economic or financial conditions. As such, this type of intervention typically takes place only after the exchange rate has already appreciated or depreciated significantly, and is often intended to restore a sense of two-way price risk, thereby lessening momentum which might otherwise lead to further overshooting. Intervention is not used to pursue a particular level of the exchange rate.

B. External shocks and the business cycle

Since 1990, Australian GDP has grown at an average annual rate of 3¼ per cent (Figure II.1; panel 1). Early in the 1990s the economy experienced a severe recession, largely due to the unwinding of the credit and commercial property boom of the late 1980s, but also reflecting the recession in the United States. Since 1992, the economy has experienced 13 years of consecutive expansion with growth averaging almost 4 per cent. The low point in growth over this period was in the year to June 2001, when GPD expanded by just 1½ per cent. This outcome largely reflected an exceptionally large decline

in dwelling investment associated with the transitional effects of introducing a revised indirect tax (the Goods and Services Tax).

The overall strong growth performance of the Australian economy has been achieved despite two significant adverse external shocks; the first, the Asian/Russian financial crisis of 1997/98, and the second, the US recession in 2001. In previous decades these shocks might have been expected to cause significant disruptions to the Australian economy. That they did not is attributable to a range of factors, not least of which is the flexibility of Australian dollar. These factors are discussed in more detail below.[2]

B.1 The Asian/Russian crisis

In 1998 and 1999 Australia recorded average growth of nearly 5 per cent – higher than the average of the past decade – despite the financial and economic turmoil in some of its largest trading partners. While external demand and Australia's terms of trade clearly weakened over this period, the effect on growth was more than offset by strong domestic demand. Reflecting this, the current-account deficit doubled from around 3 per cent of GDP prior to the crisis to a peak of around 6 per cent in 1999 (Figure II.1; panel 3).

Not surprisingly, given the close trading links between Australia and Asia, the Australian dollar depreciated significantly in response to the turmoil. Against the US dollar, the currency depreciated by almost 20 per cent between mid 1997 and end 1998, while a trade-weighted terms basis the fall was a smaller 6 per cent given the sharp appreciation of the Australian dollar against the devalued Asian currencies.

Largely in response to the depreciation, underlying inflation rose from around 1½ per cent prior to the crisis, to around 2½ per cent in late 1999. This increase was considerably less than would have been expected based on the historical relationship between inflation and the exchange rate (see below).

Throughout the crisis period, monetary policy remained expansionary. At the time of the Thai devaluation, the target cash rate stood at 5 per cent – 2 percentage points below its level a year earlier (Figure II.1; panel 6). The target rate remained unchanged until late 1998, when it was reduced to 4.75 per cent. The decision to maintain expansionary policy through this period distinguishes the Australian experience from that of some other countries and reflects a number of factors:

(i) The cyclical starting point was advantageous.

At the time of the Asian crisis, the Australian economy was growing strongly and the underlying inflation rate was a full percentage point below the medium-term target. This meant that the immediate inflationary consequences of the depreciation were of less concern than might have been the case had inflation been above the medium-term target when the crisis hit.

[2] See also Macfarlane (2001).

(ii) Foreign exchange risks were well managed.

As has been the case in other countries with well-developed financial markets, the depreciation of the exchange rate was unambiguously expansionary. In particular, it was not associated with an increase in Australia's country risk premium and, importantly, it did not lead to concerns about the balance-sheet effects of currency mismatches of either the banking or corporate sectors.

This was despite the fact that, at the time of the crisis, Australia's net foreign debt was equivalent to around 42 per cent of GDP, with the net debt of financial intermediaries amounting for around 60 per cent of this total. While much of the banks' overseas liabilities were, and remain, in the form of foreign currency bonds, the banks maintain very little currency risk on their own balance sheets due to the extensive use of foreign currency derivatives. In 2001, for example, the banking sector had outstanding foreign currency debt amounting to A$117 billion, offset by a net long position in derivatives of A$109 billion. The sector's main foreign exchange exposure results from its equity investment of offshore operations which are intentionally left unhedged.[3]

The derivative contracts that have been used to hedge the currency exposure have been undertaken mainly with non-residents. Some of these are entities that have borrowed Australian dollars and are seeking to swap their liability back into their own currency, while others are investors who are looking for exposure to the Australian dollar.

The derivatives market upon which the Australian banks so heavily rely has developed over many years, and reflects both the liquidity in the Australian dollar spot market and, more fundamentally, a willingness of foreign investors to take on Australian dollar risk. This willingness is partly an outcome of Australia's relatively stable macroeconomic and financial framework.

(iii)Markets retained confidence in the macroeconomic and structural policy settings in Australia.

At the time of the Asian crisis, fiscal policy had moved into surplus and the level of government debt to GDP was low by international standards. The banking system was widely recognised to be in sound shape, as was Australia's financial infrastructure. Moreover, the expectation of low inflation had become reasonably well embedded, as had the view that a decade or more of structural reform had delivered a substantial pick-up in the underlying rate of productivity growth in Australia.

Together, these factors meant that international investors were prepared to fund a significant increase in the current-account deficit, albeit at a much lower exchange rate. They also meant that there was reasonable confidence that a temporary pick-up in inflation associated with the depreciation would not translate into a troublesome pick-up in inflation expectations.

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[3] For more details, see Reserve Bank of Australia (2002). See also Caballero, Cowan and Kearns (2004).

The policy response of maintaining expansionary monetary policy and allowing the currency to depreciate was clearly successful. There were nonetheless some difficult moments.[4] In particular, in June 1998 there was extensive speculative selling of Australian dollars by large international fund managers and exporters who would normally have been natural buyers of Australian dollars. This speculation occurred after the exchange rate had already depreciated significantly and saw the Australian dollar fall US4 cents in a few days. This fall led financial markets to quickly price in a 75 basis point increase in interest rates over the following few months (Figure II.3).

In contrast to this market expectation, the RBA did not increase interest rates, instead undertaking a heavy round of foreign exchange intervention, purchasing around $A2.6 billion in the spot market in June. At the time, the RBA judged that higher interest rates were not justified on general economic grounds, and that in the highly uncertain environment that then existed there was a substantial risk that the short-run dynamics could lead to the exchange rate moving by more than could be reasonably justified by the changed fundamentals. Given this assessment, intervention in the foreign exchange market was viewed as the most appropriate response.

The approach was largely successful. Two-way price risk was introduced back into the market, with the exchange rate appreciating by around US2 cents over the second half of June. Market expectations of a tightening of monetary policy gradually waned, with the short-term yield curve being broadly flat again by end July.

A second difficult period occurred following the Russian crisis in late August. Again, the exchange rate came under significant downward pressure and short-term market interest rates increased. As in June, the RBA intervened to support the Australian dollar, although instead of relying solely on outright purchases of Australian dollars, as it had done in the past, it also purchased call options on the currency. This permitted the RBA to stimulate a significant demand for Australian dollars – triggered initially by the dealers who had sold the options – for a limited outlay. The sharp fall in the exchange rate was reversed and the options, which were then in profit, were resold. Conditions in the foreign exchange market stabilised over the following months, and the RBA cut the target cash rate by 25 basis points in December.

B.2. The US recession

The second major external shock was the US recession in 2001.

During the 1990s the macro-economic performance of Australia and the United States in terms of output and inflation were very similar. Yet, while Australian growth did slow in response to the US recession, the economy was able to considerably outperform the global economy. As was the case during the Asian crisis, weak world demand was counterbalanced by strong domestic demand, resulting in the current-account

[4] The following discussion on intervention that follows draws heavily on the Reserve Bank of Australia's Annual Reports for 1997/98 and 1998/99.

deficit again increasing to around 6 per cent of GDP. Unlike the Asian crisis though, the exchange rate appreciated slightly, albeit from a very low level, and the terms of trade experienced a modest increase, partly due to the falling world price of manufactures.

The solid performance of the Australian economy despite the difficult international environment can be explained by a number of factors.

First, Australia avoided the worst of the stock market and investment excesses associated with high-tech sector, and so avoided the worst of the fallout. This reflects, in part, the absence of a large information technology production sector in Australia.

Second, the level of the exchange rate during 2000-2002 was very expansionary. In 2000 and early 2001 the Australian dollar depreciated by around 25 per cent against the US dollar to a record low. For the three-year period from 2000 to 2002 as a whole, the real value of the Australian dollar against the US dollar was 23 per cent below its average level since the float. This weakness in the currency was unexpected, particularly given the increase in Australia's terms of trade during this period.[5] Indeed, it represented the first occasion since the float where the exchange rate had depreciated considerably in an environment in which the terms of trade were rising. This outcome reflected a view amongst certain investors that Australia was an "old economy" with only a small information technology sector. Given this view, the level of capital inflow declined, and correspondingly the current-account deficit narrowed to just below 2 per cent of GDP in early 2001, its lowest level in 22 years. As noted above, the deficit subsequently widened to around 6 per cent of GDP, as Australian assets once again became more attractive given the relative strong performance of the Australian economy.

Third, Australian households have been prepared to borrow heavily, mainly for the purposes of housing. This borrowing has underpinned a strong construction sector and has pushed up house prices, generating a positive wealth effect for existing homeowners.

In terms of policy, an interesting aspect of this period is the monetary policy response to the large swings in the exchange rate. Between November 1999 and August 2000, when the Australian dollar was depreciating, the RBA increased the target cash rate by 2 percentage points. This increase was designed to withdraw the monetary stimulus that had been in place during the Asian crisis. The weakness in the exchange rate was not a primary reason for tightening policy, although it did suggest that the stimulus was no longer required.

Later in 2000 and into 2001, the exchange rate continued to depreciate, reaching a record low of US47.75 cents in April 2001. At the same time, the deterioration in the international economy meant that the case for tighter policy on general macro grounds no longer existed. Given this assessment, as in 1998, the RBA undertook a round of foreign exchange intervention. Between September 2000 and April 2001 total intervention amounted to around $2½ billion (around the same as in June 1998) and was conducted both through purchases of call options on the Australian dollar and outright purchases of

[5] For a fuller discussion of exchange rate movements around this time see Macfarlane (2000).

Australian dollars. In contrast to the earlier episode though, the intervention was more spread out over time and market interest rates did not spike higher when the Australian dollar was depreciating sharply (Figure II.4).

The fall in the exchange rate in 2000 led a rise in forecast inflation. In late 2000, for example, the RBA was expecting inflation to increase to around 3 per cent over the next year or so. Despite this, further monetary tightening did not occur as the increase was largely seen as temporary, particularly given the deterioration in the world economy and apparently well-anchored inflation expectations. As was the case with the 1997-1998 depreciation, the pass-through into domestic prices has turned out to be relatively muted. This reflects a number of factors including inflation expectations that are well anchored, the ability of businesses to hedge currency risk and the unwillingness of firms to increase prices in a low-inflation world, particularly when the exchange rate is viewed as having a large cyclical element.

III. Brazil: Policy response to external shocks

In the last 10 years Brazil had no lack of shocks and crises. The Mexican crisis hit Brazil soon after the Real plan (successful stabilisation years of hyperinflation) and was followed by the Asian, Russian, the 1999 floating of the Real, the Argentine, power and, finally, election crises. In all of these occasions Brazil's financial (see Brazilian spread over treasury in figure III.1 below) and real variables suffered.

Over time Brazil has developed a set of reactions and policies to withstand large shocks, as for example, the appropriate timing for intervention, allowing further depreciation and/or tapping the resources of the IMF. In some cases, policies developed into frameworks, as is the case of the inflation targeting regime and the way the central bank reacts to these shocks. Even the relationship with the IMF during crisis provides lessons to other countries that may come to face similar events.

In the rest of this Brazilian section we describe how policies reacted to the 2002 crisis[6], the role of the IMF and the framework developed by the central bank to deal with the increased volatility. Before that, the next section introduces the reader to the current policy framework, as it has evolved from the Real stabilisation plan.

A. Policy framework

During the 1980's and early 1990's, Brazil experienced chronic high inflation, despite a series of failed stabilisation plans – involving six monetary reforms in ten years. Potential GDP growth had been hampered and all sorts of distortions developed. Contrary to some other high inflation countries in Latin America, Brazil was never a dollarised economy. Instead, indexation, the adaptive policy response, became pervasive throughout

[6] We will concentrate on the 2002 crisis and policy reactions. Most of the policy reactions to previous shocks are embedded in the rules and frameworks developed for this case.

the economy and its capacity to accommodate inflation may perhaps partially explain Brazil's failure to engage in serious structural change before 1994.

The Real plan of July 1994 succeeded in reducing inflation by an exchange-rate based stabilisation program that had the novelty of introducing a transitory unit of reference for prices. In March 1994 nominal prices, wages and other contracts were allowed to be quoted in a unit of reference value called URV that would be replaced by a new currency, the Real, on July 1994. The key issue was to co-ordinate a de-indexing process to break the inflationary inertia, since the automatic price adjustments to past inflation were not synchronised. The URV value was fine-tuned on a daily basis by the Central Bank in line with the loss of the currency's purchasing power. In the interim period after the introduction of the URV and before its replacement by the new currency, it was expected that relative prices would converge to their equilibrium value. This was important to the second phase of the conversion, when the URV would be transformed into Real on a one-on-one basis. The plan indeed caused inflation to plunge from 46 per cent in June 1994 to 1.5 per cent in September 1994, and succeeded in keeping inflation low in the subsequent years. However, the use of the exchange rate as the main anchor for monetary policy was not sustainable, as the currency remained overvalued in real terms for several years.

Brazil adopted inflation targeting in early 1999, after floating its currency and a 50 per cent nominal depreciation. Inflation targeting was one element of a wider policy regime that entailed, importantly, the announcement, a year earlier, of a sequence of higher primary budget surpluses. The new monetary regime worked well: the initial inflation targets were set at 8 per cent for 1999 and 6 per cent for 2000—with a 2 per cent tolerance range. In December 1999 the 12-month inflation rate was 8.9 per cent, and the following December 6 per cent, exactly on target.

This successful start was followed by two difficult years: contagion from Argentina, a domestic energy crisis, a widening of bond spreads world-wide, a sudden reversal in capital flows amounting to 6 per cent of GDP, and finally the political uncertainty surrounding by the 2002 presidential campaign. During this period the *real* depreciated again—20 per cent in 2001 and 50 per cent in 2002: inflation temporarily increased to as much as 16 per cent, but by March 2004, it was back to 6 per cent.

In spite of large shocks, private sector inflation expectations did not depart significantly from the country's inflation targets until September 2002. In 2003, after a quarter of high inflationary expectations, both inflation and expectations converged back to the targets.

B. The 2002 shock crisis[7]

During 2002, Brazil underwent a severe "stress test." Due mainly to the uncertainties related to the presidential campaign, but also to the widening of spreads

[7] This section draws on Giavazzi, Goldfajn and Herrera (2004)

world-wide, especially on U.S. corporate bonds, there was a sudden stop in capital flows[8] amounting to 6 per cent of GDP, an exchange rate depreciation of almost 50 per cent and a substantial increase in the spread over Treasuries of Brazilian bonds. The real depreciation and the sudden stop in capital inflows required a sharp adjustment in the current account (5 per cent of GDP**,** from 2001 to 2003) and a corresponding reduction in domestic absorption, mostly private consumption and investment.

The sudden stop and the resulting depreciation also led, because of the composition of Brazilian public debt, to an increase in the amount of debt as a fraction of GDP. Both domestic and external public debt were linked to the exchange rate: 30 per cent of domestic debt was indexed to the nominal exchange rate and, as in most emerging markets, all public external debt is denominated in strong currencies. As a result the ratio of net public debt to GDP jumped, in a few months, from 0.54 to 0.63.

The composition of public debt in Brazil has been an important issue for a while. The unwillingness of the private sector to bear currency risk limits the ability of the government to reduce the dollar-linked component of the debt. After two years (1999-2000) of continuous reduction, the proportion of dollar-linked debt increased again in 2001. Only after the crisis, since mid-2003, the government has been able to reduce once again this component of the debt. It remains an open question by how much and at what speed the Brazilian government should continue reducing its exposure to currency risk.

As public debt increased, and investors became suspicious regarding the economic policies that would be adopted after the election, doubts regarding the sustainability of the debt mounted. At one point, in mid 2002, the market began to price into Brazilian bonds a risk of default within the coming 12 months. The Embi spread (the difference between the yield on dollar-denominated bonds issued by Brazil and that on equivalent U.S. Treasury bonds) moved from 700 basis points in the Spring to 2400 at the end of July.

The uncertainty regarding the sustainability of public debt induced market participants to reduce their exposure to public debt or seek shorter government securities. As a result, the discount on long term domestic government securities widened substantially and the debt maturity was shortened. The average maturity of Selic-indexed debt held by the market fell from 36 months in March 2002 to 20 months in January 2003 and the percentage of debt coming due in the following 12 months rose from 6 percent to about 50 percent.[9]

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[8] The expression "sudden stop" reflects a rapid collapse in net capital inflows into the country and is defined and analysed in Dornbusch et al. (1995).

[9] Mutual funds, that held 30 per cent of the domestic public debt, were particularly vulnerable to the widening of the discount on longer term securities. Since these institutions were issuing de facto very liquid liabilities against long term government bonds, the losses on their assets induced heavy withdrawals from depositors, Moreover, some funds were delaying the recognition of the losses on their balance sheets, increasing the risks of runs on their liabilities. In order to avoid that, the central bank forcefully enforced the mark-to-market regulations, leading in the short run to more recognized losses and withdrawals. Eventually, and partially as a result of central bank intervention, the discounts stop widening, further losses were prevented, cutting short the withdrawals.

The inflation targeting regime also underwent a direct stress test: the exchange rate depreciation (and doubts regarding monetary policy under the new government) had led to higher expected inflation: one-year-ahead inflation expectations increased from 4.5 per cent in the Spring to 5.3 per cent in early August and 10 per cent in October.

C. Policy reaction

The sudden stop confronted the government with a number of challenges. First, the government had to restore confidence on future policies to avert the net capital outflows and reduce doubts regarding debt dynamics. Second, the central bank had to evaluate whether the impact of the exchange rate depreciation would be limited to a once and for all change in the level of prices, or inflation would remain higher even after the exchange rate had stabilised. In this regard, how fast and by how much should interest rates be raised? Third, the government had to manage the sharp fall in the demand for long term government securities and avoid a roll-over crisis.

The depreciation had rapidly increased the ratio of public debt to GDP. This called for an increase in the primary surplus if the level of the debt were to remain stable at this new level; alternatively, the debt level could fall as the result of a reversal of the exchange rate depreciation. In any case, confidence in future fiscal policies was necessary: but there was widespread uncertainty as to the policy that the future government would adopt.

Given the need for a co-ordinated approach and while evaluating the consequences of the shock to inflation, the central bank refrained from raising nominal interest rates. In mid July the target Selic rate was in fact cut from 18.5 to 18 per cent. As a result real rates, measured using the one-year ahead inflation forecast fell, though remaining at a still relatively high level of 11 per cent.

The situation called for a change in expectations regarding future fiscal and monetary policy. But, how to achieve a commitment on future fiscal policy by the leading candidates in the midst of the campaign? And how should monetary policy act in the process?

A first response came in August, when the IMF granted Brazil a U.S. $ 30 billion loan--the largest ever in IMF history—conditional on Brazil maintaining “responsible policies” in the next few years: fiscal primary surpluses, inflation targeting, a floating exchange regime and respect of contracts, including the public debt. The purpose of the loan was not only to provide the central bank with foreign exchange reserves but also, and importantly, to provide a mechanism that would help the main candidates co-ordinate their public support for sound policies—precisely as suggested in Mishkin (2004). The statements from the candidates came, though some were more vague than had been hoped, but they certainly helped avoiding a further deterioration of market conditions ahead of the October elections. More importantly, the leading candidate started sending stronger signals that he was prepared to adopt the fiscal stance required to stabilise debt dynamics.

At the same time, it became progressively clearer that the exchange rate depreciation would have persistent effects on inflation (we explain in detail below how the

central bank confronted the rise in inflation). Understanding the response of price setters to changes in the exchange rate was crucial to determine the optimal monetary policy response, since the larger and the more persistent is the effect on prices, the longer is the horizon needed for inflation to return to the target path. The most recent experience prior to the crisis was that of 1999: after a 60 per cent depreciation, inflation had increased temporarily to 9 per cent, but at the end of 2000 it was back to 6.0 per cent, the mid-point of the central bank's target range.

There was, however, a big difference between 1999 and 2002: the level of the real exchange rate before the depreciation: in 1999, before the devaluation, Brazil's effective real exchange rate (measured relative to 13 currencies and normalised to 100 in 1994) was 95.7—a fall in the index indicating a real appreciation; in 2002 it was 150. As shown in Goldfajn and Werlang (2000) the level of the real exchange rate before a devaluation is an important factor in determining the pass-through from the exchange rate to prices. When the real exchange rate is weak, foreign exporters enjoy large margins and can afford to cut them to preserve their market shares, thus dampening the pass-through. This was the case in 1999, but not quite the situation in 2002.

At this point monetary policy reacted strongly: on October 15 the Selic was raised from 18 to 21 per cent, followed by a further rise to 25 per cent in mid December; the real rate jumped from 11 to 18 per cent, consistent with a monetary policy rule that responds more than proportionately to an increase in inflation expectations. Eventually President Lula delivered on his promises: the new government maintained the floating exchange regime and inflation targeting, made clear that public debt would be honoured, and increased the primary surplus by one half per cent of GDP (the shift in perceived fiscal policy was large, expectations were that primary surplus will actually fall by a few percentage points).

C.1 Policy Reaction: Central Bank Framework for Dealing with Shocks[10]

In early 2003 the Central Bank realised that it was not feasible (under reasonable output loss estimations) to pursue the original targets set a couple of years earlier. As a consequence of the depreciation, and also doubts regarding monetary policy under the next government (would he adopt a populist stance?), annualised inflation had reached 6 per cent just in the last quarter of 2003 (30 per cent annualised). Simulations based on a set of assumptions indicate that a convergence trajectory that reaches 6.5 per cent in 2003, the ceiling of the target tolerance interval, would imply around 1-2 per cent drop in GDP. Moreover, a trajectory that reaches the centre of the target, 4 per cent, in 2003, would imply an even larger decline in GDP (-7 per cent).

The decision was then to pursue an inflation trajectory based upon these adjusted targets. The idea was gear monetary policy towards converging inflation to the original target tolerance interval in two years (two years is no magic number, all depends on the size and type of the shock). Figure III.3 draws the expected path for inflation. The trajectory is

[10] This section draws on Fraga, Goldfajn and Minella (2003)

compatible with the (end-of-year) adjusted targets of 8,5 per cent in 2003 and 5,5 per cent in 2004.

Of course, there is always some credibility costs associated with breaching original targets. However, given the size of the shocks, one should also consider the credibility loss stemming from deciding to keep the old target because that could be considered unattainable (in fact, for most practical purposes, coming from an annualised rate of 30 per cent to a 6 per cent ceiling rate in one year was not reachable). The decision to keep the original targets must weigh these two effects. Overall, the decision was to pursue the original targets over a longer horizon, and increase communication (and transparency) to explain that this entailed a choice for a path with the best inflation/output trade-off.

In what follows we summarise the methodology used by the Central Bank of Brazil (BCB) to deal with shocks. The methodology is built on the recent experience with inflation targeting during turbulent times. In short, the methodology calculates the inflationary impact of current supply shocks as well as the secondary impact of past shocks (due to inertia in the inflation process). The idea is simply to accommodate the direct impact of current shocks and to choose a horizon to weed out the secondary impact of past shocks.

When facing shocks, the BCB initially considers the nature and persistence of the shock. Then it builds different inflation and output trajectories associated with different interest rate paths. Based on its aversion to inflation variability, it chooses the optimal path for output and inflation. Banco Central do Brasil (2003) has published this path and also the outcome of different paths. This is in line with Svensson's (2002) recommendations.[11]

However, if shocks are large and/or persistent, their inflationary effects may last one year or more. The optimal inflation path may imply a 12-month ahead inflation superior to the previous annual target. Therefore, in this situation, given that the BCB would not be targeting the previous inflation target, it uses an "adjusted target". More specifically, the target is adjusted in order to take into account primary effects of change in relative prices and of past inertia that will be accommodated. The new target is publicly announced. In the concept of adjusted target, the primary effect of the shock to regulated-price inflation, and the inflation inertia inherited from the previous year to be accommodated in the current year, are added to the target previously set by the government. Facing cost shocks, such as the increase of regulated prices above the inflation of the other prices of the economy, monetary policy should be calibrated so as to accommodate the direct impact of shocks on the price level, but to fight their secondary effects. Furthermore, since the Central Bank also takes into account output costs, the inertial impacts of the previous year's inflation should not necessarily be fought completely.

Indeed, changes in relative prices, such as the prices of regulated utilities and the exchange rate, have been one of the main challenges faced by the Central Bank of Brazil (BCB). Since the implementation of the Real Plan, in July 1994, for a variety of reasons,

[11] Svensson's (2002) recommendations also involve publishing the corresponding instrument-rate plan.

regulated-prices inflation has been well above the market prices inflation. Considering since the start of the inflation targeting period, the ratio of regulated prices to market prices rose 31.4 per cent (1999:7 - 2003:2). As long as there is some downward rigidity in prices, changes in relative prices are usually translated into higher inflation. If these increases are treated as a supply shock, monetary policy should be oriented towards eliminating only their secondary impact on inflation, while preserving the initial realignment of relative prices. Therefore, the efforts of the BCB to quantify the first-order inflationary impact of the regulated-price inflation have become particularly important, since it helps to implement monetary policy in a flexible manner and without losing sight of the larger objective of achieving the inflation targets. [12]

This methodology was applied to the Brazilian case after the 2002 crisis, for the inflation in 2003 and 2004.[13] In an open letter sent to the Minister of Finance in January 2003[14], the bank first explained why the exchange rate had overshot, and made explicit estimates of the size of the shocks and their persistence. It estimated the shock from administered prices to be 1.7 per cent and the inertia from past shocks to be 4.2 per cent of which two thirds was to be accepted, resulting in a further adjustment of 2.8 per cent. The central bank added these two numbers to the previously announced target of 4 per cent to get an adjusted inflation target for 2003 of 8.5 per cent (=4 per cent + 1.7 per cent + 2.8 per cent). Specifically, the letter indicated that an attempt to achieve an inflation rate of 6.5 per cent in 2003 would entail a fall of 1.6 per cent in GDP, while trying to achieve the non-adjusted target of 4 per cent would lead to an even larger decline of GDP of 7.3 per cent. Eventually inflation in 2003 ended up at 9.3 per cent, very close to the adjusted target, and the GDP declined by 0.2 per cent.

In the inflation targeting design, a core inflation measure or the establishment of escape clauses have also been used or suggested as a way of dealing with shocks and volatilities. The main argument contrary to the use of core inflation is that it is less representative of the loss of the purchasing power of money, at a given point in time. Agents are concerned about the whole basket of consumption. In the Brazilian case, exclusion of the regulated price items would imply to leave out more than 30 per cent of the representative consumption basket. In this sense, private agents may question a monetary policy that is not concerned about the overall consumer price index.

In general, there are two advantages in the use of the "adjusted target" procedure. First, the core inflation measure is not necessarily isolated from the effect of shocks. For example, the large depreciation shock of the Brazilian economy in 2002, led to a core inflation of xx, way above the inflation target. Second, the construction of the adjusted

[12] The first-order effect to market prices (in contrast to regulated prices) are not calculated. The methodology assumes that the primary shock to market prices tend to occur faster, within the first quarter after the shock. Therefore, all the primary shock to market prices is assumed to have already occurred when calculating the adjusted targets.

[13] See Banco Central do Brasil (2003). For a more detailed explanation of the methodology, see Freitas, Minella, and Riella (2002).

[14] Under the presidential decree that introduced inflation targeting, the Banco Central do Brasil is required to submit an open letter to the Ministry of Finance explaining the causes of any breach of the inflation target and what steps would be taken to get the inflation rate back down again.

target is directly based on the idea that monetary policy should neutralise second-order effects of supply shocks and accommodate the first-round effects, and on the fact that some weight to output volatility should be assigned in the objective function. Therefore, some principles under which the monetary policy is conducted become more transparent.

In the case of escape clauses, the circumstances under which the central bank can justify the non-fulfilment of the targets are set in advance. It has more similarities with the adjusted target procedure than with the use of core as it does not exclude items from the inflation target, but defines circumstances in which the breach of targets can be justified. The main advantages of the adjusted target procedure are the following: i) it is a forward looking procedure, ii) it defines clearly the new target to be pursued by the central bank, and iii) it explains how the new target is measured.

C.2 Policy reaction: The Role of the IMF

It is important to analyse the role of the IMF in the crisis management. IMF scepticism regarding the success of the Real plan in 1994 led to a lack of effective dialogue between the institution and part of the Brazilian authorities. During the 1994-97 period, effective dialogue was not vital: inflation stabilisation was a success, capital flows abundant and Brazilian risk premium reached record low levels. Brazil was not engaged in a program with the IMF, as it was not needed.

The institution surveillance could have had a role in advising the need for fiscal and external adjustment early in the process. In fact, surveillance papers often mentioned the need for further fiscal consolidation (but as characteristic, no strong position regarding the exchange rate regime).[15] However, it is fair to say that the IMF's comments during this period lacked the necessary emphasis as well as had little impact on Brazilian economics and politics. The explanation resides in both the lack of effective dialogue between the IMF and part of the Brazilian government and the fact that market conditions remained favorable during this period.

The turbulence in international markets after the Asian crises and, in particular, in the aftermath of the Russian crisis triggered the need for a formal IMF program and financial assistance to Brazil in 1998. The program was centred in the fiscal adjustment but maintained the support for the exchange rate regime. Despite Brazilian progress in the fiscal accounts, market forces obliged Brazil to change its exchange regime and the program to be revised as soon as March 1999.

The most interesting role of the IMF is in the 2002 crisis. There was an important political component to the turbulence in the markets. However, IMF officials were not directly involved in talks with politicians. Both the Cardoso administration as well as the IMF understood that it would not be beneficial for all parties involved that an international organisation to be seen engaged in the political process. The reforms and economic adjustments were exclusively of the interest of the Brazilian people and they were to be

[15] See "The IMF and Recent Capital Account Crises: Indonesia, Korea and Brazil," The Independent Evaluation Office, IMF, 2003.

seen as that. In fact, the Brazilian government had always expressed strong "ownership" of the reforms and adjustments and this was an important message to transmit to the future government.

Although the IMF would not engage in political negotiations, it was essential for Brazil and the future IMF program that the candidates agree on basic principles. However, it became clear immediately that it was not feasible to engage the candidates in detailed negotiations of a program with the IMF. This implied that the negotiations had to be first agreed in broad terms with the IMF and then presented to the candidates by the outgoing administration in order for them to, hopefully, indicate publicly their support for the agreement.

This strategy was only feasible if the IMF program was not filled with detailed conditionalities to be fulfilled by the future government. This was a delicate balance, since a coherent economic program usually involves future commitments. But the outgoing administration was very firm in not imposing neither abundant nor stringent conditionalities on the future government. The diagnosis by both the IMF and the government was that the solution to the uncertainties regarding the future of Brazil relied not on establishing further measures but rather on guaranteeing that current policies would be followed in the future. The most important example is the target for the primary surplus. Both IMF staff members and some economists in the government believed that a higher primary surplus could provide a cushion for unforeseen events that could impact debt dynamics. However, the most senior officials in the government and at the IMF rightly agreed and emphasised that the overwhelming priority was to device a program that obtained support from all parties involved to fiscal and monetary responsibility and the respect to contracts.

D. Results

Far from falling into a vicious circle, the economy rapidly stabilised. By the end of December the Embi spread had fallen to 1500 basis points: a year later, when Brazil's rating was raised from B to B+, the spread would fall to 450 bp, 100 less than in February 2002, before the crisis had started. As it had happened on the way up, part of this reduction is explained by the simultaneous reduction in the U.S. corporate bond spread which fell 200 bp between October 2002 and December 2003, but there is little doubt that markets' perceptions of Brazil had shifted. The exchange rate stabilised and inflation expectations, which had been rising for six month, by December 2003 were back to 5.8 per cent. Eventually the central bank could lower rates: by late 2003 the Selic was reduced to 16.5, two points below its level before the crisis had started.

Nevertheless, the 2002 shock had severe real consequences. Higher inflation and tight monetary policy in 2003 led to lower wages, reduced consumption and zero (-0.2 per cent) growth, mostly driven by export boom.[16]

[16] In 2004, the economy is showing signs of substantial wages, consumption and output recovery. Inflation is within the targets.

IV. Chile: Policy response to external shocks

A. External shocks and the business cycle

During the period 1990-2003, the Chilean economy grew at an average rate of 5.5 per cent per year. Over this period the inflation rate has fallen from levels close to 30 per cent in the beginning of the nineties to single-digit levels by the end of 1994. Since 1999, the inflation rate has fluctuated around a steady state level of 3 per cent. External conditions have played an important role in shaping the Chilean business cycle during this period. Importantly, the terms of trade have exhibited significant fluctuations, which in turn have been mainly determined by the evolution of the price of copper, the main export of the economy, and oil prices. Additionally, during this period the Chilean economy regained access to the international capital markets. By mid nineties, net private capital flows had more than doubled capital flows at the end of the eighties. This access to external financing allowed the economy to experience an important boom in investment, which averaged 28 per cent of GDP in the period 1995-1998 (see Tables I.5 and IV.1).

Figures IV.1 and IV.2 show the relation between an index of external conditions (ECI) and GDP growth and output gap.[17][18] As can be seen, there is a strong correlation between the ECI and the different measures of activity. Using the output gap measure, we distinguish one contractionary phase and one expansionary phase during the period 1990-2003. For the years 1990-1998, the economy grew above potential while in the period 1998-2003, the economy operated below potential. External conditions were particularly favourable in 1989, 1992 and 1995-1996. Nevertheless, there is a single external shock that can be used to divide the whole period in these two clearly different phases: the Asian crisis and the associated events (see Table IV.2). After a short period of improved conditions in 2000-2001, another important external shock hit the Chilean economy: the contraction in output experienced by the major industrialised economies in the period 2001-2002 following the end of the asset price bubble in the US and the attacks of September 11. Additionally, during this period there was increasing pressure on Argentina and Brazil, ending with the collapse of the currency board in the former country, with debt sustainability problems in the latter and with pressure on other emerging markets. In the next sections we study in details the effects of these two shocks on the Chilean economy and the policy responses implemented in each case. As the policy framework differed in both episodes, before analysing each shock, we describe the main components of the monetary policy framework at the time of the shock.

B. The policy framework I: 1990-1999

After being granted independence in 1989, aimed at fulfilling its objective of price

[17] The index of external conditions is constructed as a weighted average of the change in world interest rates, the change in terms of trade and the GDP growth of commercial partners. The weights come from a regression among GDP growth, these variables and other relevant variables to explain GDP growth.

[18] A panel of economists concerted by the Ministry of Finance computes this output gap measure, which is used the estimation of the structural fiscal surplus (See Marcel et al. (2001)).

stability, the Central Bank of Chile (CBC) pursued a *pseudo* inflation targeting (IT) regime until 1999, and then a full-fledged IT regime in 2000. At the moment it began implementing this strategy, inflation reached 27.3 per cent in December of 1990, after major fluctuations during the previous years. Probably the most basic components of the macro framework included annual quantitative inflation targets and the predominance of these targets as the nominal anchor of the economy, which eventually entered in contradiction with other nominal commitments. The announcement of these targets was probably the most symbolic characteristic of the regime, and has led some authors to consider the Chilean experience of the nineties as an IT regime. Other typical features of this regime were rather absent, however. For instance, both the transparency and the communication devices of the regime fell short of what today is regarded as a prerequisite of IT (see table I.1).

Annual targets were announced in September of each year, for the December-December inflation rate for the coming year, within the annual CBC report to Congress considered in the CBC Charter. Strategically, this report appears only one month before Congress begins debating next year's fiscal budget. In making these announcements, the CBC first considered the goal of converging to single-digit inflation and, once accomplished, the final goal of achieving the level of inflation of developed countries, a level that was not defined with precision. The announcements included a slow convergence to lower inflation explicitly because of the prevalence of widespread backward-looking indexation in the Chilean economy. A rapid convergence to a low-inflation regime was considered riskier because the key price misalignment that was likely to result would both produce real negative effects and jeopardise the disinflation program's sustainability. Only once in the 11-year period was this annual announcement overridden during the next year. The episode occurred in 1995 when the target was modified from 9 per cent to 8 per cent, in a policy decision closely related to the opportunistic approach to disinflation (see Dornbusch and Fischer (1993)). The initial inflation targets came under the form of a target range, which was modified in 1995 for point targets (see Figure IV.3).

Given the date of the announcement and its focus on December of the coming year, the average life of the target in the 1990s was only 7.5 months, hardly a time span for monetary policy to have strong effects through the conventional transmission mechanisms. Rather, it is possible to think of announcements that were a compromise between inflation forecasts, the need for lower inflation and a well thought communication strategy. The CBC was remarkably successful in bringing inflation down from 30 per cent to less than 5 per cent with this strategy.

There is no consensus on the precise reasons for this outcome. De Gregorio (2003) and García (2003) identify the positive productivity shocks faced by the economy through the 1990s as a key driving force of the inflation dynamics. Unit labour costs decreased despite indexation and declining inflation thanks to the unexpectedly high growth performance. Corbo (1998) and Morandé (2003) identify the existence of the inflation target as a key co-ordinating device for expectations. They show that inflation dynamics changed substantially during the nineties.

Besides these annual inflation targets, the CBC managed a target band for the

exchange rate. The band was perceived as the key instrument to achieve the objective of normal functioning of the external payments system, which in turn was brought to practice as a target (a cap) for the current-account deficit. The exchange rate band was based on a purchasing power parity rule, corrected during some periods for productivity differentials between Chile and its trading partners. It underwent a number of modifications over the 1990s, including changes in its width and once-and-for-all realignments. The CBC intervened not only at the edges of the band, but also actively within it.

During the 1990s, the CBC maintained important regulations in the capital account, including a non remunerated reserve requirement for capital inflows — which was increasingly broadened until 1997 — and a minimum staying period for some inflows. Behind these regulations lies the wish to retain the possibility of managing the exchange rate with monetary policy autonomy as well as the intent to manage inflows in order to keep total expenditures under control.

Throughout the 1990s the way the CBC conducted monetary policy was progressively improved. From a rather rough management of interest rates of instruments of different tenors in 1990, the CBC converged to managing liquidity in order to achieve certain overnight interest rate in the interbank market. Foreign exchange interventions, in turn, were done in different ways, directly through forex purchases from public enterprises (mainly Codelco) and indirectly trough market operations. From the publicly available information it was not straightforward to determine the exact extent and timing of interventions — public information showed together interventions and other International Reserves movements — although interventions clearly tried to hinder the strong real exchange rate appreciation trend. The effort to sterilise inflows between 1990 and 1997 was a large one. During that period the CBC increased its forex reserves holding from US$ 2.5 billion to US$ 17.8 billion. Its foreign exchange position switched from 5.1 per cent of GDP short to around 25 per cent of GDP long. In 1998 the CBC also intervened in the forex market by issuing dollar-linked debt and with a short-lived trial using options.

During the 1990s fiscal policy was orderly managed, allowing the central government's net public debt to decline from 37.6 per cent of GDP in 1989 to 5.6 per cent in 1997. Of course, the aforementioned strong growth performance facilitated this result, although institutional factors also contributed. In fact, despite not having an explicit fiscal rule, Chile has strong fiscal institutions. They range from having a centralised state (not a federal state), a strong Ministry of Finance within the government, to arrangements such as a copper stabilisation fund that allows the authority set aside abnormally high copper revenues in a transparent way.

In addition to strong monetary and fiscal policies, the Chilean economy also displays strong financial institutions. Based on the experience of the debt crisis in the 1980s that led to the collapse of the banking system, there was a substantial improvement in financial regulation and supervision. These changes have allowed the development of a healthy and resilient financial system.

C. The Asian and Russian Crises

By the beginning of 1997, the Chilean economy was experiencing an unprecedented phase of growth. In the period 1991-1996, the economy grew at an average rate of 8.5 per cent. Moreover, this rapid growth was achieved with inflation falling from 27 per cent at the end of 1990 to 6.6 per cent in December of 1996. It is in this context that the devaluation of the Thailand Baht in July 1997 occurred. This devaluation marked the beginning of what was called the Asian crisis. In the months following this devaluation, many other countries in East Asia were forced to depreciate their currencies. Massive capital outflows, severe output losses and widespread bankruptcy of banks and non-financial firms followed. The negative effects of these events were not restricted only to Asian economies but troubled many other emerging economies.

Initially, the Asian crisis was expected to have an effect on the Chilean economy through real links as close to a 35 per cent of Chilean exports were directed to these countries. However, these real effects seemed to be limited. By December of 1997, GDP growth forecasts reported by consensus forecasts for the year 1998 were around 6.4 per cent, only 0.3 per cent down from those forecasts made in August 1997 (see Figure IV.4). As the crisis began to develop, it was clearer that its effects on the Chilean economy were not limited to real links but also involved financial effects. Access to international capital markets for emerging economies, extensively available for most of these countries in previous years, was severely restricted. Emerging economies suffered *sudden stops*.

After suffering a fall of more than 13 per cent in 1996, the terms of trade for the Chilean economy were experiencing a significant rebound in the first half of 1997. Led mainly by the increase in the price of copper, they grew 5 per cent in the first half of 1997 with respect to its lower level in 1996. However, the slowdown in world activity due to the Asian crisis generated a large fall in the prices of commodities in the second half of 1997. In particular, the price of copper fell more than 35 per cent in the period July 1997-June 1998. However, as the prices of the main Chilean imports were also falling, the fall in terms of trade was less dramatic. Between the second quarter of 1997 and the same quarter in 1998, the terms of trade fell close to 3.5 per cent.

Where those terms of trade figures completely informative? Alternative measures for the terms of trade indicate that the fall may have been much larger than what the national account figures suggest. Figure IV.5 shows that the terms of trade measured using a methodology developed by Bennett and Valdés (2001) fell 15 per cent in the period July 1997-June 1998.[19] As mentioned before, an additional measure that can be used to quantify the magnitude of the external shock faced by the economy is a weighted average of the changes in the terms of trade, the world real interest rate and trade partners' growth (ECI). After reaching its highest value for the 1990 in 1995, this index was decreasing and since 1998 has been below its average for the period 1985-2003.

[19] These authors construct monthly price series of exports and imports using a Laspeyres methodology, i.e. allowing for changes in the weight of the different components of the basket. Notably, the import price index is constructed using oil prices and the world import price index (adjusted by oil prices) constructed by the IMF.

As a summary, a clear deterioration in the external conditions faced by the Chilean economy was perceived only at the beginning of 1998. During that year, it became clear that the external scenario was contractionary. The initial forecast for the price of copper of $0.96 for 1998 made by the CBC in September of 1997 was rapidly out of date. By January of 1998, the price of copper had reached its lowest value in four years, and by the end of 1998, its lowest value since March of 1987 (see table IV.3).

C.1 Initial conditions

The conduct of monetary policy in that uncertain environment was unquestionably difficult. Some domestic conditions made the task more complex, in particular the cyclical situation and the expansionary fiscal stance at the beginning of the adjustment period. By the second quarter of 1997, the Chilean economy was entering in a strong expansionary cycle of domestic demand. During the second semester of 1997, household consumption grew at a rate of 10.5 per cent while investment growth was close to 14 per cent. Estimates by the CBC made at the beginning of 1998 indicated that the economy faced a potential deficit in the current account close to 8 per cent in 1998. This was well above what the CBC considered appropriate to attain external sustainability (see "*Evolución de la Economía en 1999 y Perspectivas para el 2000*" page 14).

What were the reasons behind the strong expansion in domestic demand in 1997? In the first place, large capital inflows (close to 10 per cent of GDP in 1997) played a crucial role. These capital inflows were the consequence of relatively high interest rates and expectations of exchange rate stability. In addition, the perception by the public that potential GDP growth was around 7 per cent fuelled the private boom consumption. With all, the CBC and most private observers saw the strong growth in domestic demand as unexpected. In fact, the CBC gradually reduced real interest rates during 1997 from 7.5 per cent early that year to reach 6.5 per cent by December. It has been argued that this "expansionary" policy was one reason behind the domestic demand expansion. However, this claim does not seem convincing after a closer look to the data. If something, the monetary policy seems to have been less contractionary at that time. Several measures for the neutral real interest rate confirm this view (see Figure IV.6). Moreover, it is unlikely that the 1 per cent change in interest rate could have explained, in a significant way, the magnitude of the expansion.[20]

The second domestic condition that made monetary policy more difficult was an expansionary fiscal stance at the time of the external shock. Arguably, it was politically difficult to increase an already positive fiscal balance in a booming economy, but it was also clear that the expansionary fiscal stance contributed to the growth of domestic demand. Even though at lower rates than private domestic demand, the inflationary effects of this type of expenditures could have had significant effects. The situation for the year 1998 was not different. Despite the announcement of cuts to expenditures by the fiscal authority, the delay in the implementation of these cuts made fiscal policy in effect expansionary in 1998

[20] Nonetheless, if agents perceived at some point this policy as unsustainable given external conditions it could have accelerated expenditures in a sizeable way.

(see Figures IV.7 and IV.8).

Additionally, in May of 1998 there was a substantial increase in the minimum wage. The government set an increase in the minimum wage of 12.7 per cent for the year 1998. Moreover, the path for this wage was set for a period of three years. For the year 1999, the minimum wage was increased by 12.4 per cent while for the year 2000 this was raised 10.4 per cent. This policy translated into a significant increase in the real minimum wage, which may have reduced the ability of labour markets to deal with the negative external shock that the economy was facing. Moreover, average wages grew 2.5 per cent in 1997 in an environment of highly persistent growth wages due to indexation.

C.2 Policy responses

At the end of 1997, the CBC intervened several times in the exchange rate market in order to avoid pressures towards the devaluation of the peso, which were associated to the uncertain external environment coming from the unstable situation in East Asia. In a scenario in which the fulfilment of the inflation target for that year was far from secured, additional pressures from the exchange rate on inflation were not welcome. By the beginning of 1998, it was clear that domestic demand was in a clear expansionary path and that the international scenario was becoming more uncertain. In this context, the CBC raised the interest rate by 50 basis point on January 8. By controlling internal demand, the CBC was expecting to moderate the current-account deficit to around 4 per cent of GDP for the year 1998, and reassuring the inflation target for December of 1998 of 4.5 per cent.

Nevertheless, doubts regarding the feasibility of the current-account deficit target for the year persisted. This triggered a first round of speculative attack against the peso in mid January. The intervention in the exchange rate market was implemented via non-sterilised interventions. As a consequence of this strategy, the inter-bank interest rate reached values over 90 per cent in real annual terms at the end of January (see figure IV.9). The severe restriction to liquidity generated that the cost of funds rate plus the spread was above the maximum legal rate during some days in January, which resulted in that banks were unable to lend normally.

A new increase took place in February 3, this time the CBC raised the monetary policy rate by 150 basis point. The CBC made explicit in its press release that the increase in interest rate had the intention to bring the current-account deficit to around 5 per cent of GDP. This time however, the CBC made clear that the interest rate that the bank was *targeting* was the monetary policy rate.[21] The CBC stated that liquidity was going to be controlled in order to ensure the normal functioning of the financial system with no ceiling in the behaviour of the inter-bank rate, which was to be determined by market forces.

In the next few months, the CBC indicated that the interventions in the exchange rate market were implemented in order to smooth the fluctuations of the exchange rate.

[21] Despite the fact that in its press release of January 8, the CBC indicated that was willing to take the necessary actions to keep the interbank rate around 7% in real annual terms, this interest rate was never close to this level during the second half of January 1998.

Moreover, the CBC authority made clear that it was impossible for the CBC to affect a natural tendency in the exchange rate (see *El Diario Financiero*, 05/07/98). Nevertheless, by mid June 1998, a new round of speculative attacks was in place. Increasingly bad news regarding the evolution of the Japanese economy, the second largest trade partner of the Chilean economy, generated a clime of increasing uncertainty. Additionally, doubts regarding the solvency of the Russian economy were intensified. The CBC intervened again in the exchange rate market while letting the interbank rate reach levels as high as 60 per cent in real annual terms. By the end of June, the CBC announced a set of changes to the exchange rate regime and to the existing restrictions on capital flows (*encaje*). On June 25, it reduced considerably the width of the exchange rate band from a symmetric 12.5 per cent around the centre of the band to a +2 per cent and –3.5 per cent eliminating also the tendency of the centre of the band equal to 2 per cent maintaining its PPP adjustment.[22] Additionally, the CBC reduced the non-remunerated tax on capital inflows from 30 per cent to 10 per cent and started to issue dollar denominated bonds. These actions were aimed to reduce volatility in the financial markets. By signalling a strong compromise with the inflation target for that year and providing hedging instruments for the financial system, the CBC was trying to decrease the pressure on the peso. However, these policy actions were not enough to reduce this pressure, which determined additional interventions in the exchange rate market and high inter-bank rates during the next few weeks.

A third round of speculative attacks took place in the period August-September of 1998 amid devaluation expectations for many Latin American countries and the imminent debt default by the Russian Federation. The CBC intervened actively the exchange rate market in order to avoid large movements in the exchange rate. Again, the inter-bank interest rate reached extremely high levels during this episode. By mid September, the CBC announced a series of actions in order to reduce the volatility of the interest rates and to protect the macroeconomic stability. In first place, the CBC increased the monetary policy rate to an unprecedented 14 per cent in real annual terms. Also, the CBC increased the exchange rate band width to +/- 3.5 per cent establishing a gradual increase in it from 3.5 per cent to 5 per cent by the end of the year 1998.[23] Additionally, some technical changes were introduced to the way the centre of the band was adjusted over time. Finally, the CBC announced the end of the non-remunerated tax (*encaje*).

Several reasons were behind these policy actions. In the first place, the CBC argued that "…the true dilemma was how to manage the uncertainty, via exchange rate or via interest rates". In other words, the CBC had to decide between letting the exchange rate to depreciate or increasing interest rates in order to cool down domestic demand while sustaining the peso. The alternative of allowing the exchange rate to depreciate was considered dangerous because it could have de-anchored inflation expectations (and finally effective inflation) because the inflation target for the year 1998 was not likely to be reached in that context. As the historical experience showed, a devaluation of the exchange rate was expected to have great impact on inflation given the degree of indexation of the

[22] The 2% tendency rate was towards recognising a real depreciation of the peso.

[23] In December 1998, the CBC introduced a new modification to the exchange rate regime increasing the bands to +/- 8%.

Chilean economy. As stated by the CBC[24]: "…different estimations show a pass-through coefficient close to 50 per cent after one year, which means that a depreciation of 10 per cent translate into 5 per cent extra inflation…The evidence shows that this coefficient is pro-cyclical and could be 70 per cent in a period in which the economy is growing beyond its potential as in the second half of 1997…Moreover, this coefficient is higher if operates through expectations and costs simultaneously". Adding the possibility of a exchange rate overshooting, being loose in the short time would have generated, in the opinion of the CBC, a severe credibility loss which would had implied tough policies in the future in order to regain it.[25]

Additionally, the CBC feared that a large devaluation could have created problems in the balance sheets of firms, given the mismatch generated by seven years of real appreciation (Morandé and Tapia, 2002). This could have affected the general perception regarding the Chilean economy. The CBC saw these actions as a way to help the private sector in the process of portfolio adjustment, by providing dollars necessaries o reduce the exposure of this sector to the exchange rate.

Finally, the CBC was worried about a current-account deficit beyond a level considered sustainable around 4-5 per cent of GDP. As mentioned before, the CBC justified part of the increase in interest rate by the need to control the current-account deficit. Levels above the 6 per cent of GDP were considered to have negative effects in the long run over the economy.

In summary, the increase in interest rates to control the growth of domestic demand, the restriction of liquidity, and the exchange rate intervention, allowed in the opinion of the CBC an "orderly" exchange rate adjustment without risking financial and price stability.

The mix of negative external shocks and the contractionary monetary policy resulted in GDP growth of 3.2 per cent in 1998 and –0.8 per cent in 1999. For these years, effective GDP growth rates were 2 per cent and 4.5 per cent lower than the respective projections made by the CBC in September of 1998. On the other hand, the inflation target was reached in the year 1998 (4.7 per cent) while inflation in 1999 was 2 per cent lower than the target fixed in September of 1998. The current-account deficit fell to 4.9 per cent in 1998 and –0.1 per cent in 1999.

How much of the macroeconomic performance of the Chilean economy during that time can be attributed to policy and how much to the external scenario is a difficult task. Nevertheless, we can obtain some simple estimates of the monetary policy impulse by computing simple Taylor rules. Using the inter-bank interest rate as the actual instrument for monetary policy during 1998, we found that the different specifications for Taylor rules, that include inflation differentials, output gaps and the current account, can not capture the

[24] See "*Evolución de la Economía en 1999 y Perspectivas para el 2000*" page 17.

[25] In the year 1997 effective inflation exceeded the target of 5.5% (Dec.-Dec.) by 0.5%. While this was a small margin, the monetary policy framework was strict regarding the fulfilment of the target in an annual base (see Massad (1998)). As it was made clear to the public (see Massad*, El Diario Financiero*, 08/20/98), the possibility of a revision of the target for the year 1998, 4.5% was impossible.

magnitude of the increases in real interest rates during the first three quarters of the year 1998.[26] (In progress)

D. The policy framework since 2000

In part as a reaction to the aftermath of the 1997-98 shock, but also following the growing international consensus of the time, in 1999 Chile began a substantial enhancement of its macroeconomic framework. Five major changes are worth singling out:

(i) The adoption of a free-floating exchange rate regime.
(ii) The deepening of the foreign exchange derivatives (forward) market.
(iii) The implementation of a full-fledged IT system.
(iv) The total opening of the capital account.
(v) The use of an explicit fiscal policy rule for the Central Government.

The gradual transition to a floating exchange rate system was pursued with the adoption of a widening exchange rate band in December 1998. After ten months in which the band's width was increased from 7 per cent to 16 per cent of the central parity, the Central Bank of Chile (CBC) announced in September 1999 that the band was no longer in the policy framework. The CBC officially retained the authority to intervene, but it announced that it would do so only in special circumstances, and it would inform the public about those decisions. In parallel to this "slow" transition to a floating regime—that, remarkably, did not entail any specially abrupt movement in the foreign exchange rate—, the CBC made the regulatory adjustments necessary to foster the development of hedges. In particular, it eased banking regulations to allow banks to participate more actively in the forward market. Volumes increased rapidly. Between 1998 and 2003, total turnover volume in the derivatives market increased by 60 per cent, while the spot market more than doubled (see Alarcón, Selaive and Villena, 2004).

The inflation-targeting framework was enhanced in several dimensions. In September 1999, an ongoing target band of 2-4 per cent was announced as the new inflation target starting 2001 (the interim target for December 2000 was 3.5 per cent). The CBC began publishing an inflation report three times a year (the first issue was released in May 2000), announced monthly monetary policy meeting dates six moths in advance, disclosed monetary policy meeting minutes with a three-month delay —period that was subsequently shortened to three weeks. Overall, it improved markedly the disclosure of information, including detailed forecasts and views about transmission mechanisms. Procedural changes were enacted in a new CBC Board ruling.

As regards to fiscal policy, the new Administration announced in 2000 that during the next six years it would follow a rule for determining total expenditures. The rule, known as the one-percent structural surplus rule, aimed at ensuring a 1 per cent surplus for the central government every year considering structural revenues, measured as cycle-

[26] We thank Rodrigo Caputo for providing these estimates.

adjusted tax revenues and what could be considered a "normal" copper price.[27] The 1 per cent target was explained as necessary to cover for the recurrent CBC deficit, as a means to save copper wealth for future generations and as an insurance against contingent liabilities (see *Estado de la Hacienda Pública* 2000). The rule allowed to better communicate the fiscal position, separating cyclical from structural changes and, because it was accompanied by an important fiscal restraint, it helped to improve credibility.

Lastly, the capital account was completely opened in 2001, although the CBC retained its faculty to impose restrictions. After years of pursuing a strategy of gradual integration, which included a 30 per cent unremunerated reserve requirement of one year for capital inflows up to 1998 and several other controls, such as a minimum stay period requirement, the CBC totally opened up the capital account. This development was also accompanied with ever fewer restrictions for the international allocation of funds managed by the private pension system.

E. The US recession and global uncertainty in 2001

After suffering a deep fall in GDP growth in the year 1999, the Chilean economy recovered in the year 2000 helped by a positive external environment and the gradual normalization of monetary policy. The improvement in the terms of trade, which reached levels close to the ones observed in the years previous to 1996, and the strong economic expansion of commercial partners all supported this recovery. After ending the year 1999 with the lowest annual rate of inflation in decades, domestic prices started to increase steadily explained mainly by the evolution of oil price. Nevertheless, core inflation remained stable around 3 per cent during that year.

Based on the dynamism that the economy was starting to exhibit, which was expected to push up costs, and on the possibility that the increases in oil prices could have been more permanent, and could have produced second order round effects on inflation, the CBC decided to increase the real interest rate in January 2000 from 5 per cent to 5.25 per cent. Despite the fact that aggregate demand increases remained within the limits expected by the CBC, the reduction in oil prices was being slower than expected leading the CBC to additionally increase interest rates by 25 basis points in March of 2000. These policy adjustments were expected to be consistent with inflation rates within the target range in the 1-2 year policy horizon and with GDP growth around 6 per cent for the years 2000 and 2001.

However, towards the second half of the year 2000, the external conditions started to deteriorate. The price of copper fell 27 per cent between the third quarter of 2000 and the same period in 2001 while the price of other important export goods were also falling. Summing up, the terms of trade in goods and services fell almost 7.5 per cent in this period. International credit conditions, that had remained tight for the previous periods, did not

[27] See Marcel et al. (2001) for details.

improve.[28] In addition, GDP growth by trading partners, after reaching 3.8 per cent in the year 2000 was in a clear path of deceleration at the end of that year, and would end up being only 1.3 per cent in the year 2001. This fall was mainly explained by the drastic reduction in GDP growth in the U.S. from 3.8 per cent in 2000 to 0.3 per cent in 2001.[29]

As information regarding the external scenario was deteriorating more rapidly than expected, which tended to push the balance of inflationary risks in a negative direction, the CBC implemented a reduction in interest rate in the August of 2000. Later, the CBC reduced interest rates for a total of 100 basis points in the first three months of the year 2001 as inflationary expectations fall. The international scenario continued worsening along the year 2001 while inflation expectations continued falling. In this context, the CBC implemented additional cuts in the interest rate totalling a reduction of 150 basis point in the first half of the year.

The worsening in world economic perspectives and the fragile position of some Latin American economies led the peso to depreciate almost 10 per cent in a two-month span (June-August).[30] The CBC, considering that the speed of the depreciation was generating excessive volatility, implemented a number of actions tending to provide to domestic financial markets with hedging instruments and international liquidity. In particular, the CBC increased the supply of dollar denominated bonds by $2 billion dollars in a period of one year. Secondly, the CBC assigned until $2 billion dollars of international reserves to finance spot market interventions. Additionally, and as a clear difference to previous intervention episodes, the CBC indicated that any monetary effect of these actions were going to be compensated in order to keep the provision of liquidity in pesos coherent with the monetary policy interest rate.

The exchange rate market interventions were concentrated between September and October of 2001 and involved around $800 million dollars (See Tapia and Tokman (2004)). Compared to previous interventions these rounds of interventions involved fewer resources and seemed to have been more effective. In effect, as Tapia and Tokman (2004) argue, the fact that these interventions were announced and explained to the public seemed to have increased its effectiveness.

The combination of an expansionary monetary policy and adverse external conditions in the year 2001 determined a GDP growth of 3.4 per cent. This figure was 2 per cent less than expected at the end of the year 2000. Nevertheless, this external scenario was

[28] Moreover, as the central banks of the main economies increased interest rates in order to avoid inflationary pressures coming from the expansionary cycle, risk premiums paid by emerging economies increased.

[29] The sharp decrease in unemployment in the US, the evolution of asset prices, and the significant increase in its current-account deficit led the US Federal Reserve to initiate a process of steady increase in the Fed Fund interest rate. However, after the technology asset prices collapse in March 2000, news regarding a harder-than-expected landing of the US economy emerged. This deceleration materialised during the year 2001. Moreover, the September 11 attacks and the accounting frauds revealed along that year generated more uncertainty.

[30] Moreover, the exchange rate had suffered a depreciation close to 10% between February and May of 2001.

constructed with a rate of growth for the world economy of 3.9 per cent, almost 2.5 per cent less than the actual figure. Additionally, despite the fact that the nominal exchange rate devaluated 15 per cent in the year 2001, inflation rate remained low. The current-account deficit increased from 1 per cent in 2000 to 1.7 per cent in 2001.

V. Policy Lessons

The design of policy regimes in medium-sized economies that are well integrated into the international trading system and that face large movements in their terms of trade and/or external financial conditions poses particular challenges. It is, nevertheless, arguable that, given the positive experience of Australia, Chile's economic performance during the past three years, and the experience of Brazil, a first-best regime should include at least the following elements:

- A floating exchange rate that helps to stabilise swings in the economy arising from the external sector;

- Liquid and well-developed financial markets that allow financial institutions and firms to hedge risks arising from movements in financial prices, in particular the exchange rate, and that allow the country to be less vulnerable to shocks.

- A credible medium-term inflation-targeting regime that anchors inflation expectations appropriately, but at the same time allows the central bank to respond flexibly to short-run movements in the inflation rate.

- A sustainable and credible fiscal policy, with favourable public debt dynamics in case of shocks

All these elements are inter-related and mutually reinforcing. For example, well-developed financial markets and a credible monetary policy regime are important in allowing exchange-rate movements to play an effective, stabilising role in the economy. While these interactions can be helpful, they can also impose significant complications in the adoption of a first-best regime, particularly for countries where the initial conditions are unfavourable.

Inflation targeting (IT) has been adopted as the monetary framework in a significant number of countries, including the three countries examined in this study, each of which stands at a different point in the path to establishing such a regime. While a floating exchange-rate has been embraced by all three, and fiscal policy has been improved markedly in both Chile and Brazil, the latter still faces important challenges in reducing its debt-to-GDP ratio.

The experience of the three countries suggests some lessons regarding the design of the regime and the challenges of implementation. These are discussed below.

A. Within Framework vs. Outer Policy Reactions

Despite the apparent framework similarities, the actual implementation of IT regimes has differed across countries. For example, some countries, such as Chile during the period 1900-1999, have implemented inflation targeting regimes that combine inflation targets with targets for other macroeconomic variables such as the exchange rate or the current account. On some occasions, these multiple objectives have been in conflict with one another, which has increased tension regarding the monetary policy framework and has led to changes in the framework itself, generally in the direction of establishing the inflation rate as the only policy target.

One important element for any monetary policy framework to be useful, is stability. It can be argued that policy actions that are well understood by the public and are inserted within the framework are more effective, as they also operate through the expectations of private agents. In this respect, policy actions that are not consistent with the framework are likely to create uncertainty. Accordingly, policy changes or changes in the framework are also likely to generate uncertainty and expectations of further adjustments.

The experience of the three countries in this matter is illustrative. Arguably, Chile's changes to the exchange rate band in 1998 may have stirred expectations of further changes. On the other hand, letting the inter-bank interest rate drift away from the announced target probably created uncertainty regarding the monetary policy direction. In the case of Brazil, part of the framework was being built as policymakers were facing the shocks (how much to accommodate? What is the appropriate horizon for inflation to converge to the target path?). The policy reactions in Australia and in Chile in 2002 were part of the same framework, built in advance and, probably, well understood. The challenge, therefore, is to develop resilient enough frameworks so that policy reactions can be predictable as a contingency. Of course, having multiple objectives for a central bank complicates this task further.

B. Exogenous and "Endogenous" Shocks

In some sense, shocks hitting economies are not solely exogenous events. The crises in Brazil had severe real costs in terms of output, real wages and consumption growth. Over time, the presence of large and frequent external shocks generates greater instability in the economy which map into lower credit ratings, among other problems. This may jeopardise the fulfilment of goals and targets, which may in turn hurt the credibility of the country. In the short run, these crises may be considered as shocks: exogenous events out of the control of policymakers and the country. However, the vulnerability to shocks reflects weaker fundamentals and institutions, so they cannot be taken as exogenous in a longer time horizon. This means that learning how to respond to shocks is not sufficient. It is important not to delay reforms and adjustments, developing institutions, in order to reduce the frequency and magnitude of shocks.

Moreover, one can argue that the development of rules and institutions help smooth political transitions and create consensus for future reforms, essential ingredients for sustained growth. However, institutions and rules require time to establish themselves since

they require credibility and are not disconnected from the culture of the country. In the case of Brazil, good examples of institutions and rules recently created (some not completely established) are the Fiscal Responsibility law, the inflation targeting and floating exchange rate regime and fiscal federalism. Additionally, there have been improvements in the degree of openness, flexibility and respect to contracts. In Chile, the fiscal rule implemented in the year 2000, that ensures a structural surplus, has allowed the fiscal policy to be countercyclical.

C. Flexibility vs. Credibility

As experience with inflation targeting has accumulated, there has been a trend toward adopting flexible regimes, with the focus more on medium-term outcomes than on the permissible variation of inflation in the short run. Theoretically, this shift has offered policy makers the scope to tolerate greater year-to-year variation in inflation, potentially increasing the stability of the economy without prejudicing the overall goal of sustaining a low average rate of inflation.

In the first-best world, extra flexibility can be useful for dealing with external shocks and swings in the exchange rate.[31] As an example, consider the case in which inflation is initially at the central bank's target, but then the terms of trade rise and the exchange rate appreciates considerably. Inflation might be expected to fall for a couple of years as lower import prices feed through into the CPI, before gradually picking up due to the income effects of the higher terms of trade. In these circumstances, a strict approach to inflation targeting may require monetary policy to be eased initially, adding to the already expansionary effect of the higher terms of trade. Conversely, the central bank may need to tighten its policy in response to an exchange rate depreciation caused by an adverse external shock. In terms of overall welfare, such responses may well be sub-optimal, increasing the volatility of growth, without any benefit in terms of the average rate of inflation. In contrast, a more flexible regime might allow the central bank to avoid easing in an expansionary environment or tightening in a contractionary environment, contributing to greater stability of both the economy and interest rates.

While such a flexible regime may be useful, it can come at a cost, if it lacks credibility at first and communication is not ideal. In particular, it has the potential to weaken the credibility of the regime, especially if the private sector expects the central bank to use flexibility to avoid taking difficult decisions. For example, a decision not to increase interest rates in response to a depreciation may be perceived as a signal of lack of commitment by the central bank to the regime. In Chile and Brazil, the announcement and achievement of annual inflation targets were very much part of the process of building credibility. Only after it reached its long-term inflation rate, and presumably upon

[31] When the inflation target is strict (or short term), the exchange rate is the only instrument that allows the monetary authority to affect inflation dynamics in the short run. As has been documented extensively in the empirical literature, the effects of changes in monetary policy on the output gap —and through this on inflation— usually requires horizons longer than three quarters. Therefore, when the interest rate is used to control the evolution of the exchange rate in the short run, there are additional effects in the medium term over activity that must be taken into account.

establishing a credible reputation, Chile moved toward a flexible regime with medium-term targets.

One view is that when credibility is lacking, if inflation is above its steady state, clear and verifiable short-term targets are preferred, but as credibility is established more flexibility is permitted. The difficulty arises if the targets can only be achieved with a severe contraction of the economy, or they simply become unattainable because circumstances change. In such cases, the strict target could actually work to undermine the credibility and/or durability of the regime.

Somewhat in contrast to the above view, the credibility of the Australian regime was not built on achieving tightly defined short-run targets. When the objective was articulated initially, there was considerable scepticism about the central bank's commitment to it. In particular, a number of commentators noted the absence of any institutional changes and the multiple objectives of the RBA set out in legislation. There was also a widely held view that the fall in inflation of the early 1990s was accidental, rather than the result of a deliberate action by the RBA. In this environment, the process of building credibility has been evolutionary rather than revolutionary. One element in this process was the progressive upgrading of the quality and quantity of published material on the economy and the greater focus on inflation in the RBA's public communication. An important period was the tightening cycle that commenced in the second half of 1994. At that point in time, inflation remained low although confidence that this would be maintained was rather weak. Somewhat to the market's surprise, the RBA began raising interest rates in August 1994. In total, rates were increased by 275 basis points over a five-month period to December 1994, with public communication being explicitly forward looking, emphasising the need to control inflation so as to sustain growth over the longer term. The enhanced credibility of the RBA arising partly out of this episode was evident in 1996 when, as interest rates were being cut, there was very little public comment that the cuts were politically motivated as there had often been in the past. Another factor useful in building credibility has been the fact that the regime and the target have remained unchanged for more than a decade. Over this period the RBA has communicated essentially the same message about its goals and the way it operates, and the message has become increasingly ingrained into the way that the public thinks about monetary policy. There is little, if any, public discussion of the need to change the framework or the numerical objective.

In Brazil, inflation targeting (coupled with a floating exchange rate regime) helped absorb the severe shocks that hit the economy, while at the same time keeping inflation under control. The latter was an essential ingredient for producing the real exchange rate depreciation (as opposed to only nominal depreciation) and, therefore, the external adjustment. Following the depreciation, the central bank assessed the nature and persistence of the shock; then it built different inflation and output trajectories associated with different interest rate paths; based on its aversion to inflation variability, it chose the optimal path for output and inflation. If the shock is abnormally large and/or persistent, its inflationary effect may last more than a year: then the optimal inflation path may imply a 12-month-ahead inflation above the previous annual target. In such a case it is not possible, nor optimal, to pursue blindly the central point of the old target: the target should be adjusted to

take into account the effects of the change in relative prices. Eventually, although at longer horizons, inflation must converge to its target path.

Of course, there are always some credibility costs associated with breaching original targets. The decision to neutralise the shock in a longer time horizon, based on an evaluation of the size and persistence of the shock, may lead to time consistency issues: too much accommodation in the short run leading to loss of credibility in the long run. However, given the size of the shocks, one should also consider the lost credibility from deciding to keep the old target because this one could be considered unattainable.

Therefore, it is essential that the whole procedure be explained publicly in great detail, so that agents can judge effectively whether the size and persistence of the shock justify the decision taken by the central bank. It is transparency, therefore, that imposes enough discipline to avoid time-consistency issues. Nevertheless, agents find it difficult to evaluate the results conditional on the environment where policymakers operate.

D. Flexibility vs. Credibility: Initial Macroeconomic Conditions

It seems important to differentiate between a situation in which the inflation is at its steady state and a situation in which the inflation rate is converging towards to its long run level. The policy responses that have been analysed in the case of Brazil and Chile (specifically during the Asian crisis) occurred at a moment in which the inflation rate was converging to its long-run level. This created additional difficulties in handling the situation. Faced with a sudden stop, which called for a large devaluation, Brazil decided to adjust its inflation targets and let the exchange rate depreciate in order to accommodate the shock and avoid potentially large output losses. Instead, confronted with a large negative external shock in 1998, the Chilean authorities decided to adjust the interest rate in order to keep control of inflation.[32] The outcome of this policy was the fulfilment of the inflation target in 1998, a recession in 1999 and an inflation rate almost 2 percent lower than the target in 1999. The long-run benefits from both policies are difficult to assess. However, in the case of Chile, the gains in credibility allowed the economy to move toward a more flexible inflation-targeting regime with well-anchored inflation expectations around the long-run level of 3 percent. In Brazil it could be argued that, notwithstanding the communication effort, having missed the short-term target may have inevitably generated some credibility costs.

From an empirical perspective, there is evidence that the level of inflation at the moment of facing a shock matters for policy responses. This is possibly one characteristic that allowed Australia to implement a more flexible regime to begin with. And also, this is one possible reason why Brazil and Chile had to increase (decrease) interest rates more (less) during the Asian crisis and the US recession. Using a simple regression analysis to study the changes in real interest rates from the previous year for a group of inflation-

[32] It can be argued that a point inflation target reduced even more the flexibility that the monetary authority had to deal with the external shock. Also, fear of floating, due to perceived forex mismatches in the corporate sector.

targeting countries during the years 1998 and 2001[33], we found that the difference between the inflation rate at the beginning of the period and the inflation target at the end of the period is positively correlated with the real interest rate change (table V.1). This evidence is consistent with the view that for countries with declining inflation rate targets, an unexpected shock reduces the space for flexibility. Additionally, the difference between the inflation rate and the target can be evidence of an unfavourable cyclical position (see below).

The contrasting monetary policy responses of Australia on one hand, and Chile on the other, in response to the Asian crisis, reflect not only differences in monetary policy credibility, but also the cyclical position of each economy. In Chile, for example, when the crisis occurred, inflation was above the central bank's announced target for the year 1998 and there were concerns about excess demand growth and its implication on the current-account deficit. By way of contrast, while domestic growth was solid in Australia, inflation was below the medium-term objective partly because of a previous appreciation of the currency. This difference in starting points contributed to the inflationary concerns resulting from the depreciation being considerably greater in Chile than in Australia. In fact, based on the regression analysis mentioned before, it could be argued that, in fact, countries with greater deficits in their current accounts with respect to their long-run levels experienced smaller (larger) increases (reductions) in their real interest rates (see table V.1 and figure V.1).

E. Pass-through and Fear of Floating

Another difference that shapes the policy responses is the extent of actual and perceived pass-through of exchange rate changes to CPI inflation. In Chile, for example, a 10-percent depreciation of the exchange rate might be expected to add around 5 percent to the CPI within a year, whereas in Australia the figure is closer to three quarters of one percent. This more pervasive pass-through, increased according to what was perceived, made the task of the Chilean authorities more difficult than that of their Australian peers. Again, our simple econometric work indicates that countries with higher pass-through experienced larger (smaller) increases in the real interest rate in the years 1998 and 2001 (see table V.1 and figure V.2).

In the first-best world, countries with a high degree of pass-through probably stand to gain more from a flexible approach to inflation targeting than those with low pass-through. Given that these countries are likely to demonstrate more short-term volatility in their inflation rate, additional flexibility increases the probability that they will not be drawn into the type of sub-optimal policy responses discussed above. However, again the difficulty arises where credibility is weak. In such cases, the needed flexibility cannot be used for fear of undermining confidence in the regime.

[33] The countries considered in the analysis are Australia, Brazil, Canada, Chile, Colombia, the Czech Republic, Hungary, Iceland, Israel, Korea, Mexico, New Zealand, Norway, Peru, Poland, South Africa, Sweden, Switzerland, Thailand and the U.K.. The dependent variable corresponds to the change in real interest rate in 1998 (2001) with respect to 1997 (2000) from the WDI indicators. Hence, each country has two observations.

Now, as has been already discussed, if pass-through is perceived as high, the authority will avoid using the exchange rate to accommodate the negative external shock. This policy action may lead to significant effects on the competitive stance of the country. For example, in the case of Chile, while some important trade partners were devaluating their currencies strongly during the Asian crisis, in the period June 1997-June 1998, the real exchange rate appreciated close to 4 percent. Different estimations suggested that the magnitude of the real exchange rate misalignment was between 10 and 20 percent by mid 1998 (see Céspedes and De Gregorio, 1998 and Calderón, 2004). This misalignment suggests that the inflationary fears from the nominal devaluation may have been overstated as the empirical analysis suggests that the real exchange rate misalignment may reduce the inflationary effects of the nominal devaluation significantly (see Céspedes and De Gregorio, 1998 and Goldfajn and Werlang, 2000).

One interesting observation from the Australian, the Chilean, and also the Brazilian, experiences is that the extent of pass-through has declined over time. Among a number of reasons is the enhanced credibility of monetary policy. With inflation expectations well anchored, wage demands now show little movement in response to changes in the exchange rate. Moreover, price-setters often view at least some part of exchange rate movements as temporary, and are thus prepared to absorb, for a time, changes in the cost of imported goods in their margins. This experience suggests another self-reinforcing mechanism: high credibility not only provides more flexibility but also reduces pass-through that, at the margin, reduces the need for flexibility. The flip side of this, of course, is that low credibility means high pass-through and little scope for flexibility even though the benefits of flexibility may be high.

F. Financial Markets, Mismatches and Fear of Floating

In the first-best world, terms of trade or external demand shocks would be accompanied by movements in the exchange rate that help redistribute the burden of the shock. By and large, this has happened in Australia, with exchange rate movements playing an important stabilising role. While at times large movements in the exchange rate have been somewhat uncomfortable, overall they have served the Australian economy well.

In Chile and Brazil, exchange rate movements have raised more concern. This partly reflects their impact on inflation, as discussed above. But it also reflects the structure of balance sheets (of either the private or public sector) and the state of development of financial markets. A critical issue in this regard is the willingness of those outside the country to accept local currency liabilities. In Australia's case, foreigners have been willing to take on Australian dollar exposures, either directly through the bond or equity markets, or indirectly through the derivatives markets. This has allowed the exchange rate to move considerably in response to external shocks without generating concern about the health of domestic balance sheets. In contrast, Chile and Brazil have much more difficult borrowing at reasonable interest rates in their own currencies on global capital markets.

It should be pointed out that a flexible exchange rate arrangement may provide the right incentives to hedge the exchange rate risk. In Chile, a rigid exchange rate may have

provided lower incentives to do it. Moreover, the authorities' commitment with the inflation target provided space to the private agents to react to changes in the conditions that called for depreciation. A flexible exchange rate regime has the benefit of providing the right incentives to hedge exchange rate risk but requires a development of an efficient and liquid exchange rate derivatives market.

The role played by financial markets is crucial to understand the effects of external shocks in less developed economies. Because financial markets are more shallow, the effects of external shocks on output, investment and employment are magnified by the role played by balance sheets or the collateral of firms. Firms operating in less developed financial markets suffer higher increases in risk premiums, which tend to reduce aggregate demand and may require a more expansionary policy. But, as explained previously, it is precisely for those less developed countries that a more flexible response of monetary policy may undermine credibility and reduce the scope for cuts in interest rates.

Now, fluctuations in the exchange rate and/or in risk premia can also cause corresponding fluctuations in the debt ratio—the larger is the share of dollar-denominated debt (see, for example, Céspedes, Chang and Velasco, 2004). If the debt is perceived as unsustainable, the economy may fall into a vicious circle of further depreciation and further increases in the debt ratio. In such a situation monetary policy cannot work alone: fiscal policy needs to adjust (in the present and/or future) to the permanent change in the real exchange rate or risk premium. The lesson is that working toward deepening financial markets may reduce vulnerability to negative shocks and therefore may help to increase the effectiveness of the inflation-targeting regime.

G. Fiscal Policy

The possibility of implementing an (flexible) inflation-targeting regime also depends crucially on the implementation of a sustainable fiscal policy. Fiscal institutions or arrangements play a crucial role in guaranteeing consistency and credibility of the inflation-targeting regime. As has been extensively argued, the excessively pro-cyclical fiscal policies in developing countries are the consequence of weak and deficit-prone fiscal policies. In the cases of Australia and Chile more recently, strong fiscal institutions have allowed fiscal and monetary policy to play a stabilising role. Brazil has started to develop fiscal arrangements that are oriented to increasing the sustainability of the fiscal debt. The Brazilian experience shows that in such a situation monetary policy cannot work alone: fiscal policy needs to adjust (in the present and/or future) to the permanent change in the real exchange rate or risk premia.

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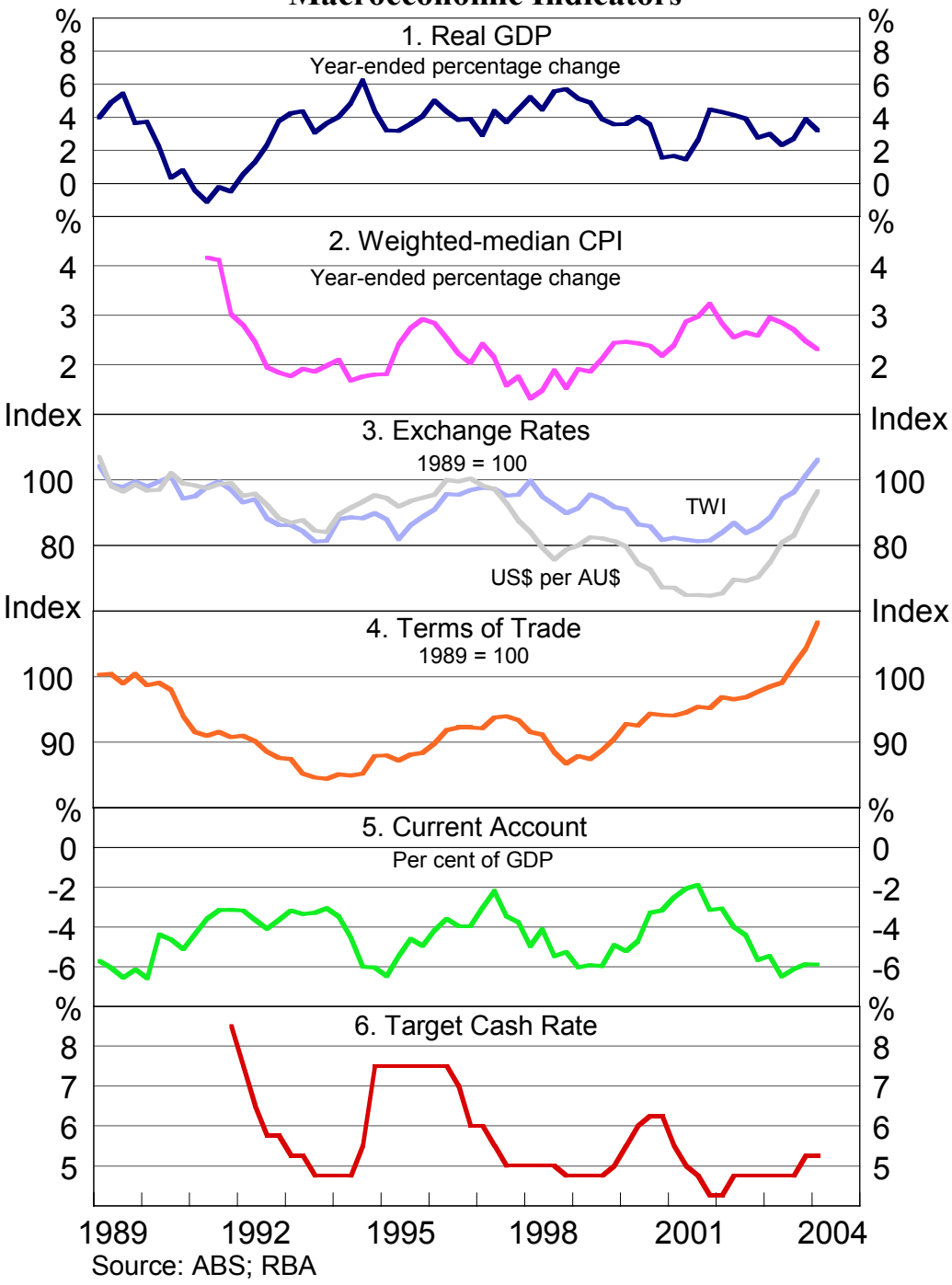
Figure II.1

Macroeconomic Indicators



Source: ABS; RBA

Figure II.2
Real Exchange Rate and Terms of Trade

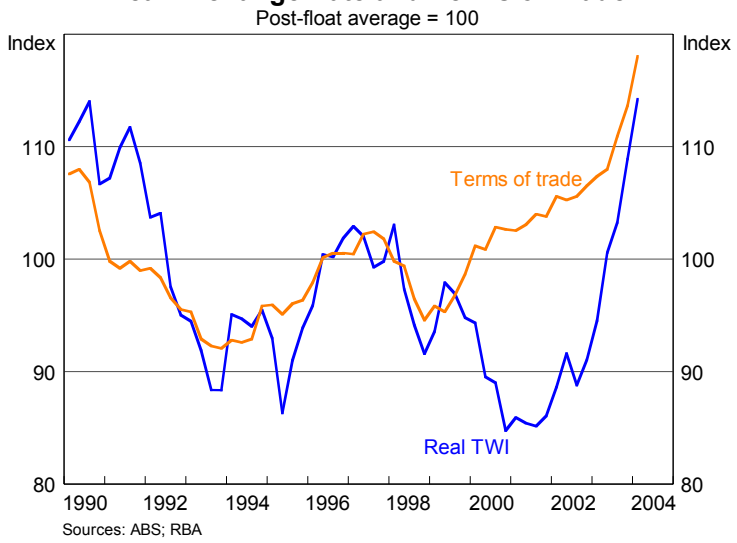


Figure II.3
Exchange Rate and Interest Rates - 1998

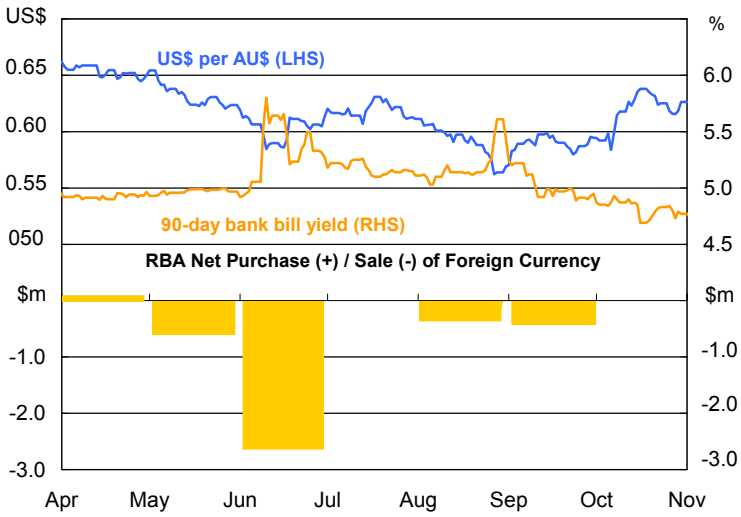


Figure II.4

Exchange Rate and Interest Rates - 2000 and 2001

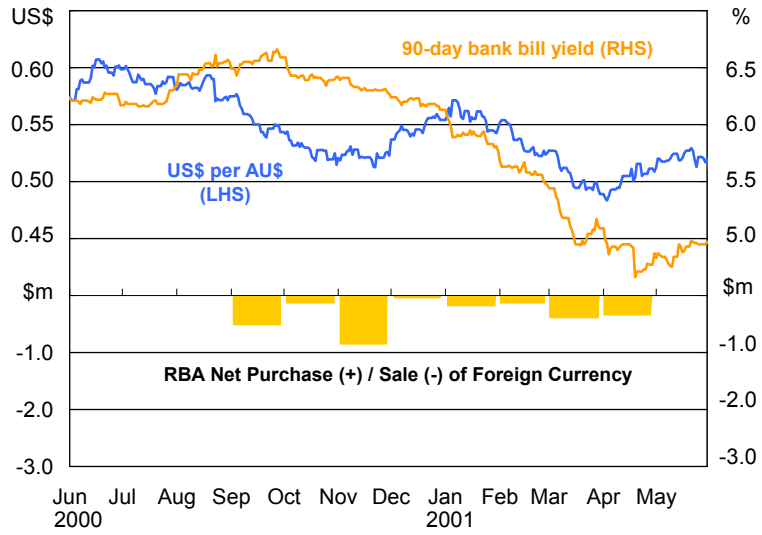


Figure III.1

Embi Brazil (1994:1-2004:5) - Spread

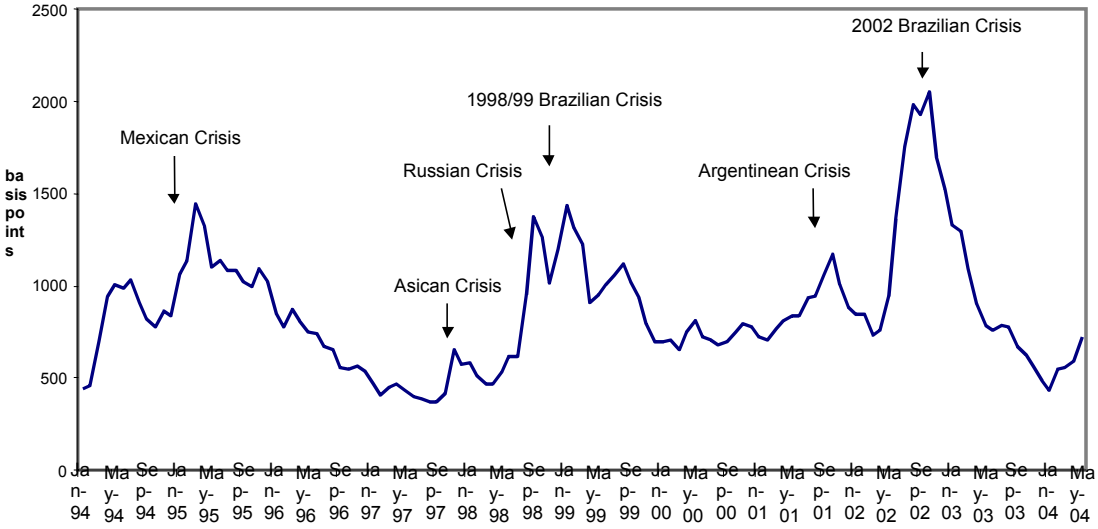


Figure III.2
Inflation path, Consumer Price Index (IPCA), Monthly variation, 1991-2002

Source: Central Bank of Brazil, Economic Department

Figure III.3
Annual Inflation Rates

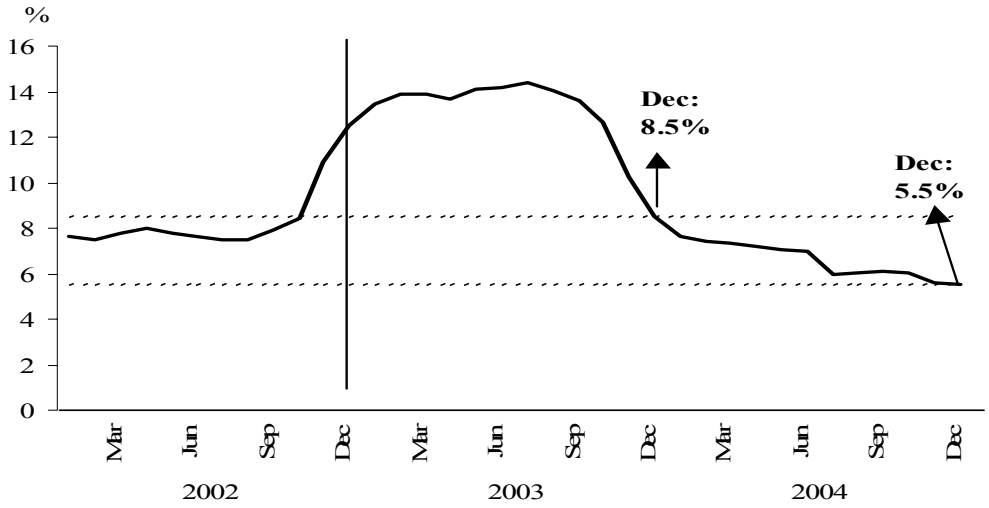
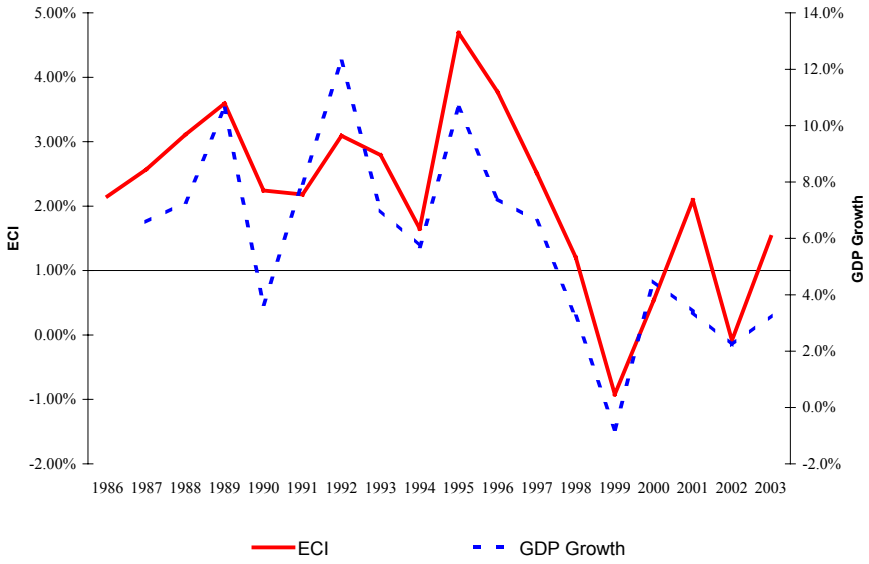
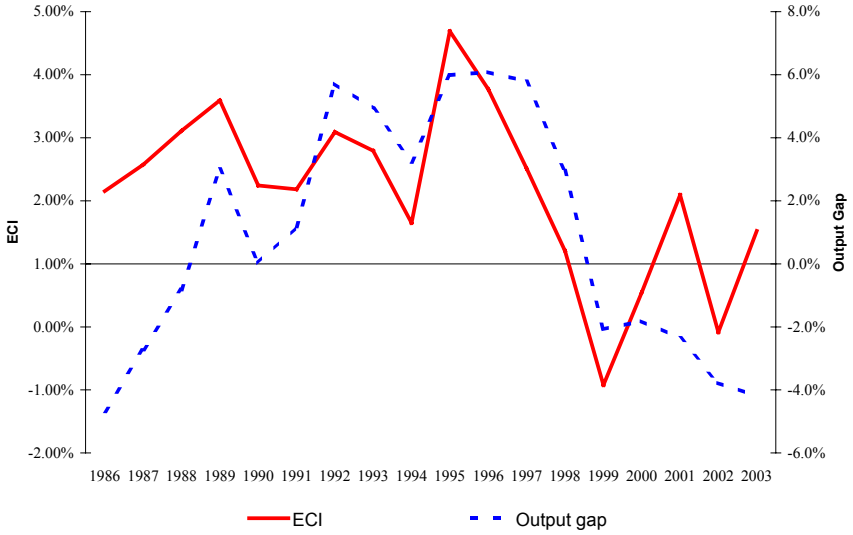


Figure IV.1
Chile: External Conditions Index and GDP Growth



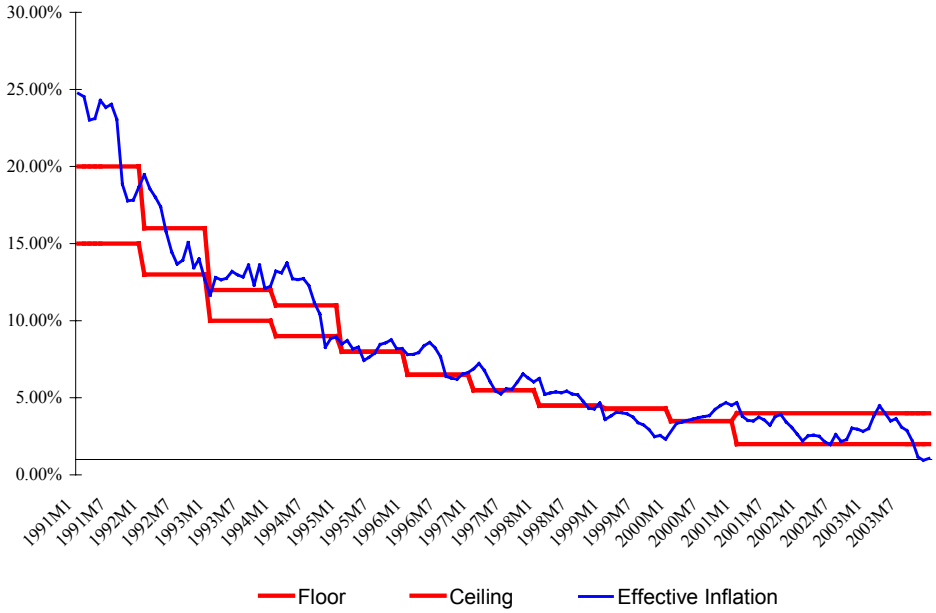
Source: Central Bank of Chile and authors calculations.

Figure IV.2
Chile: External Conditions Index and Output Gap



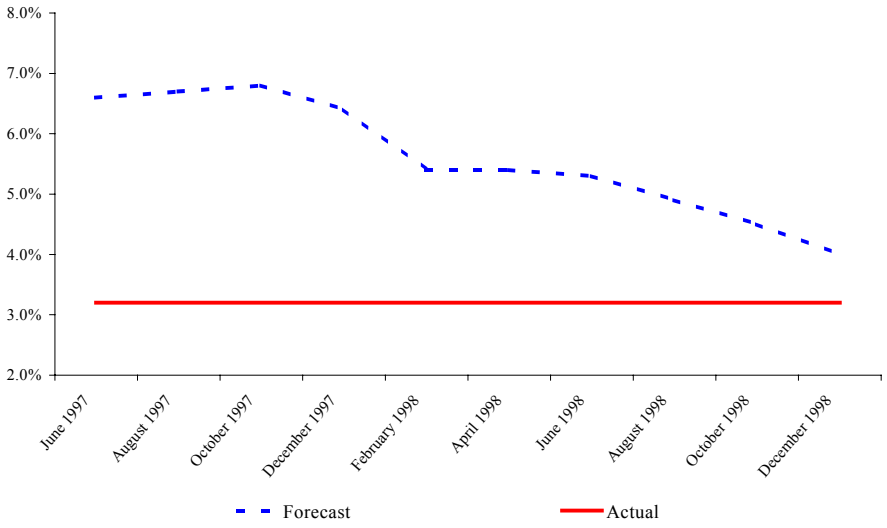
Source: Central Bank of Chile, Ministry of Finance-Chile and authors calculations.

Figure IV.3
Chile: Actual and Targeted Inflation



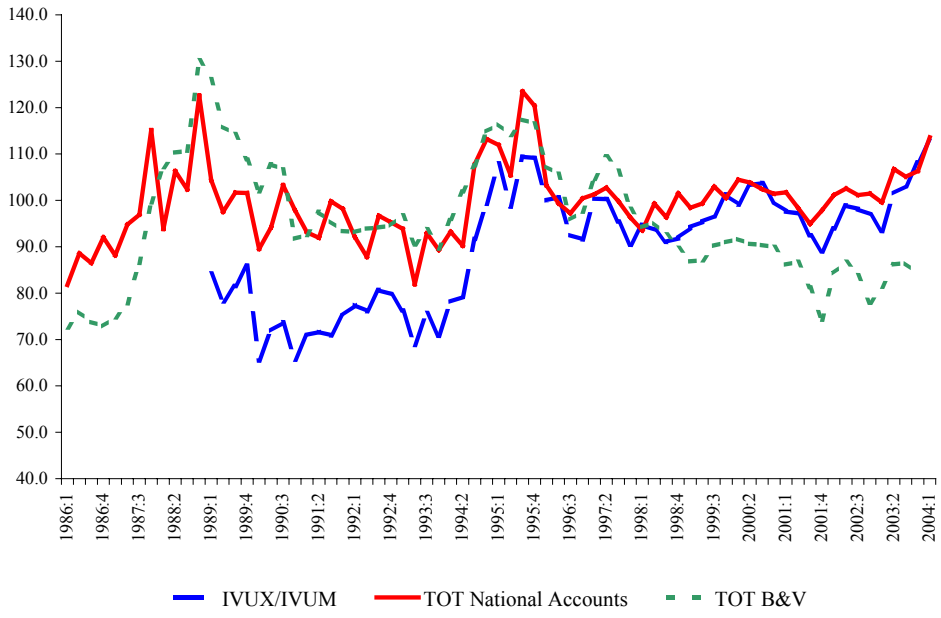
Source: Central Bank of Chile.

Figure IV.4
Chile: Actual and Forecasted GDP Growth



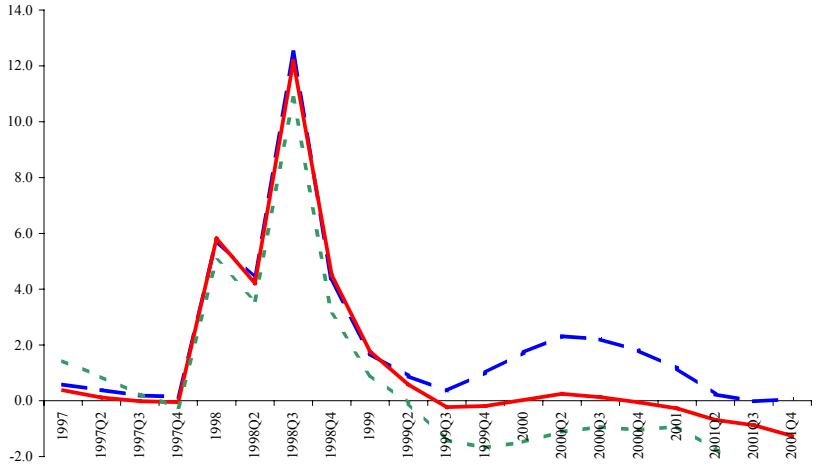
Source: Central Bank of Chile and Consensus Forecasts.

Figure IV.5
Chile: Terms of Trade Indicators



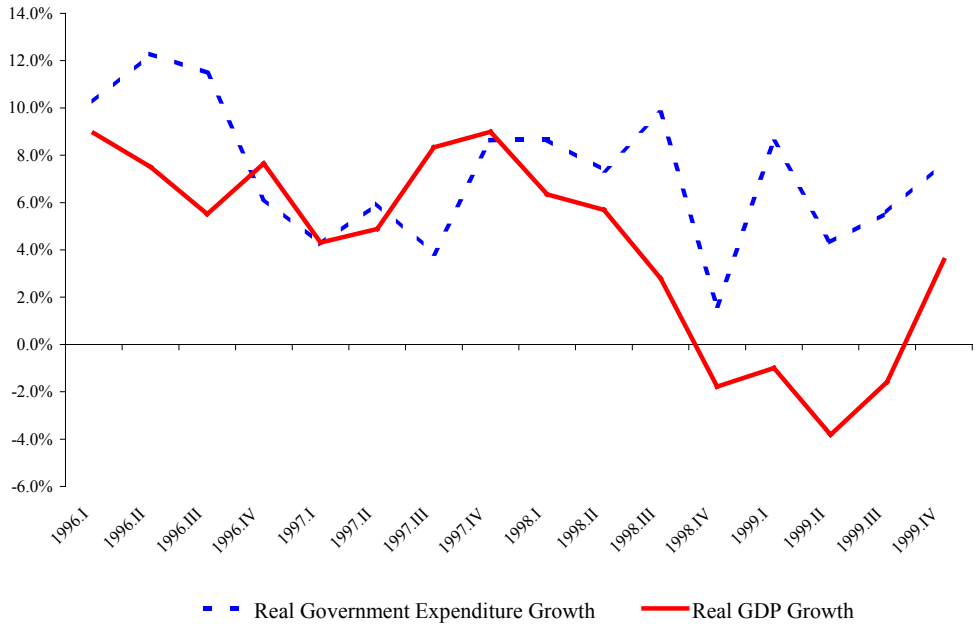
Source: Central Bank of Chile and Bennett and Valdés (2001).

Figure IV.6
Real Interest Rate Gap Measures



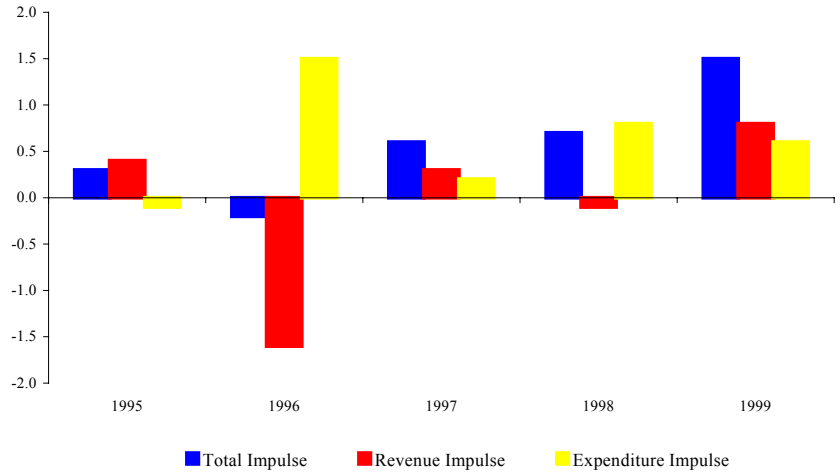
Source: Central Bank of Chile (IPOM-May 2004).

Figure IV.7
Chile: Government Expenditure and GDP Growth



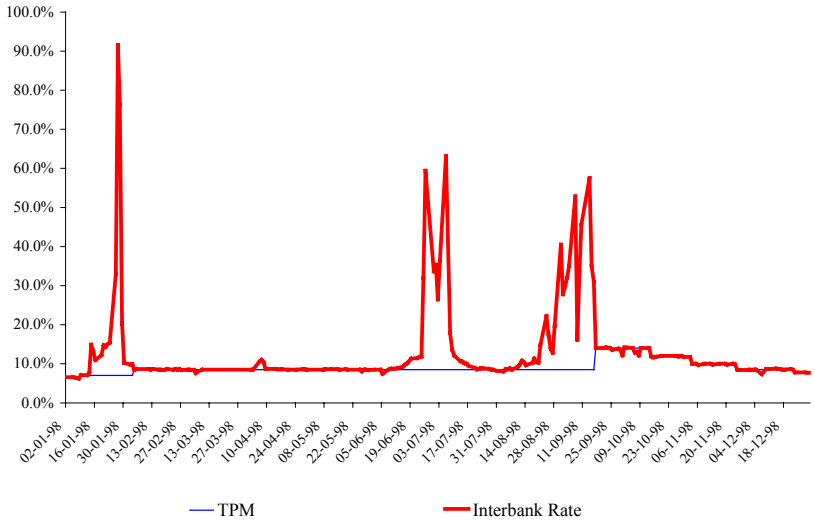
Source: Central Bank of Chile and Ministry of Finance-Chile.

Figure IV.8
Chile: Fiscal Impulse



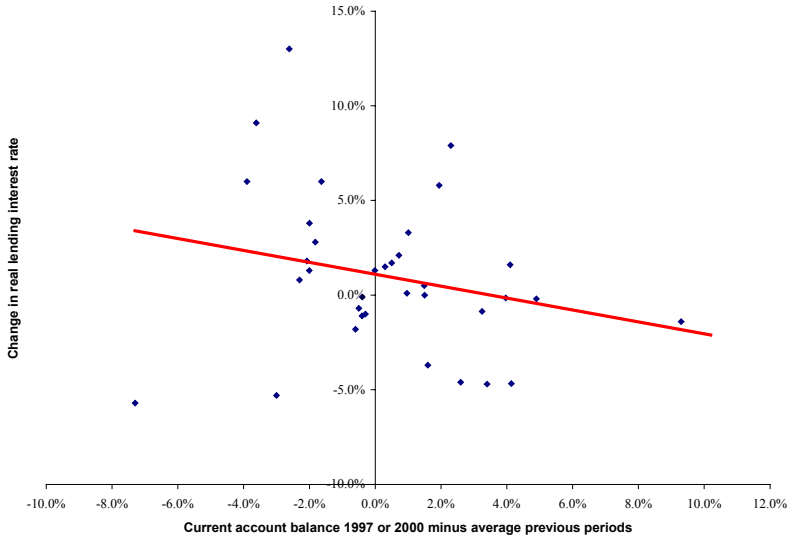
Source: International Monetary Fund.

Figure IV.9
Chile: Monetary Policy Interest Rate and Interbank Rate



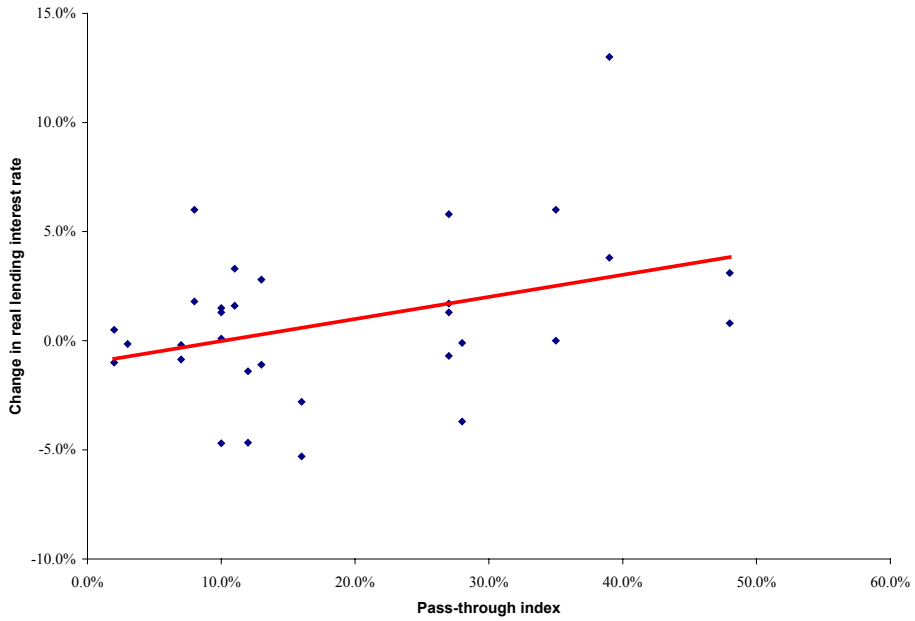
Source: Central Bank of Chile.

Figure V.1
Current Account Balance and Real Interest Rate



Source: WDI.

Figure V.2
Pass-through and Real Interest Rate



Source: WDI and Choudhri and Hakura (2001).

Table I.1
Inflation Targeting In Australia, Brazil and Chile: Main Characteristics

	Australia	Brazil	Chile
Independence of Central Bank:			
Formal	Yes	No	Yes
Targets		No	Yes
Instruments		Yes	Yes
Absence of conflicts with other goals	Yes	Yes	Yes (Previously: Exchange rate band until September of 1999)
Price Measure for Inflation Target	CPI , excludes cost of interests	CPI	CPI
Date of Adoption	Jun-93	1998	Sep-90
Annual Inflation at Adoption of Inflation Targeting Framework	1.0%	6.9%	17.0%
Target	Range 2-3%	Range	Range 2-4% (Previously: Point since 1995 until 1999)
Time Horizon of the Inflation Target			Medium Run (Previously: December to December)
Years of convergence since adoption to the steady state			9 years
Escape Clauses	None	If the inflation target is not going to be fulfilled, the Governor of the Central Bank of Brazil must send an open letter to the Ministry of Finance.	None
Transparency Publication of:			
Board minutes	Yes	Yes	Yes (since 2000)
Inflation Forecasts	Yes	Yes	Yes (since 2000)
Inflation Report	Yes	Yes	Yes (since 2000)
Accountability		Finance Minister	Parliament

Sources: Massad (1998); Morandé (2001); Schmidt-Hebbel and Tapia (2002).

Table I.2
Economic Indicators: Australia, Brazil and Chile

	Australia	Brazil	Chile
Gross Domestic Product (PPP) per capita (US dollars)	27,818	8,015	9,992
Financial Markets Deepness			
Private Debt (% GDP)	88.3	30.2	60.9
Rule of Law	6.0	2.4	5.0
Foreign Exchange Turnover (% GDP)	19.1	2.0	8.2
Creditors Right Index	3.0	1.0	2.0
Domestic Interest Rate Spread	4.2	49.2	4.9
Openness	41.0	17.1	57.9
Net External Debt (% GDP)			
External Debt in Local Currency (% total)	26.7	0.0	0.0
Public Debt (% GDP)	13.5	49.4	14.1

Source: WEO Database; Hausmann and Panizza (2002); WDI Database and BIS Financial Market Database.

Table I.3
Australia: Main Macroeconomic Indicators

	GDP Growth	Inflation (Dec.-Dec.)	Investment Rate	Current Account Deficit to GDP	Terms of Trade Growth	Real Exchange Rate	Unemployment Rate	Real Wages Growth	Government Balance to GDP	External Debt to GDP	Sovereign Spread (Average)
1990	1.8%	7.3%	22.3%	5.2%	-2.9%	85.1	6.7%		0.2%		
1991	-0.6%	3.2%	20.4%	3.6%	-9.6%	86.2	9.3%		-2.7%		
1992	2.0%	1.0%	21.5%	3.6%	-2.3%	95.1	10.5%		-4.7%		
1993	3.8%	1.8%	22.3%	3.2%	-6.3%	101.6	10.6%		-4.5%		
1994	4.9%	1.9%	23.5%	5.0%	-0.4%	97.7	9.4%		-3.5%		
1995	3.5%	4.6%	22.0%	5.4%	3.7%	100.0	8.2%		-2.1%		
1996	4.3%	2.6%	22.2%	3.9%	1.3%	91.0	8.2%		-0.9%		
1997	3.9%	0.3%	23.1%	3.1%	1.9%	91.5	8.2%		-0.1%		
1998	5.2%	0.9%	24.3%	5.0%	-3.2%	103.4	7.7%		0.3%		
1999	4.3%	1.5%	24.4%	5.7%	-5.0%	101.6	6.9%		0.9%		
2000	3.2%	4.5%	21.5%	4.1%	6.1%	106.1	6.3%		0.9%		
2001	2.5%	4.4%	22.3%	2.4%	4.1%	110.1	6.7%		-0.1%		
2002	3.8%	3.0%	24.1%	4.3%		104.0	6.3%		-0.6%		
2003	3.0%	2.8%		6.0%			5.9%		-0.6%		

Source: WEO Database.

Table I.4
Brazil: Main Macroeconomic Indicators

	GDP Growth	Inflation (Dec.-Dec.)	Investment Rate	Current Account Deficit to GDP	Terms of Trade Growth	Real Exchange Rate	Unemployment Rate	Real Wages Growth	Government Balance to GDP	External Debt to GDP	Sovereign Spread (Average)
1990	-4.2%	2947.7%	20.2%	0.8%	-10.4%		3.7%			24.8%	
1991	1.0%	432.8%	19.8%	0.3%	18.3%					26.0%	
1992	-0.5%	951.6%	18.9%	-1.6%	4.2%		6.5%			29.7%	
1993	4.9%	1928.0%	20.8%	0.1%	8.1%		6.2%			33.0%	
1994	5.9%	2075.9%	22.1%	0.3%	15.0%					32.9%	
1995	4.2%	66.0%	22.3%	2.6%	8.7%		6.1%			27.9%	
1996	2.7%	15.8%	20.9%	3.0%	-2.0%		7.0%			22.8%	
1997	3.3%	6.9%	21.5%	3.8%	6.1%		7.8%			23.4%	
1998	0.1%	3.2%	21.1%	4.2%	0.0%		9.0%			24.5%	
1999	0.8%	4.9%	20.4%	4.8%	-9.6%		9.6%			30.6%	
2000	4.4%	7.0%	21.5%	4.0%	-3.2%					46.0%	
2001	1.3%	6.8%	21.2%	4.6%	0.0%		9.4%			39.7%	
2002	1.9%	8.4%	20.3%	1.7%						44.5%	
2003	-0.2%			-0.8%						50.4%	

Table I.5
Chile: Main Macroeconomic Indicators

	GDP Growth	Inflation (Dec.-Dec.)	Investment Rate	Current Account Deficit to GDP	Terms of Trade Growth	Real Exchange Rate	Unemployment Rate	Real Wages Growth	Government Balance to GDP	External Debt to GDP	Sovereign Spread (Average)
1990	3.7%	27.3%	18.8%	1.6%	-5.0%	126.7	7.8%	1.8%	0.8%	63.4%	
1991	8.0%	18.7%	17.3%	0.3%	-0.5%	122.6	8.2%	4.9%	1.5%	51.8%	
1992	12.3%	12.7%	19.5%	2.1%	-2.9%	113.6	6.7%	4.5%	2.2%	45.7%	
1993	7.0%	12.2%	23.0%	5.4%	-3.7%	114.5	6.6%	2.1%	1.8%	45.0%	
1994	5.7%	8.9%	21.8%	2.9%	13.0%	110.6	7.9%	4.4%	1.6%	43.5%	
1995	10.6%	8.2%	27.7%	1.9%	14.1%	100.0	7.3%	3.8%	2.4%	33.8%	
1996	7.4%	6.6%	27.4%	4.1%	-13.2%	99.7	6.3%	3.8%	2.1%	33.6%	
1997	6.6%	6.0%	28.1%	4.4%	0.0%	95.6	6.1%	2.5%	1.8%	30.3%	
1998	3.2%	4.7%	27.8%	4.9%	-2.4%	97.7	6.3%	2.7%	0.4%	41.3%	
1999	-0.8%	2.3%	22.4%	-0.1%	2.7%	106.5	9.8%	2.9%	-1.4%	46.9%	1.8%
2000	4.5%	4.5%	24.4%	1.0%	2.7%	111.7	9.2%	0.8%	0.1%	49.1%	2.0%
2001	3.4%	2.6%	23.7%	1.7%	-4.7%	128.3	9.1%	1.4%	-0.3%	57.8%	1.9%
2002	2.2%	2.8%	24.1%	0.8%	3.4%	132.7	9.0%	2.2%	-0.8%	65.4%	1.8%
2003	3.3%	1.1%	24.2%	0.8%	2.8%	136.5	8.5%	0.8%	-0.8%	57.1%	1.3%

Source: Central Bank of Chile; JP Morgan and WEO Database.

Table IV.1
Chile: External Conditions Indicators

	Terms of Trade Growth	Copper Price	Oil Price	Capital Inflows to LA to GDP	Trading partners GDP Growth	Risk Premiun Emerging Markets	Risk Premium Chilean Corporates	USA Fed Rate
1990	-5.0%	121.7	21.2	-8.4%	2.9%			8.1%
1991	-0.5%	104.0	15.8	-1.6%	3.3%	6.6%		5.7%
1992	-2.9%	103.8	17.3	-2.4%	2.5%	6.7%		3.5%
1993	-3.7%	86.1	14.4	4.9%	2.1%	6.3%		3.0%
1994	13.0%	110.8	14.7	2.4%	4.1%	8.8%		4.2%
1995	14.1%	133.4	16.2	4.6%	3.0%	12.2%		5.8%
1996	-13.2%	101.4	19.0	2.0%	3.1%	7.0%		5.3%
1997	0.0%	101.0	17.4	5.5%	3.6%	4.4%	1.1%	5.5%
1998	-2.4%	74.0	11.6	-3.5%	2.4%	8.8%	2.4%	5.4%
1999	2.7%	71.6	18.1	-13.8%	2.7%	9.8%	2.7%	5.0%
2000	2.7%	82.8	26.1	-22.7%	3.8%	8.1%	2.5%	6.2%
2001	-4.7%	70.8	22.7	-20.5%	1.3%	8.8%	2.8%	3.9%
2002	3.4%	71.7	24.8	-19.2%	1.9%	9.0%	3.2%	1.7%
2003	2.8%	83.2	26.5	-22.9%	2.8%	5.8%	2.7%	1.1%

Table IV.2
Main External Events 1997-2001

Country	Event	Date
Thailand	Crisis y Devaluation	July 1997
Russia	Devaluation and Default	July 1998
Brazil	Speculative Attack and Devaluation	September 1998
USA	Technology Stocks Bubble Burst	March 2000
Turkey	Speculative Attack and Devaluation	January 2001
Argentina	Political Turmoil, Speculative Attack and Debt Sustainability Problems	February 2001
USA	Twin Towers Attacks	September 2001
USA	Accounting Scandals	December 2001
Argentina	Devaluation and Default	December 2001

Source: Massad (2003).

Table IV.3
Chile: External Conditions Indicators (Quarterly)

	Terms of Trade Growth	Copper Price	Oil Price	Capital Inflows to LA to GDP	Trading partners GDP Growth	Risk Premiun Emerging Markets	Risk Premium Chilean Corporates	USA Interest Rate
1997:1	-1.8%	109.8	18.1	4.9%	3.6%	5.1%	1.0%	5.3%
1997:2	3.4%	118.5	17.3	7.2%	3.8%	4.0%	1.1%	5.5%
1997:3	2.7%	95.6	18.0	3.7%	3.6%	3.6%	1.1%	5.5%
1997:4	-4.1%	79.9	16.3	6.4%	3.5%	5.0%	1.3%	5.5%
1998:1	-7.7%	79.3	11.5	-0.7%	3.2%	4.5%	1.7%	5.5%
1998:2	-3.3%	75.3	11.7	-1.9%	2.4%	6.4%	1.7%	5.5%
1998:3	-3.4%	74.7	13.1	-7.4%	2.2%	12.9%	2.4%	5.5%
1998:4	5.4%	66.8	10.1	-4.2%	1.9%	11.2%	3.6%	4.9%
1999:1	5.3%	62.5	12.1	-7.9%	2.2%	10.3%	3.1%	4.7%
1999:2	0.0%	64.5	15.4	-11.2%	2.3%	10.2%	2.6%	4.7%
1999:3	6.9%	79.4	21.5	-18.1%	2.7%	10.9%	2.8%	5.1%
1999:4	-1.0%	80.0	23.5	-18.2%	3.8%	8.0%	2.4%	5.3%
2000:1	6.2%	78.9	25.1	-16.8%	4.1%	8.1%	2.0%	5.7%
2000:2	4.5%	79.5	27.3	-21.6%	4.3%	8.0%	2.6%	6.3%
2000:3	-0.5%	88.9	29.7	-25.8%	3.8%	7.6%	2.5%	6.5%
2000:4	0.9%	83.9	22.2	-26.8%	2.8%	8.6%	3.0%	6.5%
2001:1	-2.6%	78.9	23.4	-21.3%	2.1%	8.9%	2.8%	5.6%
2001:2	-5.2%	73.0	25.6	-24.1%	1.4%	8.1%	2.8%	4.3%
2001:3	-7.3%	64.7	24.0	-19.0%	0.9%	10.1%	2.9%	3.5%
2001:4	-3.5%	66.8	17.6	-17.6%	0.7%	8.0%	2.9%	2.1%

Table V.1
Real Interest Rate Change

	(1.1)	(1.2)	(1.3)	(1.4)
Pass-through	0.096	0.114	0.106	0.106
	(0.05)*	(0.05)**	(0.04)**	(0.04)**
Inflation gap			0.766	0.765
			(0.25)***	(0.27)**
Current account balance		-0.565	-0.456	-0.456
		(0.20)***	(0.15)***	(0.16)**
Terms of trade change	-0.030	-0.015		0.001
	(0.12)	(0.10)		(0.09)
No. Observations	29	29	22	22
R^2	0.13	0.34	0.59	0.59