

## MANAGING CAPITAL INFLOWS IN CHILE\*

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### I. INTRODUCTION

Towards the end of the 1980s, private capital inflows began to return to Latin America (see Calvo *et al.*, 1993; Ffrench-Davis and Griffith-Jones, 1995; and Ocampo, 1994). Chile was one of the first countries to attract the renewed flows of foreign capital, and one that faced the largest supply, in relation to its size. The reversal of the drought in capital inflows of the 1980s undoubtedly had positive effects. It relaxed the binding foreign exchange constraint under which most countries labored during the debt crisis. However, both the large magnitude of the new capital flows and their composition prone to volatility have caused problems for which the recipient countries have been, by and large, ill-prepared.

In the first place, there is the problem of domestic absorption. If they are to contribute to long-term development, capital inflows should lead to a significant increase in the investment rate, something which, with the exception of Chile, has not taken place in most countries in the region. In Chile, it will be argued that one reason for the greater degree of success in channeling foreign capital to investment has been the discouragement of short-term flows and the large share of foreign direct investment (FDI) in capital inflows in the 1990s. The Chilean experience does indeed suggest that, when capital inflows take the form of FDI, there is a greater likelihood that the investment rate will rise than when foreign capital is in more liquid or short-term forms.

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Secondly, large inflows pose difficult dilemmas to policy makers. Without intervention on foreign exchange markets and in the absence of regulations on capital inflows, the real exchange rate will appreciate, which may be undesirable from the point of view of other important policy objectives (e.g., encouraging export growth and diversification, attaining higher domestic investment rates, or meeting targets for the current account deficit consistent with sustainable capital inflows). On the other hand, intervention in the foreign exchange market tends to swell the domestic money supply and increases the difficulties in controlling inflation.

Third, a significant proportion of the recent inflow to emerging markets has taken the form of short-term or liquid capital. There have been two components of capital inflows that are clearly of a short-term nature: short-term credits and deposits, on the one hand, and portfolio flows, on the other.

Portfolio inflows, defined here as financial investment mostly in Chilean equity, are new to the Chilean economy. They are not usually thought of as short-term capital, but in practice they are. Portfolio investments can be liquidated at a moment's notice at the market price of the moment and, therefore, may be just as short-term in nature as short-term indebtedness. Typically, portfolio investors operate with imperfect information, they seek short-term capital appreciation, and are prone to bandwagon effects, either in taking positions or in liquidating them. This has been clearly in evidence in the financial crises that have stricken first Mexico (December of 1994) and more recently the Asian economies since mid-1997, and to Latin America since 1998. In both cases, the original crisis spread to other "emerging market" countries, as investors lost confidence not only in the economy where the crisis had started but also in those of other developing countries that had received large financial capital inflows. Large portfolio inflows were thus followed by large outflows, with sharp reversals of initial appreciations in exchange rates and stock market prices.<sup>1</sup>

Up to the mid-1970s, Chile had a tradition of capital controls. Since then policy makers had maintained a fairly open capital account. However, policies in the 1990s represent a significant move toward greater pragmatism. In a nutshell, the policy response during the current surges in the supply of foreign capital can be described as an attempt to discourage short-term capital inflows

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<sup>1</sup> Nationals of the countries concerned have been observed to behave much in the same way as foreign portfolio investors, when they are allowed to do so. In fact, it is believed that, in Mexico, the first ones to lose confidence in the peso and to shift to dollar-denominated assets were Mexican investors. Thus the ultimate cause for exchange rate and asset price volatility appears to be the openness of the capital account and the ease of moving into and out of assets denominated in foreign currency, rather than just the behavior of foreign investors.

while maintaining liberal policies toward long-term inflows. Particularly, policies have been geared to increasing the cost of short-term inflows via non-interest-bearing reserve requirements; it is a price-based policy tool, directed to modify relative costs in the market. The authorities have also resorted to the introduction of greater uncertainty in the spot exchange-rate, to sterilized intervention in order to slow down real exchange rate appreciation and to compensate the monetary effects of reserve accumulation. With the set of policies it has been sought to protect a development strategy whose main elements are export growth and diversification.

Policy was effective in achieving its targets in most part of the 1990s. However, in 1996-97 this policy mix and the intensity with which it was applied remained unchanged, in spite of a new vigorous surge in capital flows to most countries in the region. This surge should have been met with increased restrictions.

As a consequence of such lack of stronger action on capital inflows during 1996-97, despite heavy intervention in foreign exchange markets, the Central Bank was unable to prevent a sharp real exchange rate appreciation and a worrisome rise of the deficit on current account. Nonetheless, as discussed below, the benefits of the active regulation implemented in previous years, had left large international reserves, a low stock of foreign liabilities and a small share of volatile inflows. Additionally, in 1995-97, capital account liberalization was gradual and moderate and the set of prudential macroeconomic regulation on inflows was not dismantled but kept rather unchanged.

During 1998-99, the contagion effects of the Asian currency crisis made themselves felt. The large inflows of financial capital that had taken place in 1996-97 gave way to outflows, as well the windows opened in previous years for domestic capital to fly away were used intensively. As a consequence, the nominal exchange rate started to depreciate. But, in our view, up to late 1999 all the depreciation had been a move towards a sustainable equilibrium, partly correcting the disequilibrium generated in 1996-97; the real exchange rate had returned to its 1995 average level. However, the economic recovery in late 1999 and the generation of an external surplus associated to a sharp drop in imports, caused a new exchange rate appreciation between December 1999 and April 2000.

Thus there is a need to assess the policy options to further improve the management of financial flows in the future, so as to discourage excessive inflows and protect the economy from excessive exchange rate volatility. A more active and flexible use of a comprehensive policy mix, matching the intensity of surges, should be at hand.

This paper studies the phenomenon of massive capital inflows in Chile in the 1990s, the policy approaches utilized to deal with it, and its effects on the domestic economy. The next section describes the dimensions and composition of capital inflows. Section III discusses the policy approaches utilized to deal with inflows, section IV analyses the impacts on the economy, and section V draws some policy lessons.

## II. RECENT CAPITAL INFLOWS: MAGNITUDES AND COMPOSITION

It is important to place recent capital inflow in historical perspective. This is done in table 1, which shows total capital inflows in the period 1960-97 as a proportion of GDP, both in current prices and in 1986 prices.<sup>2</sup> The transformation of the data to a constant-dollar basis was undertaken because the real exchange rate has experienced very wide fluctuations which distort the meaning of changes in the ratio in current dollars. In table 1, we use a periodization that we maintain below in the analysis of growth, saving, and investment data. We take the period before 1971 to reflect a sort of long-run steady state for the Chilean economy, before the wide policy swings that followed. The 1971-73 period corresponds to the socialist experiment. The period from 1974 to 1981 represents the first complete business cycle of the military government, during which the authorities introduced most of the free-market reforms with which Chile is associated. It begins with the deep recession of 1974-75 and ends with the peak of the boom of the late 1970s and early 1980s. The 1982-89 period coincides with the debt crisis and is also of a somewhat greater pragmatism in economic policy. The first four years are marked by depressed economic conditions, followed by quick recovery in 1986-89. This latter year also represents a cyclical peak.<sup>3</sup> Finally, the period since 1990 corresponds to the return to democratic rule and is roughly coincident with the latest episodes of foreign capital abundance (1990-94 and 1996-97) and the implementation of a set of active macroeconomic policies. During most of the 1990s, the economy has been expanding briskly and has been close to capacity output. This has been determinant of a record investment ratio, in a virtuous circle.

[Insert table 1]

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<sup>2</sup> The constant price series was derived by deflating the series of inflows in dollars by an index of foreign prices faced by the Chilean economy; see Ffrench-Davis (1984). As for the denominator, GDP at constant 1986 prices was transformed to 1986 dollars using the average exchange rate of that year.

<sup>3</sup> In 1990, there was a policy-induced slowdown in economic growth, as the economy was overheated (for electoral reasons) during the last year of military rule (1989). Thus one can distinguish a "mini" business cycle with a peak in 1989, a trough in 1990, and a subsequent peak in 1992, a year of exceptional economic growth.

The data show that capital inflows, as a proportion of GDP, were substantially larger in the 1990-97 period than in the 1960s and, surprisingly, only slightly higher than during the debt crisis (1982-89). However, it should be taken into account that Chilean GDP is much larger now (by any measure, but certainly in dollar terms) than in previous periods. Consequently, in absolute terms, capital inflows are of a much larger order of magnitude. Moreover, since 1995, total inflows have soared, reaching levels that are much larger than earlier in the decade and accounting for over 10 per cent of GDP in 1997 (in 1986 prices).

Since 1998 Chile suffered the effects of the Asian crisis, reflected in significant outflows of short-term capital; in 1998-99 net inflows merely represented 1 percent of GDP, in combination with a huge terms of trade shock.

Detailed and (almost) consistent disaggregated capital account data are available since 1983. Figure 1 shows the breakdown of total flows into private and public recipients. In the mid-1980s, and in spite of the debt crisis, as said, capital inflows were relatively large, both in nominal terms and as a proportion of GDP.<sup>4</sup> The disappearance of voluntary bank lending was partly compensated by substantial support from the multilateral financial institutions. Thus, public flows became the main form of international financial resources available to the Chilean economy during the 1980s.

[Insert figure 1]

The story of the return of private foreign capital inflows has been told before (see Agosin, 1995; Ffrench-Davis, Agosin, and Uthoff, 1995), so that a brief summary will suffice. Private capital began to return to Chile in 1986, well ahead of the foreign capital surge to Latin America as a whole. The initial spurt was associated almost exclusively with the debt-equity swap program instituted by the authorities in the second half of 1985. It was not until 1989 that other private flows became significant (see figure 2). In part owing to the large exchange rate subsidy implicit in the swap scheme, the programme was successful in attracting significant amounts of foreign investment in the form of swaps (Ffrench-Davis, 1990). The swap programme stopped being used by foreign investors in 1991, mainly because the rise in the international price of Chilean debt made it no longer profitable to invest via debt swaps. However, FDI not associated with swaps continued to grow apace. Thus, FDI represents a large part of the capital inflows into Chile over this decade.

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<sup>4</sup> This partly reflects the effects of the debt crisis itself, which led to the dramatic real devaluations of the period 1982-85, with the consequent fall in the dollar value of Chilean GDP, from US\$ 32 billion in 1981 to US\$ 16 billion in 1985.

About 60 per cent of FDI through regular channels has gone into copper mining, the remainder concentrating in services. The bulk of investments made with debt-equity swaps in the second half of the 1980s went into the processing of natural resources, especially forestry and pulp and paper, and into services (see Riveros, Vatter, and Agosin, 1996; and Calderón and Griffith-Jones, 1995).

[Insert figure 2]

As already noted, short-term private inflows have also figured prominently in the recent capital surge, though at a much lower scale than FDI. For interest-arbitraging capital inflows to take place, the domestic interest rate must exceed the international rate by a margin that is more than sufficient to compensate for the expected exchange rate depreciation and the country risk premium. These conditions have prevailed in Chile since the late 1980s. On the one hand, domestic interest rates have remained high, owing to lingering inflation and restrictive monetary policies. On the other, in 1992 and 1993, international dollar interest rates reached a thirty-year low, and, while they have risen since then, they have remained moderate and are still much lower than they were in the 1980s.

The other two terms in the interest arbitrage condition have also been favourable to capital inflows. As Chile began to emerge from the debt crisis, expectations regarding the real exchange rate turned from depreciation to appreciation. Improving terms of trade also contributed to the change in expectations. Moreover, expectations of exchange rate appreciation, owing to the capital inflow itself and to an improved current account position, made short-term roundtripping appear very profitable. Also, as in other countries in the region, there was a decline in the country risk premium. The "emerging markets" mania of recent years in international stock markets can be interpreted as a dramatic reduction in perceived country risk. Chile's relatively developed domestic stock market, plus the burgeoning use of American Depositary Receipts (ADRs) for placing shares in the United States stock markets, made Chilean stocks a prime candidate for investors seeking new and more exotic financial vehicles. Short-term private flows were very important until 1993, when they began to fall off as a consequence of the measures adopted to stem them (see below).

Portfolio inflows have taken two forms: investments through mutual funds set up in the major international capital markets and the issuance of ADRs by a handful of large Chilean corporations. The ADR is a mechanism by which foreign corporations can issue new shares on the United States stock markets. The original or ("primary") issue of ADRs represents an opportunity for expanding the capital of firms at relatively low cost, since capital costs in international markets

tend to be lower than in Chile. However, there is also what is known as the "secondary" issue of ADRs through the purchase of the underlying stock in the Chilean market by foreigners and its subsequent conversion into ADRs (for a thorough discussion, see French-Davis, Agosin, and Uthoff, 1995). This operation does not constitute an enlargement of the capital of the issuing company but only a change in ownership from nationals to foreigners. While there is nothing intrinsically negative about these operations, at a moment when foreign exchange is overabundant and there are significant downward pressures on the exchange rate<sup>5</sup>, it may be necessary to discourage them. These shifts in ownership involve exposing the economy to an additional degree of uncertainty and volatility, since when foreign investors' mood changes they can easily reverse the operation and convert their ADRs into the underlying stock in national currency for sale on the domestic stock market.<sup>6</sup>

The Mexican and the more recent East Asian crises are illustrative of these dangers. In the case of Mexico, as emphasized by Sachs, Tornell, and Velasco (1995 and 1996), domestic policy failures, particularly the large increase in domestic credit that resulted from a poorly regulated domestic financial system, were important factors. Domestic credit booms were, however, in both of these crises, triggered by large capital inflows. The herding behaviour displayed by foreign portfolio investors has been increasingly recognized as a critical element in the crisis (Calvo and Mendoza, 1996). Since assets of firms from a particular developing country are normally a very small proportion of international investors' portfolios, it may not pay to go to the trouble of obtaining information, which is very costly. Therefore, they tend to go on "signals". The positive signal at the end of the 1980s was that Mexico was undertaking market-oriented reforms (and entering NAFTA) that would, in the eyes of the international banks, raise returns on Mexican corporate assets. However, the rush to invest in Mexico created conditions which turned the positive signal into a negative one. In the case of Mexico, the "signal" for a reversal of the financial capital inflow was the notion that current account deficits had become "unsustainable" and that the exchange rate had appreciated "excessively". Of course, the large current account deficits and

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<sup>5</sup> This paper follows the Latin American convention of defining the exchange rate as units of domestic currency per unit of foreign exchange. Therefore, an appreciation is a downward movement.

<sup>6</sup> It has been argued that foreigners who become pessimistic about a country will sell their ADRs in the United States stock market, therefore having no impact on the domestic stock and foreign exchange markets. However, this argument ignores the fact that the issuance of ADRs implies that stock prices in the domestic and United States markets must tend to equality through arbitrage. This is in fact what has happened: movements in stock prices of Chilean companies that have issued ADRs in US stock exchanges are highly correlated with those in the Santiago exchange.

outlier macroeconomic prices, particularly an appreciating exchange rate, had been principally a consequence of the exogenous (and collective) behavior of foreign investors in the first place.

What this boils down to is that a large component of capital inflow, particularly portfolio capital, is not only volatile but is largely exogenous from the point of view of the recipient country. Even short-term credit has an exogenous component, since the so-called country risk premium has a large subjective element. Hence, paradoxically, a successful country can see its fundamentals --such as deficit on current account, exchange-rate, domestic savings and bank portfolio-- worsened by a large capital surge (see French-Davis 1999, ch. 5).

From a theoretical point of view, what we have here is the possibility of multiple equilibria: an appreciated exchange rate with large capital inflows and a depreciated exchange rate with capital outflows. Moreover, there are dynamics involved: capital inflows appreciate the real exchange rate, and the latter, if it is gradual, encourages additional inflows. This can proceed for several years, as it happened in 1976-81, 1990-94 and 1996-97 in several LACs. After a while, when the deficits on current account accumulate and the stock of external liabilities have risen, the appreciation trend is replaced by expectations of depreciation, which in turn subsequently tends to lead to a reversal of the direction of flows. This would suggest that there is a need for policies that reduce the more volatile components of capital inflows; and that the "fundamentals" are not independent of policies toward inflows. Moreover, some equilibria are more "desirable" than others, in terms of effects on economic growth and sustainability.

While private flows were increasing, public debt was reduced with public outflows. During 1989-91, these net outflows were caused mainly by the counterpart public debt operations involved in debt-equity swaps. More recently, they represent mostly debt prepayments. These were particularly large since 1995. These prepayments have been undertaken to alleviate the large accumulation of international reserves by the Central Bank so to relieve appreciating pressures on foreign exchange markets and to improve the balance of the Bank.

Since 1991, several large Chilean corporations have been making direct investments abroad. These flows are now significant and account for almost 2 per cent of GDP in 1997.<sup>7</sup> The destinations are mainly neighboring countries. The largest investments have been in electricity

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<sup>7</sup> Balance-of-payments data underestimate the size of these investments, because a large share of them is financed with funds raised on international capital markets and which never enter the country. A similar situation emerged in Korean investments into its neighbours.

generation and distribution (mostly in recently privatized companies, first in Argentina and then in other Latin American countries), but other sectors such as light manufacturing and retailing are also represented (Calderón and Griffith-Jones, 1995).

In 1997-99, there was a spectacular increase in investment abroad; however, the nature of flows was overwhelmingly related to "speculative" movements by pension funds and other financial investment abroad, in face of expectations of devaluation and a policy of the Central Bank delaying exchange rate adjustments until the economy had been cooled.

### **III. THE POLICY RESPONSE AND ITS EFFECTS**

In the 1990s the Chilean monetary authorities deployed a wide array of policies to regulate the surge in capital inflows. On the one hand, the Central Bank attempted to discourage short-term and speculative capital inflows while maintaining open access to the economy for FDI. On the other, it sought to insulate partially the domestic economy from the impacts of capital inflows, by intervening in foreign exchange markets so as to prevent an excess supply from unduly appreciating the real exchange rate and by sterilizing almost completely the monetary effects of the rapid accumulation of international reserves (see French-Davis, Agosin and Uthoff, 1995).

Two other policy factors have contributed to the successes achieved in managing capital inflow. First, fiscal policy was very cautious. Chile was running a significant public sector surplus during the 1990s, amounting to one to two per cent of GDP. The prudent stance of fiscal policy, including the compliance with the rules of a copper stabilization fund, eased the task of the monetary authorities in managing capital inflows and in preventing undue exchange rate appreciation during most part of the decade. Second, as a result of the 1982-83 banking crisis, prudential banking regulations were introduced and have been perfected over the years. This, again, prevented capital inflow from unleashing a lending spree by the commercial banks, which, in turn, eased the task of keeping the current account and the exchange rate within bounds.

#### **1. Inflow management policies**

The two main considerations of exchange rate and inflow management policies has been, first, in an economy prone to huge cycles (recall that in 1975 and 1982 Chile experienced the sharper

recessions in all Latin America), achieving sustained macrostability should be a priority; second, to protect the growth model adopted by the authorities, which gives the expansion and diversification of exports a crucial role. In order for exports to continue to be an engine of growth of the Chilean economy, the level and stability of the real exchange rate are crucial. This objective could have been placed in jeopardy if capital inflows caused excessive exchange rate appreciation and greater future volatility when the direction of net flows went into reverse.

The Chilean authorities opted to regulate the foreign exchange market in order to prevent large misalignments in the real exchange rate relative to its long-term trend. The option chosen to make the long-term fundamentals prevail over short-term factors influencing the exchange rate assumes (correctly, in our view) that there exists an asymmetry of information between the market and the monetary authorities, because the latter have a better knowledge of the factors driving the balance of payments; and principally because they have a longer planning horizon than agents who operate intensely at the short-term end of the market. However, in the face of market uncertainty, rather than a unique price, the authorities have used an exchange rate band centered on a reference price linked to a basket of three currencies, in which the dollar, the deutsche mark and the yen are represented with weights associated to their share in Chilean trade.

The excess supply of foreign exchange began in mid-1990. A summary of policy actions to tackle the excess supply can be found in table 2. Here we give an analytical account relating policy changes to the events that elicited them. The changes taking place in global markets, the increasing international approval of Chilean economic policies, high interest rates in Chile, and a smooth transition to democracy stimulated a growing inflow of capital to Chile.

[Insert table 2]

In June 1991, a non-interest bearing reserve requirement of 20 per cent was established on external credits (covering the whole range of foreign credits, from those associated with FDI to trade credits). The reserves had to be maintained with the Central Bank for a minimum of 90 days and a maximum of one year. At the same time, a stamp tax on domestic credit, at an annual rate of 1.2 per cent on operations of up to one year, was extended to apply to external loans. In July, an alternative to the reserve requirement was allowed for medium-term credits which consisted in making a payment to the Central Bank of an amount equivalent to the financial cost of the reserve requirement. The financial cost was calculated applying LIBOR plus 2.5 per cent (at an annual rate) to the amount of the reserve requirement. The reserve requirement, the option of paying its financial

cost and the tax on foreign credits all have a zero marginal cost for lending which exceeds one year, and, as discussed below, the first two are particularly onerous for flows at very short maturities.

With continuing capital inflows, over time the system of reserve requirements was tightened and extended to most international financial transactions. Beginning in May 1992, reserve requirements on external credits stand at 30 per cent and was extended to time deposits in foreign currency and in 1995 to purchases of Chilean stocks ("secondary ADRs") by foreigners.<sup>8</sup> The period during which the deposit must be maintained was extended to one year, regardless of the maturity of the loan. The spread charged over LIBOR in the option of paying the financial cost of the reserve requirement was increased to 4 per cent, up from the original 2.5 per cent. In order to close a loophole through which the reserve requirements were being evaded (since equity investment is exempt), the authorities are now screening FDI applications; permission to enter into the country as FDI exempted from the reserve requirement is denied when it is determined that the inflow is disguised financial capital. In such cases, foreign investors must register at the Central Bank their funds as financial investments subject to the reserve requirement.

With the Asian crisis, and the sharp scarcity of financial inflows, the reserve requirement rate was reduced to 10% and then to zero in 1998. The authorities announced, however, that the policy tool remained available in case of future new capital surge.

Since 1991 an attempt has been made to ease capital outflows as a way of alleviating downward pressures on the exchange rate (see Ffrench-Davis, Agosin, and Uthoff, 1995). In particular, Chilean pension funds were allowed to invest abroad up to 16 per cent of their total assets in successive steps. The policy was effective in encouraging significant flows of FDI and purchases of foreign firms by Chilean companies in neighboring countries (Calderón and Griffith-Jones, 1995). However, higher rates of return on financial assets in Chile than abroad and expectations of peso appreciation discouraged foreign financial investments by Chilean pension funds and by recently authorized closed-end mutual funds for international financial investment. These investments had been rising slowly as domestic firms and pension funds obtain more and better

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<sup>8</sup> It is not difficult to impose reserve requirements on foreign portfolio investments. If the funds that will be used for the investment are deposited with a Chilean bank, the foreign deposit is liable to reserve requirements. For those funds that do not use a Chilean bank as intermediary, the reserve requirement can be imposed at the moment the asset is registered in the name of an agent with a foreign address. In order to be converted into ADRs, they must also go through registration with the Central Bank.

information about foreign financial assets.<sup>9</sup> An immediate effect of liberalizing outflows has probably been to encourage additional inflows (Williamson, 1993; Labán and Larraín, 1997). Furthermore, in face of expectations of exchange rate devaluation there were massive outflows in channels opened; for instance, outflows by pension funds rose sharply only when expectations changed from appreciation to depreciation, since late 1997. Actually, net outflows by pension funds between January 1998 and June 1999 climbed to the equivalent of 4.8% of GDP.<sup>10</sup>

## 2. Exchange rate policy

Exchange rate policy also experienced substantial change over time. The use of a fixed nominal exchange rate in 1979-82, in the context of an increasing and eventually complete liberalization of capital account transactions, was abandoned after the crisis of 1982-83 during which GDP declined by 17 per cent. In 1983 through 1989 the authorities utilized a crawling peg, with a floating band of  $\pm 2$  per cent (widened to 3 per cent in 1988 and  $\pm 5$  per cent in mid-1989). The "official" rate was devalued daily, in line with the differential between domestic inflation and an estimate of external inflation. On a number of occasions, discrete nominal devaluations were added, helping to achieve a remarkable real depreciation following the 1982 crisis: 130 per cent between 1982 and 1988 (see figure 3).

Since early 1992, the exchange rate band has been gradually widened (with the band standing at 12.5 per cent on either side of the official rate by mid 1998), and the official rate was revalued on several occasions.<sup>11</sup> Also the dollar peg of the official rate was replaced by a peg to a basket of currencies as the new benchmark exchange rate. Given the instability of international exchange rates, these measures were intended to make interest rate arbitrage between the dollar and

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<sup>9</sup> One obstacle to the liberalization of outflows by institutional investors is the lack of knowledge that regulators have of foreign financial assets. Thus the fear that liberalization will lead to a worsening of the asset quality of institutional investors has been a key factor explaining the gradual approach taken to the liberalization of outflows.

<sup>10</sup> A hasty financial liberalization risks leaving too many doors open for outflows, which tend to be massive in case of market nervousness and shifts to expectations of currency depreciation, as we advised in due time (see Ffrench-Davis, Agosin and Uthoff, 1995). This could make more difficult the achievement of exchange rate and macroeconomic stability, as illustrated by the recent international financial crises.

<sup>11</sup> It must be noted that Chile was coming out of a profound debt crisis which was accompanied by a sharp exchange rate depreciation. Consequently, there was space for some appreciation. However, as Chile was moving from a restricted to an overabundant supply of external savings, the authorities wanted to avoid an overadjustment of the exchange rate. One specifically troublesome feature is that, as expectations of foreign agents change from pessimism to optimism, they seek to reach a new desired stock of investment in the "emerging market" over a short period. This implies excessively large inflows for a while. Obviously, these are transitory rather than permanently higher levels of periodic inflows.

the peso less profitable by introducing greater exchange-rate uncertainty for speculative capital flows, which are denominated mostly in dollars. In order to lower the floor of the band, the Central Bank tinkered in 1997 with the weights assigned to each currency, making the peg to a currency basket rather than the dollar less credible.<sup>12</sup> In addition, the Bank factored in a 2 per cent annual appreciation into the calculation of the central rate, ostensibly to account for higher productivity growth in Chile than in its main trading partners.

Given that the market exchange rate was for some years close to the floor of the band, with little variation in the nominal dollar-peso rate, the policy of maintaining an increasingly wider band has lost effectiveness in dissuading speculative capital inflows. Indeed, speculators could observe that, when they bet strongly on peso appreciation, the authorities had frequently wound up lowering the band.<sup>13</sup> With expectations overwhelmingly in favor of currency appreciation, after the Tequila shock appeared to have been left behind, the large interest rate differential between the peso and the dollar (together with good prospects for large Chilean companies) gave foreign portfolio and short-term investors what amounted to a very profitable one-way bet, in spite of the toll they had to pay for entering domestic financial markets (in the form of the reserve requirement (see table 3). This trend toward appreciation could have been softened by intensifying price restrictions on inflows (i.e. increasing the height of the reserve requirement). The generalized overoptimism that financial crises had been left behind and the risky temptation to speed the reduction of domestic inflation with exchange-rate appreciation weakened a highly successful policy of sustainable macroeconomic equilibria.

The effects of the Asian crisis, including a notably worsened terms of trade, found Chile with an appreciated exchange rate (which had not happened up to mid-1995) and a deficit on current account twice as large as the average for 1990-95 (see table 9.1) In September 1999, the Central Bank decided to suspend the crawling-band policy in order to facilitate the market to make the long delayed devaluation of the exchange rate.

[Insert figure 3]

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<sup>12</sup> In November 1994 the weight of the US dollar was reduced from 50% to 45%, reflecting the falling incidence of that currency in Chilean trade. In January 1997, it was arbitrarily raised to 80%. For a comparative analysis of bands in Chile, Israel and Mexico, see Helpman, Leiderman and Bufman (1994). For an analysis of Chile, Colombia and Israel, see Williamson (1996).

<sup>13</sup> It should be remembered that the official policy was to maintain a "crawling band", with the rate of crawl determined by the differential between Chilean and international inflation (minus the 2 per cent productivity differential). Thus the lowering of the floor of the band became consistent with a nominal market exchange rate that remained stuck around a constant level. Of course, the consequence was a significant real appreciation of the domestic currency in 1996-97.

### 3. Effectiveness of measures

What have been the financial costs imposed by the system of reserve requirements and taxes on foreign lending? The total tax consists of the extra interest costs imposed by the reserve requirements and the tax on foreign credits. The calculations can be seen in table 3. As a result of the lengthening (in 1992) of the reserve requirement holding period to a full year, regardless of the maturity of the financial transaction, the implicit tax rate on foreign borrowing increased dramatically as maturities shortened. This characteristic of the system, which is similar to its effects to a unilateral Tobin tax (Tobin, 1978), is the rationale behind the requirement that reserves be held for an entire year. Before its imposition, the implicit tax rate (on an annualized basis) was identical on transactions as short as a quarter (the minimum holding period up to May 1992) or as long as a year. These very large estimates of the implicit tax rate on short-term operations suggest that, if the regulations were not evaded, they must have implied a strong discouragement to short-term and portfolio flows.

[Insert table 3]

How effective has the reserve requirement (together with exchange rate management) been in deterring short-term flows and preventing excessive exchange rate appreciation? There are two kinds of evidence which one can use. The first kind is qualitative. Chile faced a larger supply of external finance (relative to its GDP) than other countries in the region, because of its better economic performance and greater political stability. However, exchange rate appreciation and the current account deficit (as a share of GDP) have both been smaller than in other countries in the region that have been large recipients of foreign capital. In addition, FDI has been a much larger proportion of inflows in Chile than in other countries.<sup>14</sup> Second, there is econometric evidence that policies towards the capital account have worked rather well. Recent studies indicate that the combination of disincentives to short-term inflows with the reforms in the exchange rate régime, at least up to 1994, had been able to reduce significantly the inflow of short-term, interest-arbitrage funds (Agosin, 1995 and 1998; Larraín, Labán and Chumacero, 1997). As noted below, the situation changed markedly in more recent years, in face of both a new capital surge toward the emerging

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<sup>14</sup> It should be noted that the loans associated with FDI were subject to the reserve requirement. Since the average maturity of these loans is about seven years, the incidence of the restriction is low.

economies and restrictions that paradoxically were kept unchanged by the autonomous Central Bank.

Some observers have claimed that the efficacy of measures to discourage capital inflows is only temporary, as private sector operators find ways to evade them (for an example of this literature, see Valdés-Prieto and Soto, 1996). In principle, this can be done through several mechanisms. One is the underinvoicing of imports or the overinvoicing of exports. The second one is to delay payment for imports or accelerate export receipts. Thirdly, it is possible to bring in funds through the informal foreign exchange market. Fourth, there is also the possibility of registering short-term funds as FDI. However, this could be a costly option, since Chilean law requires that FDI remain in the country for at least one year before repatriation. Nonetheless, it was becoming a significant loophole, which, as already noted, the authorities have moved to close. Fifth, it is possible for agents to arrange back-to-back operations in which, for example, an agent pays for imports with a bank deposit in Chile rather than with foreign exchange; at the same time, the exporter is paid in foreign exchange by a bank in his country. All of these (and other forms of evasion, as well) are possible, but they are not costless, and some of them may have undesirable effects on tax liabilities. While some evasion is inevitable, there is no hard evidence that the measures to discourage short-term capital inflows have been massively evaded.

However, it is clear that maintaining the reserve requirement at an unchanged rate and/or failing to supplement it with other measures became insufficient in face of the new capital surge in 1996-97. Additionally, depressed stock market prices in late 1995 and a real exchange rate that was widely expected to appreciate further over time, attracted portfolio inflows, as witnessed by the very heavy inflows into the Chilean stock market in 1996-97. But large financial inflows are inevitably bound to turn into outflows at some point. Contagion from the Asian crisis is now having that effect.

In addition, actual exchange rate management (in contrast to what the authorities claimed they were doing) did not contribute to discouraging speculative inflows. In spite of its formal adherence to a crawling band in 1996-97, the Central Bank was in effect managing a quasi fixed nominal price for the dollar.

In the period after 1993, the secondary issue of ADRs became a large source of short-term capital inflow with particularly volatile characteristics. Thus the extension of reserve requirements to these inflows in 1995 can be considered to have been an attempt to deal with an incipient

problem which was already causing difficulties in policy management and which could become even more important in the future. It is likely that, in the absence of reserve requirements, portfolio inflows would have been much larger. However, after a temporary lull in 1995, they again surged beginning in early 1996, paying the corresponding cost of the reserve requirement. It would seem that foreign investors were considering the reserve requirement as a sort of option price for investing in Chile (see Herrera and Valdés, 1997). The evidence suggests that the entry fee became to be perceived as cheap in the face of positive fundamentals and a strong likelihood of further real exchange rate appreciation.

Another line of attack against the use of disincentives to short-term capital inflows has been to claim that, as regards their behavior, it is impossible to distinguish between capital inflows such as FDI or long-term lending, on the one hand, and short-term flows, on the other. Claessens, Dooley and Warner (1995) claim that balance-of-payments categories have nothing to do with the stability of flows themselves, long-term flows being just as likely to be unstable as short-term flows.<sup>15</sup>

In order to check their hypothesis for Chile, several tests were run to determine the degree of persistence of different types of private flows. In the first place, after determining the optimal lag for each type of flow,<sup>16</sup> we did an autoregressive analysis of quarterly data on FDI, portfolio capital, long-term private borrowing, and short-term private borrowing for the period 1983-95. The results are shown in table 4, which reveals that, indeed, FDI and long-term borrowing have the most persistence, judging by the significance of their own lags. For FDI, the second and third quarterly lags are very significant predictors of contemporaneous levels; for long-term private borrowing, it is the first and third lags. On the other hand, for portfolio flows and for short-term private borrowing, there just is no persistence at all.

[Insert table 4]

Secondly, we calculated the coefficient of variation and the  $R^2$ s of the time trends of the same four categories (also shown in table 4). The coefficients of variation are indicators of the variability of flows around their mean; and  $1-R^2$  is an indicator of their variability around their time trend. On both counts, FDI is more stable than short-term borrowing and portfolio flows.

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<sup>15</sup> Part of the explanation for their result that FDI is just as likely to be volatile as short-term flows may stem from the fact that, for the countries that they chose, FDI flows are a very small percentage of total foreign financing, at least as reported by IMF statistics (which, by the way, sometimes seriously underestimate FDI). Fluctuations of small numbers tend to be larger than fluctuations of large ones. On the other hand, the period covered excludes the tequila crisis, when portfolio flows played a significant destabilizing role. It is evident that instability must be tested in critical situations rather than on bonanzas.

Third, we ran unit root tests for FDI and other net capital inflows in real annual terms for the long period of 1960-95.<sup>17</sup> It is interesting that FDI turns out to have a unit root, while other flows are stationary (without constant or trend). Therefore, in Chile FDI has behaved as a "permanent" variable and other flows as "transitory" disturbances. The behaviour of these two series is shown in figure 2.

Thus we can conclude that FDI is considerably less volatile than other kinds of capital inflows, and that it is worthwhile to target policies on the latter. This is what the Chilean authorities have attempted to do, with more success in the early years of application than more recently. Undoubtedly, short-term and portfolio inflows would have been much larger in the absence of the reserve requirement. Additionally, sterilized intervention in foreign exchange markets prevented undue exchange rate appreciation and a consumption boom, thus keeping the current account deficit within reasonable bounds, except in 1996-98.

The policy mix used has also had financial costs for the authority. The accumulation of large volumes of foreign exchange reserves imposes a social cost on the economy, since the returns on these assets have been inferior to the interest payments on the Central Bank liabilities that have been issued to sterilize the monetary effects of reserve accumulation, generating large losses for the Central Bank (estimated at about one half of a percentage point of GDP *per annum*). The disincentives on short-term capital inflows, given the effects on net inflows, lessened these costs and eased the task of sterilizing the monetary consequences of reserve accumulation.

#### **4. The strengthening of banking supervision**

As already noted, a tough bank supervision and regulatory environment prevented excess liquidity of banks from fueling a consumption boom and a deterioration in the quality of bank assets (as clearly took place in Mexico). This was a legacy of the banking crisis of 1982-83, in the aftermath of the preceding foreign capital surge, which led to a virtual collapse of the entire banking system (see Díaz-Alejandro, 1985; Held and Jiménez, 1999). Some elements of prudential supervision adopted over the years since then include the continuous monitoring of the quality of bank assets;

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<sup>16</sup> The minimum lag which produces white-noise residuals.

<sup>17</sup> "Real" flows are calculated deflating nominal dollar flows by the index of foreign prices estimated by the Central Bank of Chile for the period 1977-95. For earlier years, the index of foreign prices was spliced backward to 1960 using the index of

strict limits on lending by banks to related firms; the existence of automatic mechanisms of bank equity adjustment when the market value of equity falls below the limits required by the regulators; and faculties to freeze banking operations, impede fund transfers outside of troubled banks, and restrict the payment of dividends by institutions that fail to comply with capital adequacy requirements (Aninat and Larraín, 1996). Chilean financial markets have also acquired a depth that allows for the orderly infusion of new funds and also for their withdrawal, without affecting the quality of bank portfolios (Larraín, 1995).

Capital adequacy ratios along the lines of the 1988 Basle accord have been incorporated in the new banking law approved by Congress in 1997. But banks' capital, in practice, is well above the Basle norm of 8 per cent. In addition, the Central Bank imposes limits on banks' open positions in foreign exchange, but these are still fairly crude, in that they do not differentiate between loans made in foreign currency to firms that earn foreign currency and to firms whose earnings are in domestic currency. Neither do these limits differentiate between different foreign currencies. Currency risk is only one aspect of credit risk evaluation systems, which as a whole are quite good in Chile. Therefore, this compensates for the weaknesses in the norms on open positions in foreign exchange.

Nevertheless, despite the quality and significant implications of prudential supervision, there are other macroeconomic variables –such as imbalances that cause abrupt devaluations, too high interest rates and bubbles in stock markets– that can dampen the banking portfolio. Sustainable macroeconomic balances are unavoidable partners of a sustainable prudential supervision.

#### **IV. SAVING, INVESTMENT AND GROWTH**

The period since 1989 marks a clear-cut improvement in growth performance, not only in comparison with the 1974-89 period, but also to the more favourable 1960s (see table 5). The ratio of gross fixed investment to GDP rose steadily since its trough in the mid-1980s, from about 15 per cent of GDP in 1983-84 to over 30 per cent in 1995-98. Even taking longer averages, for 1974-89 and 1990-99, the ratio of fixed investment to GDP can be seen to have risen sharply, from 18 per cent to 28 per cent. This increase in the investment ratio has allowed Chile to sustain a growth of GDP averaging close to 7 per cent per annum in the 1990s. The increase in the national saving rate

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foreign prices calculated by Ffrench-Davis (1984).

was even stronger than the increase in the investment rate, going from 11 per cent in the 1980s to 22 per cent in the 1990s (in 1986 prices). This reveals that domestic and foreign savings worked as complements, as opposed to the substitution that took place in Mexico before 1995 and Chile before 1982.<sup>18</sup> At the same time, foreign saving declined sharply, from 6 per cent of GDP to 3.3 per cent. This is indeed surprising, since, as discussed in section II above, foreign capital inflow averaged about 6.5 per cent of GDP in the 1990s. This shows that the policies of sterilizing capital inflow and fiscal austerity, by preventing undue real exchange rate appreciation, made the economy absorb less foreign capital than what was on offer, and regulated it to amounts consistent with an efficient absorption. The counterpart of the difference between capital inflow and foreign saving (i.e., the current account deficit) was, of course, the accumulation of foreign assets by the Central Bank.

[Insert table 5]

The long-term behavior of saving and investment rates shows much less spectacular increases. During the 1990s, they barely exceed the averages achieved during the 1960s, and it is only since 1993 that the investment rate has overtaken its 1963 peak. The real difference between the earlier and the later periods is in the behavior of private and public investment.<sup>19</sup> In the light of the long-run data, it is not the most recent period that appears as an outlier, but the periods between 1971 and 1989, which exhibit strong declines in domestic saving and investment rates. There was a clear downward trend in public investment, that was compensated only in the 1990s by a vigorous increase in private investment. The main culprit for the fall in public investment was the decline in investment in infrastructure, schools, hospitals and the like during the 1970s and 1980s. This was perhaps one of the weakest links in the so-called Chilean model: steady increases in international competitiveness (the basis of the growth strategy for over two decades) require *increases* in investment in social and economic infrastructure, not declines.

Nonetheless, the rise in domestic saving and investment rates since their troughs in the mid-1980s has been remarkable. Moreover, it has taken place at the time of strong capital inflow and even stronger increases in the availability of foreign capital to the Chilean economy. In other countries (e.g., Mexico or Argentina), in the face of large capital inflows, investment rates have risen modestly and domestic saving rates have fallen, partly owing to the income and wealth effects

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<sup>18</sup> Data suggests that some crowding-out took place in 1996-97, associated to excessive inflows and exchange rate appreciation.

<sup>19</sup> To obtain private investment, central government investment (excluding that of public enterprises) was subtracted from gross fixed capital formation. Therefore, private investment is here defined as corporate gross capital formation, including the investment of public corporations, plus household investment in housing.

of real exchange rate appreciation and sky-rocketing stock and real estate prices.

The Chilean policies to restrain capital inflow and to moderate exchange rate appreciation can be credited with a significant share of the success achieved with regard to investment, saving and growth rates. On the one hand, the management of inflows has had a positive impact on macroeconomic stability and has contributed to keeping effective demand close to productive capacity, which is essential for investment expenditures to rise. On the other, there is evidence that foreign and domestic saving tend to have a high degree of substitutability in cases of surges; when capital arrives in surges rather than trends, it takes the form of volatile financial flows rather than FDI or financing of imports of capital goods. The foreign saving stimulates consumption through its effects on domestic liquidity, exchange rate and asset prices. Thus success in keeping the current account deficit and aggregate demand within reasonable bounds, according to analytical and empirical support, contributed to the increase in saving rates (see Agosin, 1998; Agosin, Crespi, and Letelier, 1998; Uthoff and Titelman, 1998).

## **V. SOME POLICY LESSONS OF THE CHILEAN EXPERIENCE**

The Chilean experience with the management of capital inflows provides us with several important lessons. For developing countries, the swings in capital flows can be of extraordinary magnitude relative to the size of their economies. Over the last 15 years, Latin American countries have gone from a severe shortage of financing during the debt crisis (and the shorter-lived Tequila crisis) to an over abundance of foreign capital during most of the 1990s. Totally passive policy stances will inevitably result in enormous volatility in key domestic macroprices (exchange rates and interest rates) and economic aggregates. By depressing investment, these fluctuations have adverse effects on long-term growth.

Chile has held on to steady policies toward capital inflows and exchange rate management. By and large, these policies appear to have discouraged the more volatile forms of inflows and have prevented excessive exchange rate appreciation. However, in 1996-97, financial capital inflows overwhelmed the capacity of the authorities to limit them with the unchanged intensity of policy tools they were using. Inflows were very large relative to GDP (over 10 per cent), jumping to what

we judge to be unsustainable levels.<sup>20</sup> Then, the Central Bank was unable to prevent a significant real appreciation of the peso, in spite of heavy purchases of foreign exchange. The ensuing real exchange rate appreciation contributed to a widening of the current account deficit, which climbed from 2.5 per cent of GDP in 1990-95 to 5.7% in 1996-97. There was clear evidence that a strengthening of the instruments to deal with financial surges had become necessary. Then the economy experienced the down side of large financial inflows: outflows of financial capital began in late 1997 and accelerated in 1998-99, with a 19% nominal exchange rate depreciation. However, in response to the active management of inflows in the first half of the 1990s, the accumulated deficit on current account was moderate, the stock of external liabilities was rather low, and the share of volatile funds was minor. Together with large international reserves, it allowed Chile to face, without a major crisis, the sharp terms of trade shock brought on by the Asian contagion.

Contrary to conventional wisdom, it is possible to discriminate between flows which are stable, of a long-term nature, and that do contribute to the country's growth (such as FDI) and those which are basically speculative and lead to excessive domestic volatility. In the Chilean case, the market-based discouragements applied to speculative flows have had no adverse effects on FDI, which has continued to exhibit unprecedented levels, even during the Asian crisis. The large share of FDI in capital inflows, in fact, mitigated the effects of Asian contagion on the Chilean balance of payments.

In order to regulate capital flows, it is best to use instruments which are as non-discretionary as possible. Non-discretionary and (semi) automatic instruments have the advantage that they minimize corruption and evasion. Some evasion is inevitable: any system of discouragements makes it attractive for some operators to attempt to circumvent them. In the Chilean case, it has been necessary to close loopholes as it became obvious that agents were using them. However, circumvention can be kept to a minimum with a well-designed and transparent system as the “*encaje*” implemented by Chile.

The objective of sustaining economic growth in the face of volatile capital flows (or volatile export prices, for that matter) requires the use of a battery of policy instruments. In the Chilean case,

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<sup>20</sup> It might be argued that interest rates are too high in Chile, and that this was one of the causes for excessive capital inflows. Unfortunately, there was not much room for lowering interest rates, since the economy had been operating at close to potential output for several years. Nor is it easy to tighten fiscal policy, increasing further its savings ratio. The need to increase spending on health and education, and professionalization of the government, precludes any significant decline in public expenditure.

the combination of tax-like instruments to deter speculative inflows, increasing short-term exchange rate uncertainty, and sterilizing the monetary effects of capital inflow worked well for several years. It should be remembered that reserve requirements alone (or any other policy that increases the cost of external borrowing), while clearly useful, do not deter speculative attacks when large exchange rate changes are anticipated. Thus a flexible policy package, rather than a single rigid policy tool, is desirable when a new capital surge emerges.

There are series of possible complements to the present set of policies, in face of a new surge. One possibility is to raise substantially the withholding tax on interest rate remittances, which now stands at 4 per cent. Raising it to 30-35 per cent (the tax rate on profit remittances) would discourage foreign borrowing at all maturities.<sup>21</sup> With respect to portfolio inflows, in case of capital surges, the period of application of the reserve requirement could be increased beyond one year, in order to raise the cost of financial investments in Chile; evidently, the pressures to eliminate a capital gains tax on stock dealings should be resisted, for the sake of macroeconomic stability and social equity.

As regards the exchange rate régime, the Central Bank must show a greater commitment to some sort of crawling-band policy and prevent the exchange rate from sticking to the floor or roof of an easily punctured band. The Central Bank ought to keep the exchange rate well within the band by practicing vigorous dirty floating (active intramarginal intervention). The weights assigned to each currency in the basket used to determine the central rate should reflect long-term real factors and should not be arbitrarily changed to achieve short-term exchange rate objectives. The alternative of a totally free exchange rate would evidently tend to be extremely unstable: rather than a brake to unstable flows, it would be led by them.

FDI projects of the nature undertaken in Chile are large relative to the size of the economy. In addition, they are lumpy, with periods of heavy investments followed by others in which investment essentially disappears. This is typically an upward “desired stock” adjustment problem, which may involve heavy net inflows of FDI over a period of time. It may pay countries that suddenly become attractive to multinationals to try to spread out over time the adjustment to higher

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<sup>21</sup> Since taxes on interest remittances are much lower than taxes on dividends, foreign investors have tended to bring in capital in the form of loans from parent companies (and international capital markets), rather than as equity. Thus the effective tax rate they are actually paying is extremely low, which encourages excessive inflows. This would be corrected if, as proposed above, the interest remittance tax is raised to a rate closer to that on dividends.

stocks of FDI. This can be done through the auctioning of FDI rights or some queuing mechanism for foreign investors. It also suggests that countries in this situation can be selective with FDI, giving priority to projects with large development payoffs and that allow to capture for the host nation the economic rent of natural resources. With an oversupply, authorities can choose; when choosing, countries are left in stronger positions during periods of scarcity.

## Appendix

### Calculating the implicit tax in Chilean disincentives to capital inflows

There are two main mechanisms through which the Chilean monetary authorities have sought to discourage capital inflow: (1) a tax of 1.2 per cent per year (proportionately less on shorter periods) on all foreign loans; and (2) the imposition of reserve requirements for a period of up to one year on foreign borrowing, bank deposits in foreign currency, and (recently) some portfolio inflows. Until October 1992, reserve requirements had to be maintained for a period that fluctuated between 90 days and a year. The regulations were changed in October to require that, regardless of the maturity of the loan, reserves had to be maintained on deposit for a full year.

Therefore, there are three elements which raise the cost of foreign borrowing to Chilean agents: (1) in order to constitute the reserve requirement, they must borrow funds in excess of what they need; (2) they must pay the foreign credit tax; and (3) in cases of loans with maturities shorter than one year, they must maintain reserves on deposit for longer than the maturity of their loan.

We examine three cases. Case I is the simplest and assumes that the foreign loan is for one year and, of course, the reserve requirement is also for one year. Case II assumes that the loan is for a period shorter than one year and that reserves must be maintained for the same period as the loan (essentially, the regulations in force from June 1991 until October 1992). Case III assumes that the loan is for a fraction of the year and that reserve requirements must be left on deposit for a full year (the regulations since October 1992).

#### Case I

In this case, foreign borrowing is made more expensive by the effect of the reserve requirements and the tax on foreign borrowing. The total tax on foreign borrowing ( $t_1$ ) is equal to the difference between the effective annual borrowing costs ( $\hat{r}$ ) and the international interest rate ( $r$ ):

$$\tau_1 = \hat{r} - r \quad (\text{A1})$$

And

$$\hat{r} = \frac{r+t}{1-e} \quad (\text{A2})$$

where  $t$  = fixed tax rate (in our case, 1.2 per cent)  
 $e$  = reserve requirement rate

Therefore,

$$\tau_1 = \frac{r+t}{1-e} - r = \frac{t+re}{1-e} \quad (\text{A3})$$

Under the option of paying the financial cost (fc) of the reserve requirements, the tax equivalent (as a percentage of the value of the loan) is as follows:

$$fc = e*(r+s) + t \quad (\text{A4})$$

where s = Central Bank spread. This formula is valid only for medium and long-term borrowing, because short-term borrowers do not have the option of paying the financial costs and must constitute reserve requirements.

## Case II

In this case, we work with an interest rate (i) for a shorter period that is related to the annual interest rate (r) by the following compound interest rule:

$$r = (1+i)^n - 1 \quad (\text{A5})$$

where n is the number of such periods in a year (say, 12 in the case of a one-month loan).

In this case,

$$\tau_2 = \hat{r}_2 - r \quad (\text{A6})$$

where

$$\hat{r}_2 = \left(1 + \frac{i+t/n}{1-e}\right)^n - 1 \quad (\text{A7})$$

### Case III

In this case, the non-interest bearing reserve deposit must be left for a full year, while the loan itself is for a fraction of the year. Again, we calculate an interest rate (based on the year equivalent) for the period of the loan. There are  $n$  such periods in a year.

The real cost of borrowing ( $i_3$ ), including the cost of the reserve requirement and the tax is:

$$\hat{i}_3 = \frac{i+t/n}{1-e} + \frac{e}{1-e} [(1+i)^{n-1} - 1] \quad (\text{A8})$$

On an annualized basis, the real cost of borrowing ( $r_3$ ) is:

$$\hat{r}_3 = (1 + \hat{i}_3)^n - 1 \quad (\text{A9})$$

As in the other cases, the implicit tax (on an annualized basis) is the difference between the real cost of borrowing and the international interest rate:

$$\tau_3 = \hat{r}_3 - r \quad (\text{A10})$$

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**Table 1**  
**Chile: net capital inflows and deficit on current account, 1960-99**  
(as a percentage of GDP)

	Net capital inflows		Deficit on current account
	Current prices	Constant prices 1986 <sup>a</sup>	Current prices
1960-70	2.6	4.3	2.5
1971-73	1.2	2.1	2.9
1974-77	2.7	3.4	1.9
1978-81	12.2	19.7	8.0
1982-89	5.5	6.4	6.2
1990-95	6.9	6.9	2.5
1996-97	8.0	9.2	5.7
1998-99	1.0	1.1	3.2

Source: Based on data of the Central Bank of Chile.

<sup>a</sup> The constant price series was derived by deflating the dollar series by an index of foreign prices faced by the Chilean economy. As for the denominator, GDP at constant prices was transformed to 1986 dollars using the 1986 peso-dollar exchange rate.

**Table 2**  
**Regulations on capital movements in Chile, second quarter of 1998**

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**Foreign direct investment:**

The only restriction on FDI inflows is the requirement that investments remain in Chile for a one-year period. There are no restrictions on profit remittances. FDI must be financed with a maximum debt component of 30 per cent (70 per cent equity). This limit was reduced from 50 per cent in October 1997.

**Portfolio investment inflows:**

Minimum amount of ADR issue is US\$ 25 million, reduced from US\$ 50 million in September 1994. Minimum risk rating of BBB required for non-financial firms and BBB+ for banking companies. 30 per cent reserve requirement on secondary ADRs since July 1995.

**Other financial and portfolio inflows:**

Subject to the 30 per cent reserve requirement up to June 1998, then reduced to 10 per cent. These include trade credits, foreign currency deposits, loans associated with FDI, and bond issues. Bond issuers face same quality enhancing restrictions as ADR issuers. In September 1998 the reserve requirement was set at 0 per cent.

**Foreign investment by the Chilean non-financial private sector:**

Investors not wishing to have access to official foreign exchange market need only inform the Central Bank of their investments abroad. Those wishing to have access to the official market need permission from the Central Bank. This is not difficult to obtain. At the present time, the formal and free market exchange rates are similar.

**Foreign investments of Chilean institutional investors:**

Foreign investments by pension funds, mutual funds and life insurance companies are subject to certain limits as to the amounts and types of foreign assets that they can hold. Pension funds are allowed to hold up to 12 per cent of their total assets in foreign assets (raised to 16 per cent in 1999), and stocks are limited to one half of total foreign holdings.

**Foreign investment abroad by banks:**

Foreign financial investments by commercial banks are limited to 25 per cent of bank capital and reserves and restricted to fixed income securities issued or guaranteed by foreign governments or Central Banks. Banks are authorized to use foreign currency deposits to finance trade among countries belonging to the Latin American Integration Association (LAIA). Commercial banks may hold equity in foreign banks provided they have a capital adequacy index of at least 10 per cent.

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**Source:** Adapted and updated from Budnevich and Le Fort (1997).

**Table 3**

**CHILE: IMPLICIT TAXES ON FOREIGN BORROWING, 1991-96**  
(annualized rates)

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	<b>1991 II</b>	<b>1992 I</b>	<b>1992 II</b>	<b>1993</b>	<b>1994</b>	<b>1995</b>	<b>1996</b>
Reserve requirement (%)	20	20	30	30	30	30	30
Min. reserve period (months)	3	3	3	12	12	12	12
LIBOR	5.5	4.5	3.6	3.4	5.0	6.1	5.6
Total tax, annual	2.9	2.6	3.3	3.2	3.9	4.3	4.1
6-month	3.0	2.7	3.3	5.0	6.2	7.2	6.7
3-month	3.0	2.7	3.4	8.0	11.0	13.2	12.2

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**Source:** Authors' calculations, based on data of the Central Bank of Chile. Includes the 1.2% tax.

**Note:** For formulas used to calculate the implicit tax, see appendix.

**Table 4****Persistence analysis for components of private flows, quarterly data, 1983-95****Autoregressive equations**

<b>Lags (No. of quarters)</b>	<b>FDI</b>	<b>Portfolio</b>	<b>Private borrowing</b>	
			<b>Long-term</b>	<b>Short-term</b>
1	0.201 (1.34)	0.156 (0.74)	0.643 (4.57)**	-0.158 (-1.09)
2	0.495 (3.61)**	0.055 (0.26)	-0.226 (-1.36)	-0.064 (-0.42)
3	0.491 (3.56)**	0.153 (0.72)	0.339 (2.63)**	0.241 (1.65)
4	-0.244 (-1.53)			
Constant	47.255 (1.344)	77.695 (1.57)	-10.200 (-0.539)	118.24 (2.11)*
R <sup>2</sup>	0.908	0.460	0.500	0.192

**Other indicators**

Coefficient of variation (%)	84.2	118.5	-568.4	338.4
R <sup>2</sup> of time trend	0.840	0.438	0.148	0.114

\* Significant at the 5 % level

\*\*Significant at the 1 % level

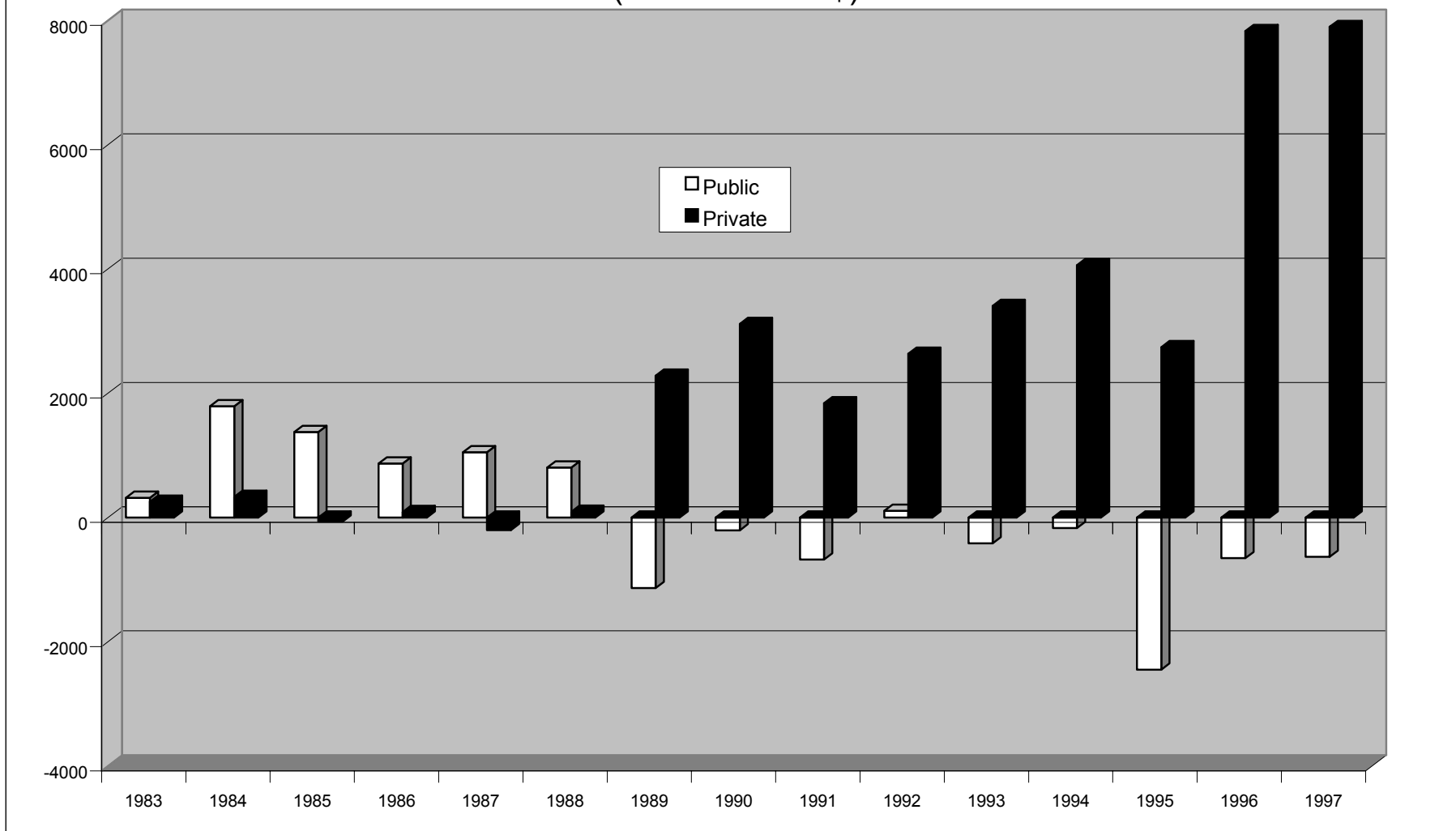
Table 5  
**Chile: Investment, foreign saving and growth indicators, 1960-99**  
 (as a percentage of GDP)<sup>a</sup>

	<b>GDP Growth</b>	<b>Gap GDP/GDP *</b>	<b>Gross fixed investment</b>	<b>Foreign saving</b>	<b>National Savings</b>
1960-70	4.2	0.98	21.2	2.5	-
1971-73	0.5	0.96	16.8	2.9	-
1974-81	3.3	0.90	17.8	5.0	12.6
1982-89	2.6	0.87	18.2	6.2	11.5
1990-95	7.8	0.98	26.1	2.5	22.1
1996-97	7.4	1.00	31.6	5.7	21.2
1998-99	1.1	0.93	29.2	3.2	20.6

**Source:** Authors' calculations, based on national accounts data of the Central Bank of Chile.

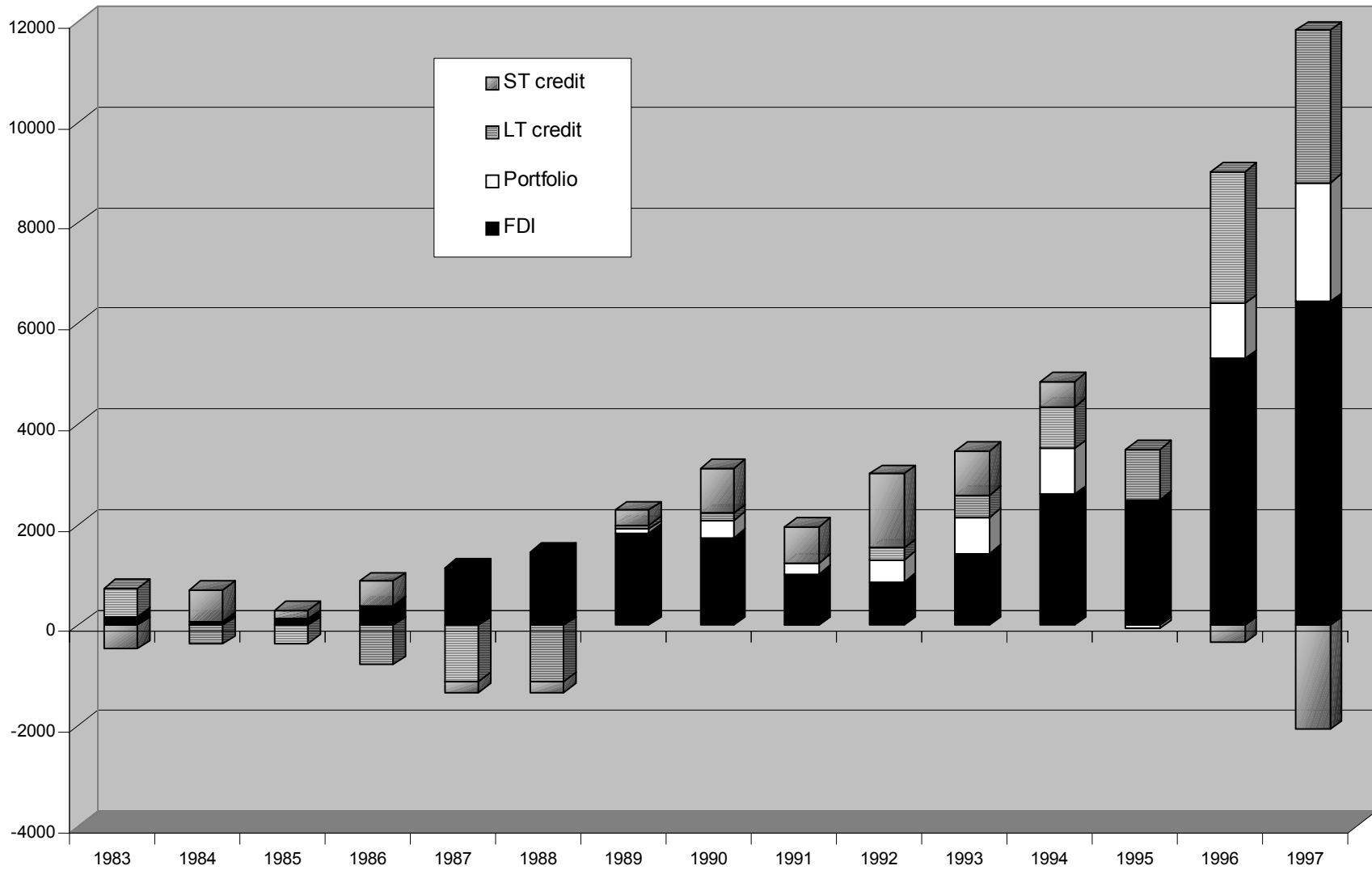
<sup>a</sup> Columns. 1 and 3, in 1986 constant prices for 1974-99 and rates of change in 1977 prices for previous years. Col. 2 is the ratio between actual and potential GDP. Cols 4 and 5, in current prices.

**Figure 1**  
**Private and public sector net inflows, 1983-97**  
(millions of US\$)



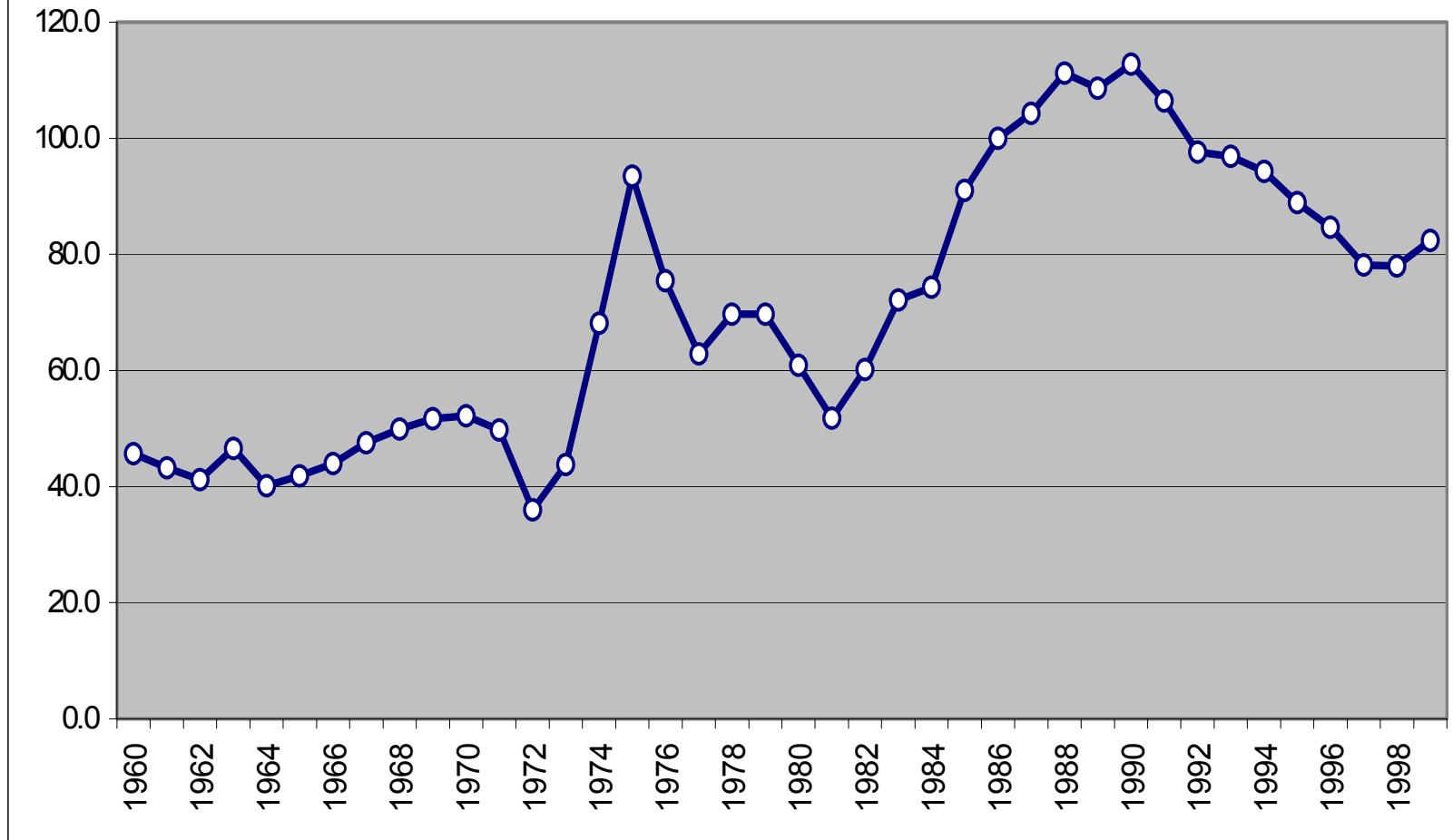
Source: Central Bank of Chile. Private figures in 1988-90 have a large share of debt-equity swaps. From 1991 they are totally effective net inflows to the capital account.

**Figure 2**  
**Composition of private capital inflows, 1983-97**  
(millions of US\$)



Source : Central Bank of Chile.

**Figure 3**  
**Chile: real exchange rate, 1960-99**  
(1986=100)



Source: Ffrench-Davis (1999b) for 1960-85 and Central Bank of Chile for 1986-99.