THE CHILEAN-STYLE OF CAPITAL CONTROLS: AN EMPIRICAL ASSESSMENT

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ABSTRACT

In this paper we review the main features of the Chilean-Style of capital controls during the nineties. In particular, we analyze empirically the effectiveness of the unremunerated reserve requirement (URR) in three key areas: its capacity to open space for monetary policy, its influence on the maturity profile of foreign liabilities, and its effect on the volume of capital flows. Our results suggest that the application of the URR was successful in those three fields, despite the existence of elusion and evasion in the application of the instrument.

We conclude that the Chilean experience could be useful for other emerging countries facing capital surges and highlight some specific advantages and relevant shortcomings of the Chilean model.

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INTRODUCTION

The Chilean economic model in the nineties has been in the center of the discussion about the path that Latin American should take in order to resume economic development. Indeed, its impressive performance, with sustained annual growth rates of about 7% in a context of very poor results in Latin America did transform Chile into a leading example of "good" economic policies. While some analysts highlight that the so-called neoliberal economic reforms carried out since the seventies in Chile are the main cause of the success in the nineties[1], other emphasize the positive role of the rather heterodox policies developed after the return to democracy in March 1990.[2]

One of the most outstanding features of the Chilean experience is the management of capital surges in the nineties. Indeed, the "Chilean-style of capital controls" has been seen as a set of successful domestic tools to deal with the problems associated with the excess of financing.[3] This dimension is very significant because, in small open economies, capital flows have accounted for a significant share of cyclical movements. In the past decades, expansions and contractions in international capital markets determined the main economic cycles in the Chilean economy: a huge boom since the late seventies, and the subsequent debt crisis since 1982, when Chile suffered one of the biggest recessions in the developing world.

In the nineties, Chile and Latin America faced two huge capital surges, separated by the Mexican crisis in 1994-95. Since most Latin American economies had liberalized their capital accounts since the mid-eighties[4], they received sizable net transfers from abroad. This process was encouraged by the need of easing the binding external constraint faced by most of the economies in the region after the debt crisis of the eighties. In this sense, the availability of external financing had a significant stimulating effect on the domestic economies and helped to

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[1] See, for instance, Larraín and Vergara (2000)
[2] See, for instance, Ffrench-Davis (2002).
[3] After some years, many outstanding economists have given credit to the Chilean policies as timely and effective. See, for instance, Fischer (2002), Koehler (2001), Stiglitz (2000).

control generalized inflationary processes through exchange rate appreciation; however, part of the progress was achieved at the expense of significant imbalances and external vulnerabilities.

In this context, the innovation of Chile was the implementation of a market-based mechanism to soften the supply of capital in 1991 and, in doing so, to allow some additional space for monetary policy. This instrument took the form of an unremunerated reserve requirement (URR; or *encaje*, in Spanish) to capital inflows. The URR, however, was not alone: it was part of a set of contemporary measures in the capital account management, the exchange rate regime, the fiscal policy, prudential regulation of banks, etc. Both strengths and weaknesses should be carefully analyzed, in their specific context, to extract general policy implications.

In this paper we review the Chilean experience with capital account management since the nineties. In section I, we review the historical context, describing the main features of the policy mix applied by Chile, including the monetary, fiscal and exchange rate policies. We focus on the main capital account regulations and, specially the URR. In section II, we review some analytical issues to understand the main goals and the macroeconomic consequences of using capital controls. In section III, we study empirically their effectiveness. Finally, in section IV, we discuss the lessons and policy implications of the Chilean experience with capital controls.

I. THE HISTORICAL FRAMEWORK: THE GOLDEN AGE

In the nineties the Chilean economy experienced a true "golden period". Table 1 summarizes some of the main macroeconomic indicators in the period 1974-2002, which highlight the impressive performance of Chile in 1990-97, in a historical perspective, with an annual growth rate above 7%. Those years also show a strong export development, a decreasing trend in inflation, high investment rates and a low unemployment, among other favorable indicators[5]. Note that in this period economic growth was sustainable in the sense that it was accompanied by a similar expansion in the productive capacity. This conjuncture is contrasting with the high growth rates achieved by

[4] See Ffrench-Davis (2000, ch. 5) for a description. A quantitative approach that shows this liberalizing trend in indexes can be found in Morley et al (1999).
[5] Changes in social standards were also significant. Poverty decreased sharply, from 45% of population in 1987 to 20% in 2000.

other Latin American countries for shorter periods in the nineties and Chile itself in the late seventies and in 1986-89, mainly based on the recovery and utilization of idle capacity after a recession.[6]

In particular, the debt crisis of the eighties hit strongly the Chilean economy, whose GDP experienced a drastic fall of 15% in 1982-83, with severe financial crisis in 1983. The huge recession and subsequent adjustment was the result of a process of excessive indebtedness in the late seventies and early eighties, which made Chile extremely vulnerable to external shocks. As a matter of fact, in 1981, the deficit in the current account climbed to 14.5% of GDP and the per capita Chilean external debt was one of the highest in the world.

In 1990, Chile recovered a democratic regime after the 16-year period ruled by General Pinochet in a favorable conjuncture of improved terms of trade and of "return of capital flows" to emerging markets. The new authorities shaped an economic policy based on the permanent benefits of previous structural reforms but also they implemented a series of significant changes. In particular, macroeconomic policies were endowed with prudential and counter-cyclical features to face a boom period.

[Table 1]

On the one hand, the Chilean fiscal policy was highly prudent, featured by a fully compensated increase in social expenditure. Thus, Central Government maintained its effective fiscal surpluses; actually, the structural fiscal balance was higher than the recently established target of 1% of GDP averaging 1.7% in 1990-97, reflecting a non-formal high counter-cyclical fiscal policy during the boom. In 1998-99, errors in GDP growth forecasts, caused an excess of public expenditure, which was corrected from 2000 on[7].

The monetary policy, in turn, responded essentially to the need of controlling inflation but it was highly sensitive to both external and real disequilibria. In 1990 the inflation rate had climbed to 27% as a result of the electoral boom of 1989. In this context, the (autonomous) Central Bank (CB) adopted an inflation targeting policy, featured by a gradual character (only in 1998 the inflation rate drop below 5%) that tried to achieve sustainable gains instead of sharp reductions of fragile nature. A key factor in this sense, during most part of the nineties, was avoiding the use of the exchange rate appreciation as the main anchor of the stabilization of prices. Therefore, the CB based its strategy on the building up of a growing credibility, which worked through expectations, and the active control of aggregate demand, expressed in (mini) adjustments in 1990, 1992-1994 and 1996.

[6] This fact can be seen in the rather modest economic growth of productive capacity, of 3.2% per year, and in the high unemployment rate that averaged 12.9% in 1986-89. Only during 1989, the real per capita GDP reached and surpassed the level recorded in 1981.

Since the mid-eighties the exchange rate fluctuated inside a band. After 1990 its design was changed in order to favor the transition from a context of shortage of foreign currency in the eighties to the new framework of capital surges in the nineties. After some discrete changes in the early nineties in addition to a widening of the crawling-band, which allowed for some appreciation[8], there was a defense of the real exchange rate through the increase of the international reserves.

Another important feature of the Chilean economy was the existence of a sound domestic financial system, which was the result of corrective measures taken after the financial crisis of 1983. In particular, financial institutions were subject to strict prudential supervision. As a matter of fact, even after the recession of 1999, the rate of non-performing loans have been low (less than 1,8%), reflecting the systemic strengthen of the banking industry.

Up to the Asian crisis, the approach followed by Chile in its capital account management combined three main features: First, a set of prudential regulations on non-FDI capital inflows, which included the application of the URR (and its successive strengthening) and minimum holding periods for foreign investments[9]. Second, a gradual but intense process of liberalization of capital outflows. Third, a preferential treatment towards FDI, which experienced a liberalizing trend in its regime.

It is interesting to note that this combination of regulation to inflows and deregulation to outflows responded essentially to the goal of protecting the economy from the negative effects of the overabundance of funds. In one dimension, authorities wanted to make space for monetary policy and, in doing so, control aggregate demand. Additionally, there was an explicit concern about potential vulnerability problems associated with the accumulation of foreign liabilities, and particularly of short-term nature. Finally, authorities thought that misaligned fundamentals could cause an inefficient allocation of resources; in particular, there was special concern about the effect of an over-appreciation of the RER on the export sector (Zahler, 1992).

This policy mix seemed to prove its value when in 1994-95 Latin America faced the contagious effects of the Mexican "tequila" crisis. In 1995, when Mexico and Argentina experienced GDP drops of 6% and 3%,

[7] For details, see Tapia (2003).
[8] In our view this movement was equilibrating. In 1995-97, there was a significant and steady real exchange rate appreciation, which was managed through changes in the rule of calculation of the center of the band. This movement was excessive (see Ffrench-Davis and Tapia, 2001).
[9] In Ffrench-Davis and Tapia (2001), we pointed out that the pre-Asian crisis years can be sub divided into two periods: first, 1990-95, where there was an active search for comprehensive macroeconomic balances (in terms of macroprices, fiscal budget, external accounts and the sustainable use of productive capacity); second, 1996-97, where the Central Bank gave priority to the inflationary goal, allowing an excessive real exchange rate appreciation.

respectively, the Chilean economy grew 10%. However, three years later, Chile was not immune to the Asian crisis and it was hit by both a negative shock in the terms of trade and a reduction in the sources of financing. The economy reduced its growth rate and, actually, suffered a recession of 1% of GDP in 1999.

Given the domestic problems and since international capital markets moved from the overabundance to the drought of foreign financing, Chile should adjust its policy mix. First, in order to fight against speculative attacks and defend the exchange rate stability, the CB carried out a sharp increase in real interest rates in mid-1998 in combination with a shortening of the exchange rate band. Second, there was a reversion in many of the measures adopted in the previous years as a way of attracting capital flows. When balance of payments problems were evident, the URR was lowered from 30% to 10% in June 1998 and then to 0% in September. Given the change in external conditions (from the capital surge in late 1997 to the shortage of funds in 1998) this movement was only considered a resetting of the parameter and not a suppression of the instrument.

In September 1999, the CB allowed the exchange rate adjustment by suppressing its commitment with the band; in other words, Chile adopted a free-floating ER regime. From 2000 on, finally, the new government and the Central Bank moved together to a new macroeconomic framework featured by the removal of most of the remaining regulations on the capital account. Thus, in May 2000 the minimum holding period for foreign investment was eliminated and, in April 2001, the URR was suspended as instrument as well as many other administrative controls: at that moment economic authorities claimed that Chile had reached the full openness of its capital account.

The poor performance in 1998-2002 has given origin to doubts about the soundness of the praised policy mix applied during the years prior to the crisis and during the crisis itself. One particular question is whether capital account regulations –applied in order to avoid BOP vulnerabilities– were effective or not, given that Chile, certainly, did suffer from significant BOP problems in 1998-99. The answer is not easy, the cause-effect relationship between some specific policy and the global economic outcome admits several analytical approaches, and also different interpretations.

From a macroeconomic perspective, there is a consensus about the overheating of the economy in 1996-97 as one of the determinants of the vulnerability of Chile and (to some extent) of the intensity of the subsequent adjustment (see Corbo and Tessada, 2002; Ffrench-Davis and Tapia, 2001). Some authors have blamed the fiscal management of being a major factor behind the excess of expenditure (see Corbo and Tessada, 2002, for instance). Others, instead, have insisted that the CB was responsible of the excess in aggregate demand and the expansion of

the external deficit. If the latter were the case, the next question is why the CB, supposedly endowed with a wide package of macroeconomic tools, failed in accomplishing its goals.

II. SOME ANALYTICAL CONSIDERATIONS

1. The URR objectives

During the nineties, the most outstanding policy to manage the balance of payments was the application of an unremunerated reserve requirement on capital inflows. The explicit objective of the URR was to equalize the cost of domestic and external financing in order to open space for monetary policy, in a period with risks of overheating, without increasing net capital inflows[10].

In simple terms, the interest rate parity after the implementation of the URR can be seen in equation (1), where r is the domestic interest rate, r^* is the international interest rate, ϕ is the country risk premium, d_t^e is the expected depreciation of the exchange rate and τ is the tax-equivalent cost of the URR.

(1) $$r_t = r_t^* + \phi_t + d_t^e + \tau_t$$

Therefore, the parameter τ must be managed according to:

(2) $$\tau_t = r_t^T - r_t^* - \phi_t - d_t^e$$

where r^T is the target interest rate, consistent with the objectives of monetary policy.

If we assume that the monetary authorities decide the level of the interest rate in terms of some type of Taylor rule, we will have that the target interest rate will respond also to the two traditional goals of the CB. They are to minimize, first, the difference between the current inflation and a target rate and, second, the output gap. In the case of Chile, it is important to consider also the existence of a target current account balance (around 3% of GDP), because it was explicitly included among the objectives to conduct the monetary policy during most part of the nineties.

[10] Central Bank authorities look at the URR as a mechanism to fight against inflationary pressures without generating imbalances in the external sector, which tend to occur in stabilization programs based on the real exchange rate appreciation. See Zahler (1992), a paper prepared by the President of the Central Bank of Chile during 1991-96.

2. Operating the URR

The URR represented a fixed percentage m of the inflows (which ranged between 0 and 30 percent), and it was to be on deposit at the CB during a *holding period* h (1 year), independent of the maturity of the operation (m). The exception was during 1991 and early 1992, when the holding period could fluctuate between 3 and 12 months.

The URR was applied only to capital inflows, with two important exceptions: foreign direct investments and trade credits. In the case of FDI inflows, authorities took into account that this kind of flow is less sensitive to changes in the arbitrage conditions (Zahler, 1992) . In the case of trade credits, the basic argument to exclude these operations was that they were relevant to the efficiency of the exporter and importer sectors.

Although the calculation of the tax-equivalent cost of the URR admits the analysis of several sub-cases, it can be approached by the following formula[11]:

$$(3) \qquad \tau_t = \left(\frac{m}{1-m}\right)\left(\frac{h}{m}\right)(r^*_{t+m} + \phi_{t+m})$$

Thus, in order to move τ , authorities could handle several mechanisms. They include: the percentage of the non-remunerated deposit (m), the holding period (h), the coverage of the instrument (exemptions in terms of size of the operation, type of flow, etc.), administrative measures to close loopholes, and general rules in terms of the currency denomination. Finally, the CB also accepted the payment of the financial cost of the URR through a variable fee instead of depositing the URR.

Figure 1 shows the tax equivalent cost of depositing the URR and its fee-equivalent cost. Both are very similar but not equal, which opened space for arbitrage. The fact that both mechanisms were used (see figure 3 in Gallego et al, 2002) implies that this arbitrage opportunities presented heterogeneity across agents.

[Figure 1]

3. Capital controls and capital flows

In order to examine the effect of capital controls on flows, we need to know their main determinants. We start analyzing the general case where an agent has to decide where to invest. The options are two: first, the agent

can invest in an emerging country, which will be named the "host" economy. Second, the agent chooses international capital markets. Naturally, the place where the agent has originally his resources will determine the nature of the flow –inflow or outflow.

Every agent ***i*** makes his portfolio decisions based on the maximization of profits Π according to the expression (4), where F_t^i represents the amount of the project.

$$(4) \qquad Max\ \Pi^i = F_t^i \left[\frac{[1+ \rho_{t+m_i}^i][1-\theta_t(m_t^i)]}{[1+d_{t+m_i}^e][1+ r_{t+m_i}^*][1+ \phi_{t+m_i}]} - 1 \right]$$

$\rho_{t+m_i}^i$ represents the expected profitability of investing in the host country. θ_t is a general parameter, reflecting the tax-equivalent cost of investing due to capital controls. Note that $\theta_t(m_i)$ depends on the nature of the potential operation: inflow or outflow. Thus, if we are talking about a foreign investor who is planning to invest in the host economy or a resident that assesses the return of his capital, $\theta_t(m_i)$ represents the tax-equivalent cost of controls on inflows (in the Chilean case, the URR was the most important). If, on the other hand, we are thinking about a resident who is assessing the opportunity to invest abroad or a foreign investor that wants to repatriate his capital, $\theta_t(m_i)$ indicates the cost associated with controls on capital outflows.

Note that every variable (the exception is the size of the investment, which is assumed to be constant) depends on the maturity of the potential investment. This mirrors the yield curve in the case of interest rates and country risk premiums. Expectations of devaluation also depend on the horizon of planning since despite the fact that the real exchange rate moves, in the long run, according to fundamentals, it is very sensitive in the short run to transitory disturbances, which become noise in the long run.

In most cases, the tax-equivalent cost of capital controls depends on the maturity of the operation. In equation (3), we already discussed that the cost of the URR is intrinsically tied with the maturity of the investment. The relationship is direct and negative through the parameter m in (3), but there is also a negative indirect effect through the opportunity cost, which, as we discussed, has a yield curve reflecting the liquidity premium. In the case

[11] This formula has been used by most empirical studies. See, for instance, De Gregorio et al (2000), Gallego et al (2002), Valdés P. and Soto (2000), etc. Deeper analysis on some alternative measurements can be found in De Gregorio et al (2000) and Herrera and Valdés (2001).

of controls on outflows, like minimum holding periods for capital and profits, there is also a direct and negative relationship.

The maximization of (4) has an important restriction. Indeed, every investor does not have complete flexibility in choosing the maturity of the project. In fact, normally the nature itself of the "operation" admits only a well-defined range of term conditions. In the case of foreign investors there are also differences in how long investors are willing to wait for profits. Although it is likely that a long term foreign investor could take advantage of an opportunity to speculate or arbitrage (which has a short-term effect in the balance of payment), that will be subject to the availability of capital, which is normally invested in non-liquid assets. On the other hand, it is highly unlikely that a short-term investor is willing to extend in years the term of the investment because they are specialized in making rapid gains, and moreover, they are accounted on the basis of short-term periods.

Thus, the optimizing process is subject to:

(5) $$\underline{m_i} \leq m_i \leq \overline{m_i}$$

where, $\underline{m_i}$ and $\overline{m^i}$ are the minimum and maximum, respectively, possible maturity terms for project *i*.

Then, after eliminating the *cross terms* for simplicity, the first order conditions (FOC) of maximizing (4) subject to (5) are:

(6) $$\frac{\partial \boldsymbol{r}^{e}_{t+m_i}}{\partial m_i} = \frac{\partial d^{e}_{t+m_i}}{\partial m_i} + \frac{\partial r^{*}_{t+m_i}}{\partial m_i} + \frac{\partial \boldsymbol{f}_{t+m_i}}{\partial m_i} + \frac{\partial \boldsymbol{h}_t(m_i)}{\partial m_i}$$

(7) $$\boldsymbol{r}^{i}_{t+m_i} \geq d^{e}_{t+m_i} + r^{*}_{t+m_i} + \boldsymbol{f}_{t+m_i} + \boldsymbol{h}_t(m_i)$$

Thus, the optimal behavior implies choosing the optimal maturity, m^{*}_i through equation (6). The second step is evaluating (7) by using m^{*}_i. We define, by convenience, $\Gamma^{i}_{t} = \boldsymbol{r}^{i}_{t+m^{*}_i} - d^{e}_{t+m^{*}_i} - r^{*}_{t+m^{*}_i} - \boldsymbol{h}_t(m^{*}_i)$ which mirrors the net expected profitability of investing in the host economy in the period ***t***. Then, the final optimizing rule for every agent ***i*** will be given by the expression:

(8) $$if\ \Gamma^{i}_{t} \geq 0, \text{ invests } F^{i}_{t}$$

$$if\ \Gamma^{i}_{t} < 0, \text{ invests } 0$$

Note that expression (8) represents the case of an agent with his resources located abroad. If the resources are inside the host economy, the flows will be 0 and $-F_t^i$, respectively. We will return to this difference in the next section.

Some aggregation criteria

We have analyzed the optimal strategy from a microeconomic perspective. In order to capture the macroeconomic effects of this behavior it is necessary to make some assumptions about the aggregation process.

i) *Maturity*

In terms of expression (6), since most of the variables are common to all the agents in the economy (yield curves for spreads and interest rates, expectation of devaluation in different horizons), major differences among agents rely on the change of the expected profitability of every particular project resulting of changes in its maturity and in flexibility conditions (expression (5)), which are project-specific variables. Therefore, the aggregate maturity will depend upon the past maturity (reflecting the inflexibility) and the derivatives of equation (8). This is:

$$(9) \qquad m_t^A = m\left[m_{t-1}^A, \frac{\partial d_{t+m_i}^e}{\partial m_i}, \frac{\partial r_{t+m_i}^*}{\partial m_i}, \frac{\partial \boldsymbol{f}_{t+m_i}}{\partial m_i}, \frac{\partial \boldsymbol{t}_t(m_i)}{\partial m_i}, \frac{\partial \boldsymbol{r}_{t+m_i}^e}{\partial m_i}\right]$$

Since we are interested in the maturity of inflows, we took the case of the URR as the relevant control. It is easy to see in (3) that the higher the maturity of the operation, the lower the tax-equivalent cost of the URR. Then, *ceteris paribus*, the expected result of implementing this kind of control is an increase in the maturity structure if that is consistent with restriction (5). This is a way of reducing the effect of the URR. If, on the contrary, $m_i^* > \overline{m_i}$, then the result will be the abortion of the project and, consequently a reduction in capital inflows.

ii) Net foreign investment

The case of net total foreign investment is more complex because there are different kinds of agents. In spite of the general character of condition (8), the absolute level of capital movements will depend very sensitively on the *heterogeneity* of the agents, the nature of their operations, and the structure of the economy.

A first distinction is related to the residence of the agents. Since equation (8) implies an adjustment in stocks, their size is crucial. In the case of foreign investors looking for new opportunities, the supply of capital is typically very elastic or, at least, well captured by price signals (foreign interest rates, emerging markets indexes,

etc.). Thus, the binding variables will be given by the size of the host economy and its growth perspectives. If foreign investors decide to leave the host economy, then the size of past investments (the stock of external liabilities of the host economy) becomes determinant. In the case of domestic residents, inflows will be determined not only by the size of the economy but also by solvency indicators relevant for foreign banks. Outflows, however, will be restricted mainly by the amount of liquid assets that could be invested abroad.

The structure of the economy imposes also some conditions to capital flows in terms of regulations. Indeed, the normal situation in most emerging countries is the existence of several restrictions to invest abroad. They can respond to prudential supervision on the quality of external assets or quantitative limits addressed to manage the capital account.

However, this analysis could be too simple. Labán and Larraín (1997) developed a model, inspired in Chile, whose conclusion is that a liberalization of capital outflows can increase net capital inflows. The reason is that a reduction in controls on outflows, understood as a reduction in the minimum repatriation period for foreign investment, reduces the degree of irreversibility of the decision to invest in the host economy, which makes it less risky. Extending the argument, controls on capital inflows would make more costly the decision of investing abroad if the investor plans to return the resources later. Thus, it is also likely that capital controls on inflows could deter capital outflows, particularly from residents, who will be interested in returning their money to the host economy.

Table 2 summarizes four cases of determinants of capital flows depending on the residence of the capitals and on the sign of the operator Γ.

[Table 2]

If we order projects according to Γ_t^i and classify them into two groups (less and greater than zero), we can establish the existence of two density functions to define the aggregate net capital flow. On the one hand, the function $g(\cdot)$ is linked to the cases A1 and B1 in table 2 and therefore it has as determinants the size of the economy, and regulations on capital inflows, as it is the case of the URR. On the other hand, the function $h(\cdot)$ represents the cases A2 and B2 in table 2, which means that, among its determinants, we find the size of liquid assets (liquid deposits, pension funds, resources from big mergers and acquisitions, etc.), the size of liquid foreign liabilities and the regulations on capital outflows. Equation (10) summarizes the behavior of net capital flows.

(10) $$F_t = \int_0^{+\infty} g(\cdot) d\Gamma_t^i - \int_{-\infty}^{0} h(\cdot) d\Gamma_t^i$$

Obviously, the heterogeneity goes beyond what we have tried to sketch in the stylized table 2 and equation (10). For example, we have said nothing about the distribution of the profitability opportunities in productive projects and its determinants. Therefore, it is necessary being careful in the use of (10) in econometric works.

The effects of capital controls on net flows can take several forms. The direct effect is captured by expression (8), where capital controls can deter foreign investments by increasing their cost. A second important consequence has to do with condition (6) in the optimization process, which signal that capital controls can affect the maturity of the project and, through this variable, affect Γ_t^i.

Finally, there are two potential indirect effects of the URR on capital flows. As we can see in table 2, capital outflows driven by non-residents depend on the stock of liabilities. Then, if the URR has a negative effect on the volume of capital flows during a period of abundance in international financial markets or , if there is a reduction in the more volatile components, there will be a positive effect of the regulation on net capital flows during "bad times". This is a strong counter-cyclical effect of capital controls like the Chilean URR.

On the other hand, the mentioned reduction in the stock of foreign liabilities and the improvement in the maturity profile of external debt, will reduce the country risk, which will reduce the interest payments and the domestic neutral interest rate. An interesting result is that the reduction in the country risk could stimulate more inflows. (see De Gregorio et al; 2000; Tapia, 2002)

III. EMPIRICAL ANALYSIS

1. International interest rate differentials

As we discussed earlier, the main intermediate objective of Chilean authorities was to equalize the cost of financing between domestic and foreign sources in order to allow monetary adjustment through movements in domestic interest rates. If, for instance, an increase in interest rates only affects the domestic cost of financing, then a part of the agents can switch to foreign sources of resources, causing capital inflows and eroding the effect of the monetary policy on aggregate demand.

We estimated directly the international interest rate differential, $r_t - r_t^*$, which is the difference between the Monetary Policy (MP) rate (managed directly by the CB) and the LIBOR rate at 180 days (both annualized). According to arbitrage conditions, in equation (1), this variable has a permanent relationship with the expectations of depreciation, the country risk and capital controls, which are expected to have a positive sign.

In the right side of the equations, we use the lagged dependent variable in order to eliminate the unit root present in $r_t - r_t^*$. Expected depreciation d_{t+1}^e was estimated as the difference between the CPI-indexed interest rate and the forward dollar-indexed interest rate (90 to 360 days); the country risk proxy (risk_spread) was based on the index published by *Euromoney* for Chile and the United States. We measure the URR effect in two ways: its tax equivalent cost (see figure 1) and through an indicator of its power (the URR tax equivalent cost weighted by pot, where $pot \in [0,1]$ is a variable that reflects the loopholes of the URR taken from De Gregorio et al, 2000). Since there are lags in the information flow and in the decision making process, we added a variable reflecting the expected change in the international interest rate, $(r_{t+1}^*)^e - r_{t-1}^*$. The expected international interest rate was estimated through a complementary model presented in annex 1.

We included two sets of additional variables. The first one includes measures of the URR "coverage". On the one hand, the (lagged) maturity of total financial credits, which diminish the cost of the URR, is expected to show a negative sign. On the other, the (lagged) share of FDI in total gross inflows, which indicates to what extent non-taxed flows lead the balance of payments and, consequently, is expected to have a negative sign. In both cases, we used a multiplicative dummy (D_t^{URR}) to isolate the effects of these variables during the URR period. Second, since the domestic interest rate is settled according to some goals, we include also the objectives of a Taylor-rule: the difference between the expected inflation and the target rate, the (lagged) output gap and the (lagged) current account balance.

Table 3 shows our estimates[12]. In all of them the main variables of (1) appear significant and with the "right" sign. In the case of the expected change in the international interest rate the coefficient showed a negative sign and high significance, which can be interpreted as a confirmation of lags in the settlement of the domestic rate.

[Table 3]

In all the cases, there is a positive impact of the URR that cannot be rejected at the 1% level of confidence. The parameters indicate that for every point of its tax-equivalent cost the URR effect varies between 25 and 42 basis points. When we consider the effectiveness of the URR, the effect was consistently higher, between 42 and 45 basis points. If we translate these results into aggregate terms, we found that during the application of the URR (1991.2-1998.3) the monetary policy real interest rate was, on average, between 1.12 and 1.88 percent higher than the international interest rate. The range was smaller, between 1.43 and 1.51 percent, when we used the parameters corrected by the power of the URR. These figures are consistent with previous estimates by Gallego et al (2002), but much lower than the static calculation based on a formula like (3) calibrated for short-term maturities[13].

These results support heavily that the URR was able to accomplish its goal of increasing the international interest rate gap and, in doing so, of giving some space for monetary policy. In general, regressions suggest that the "power" of the URR should be seriously considered. This means that the URR can be more efficient if loopholes are closed, as occurred in the Chilean case.

The indicators of URR coverage showed small explanatory power or even a positive sign (in regressions 3 and 4). However, they could not be rejected when the Taylor rule regressors were included. In turn, the Taylor rule elements showed the expected sign but they were not always significant. In particular, the output gap seemed to be irrelevant. A possible explanation for the latter fact is that the URR tax equivalent cost responded to the Taylor rule, as analyzed in section II.1.

2. Maturity

We examined the effects of the Chilean capital controls on the maturity structure of external liabilities. As we saw in the previous section, choosing the maturity of the operation is part of the process of optimization of agents (see equation 6). The main question we try to ask in this section is whether or not the URR contributed to extend the maturity of external credits.

a) Financial credits

[12] With the antecedent of presence of unit roots in some of the series, we calculated the Augmented Dickey-Fuller statistic for each series of residuals in order to see a possible problem of spurious regression. In all of the cases, we can reject the hypothesis of non-stationarity of residuals.

[13] In Gallego et al (1999), the authors try to assess the costs of the URR based on higher differentials, between 1.95 and 3.12 percent.

In this section we take (gross) flows as labeled in the ARTICULO 14. Up to mid-1999 they were consistently classified in short-term (up to 12 months) and long-term credits (more than 12 months). From then on, the CB has reported only the long-term operations. Therefore, we examine the period 1988.1-1999.3, which covers all the quarters when the URR was in place (1991.2-1998.3). These credits are one of the main components of the gross capital inflows, representing 55% of total gross inflows of non-foreign investment in our sample period 1988-1999.3[14]. The rest of the gross inflows of non-foreign investment in the period were explained mostly by external credits linked to FDI and by non-private capital disbursements, whose maturity terms have not been consistently published.

We will work with two concepts of external credit: short term credits and total credits (short-term plus long term credits). It is important to bear in mind that the separate analysis of short-term (or long-term) credits presents some problems since there is a potentially strong selection bias. If, for instance, there is a general rise in the maturity structure, many credits previously labeled as short-term will take the form of long-term credits. However, because of the limited flexibility (recall restriction (5)), it is very likely that a former short-term credit will increase modestly its maturity, being close to the frontier (1 year) of the long term operations. Therefore, if the re-labeling of credits is stronger than the rise in the maturity of the rest of the long-term credits, the average maturity will fall. Naturally, this problem is also present when analyzing short-term maturities, for analogy.

Figures 2 and 3 present the maturity and size of both total and short-term financial credits, respectively. In the case of total financial credits, their volume during the URR period (when the supply of external capital was stronger) was around one half[15] of the level showed in the rest of the sample[16]. The maturity, on the other hand, increased dramatically and persistently from levels below one year, to reach an average around 6 years in the last quarters of the URR period, to experience a new reduction afterwards.

In the case of the short-term financial credits, in turn, the effect of the URR seems to be very strong. The volume of these inflows decrease from levels of 8% of GDP in the early nineties to less than 1% of GDP during the URR period (between the vertical lines). The maturity, in turn, increased rapidly from levels around the 4 months to

[14] Non foreign investment total gross inflows are defined as the sum of total disbursements of long term credits and the net flow of short term liabilities.
[15] It is interesting to note that if we look inside the URR period in figure 2 , we will find that behind the average volume of total credits of 2.7% of GDP in 1991.2-1998.3, there are 2 clear sub-periods. During the first one, up to mid-1995, external credits amounted only to 1.7% of GDP. In the second part of the URR period the volume was much higher, averaging 4% of GDP.
[16] In figure 2 we have extrapolated the series of total financial credits (as a share of GDP), including the data of medium and long term credits in 1999.4-2002.3. This means that the average of 5.5% of GDP in 1998.4-2003 underestimates the true size of these inflows.

the range of 10-12 months. After the end of the URR period, both size and maturity of these credits seem to present a reversal.

[Figures 2 and 3]

Now we will review in a more formal way the rough evidence of figures 2 and 3 in order to confirm or reject the effects of the URR on the maturity structure of financial credits. Our empirical analysis is based on expression (9), where the main determinants of the maturity structure are the maturity constraints of (5), and the slopes of several yield curves associated with different investment alternatives: international interest rates, country risk premium, domestic interest rates, foreign currencies. Also, we tested the effect of the URR.[17]

The domestic yield curve slope (d_yield_st) is the difference between the passive medium-term (1 to 3 years) and the active short-term (90 to 365 days) inflation indexed interest rates. Note that in this variable is included also the combined effect of the change in the spread between active and passive rates associated with changes in the maturity.

The international yield curve slope is measured in four different segments: first, the short-term slope, calculated as the difference in real LIBOR rates for one month and one year (f_yield_st). Second, the medium-term slope measured as the difference between the generic US treasury interest rate for 10 years and the LIBOR rate for 1 year (f_yield_mt_1). Third, the medium-term slope measured using the generic US treasury interest rates for 30 years and the LIBOR rate for 10 year (f_yield_mt_2). Finally, the long-term slope, which is the difference between the US Treasury interest rate for 30 and 10 years (f_yield_lt).

Additionally, we include two variables related to expectations about interest rates and profitability conditions. First, in the case of international rates, we used the expected LIBOR rate for 180 days (see annex 1). Second, in the domestic front, we include the (lagged) "trend GDP growth" (the growth rate of the late 2 years).

The maturity effect in expectations of devaluation is hard to estimate. In theory, if the expectations of depreciation are higher in the long term, then there is a preference for investments with shorter matutities. In the case of the short-term expectations, we use as a proxy expectations of depreciation in markets instruments d^{e}_{t+1}, based on the assumption that there is some proportionality between this variable and its associated yield curve. In the case of the longer segment, we use the lagged real exchange rate as an indicator of misalignment. The implicit

[17] Given the presence of unit roots in some of the variables of our model, we calculated the ADF statistic for every equation in order to identify a possible problem of spurious regression. In all the cases, residuals present a strongstationarity, which indicates that we can reject the existence of spurious regressions.

idea is that there is a fixed level of RER equilibrium (RER^*) and, therefore, we are estimating the effect of ($RER_t - RER^*$) which, in turn, is assumed to be correlated with the yield curve of the expectation of long term depreciation.

Table 4 shows the estimation of the average maturity of total financial credits. In this case, we used only the lagged RER because d^e_{t+1} was not significant. A first interesting fact is that the lagged maturity appears to be non-significant, revealing some flexibility in aggregate terms (recall that restriction (5) was a condition for a particular investor). Most of the remaining variables presented statistical relevance and the expected signs. The exceptions were f_yield_spread and TREND GDP GROWTH. The latter showed some significance (and a positive sign) only in equation (1) when the URR was not present.

When we included the tax equivalent cost of the URR in all the equations it showed a positive sign, significant at least at the 5% level. Its coefficient was highly stable, implying that every point of URR tax equivalent cost increased the maturity in 4.4-4.8 months. In we translate this result to the whole URR period, then total maturity grew, on average, over 20 months.

[Table 4]

Table 5 presents the estimates for short-term financial credits. The group of explanatory variables is roughly the same that of the previous exercise with total financial credits. In regressions (1) and (2) we estimated the model without including the effect of the URR. Almost all the variables showed the expected sign and were significant. The exceptions were our *proxis* variables for the effect of maturity on the expectations of devaluation, whose significance is rejected. On the other hand, the variable "trend GDP" appears very significant but with a negative sign. However, the relevance of this variable disappeared when we added the tax equivalent cost of the URR in regressions (3) and (4). In the case of the expectations of devaluation, the predicted sign appears in regression (4) but only significant at the 10% level.

[Table 5]

On the main question of this section, regressions (3) and (4) evidence that the effect of the URR on the maturity is positive and significant at the 1% level. In rough terms, for every point of tax-equivalent cost, the maturity increased between 0.6-0.7 months. This means that for the URR period the maturity of short-term operations was, on average, around 3 months higher. Note that this figure is much smaller than the 20 months estimated in the previous exercise. The main cause seems to be the selection bias mentioned above.

This result in terms of maturity represents a net benefit in itself because a higher maturity provides more certainty about future outflows, which diminish the probability of a crisis in the balance of payments. On the other hand, the fact that Chilean firms are able to contract credits with longer-terms opens new opportunities for long lasting productive investments.

b) External debt composition

Another way of measuring the maturity structure of the foreign liabilities is through the external debt composition. Figure 4 shows the composition of the external debt, measured as the short-term external debt (contracted debt with up to 1 year of maturity) as a share of the total external debt. Here, it is clear a change in the trend in the early nineties. The short-term external debt had increased its share in the total from 8% in 1986 to 20% in 1990. In 1991 there was a break in this trend and a sharp reduction took place, precisely around the URR implementation. After a rapid recovery in 1992, there was a steady reduction in the ratio up to mid-1998, when the URR was set to zero. From then on, there has been an increasing trend.

[Figure 4]

Here again, the effect of the URR seems to be present. We run a series of regressions to test this hypothesis. We assume that the composition of the external debt follows the same determinants that the maturity of foreign credits analyzed above and, therefore, we used an analogous set of regressors.

We work with annual differentials instead of levels for two reasons. First, the short-term ratio has a significant inertial component because it is built from stocks. When we differentiate yearly, it is eliminated the inertial component of both short-term debt (because, it lasts a year at most) and total debt (because correct for amortizations, as explained below). Second, since the short-term participation in the total external debt is I(1) differences eliminate the unit root.

Estimates are presented in table 6. As mentioned, we include the long-term debt amortization in the last four quarters[18], which is not determined by changes in conjunctural variables but by term conditions at the contract of the debt. This variable is significant in all regressions.

[Table 6]

[18] We used the long-term amortization presented in the balance of payments under "other investment".

As in tables 4 and 5, the domestic yield curve slope appears reducing the short-term debt only slightly and significant solely at the 10% level. The change in the expectations about the foreign interest rate and the slopes of its yield curve (in both the short-term segment and in the medium term segment) showed the expected sign and was significant at the 1% level. The variable TREND GDP growth was found to increase the short-term debt.

The effect of the URR was tested in two ways: we consider the annual difference of its tax-equivalent cost, and its level. Both measures exhibited negative effect on the short-term ratio (significant at the 1% level), as can be seen in regressions (3) and (4). In regressions (5) and (6) we included the lagged annual difference of the dependent variable as a way of eliminating the autocorrelation of the error terms. This new regressor makes less significant the URR negative effect, particularly the differentiated; the level of the tax equivalent cost held statistical significance at the 5% level.

The fact that the level of the tax-equivalent cost appears more relevant to describe the evolution of short term debt ratio than its change reveals that the effect of the URR was persistent on this variable. This explains the strong decreasing trend of the ratio. Indeed, on the other hand, further changes in the URR would have been less effective because the short-term debt was in very low levels, as can be seen in figure 4.

3. Capital flows

A series of studies have been carried out to assess the effect of the URR of capital flows. In this section, we revisit these empirical issues by trying to add some of the analytical elements discussed in section II.3.

a) Total net capital flows

Figure 5 shows the behavior of net total flows as a share of GDP. At a first glance, the URR period is characterized by an increase in net inflows with respect to the rest of the sample. This fact is extremely important in an empirical investigation because if we fail to describe properly the behavior of capital flows, *by default* we will not be able to reject the null hypothesis of no significance of the URR effect.

[Figure 5]

Actually, in some well-known studies, the fit of the whole equation to actual data is not very satisfactory. In De Gregorio et al (2000), for example, only one of their models could not be rejected at the 1% level of confidence

(through the F-statistic), showing a set of adjusted R^2 ranging between 0.12 and 0.16. Naturally, the URR appeared to be not significant and even showed a positive sign in some estimates.

Here, we try to achieve a better representation of data as a necessary condition to assess the effect of the URR. We start from the specification of De Gregorio et al (2000) as a way to obtain comparable estimates. As it has been conventional for testing the effect of the URR on net capital flows [19], we use two stage least squares to deal with simultaneity determination problems in several variables in our models .

Table 7 presents our estimates for the period 1988.1-2002.3. We measure capital flows as a share of GDP as in previous empirical works because it is a useful way to avoid heteroscedasticity problems and eliminate unit roots. Regression (1) shows the specification of De Gregorio et al (2000) where regressors are the (lagged) international interest rate parity (reflecting relative profitability conditions), the instrumented deficit on current account (reflecting the need of external financing) and the (lagged) tax equivalent cost of the URR.

[Table 7]

Regressions (2)-(6) add new regressors. On the one hand, we try to capture better some supply signals. Thus, we include the (lagged) long-term yield curve slope (F_yield_lt). A higher slope mirrors the expectation of an increase in international interest rates and, therefore, a higher alternative cost for capital flows. This variable presents the expected sign and significance. Additionally, we tested the role of the balance on the current account of the United States as a rival of the external financing in emerging markets. As expected, this variable showed a positive sign but its significance was not robust to all specifications.

On the other hand, we include domestic variables. First, changes in the country risk spread whose coefficient is significant and negative. Second, we tested the investment rate, which reflects a process of maximization of profits based on productive projects, beyond arbitrage operations. Regressions (5) and (6) show that this variable was not rejected. Finally, we used as a regressor changes in the limit for pension fund's foreign assets(D(LIMIT_AFP)), which proved to be significant in explaining capital outflows.

Note that in regressions (2)-(6) we have improved the fit to data and overcome the problem of auto-correlation present in (1). In all those regressions the effect of the URR appears as negative and cannot be rejected at 5% of confidence. These results suggest that for every percentage point of its tax-equivalent cost, the URR

[19] See, for instance, De Gregorio et al (2000), Gallego et al (1999; 2002).

decreased net capital inflows between 0.6 and 1.1% of GDP. This percentage is sizable and similar to that found in Gallego at al (2002).

b) Short-term capital flows

Figure 6 presents net short-term capital flows as a share of GDP. We use two definitions: the first one covers short-term flows plus errors and omissions, while the second considers also the net portfolio flows. These are very volatile series that, however, allow us to see a downward movement between the vertical lines, which signal the URR period. Inside it, we can identify three minimum points: 1991.2, 1995.1 and 1998.1-1998.2. Those dates are associated with the URR starting point, the Tequila crisis and the beginning of the Asian crisis in Chile. Thus, from the figure it seems clear that in a context of abundance of capital flows, the reduction in the short-term flows is a fact that shows the negative effect of the URR on short-term flows.

[Figure 6]

Figure 6 also highlights that there is a **decreasing trend** in short term flows. In contrast, the tax-equivalent cost of the URR was rather constant (with the exception of a jump in 1995; see figure 1). In other words, the effect of the URR appears to be permanent in these kind of flows. We explore this hypothesis later.

Note that in the analysis of short-term flows, in opposition to the case of net total flows, the negative relationship between short term flows and the URR could be proved "by default" in the sense that a very simple specification is enough to show the negative effect of the URR. The challenge is to see if this effect survives after correcting by other relevant determinants.

Table 8 shows our estimates for short-term net capital flows for 1988.1-2002.3. Once again regression (1) shows a basic representation with the variables used by De Gregorio et al (2000), where short-term capital flows depend on the international interest rate gap (PARITY), the Chilean GDP GROWTH which reflects the profitability conditions in the short run; the current account balance as a share of GDP, which can be interpreted as the requirement of external resources to finance domestic expenditure, and the URR tax-equivalent cost. All coefficients present both the expected sign and significance at the 1% level.

[Table 8]

In regression (2), we used, instead of the current account, the investment ratio. Note that this ratio is associated with the use of productive capacity and, therefore the interpretation is related with profitability conditions associated with productive projects (not only financial arbitrage with interest rates).

In regressions (5) and (6) we try to assess the hypothesis of the permanent effect of the URR on these flows. We use the lagged ratio of short-term external debt to GDP as a proxy of the accumulated effect of the URR. This results to be positive and significant. This fact can be interpreted as a permanent substitution effect where agents learn how to avoid the URR or, alternatively, as a gradual deterring effect that makes progressively less profitable short-term operations.

It seems clear, however, that the effect of the URR on short-term flows is stronger than that on total flows. The "arithmetic" implication is that medium and long term flows present a positive response to the URR but milder than the negative response of short-term flows.

c) Medium and long-term capital flows

We estimate the behavior of medium and long-term (MLT) flows by separating them into two groups. First, a proxy of MLT gross inflows, which include disbursements of credits plus net liabilities associated to foreign investments (direct and portfolio). Second, a proxy of gross MLT outflows, which consider capital amortizations plus net assets movements of residents (in the form of credit lines, and direct and portfolio investment). As we saw in table 2 and equation (10) they are expected to have different sets of determinants.

Table 9 shows our estimates for gross MLT capital inflows as a share of GDP. In regression (1) we include the international interest rate differential, the investment rate, the country risk proxy, plus three alternative indicators of supply of financing: the balance on the current account in the US, the balance on the capital account in the US and the FDI inflows in Argentina, Brazil and Mexico (FDI_LA3), as a share of their combined GDP. We added as an independent variable an estimate of the mergers and acquisitions (M&A) by non-residents as a share of GDP. The reason is that those operations followed a pattern different from the traditional determinants of capital flows. Actually, they boomed in 1999 when international capital markets were depressed, the RER was depreciating and the economy was facing a recession[20].

[20] Unfortunately we cannot separate M&A operations from the rest of FDI inflows because of lack of accurate data for the entire period.

In regression (2), we tested the effect of the URR, which is not statistically significant. In regression (3) we used the policy component of the tax-equivalent cost of the URR (U)[21] in order to isolate its influence from the LIBOR rate but its significance was equally rejected.

[Table 9]

Table 10 presents estimates for gross MLT capital outflows as a share of GDP. Regressions show that these flows respond to the gap in international interest rates. Surprisingly, the country risk appears significant but with a negative sign, a point that deserves more analysis. The medium-term yield curve slope show a positive sign, implying that an expected rise in international interest rate stimulate capital outflows. Additionally, in all regressions we can see that changes in the regulations of pension funds were determinant of the behavior of capital outflows.

[Table 10]

A very interesting result is that our proxy to M&A by non-residents is positive and highly significant. This supports the idea that operations of non-Greenfield FDI tended to cause contemporaneous outflows by residents that sold their assets. This phenomenon was particularly strong after the Asian crisis, when M&A operation intensified and domestic economic conditions worsened.

Perhaps the most intriguing result in our estimates is, however, that when we included the tax-equivalent cost of the URR, it showed a significant coefficient with negative sign. In other words, the URR (only affecting inflows) presented a negative effect on outflows. This point deserves more attention and research[22]. Indeed, this statistical fact contributes to the explanation of the gap between the quantitative effect of the URR on short term flows versus total flows. In other words, it seems to clarify why most studies find a negative effect of the URR on short-term flows and, at the same time, fail to find a negative effect on total flows.

We tested finally the effect of other regulations on outflows. First, regulations on remittances of capital and profits (remit) and, second, "other regulations" (other) weighted by the size of liquid assets in the economy (measured as the ratio M7/GDP). Both variables appeared as no significant.

[21] Since the LIBOR rate appears in PARITY also, we tried to prevent a multicolineality problem. In terms of expression (3), we define the policy component of the URR-tax cost as : $U = \left(\frac{m}{1-m}\right)\left(\frac{h}{m}\right)$.

IV. CONCLUSIONS AND POLICY IMPLICATIONS

1. Main results

Our empirical analysis indicates that

- The URR was effective in opening space for monetary policy.
- The URR was very successful in improving the profile of foreign liabilities.
- The URR had a clear and sizable negative effect on short-term capital flows.
- This effect was found to be persistent. This means that even if there had been a full re-labeling of these flows, the process was gradual and, therefore, the volume of total flows was affected during this transition.
- The URR had a significant negative effect on net total inflows. Notwithstanding, this effect is milder than that on short-term inflows.
- The difference in the coefficients associated to the URR for net total flows and net short-term flows is explained mainly by the frequently ignored negative effect of the URR on MLT outflows rather than by the substitution or re-labeling of inflows from short-term to long-term.
- However, the fact that the MLT gross inflows were not negatively affected by the URR, in spite of being taxed by it (with the exception of FDI), could support the idea of some substitution or elusion through re-labeling.
- There were two additional important factors in explaining the BOP behavior, particularly after the Asian shock in 1998, which appeared relevant in our empirical work. First, investment abroad by pension funds. Second, the process of massive M&A, which generated huge inflows and outflows contemporarily, but by different agents.

2. Policy implications

As mentioned, evidence show that the Chilean-style of capital controls, and particularly the URR, worked well, despite the existence of loopholes and a progressive elusion. In fact, at least in terms of its intermediate objectives, the URR was able to open space for monetary policy, contributed to reduce the stock of foreign liabilities and improved their maturity profile. Naturally, these benefits have to be contrasted with the potential costs of these regulations (see, for example, Forbes (2002) and Gallego et al, (2003)). Indeed, the international interest gap, the size and composition of capital flows are not ends in themselves but means to achieve a better macroeconomic environment with a higher and sustained economic growth.

[22] The interpretation is not clear. On hypothesis is that regulations on inflows can affect outflows by increasing the exit cost the

In this sense, the impressive performance of the nineties seems to support the idea that the positive effect of the whole model, including the capital controls and their management, was much stronger than the costs. Actually, the investment rate of Chile in the nineties was not only the highest in Latin America but also the highest recorded in the Chilean history. On the other hand, the Chilean economy became one of the less vulnerable in the region, escaping from the contagion of the Mexican crisis. In the case of the Asian crisis, the negative effect was rather moderated and, according to our findings, was mostly linked to policy errors like careless liberalization of outflows during the boom phase. The URR, in turn, contributed to reduce the stock of liabilities and to improve its profile. According to all international research these two factors determine strongly both the probability of crises and its associated costs. In other words, the Asian crisis would have had a stronger negative effect on the Chilean economy if the capital controls had not been there.

Thus, we interpret the result of our research as a strong support to the Chilean-style of capital controls. Consequently, the main policy implication is that this kind of policy can be very helpful to achieve a sound integration to international capital markets, allowing to take advantage of the benefits and reducing the underlying costs of the process. However, the Chilean model also can provide some additional elements:

- **Comprehensive macroeconomic approach**

In the case of Chile, capital controls accounted for only a part of the whole set of prudential policies. In general, they were consistently managed to achieve a comprehensive framework of macroeconomic equilibria, including price level stability, fiscal responsibility, a balanced external sector and a consistency between the aggregate expenditure and the productive capacity of the economy. As mentioned, they included a strict banking supervision, a counter-cyclical fiscal policy and an exchange rate policy that, at least in 1990-95, resisted rather well to appreciating pressures. From an institutional point of view, Chile also has maintained a status of high integrity and probity according to international standards.

All these policies contributed to make effective the use of the URR. An increase in the fiscal indebtedness, an exuberant financial sector operating with high interest rates, an exchange rate regime favoring additional expectations of appreciation, etc. would have mitigated the effect of capital controls. Naturally, the existence of

(see section II and table 2). A second hypothesis is that the URR is correlated with a missing variable.

higher levels of corruption in economic institutions also would have menaced the efficiency, the credibility and the effectiveness of regulations.

- **Dynamic cyclical consistency**

Management of capital controls should take into account a cyclical-consistency in order to be successful. In the Chilean case, part of the BOP problems experienced after the Asian crisis were the result of liberalization of outflows carried out during the boom to soften appreciating pressures. This means that authorities must consider not only the effect of changes in capital controls during the current part of the cycle but also their consequences in the other side, especially if they are expected to be permanent. In this sense, the flexible (and reversible) character of the URR is a very positive feature.

- **External assets policies**

The Chilean case reveals that the change in private foreign assets can also be a source of macroeconomic instability. Therefore the implementation of *assets policies* could also be advisable in some contexts in order to equilibrate the objectives of a sound risk diversification and the macroeconomic costs associated to the pro cyclical behavior of capital flows (Ffrench-Davis and Tapia, 2001; Ffrench-Davis and Villar, 2003). The development of specific asset policies is beyond the scope of this paper; however, it is crucial to take them into account to avoid potential risks.[23]

Indeed, although domestic liquid assets (being a part of the limited wealth of a small economy) are in theory much less sizable than the potential liquid liabilities (whose supply is very elastic for a small economy during booms in international capital markets), there are some conjunctures, where their transformation in external assets can, at least, complicate the macroeconomic management. The Chilean case allows us to describe three of them:

Firstly, during the process of liberalization of capital outflows for residents. In many emerging countries the process of liberalization of capital outflows has been gradual and developed during the boom phase, where the economy is growing and the real exchange rate is appreciating. In general, this implies that controls are not binding and, therefore, the real effects of the changes will be met in the opposite part of the cycle.

[23] Asset policies, if necessary, must be a complement of the *liability policies* (to use the Ocampo's expression; see Ocampo, 2003) like the URR.

Secondly, after reforming saving systems like the pension funds. The volume of these funds is high enough to cause sizable macroeconomic effects. In Chile, pension funds were a key element to strengthen the development of the domestic financial market in the early nineties. However, after the Asian crisis they ran against the national currency causing further expectations of depreciation (Ffrench-Davis and Tapia, 2001).

Lastly, a context featured by big mergers and acquisitions from abroad. This is a matter of accounting. If FDI is not Greenfield but the acquisition of existing assets owned by residents, then the involved transfers become "hot money", very sensitive to short-term profitability conditions. The Chilean experience shows that inflows resulting from large M&A after the Asian crisis were soon invested abroad in international financial centers, given the depressed domestic environment and the expectations of depreciation.

- **Imposing and managing capital controls**

The Chilean-style of capital controls was a flexible and pragmatic way of dealing with some of the problems arising from the integration with international financial markets. Policies were not extracted from a receipt book but created, implemented and calibrated according to the evolving circumstances. This is, perhaps, what the Managing Director of the IMF, Horst Koehler, has called the "judicious use" of controls on short-term flows by Chile.

Clearly, the Chilean URR was not the simplest possible mechanism. It was based on a series of rules and exceptions that asked for an active role from the Central Bank in order to manage the instrument. Given the changing character of international transactions, the evolution of financial instruments and the institutional constraints, this active monitoring seems to be a necessary condition to succeed in the management of controls. However, discretion and changes in rules have their risks (corruption, non-wished uncertainty) and they must not be forgotten. In this sense, there is a typical trade off between simplicity and accuracy that has to be borne in mind.

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ANNEX 1

In order to obtain a variable that reflects the predicted future international interest rate, we estimate a model for the LIBOR rate in US dollars at 180 days (r^*). We used quarterly data for the period: 1987.4-2002.3. The estimated equation was:

$$r^*_{t+2} = \underset{(4.28)}{24.29} + \underset{(5.04)}{0.49}\cdot r^*_t - \underset{(-3.88)}{1.63}\cdot p^{DM}_t + \underset{(2.65)}{0.64}\cdot d^{\,y}(r^*_t) + \underset{2.54}{1.26}\cdot\left(\frac{dR}{y}\right)^{USA}_{t-1} + \underset{(6.26)}{0.62}\,\dot{y}^{USA}_{trend,t} - \underset{(-4.10)}{0.21}\,risk^{USA}_{t-1}$$

$$\text{OBS} = 58\,,\ Adj\ R^2 = 0.8916$$

p^{DM}_t = DM/Dollar rate in t.

$d^{\,y}(r^*_t)$ = Slope of yield curve for international interest rates (LIBOR 1-year minus LIBOR 1-month).

$\left(\frac{dR}{y}\right)^{USA}_{t-1}$ = change in international reserves of the USA as a share of current GDP.

$\dot{y}^{USA}_{trend,t}$ = trend growth rate, calculated as the average of the growth rates in t and t-1.

$risk^{USA}_{t-1}$ =country risk of the USA according to the *Euromoney* Index.

Table 1
Chilean macroeconomic indicators, 1974-2002
(annual averages)

	GDP growth (%)	Productive capacity growth (%)	Total unemployment (% of labor force)	Export growth (%)	Investment rate, 1996 prices (% of GDP)	Inflation rate (%)	Fiscal balance (% of GDP)	Structural Fiscal balance (% of GDP)
1974-81	3.0	2.1	16.9	13.6	14.7	138.9	1.6	n.a.
1982-85	-2.1	2.0	26.0	4.7	13.5	23.3	-3.1	n.a.
1986-89	7.5	3.2	12.4	11.1	17.5	18.0	0.8	-1.2[a]
1990-97	7.6	7.3	7.1	10.5	23.4	12.9	1.7	0.9
1998-2002	2.3	4.5	9.5	6.3	23.6	3.5	-0.4	0.3

Sources: GDP growth, export growth and investment rates: official data by the Central Bank of Chile and Marcel and Meller (1986). Productive capacity growth: Ffrench-Davis (2002, ch.I), Total unemplouyment (which includes emergency programs): INE and Central Bank of Chile. Inflation rate (dec-dec): Cortázar and Marshall () and INE; Fiscal balance: Larraín (1991) and DIPRES. Structural fiscal balance: DIPRES.
[a] 1987-89

Table 2

Case	Agents	FOC	Effect	Determining factors
A1	Residents	$\Gamma \geq 0$	Inflows	Size of the economy, regulations on inflows (URR)
A2	Residents	$\Gamma < 0$	Outflows	Size of liquid assets, regulations on outflows (pension funds) and inflows (?)
B1	Non-Residents	$\Gamma \geq 0$	Inflows	Size of the economy, regulations on inflows (URR) and outflows (?)
B2	Non-Residents	$\Gamma < 0$	Outflows	Size of liquid foreign liabilities, regulations on outflows (minimum stay requirements)

Table 3
Estimation of the International Interest Rate Gap

	Dependent variable: $r_t - r_t^*$					
	(1)	(2)	(3)	(4)	(5)	(6)
$r_{t-1} - r_{t-1}^*$	0.784***	0.682***	0.835***	0.784***	0.832***	0.776***
	(7.20)	(6.38)	(9.06)	(9.14)	(9.91)	(8.96)
d_{t+1}^e	0.318**	0.432***	0.287**	0.326***	0.203*	0.242**
	(2.28)	(3.37)	(2.56)	(3.21)	(1.84)	(2.05)
Risk_spread $_{t-3}$	2.108**	2.789**	2.278**	2.372***	3.624***	3.069***
	(1.96)	(2.66)	(2.50)	(2.81)	(4.51)	(4.32)
$\left(r_{t+1}^*\right)^e - r_{t-1}^*$	-0.340***	-0.246**	-0.401***	-0.295***	-0.335***	-0.252***
	(-3.50)	(-2.48)	(-4.31)	(-3.35)	(-3.98)	(-3.22)
URR_t	0.251***		0.421***		0.402***	
	(4.03)		(3.53)		(3.33)	
URR_t*pot_t		0.432***		0.445***		0.423***
		(3.37)		(3.57)		(3.19)
D*mat $_{t-1}$			-0.012	-0.008	-0.019***	-0.013**
			(-1.63)	(-1.26)	(-2.90)	(-2.51)
D*IED_share$_{t-1}$			-0.126	0.176	-0.046	0.244*
			(-0.85)	(1.23)	(-0.33)	(1.81)
$p_t^e - \overline{p}_{t+1}$					0.132**	0.056
					(2.08)	(0.97)
Output Gap$_{t-1}$					0.088	0.042
					(1.57)	(0.67)
$\frac{bca_{t-1}}{y_{t-1}}$					-0.048	-0.074**
					(-1.55)	(-2.53)
Observations	45	45	45	45	45	45
Adjusted R^2	0.876	0.875	0.873	0.893	0.899	0.912
DW-st	1.87	2.01	1.94	2.08	1.86	1.83
Prob(F-st)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
ADF-st	-6.18	-6.60	-6.37	-6.85	-6.11	-6.05

Estimates by Two-Stage Least Squares. Constants are not reported. T statistics are in parenthesis. */**/*** means significant at the 10/5/1 percent level, respectively. Sample: quarterly data, 1991.3-2002.3.

Table 4
Estimation of the average maturity of total financial credits (artículo 14)

	Dependent variable: m_t^{TO}				
	(1)	(2)	(3)	(4)	(5)
m_{t-1}^{TO}	0.163 (1.087)	-0.061 (-0.37)	-0.070 (-0.44)	-0.055 (-0.33)	-0.061 (-0.38)
RER_{t-1}	-1.477*** (-3.76)	-1.091*** (-2.75)	-1.047*** (-2.90)	-1.133*** (-2.88)	-1.105*** (-3.13)
(d_yield_st(-1))	14.340** (2.12)	10.360 (1.59)	9.530 (1.66)	11.25* (1.75)	10.731* (1.94)
(f_yield_st)	16.143* (1.92)	16.087** (2.05)	15.292** (2.12)	14.41* (1.90)	13.982* (1.99)
(f_yield_lt(-1))	-11.805* (-1.93)	-12.373** (-2.16)	-11.759** (-2.25)	-12.22** (-2.15)	-11.854** (-2.28)
$r^e_{t+2}(-1)$	-6.977** (-2.05)	-7.621** (-2.39)	-7.442** (-2.42)	-7.350*** (-2.33)	-7.249** (-2.37)
(f_yield_spread)	-2.552 (-1.11)	-1.865 (-0.86)	-1.785 (-0.84)		
Trend GDP growth	2.694** (2.18)	0.412 (0.28)		0.245 (0.16)	
URR_{t-1}		4.418** (2.54)	4.719*** (3.48)	4.606** (2.68)	4.783*** (3.55)
Observations	46	46	46	46	46
Adjusted R^2	0.736	0.770	0.775	0.771	0.777
DW-st	2.33	2.24	2.24	2.26	2.27
Prob(F-st)	0.00000	0.00000	0.00000	0.00000	0.00000
ADF-st	-7.88	-7.54	-7.54	-7.74	-7.73

Estimates by Ordinary Least Squares. Constants are not reported. T statistics are in parenthesis. */**/*** means significant at the 10/5/1 percent level, respectively. Sample: quarterly data, 1988.2-1999.3.

Table 5
Estimation of the average maturity of short-term financial credits (artículo 14)

	Dependent variable: m_t^{ST}			
	(1)	(2)	(3)	(4)
m_{t-1}^{ST}	0.686***	0.741***	0.410***	0.373***
	(7.88)	(10.62)	(3.95)	(3.64)
RER_{t-1}	-0.026		-0.024	
	(-0.98)		(-1.03)	
d_{t-1}^{e}		-0.030		0.135*
		(-0.39)		(1.78)
(d_yield_st(-1))	0.865*	0.672	1.443***	1.290***
	(1.77)	(1.51)	(3.19)	(3.20)
(f_yield_st)	1.908***	1.912***	1.468***	1.444***
	(3.26)	(3.23)	(2.80)	(2.81)
(f_yield_lt)	-0.903**	-0.980**	-0.773**	-0.696*
	(-2.01)	(-2.16)	(-1.96)	(-1.79)
r^{e}_{t+2}	-0.731**	-0.778***	-0.662***	-0.668***
	(-2.57)	(-2.73)	(-2.65)	(-2.76)
(f_yield_spread)	-0.286*	-0.272*	-0.221	-0.233*
	(-1.77)	(-1.65)	(-1.55)	(-1.67)
Trend GDP growth	0.358***	0.318***	0.190*	0.143
		(3.28)	(1.93)	(1.56)
URR_{t-1}			0.557***	0.703***
			(3.84)	(4.33)
Observations	46	46	46	46
Adjusted R^2	0.901	0.899	0.921	0.924
ADF-st	-6.71	-6.74	-5.81	-5.70

Estimates by censored data regressions (bounded by 0 and 12 months). Constants are not reported.
T-statistics are in parenthesis. */**/*** means significant at the 10/5/1 percent level, respectively.
Sample: quarterly data, 1988.2-1999.3.

Table 6
Estimation of the short term external debt as a share of the total external debt

	Dependent variable: $D(st\_share)$					
	(1)	(2)	(3)	(4)	(5)	(6)
Amort/Debt(-4)	0.432***	0.413***	0.439***	0.193**	0.236***	0.158***
	(5.13)	(5.31)	(6.11)	(2.46)	(4.74)	(3.12)
D(d_yield_st(-1),0,4)	-0.015*	-0.006	-0.004	-0.004	-0.009*	-0.009*
	(-1.76)	(-0.72)	(-0.54)	(-0.66)	(-1.99)	(-2.01)
$D(r^{e}_{t+2}(-1),0,4)$	0.025***	0.021***	0.017***	0.021***	0.013***	0.015***
	(5.17)	(4.39)	(3.91)	(5.57)	(5.04)	(5.99)
D(f_yield_st(-1),0,4)	-0.051***	-0.044***	-0.038***	-0.038***	-0.028***	-0.029***
	(-5.55)	(-4.93)	(-4.59)	(-5.34)	(-5.49)	(-6.04)
D(f_yield_mt(-1),0,4)	0.026***	0.021***	0.019***	0.017***	0.014***	0.014***
	(4.40)	(3.72)	(3.63)	(3.78)	(4.64)	(4.83)
Trend GDP growth (-1)		0.518**	0.984***	0.813***	0.268	0.289**
		(2.70)	(4.07)	(4.89)	(1.58)	(2.23)
D(URR(-1))			-0.006***		-0.001	
			(-2.80)		(-1.26)	
URR				-0.008***		-0.003**
				(-4.55)		(-2.45)
$D(st\_share(-1))$					0.594***	0.534***
					(7.93)	(7.05)
Observations	42	42	42	42	42	42
Adjusted R^2	0.547	0.615	0.678	0.753	0.886	0.898
DW-st	0.88	0.85	1.27	1.42	1.96	1.99
Prob(F-st)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000

Estimates by Ordinary Least Squares. Constants are not reported. T statistics are in parenthesis. */**/*** means significant at the 10/5/1 percent level, respectively. Sample: quarterly data, 1989.2-1999.3.

Table 7
Estimation of the Net total capital flows as a share of GDP

	Dependent variable: Net total Flows to GDP					
	(1)	(2)	(3)	(4)	(5)	(6)
$r_{t-1} - r^*_{t-1} - d^e_{t-1}$	0.012***	0.019***	0.015***	0.013***	0.014***	0.013***
	(2.62)	(3.66)	(2.94)	(2.71)	(2.82)	(2.93)
URR_{t-1}	-0.005	-0.006*	-0.007**	-0.007**	-0.011**	-0.008**
	(-1.37)	(-1.75)	(-2.05)	(-2.11)	(-2.46)	(-2.01)
$\frac{bca_t}{Y_t}$	-1.009***	-1.033***	-1.128***	-1.184***	-0.894***	-0.651***
	(-2.98)	(-3.40)	(-3.91)	(-4.34)	(-3.67)	(-2.91)
$F\_yield\_lp_{t-1}$		-0.070**	-0.061**	-0.055**	-0.049*	-0.050**
		(-2.53)	(-2.23)	(-2.16)	(-1.96)	(-2.14)
$\frac{bca^{USA}_t}{Y^{USA}_t}$			0.864*	0.795*	1.282**	0.788
			(1.86)	(1.83)	(2.41)	(1.51)
D(risk_spread,0,3)				-0.076**	-0.080**	-0.066**
				(-2.24)	(-2.56)	(-2.22)
$\frac{I_t}{Y_t}$					0.513*	0.861***
					(1.68)	(2.89)
D(LIMIT_AFP)						-0.308**
						(-2.55)
Observations	55	55	55	55	55	55
Adjusted R^2	0.217	0.297	0.313	0.397	0.430	0.500
DW-st	1.49	1.84	1.98	2.14	1.97	1.99
Prob(F-st)	0.00093	0.00035	0.00019	0.00005	0.00003	0.00000
ADF-st	-5.63	-6.80	-7.24	-5.16	-7.28	-5.20

Estimates by Two-Stage Least Squares. Constants are not reported. T statistics are in parenthesis. */**/*** means significant at the 10/5/1 percent level, respectively. Sample: quarterly data, 1988.1-2002.3.

Table 8
Estimation of the short-term capital flows as a share of GDP

	Dependent variable: Net ST Flows to GDP					
	(1)	(2)	(3)	(4)	(5)	(6)
$r_t - r^*_t - d^e_t$	0.019***	0.019***	0.024***	0.018***	0.017***	0.019***
	(3.39)	(3.31)	(4.25)	(3.26)	(3.09)	(4.14)
$GDP\ growth_t$	0.007***	0.009***	0.010***	0.009***	0.009***	0.008***
	(4.78)	(5.34)	(5.73)	(5.23)	(5.34)	(5.56)
URR_t	-0.019***	-0.022***	-0.026***	-0.021***	-0.021***	-0.023***
	(-4.85)	(-4.02)	(-4.81)	(-4.09)	(-4.33)	(-5.41)
$\frac{bca_t}{Y_t}$	-0.786***					
	(-3.12)					
$\frac{I_t}{Y_t}$		0.484**	0.829***	0.490**	0.809***	1.055***
		(2.02)	(2.95)	(2.09)	(3.16)	(4.08)
D(risk_spread,0,3)			-0.034**			-0.026**
			(-2.24)			(-2.04)
F_yield_st(-1)				0.020		0.020*
				(1.49)		(1.68)
ST_debt_{t-1}/Y_{t-1}					0.147**	0.159***
					(2.49)	(2.93)
Observations	59	59	59	59	59	59
Adjusted R^2	0.373	0.381	0.423	0.414	0.464	0.552
DW-st	1.97	1.66	1.77	1.78	1.80	2.24
Prob(F-st)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
ADF-st	-7.62	-6.69	-6.69	-6.88	-7.97	-7.71

Estimates by Two-Stage Least Squares. Constants are not reported. T statistics are in parenthesis. */**/*** means significant at the 10/5/1 percent level, respectively. Sample: quarterly data, 1988.1-2002.3.

Table 9
Estimation of the gross medium and long term capital inflows as a share of GDP

	Dependent variable: Gross MLT capital inflows to GDP		
	(1)	(2)	(3)
$r_t - r_t^* - d_t^e$	-0.012 (-1.65)	-0.013 (-1.67)	-0.014* (-1.84)
$\frac{I_t}{Y_t}$	0.393** (2.01)	0.432* (1.98)	0.336 (1.48)
$M\&A_t/Y_t$	0.531*** (2.73)	0.533** (2.65)	0.517*** (2.88)
Risk_spread	-0.110* (-1.80)	-0.122* (-1.68)	-0.087 (-1.19)
$\frac{bca_t^{USA}}{Y_t^{USA}}$	-2.410 (-1.07)	-2.157 (-0.98)	-3.137 (-1.20)
$\frac{bka_t^{USA}}{Y_t^{USA}}$	-4.165* (-1.76)	-4.018* (-1.72)	-4.874* (-1.82)
FDI_LA3/y_LA3	1.451** (2.03)	1.334 (1.44)	1.721* (1.87)
URR_t		-0.001 (-0.35)	
U_t			0.022 (0.76)
Observations	55	55	55
Adjusted R^2	0.731	0.722	0.728
DW-st	1.63	1.63	1.67
Prob(F-st)	0.00000	0.00000	0.00000
ADF-st	-6.03	-6.03	-6.17

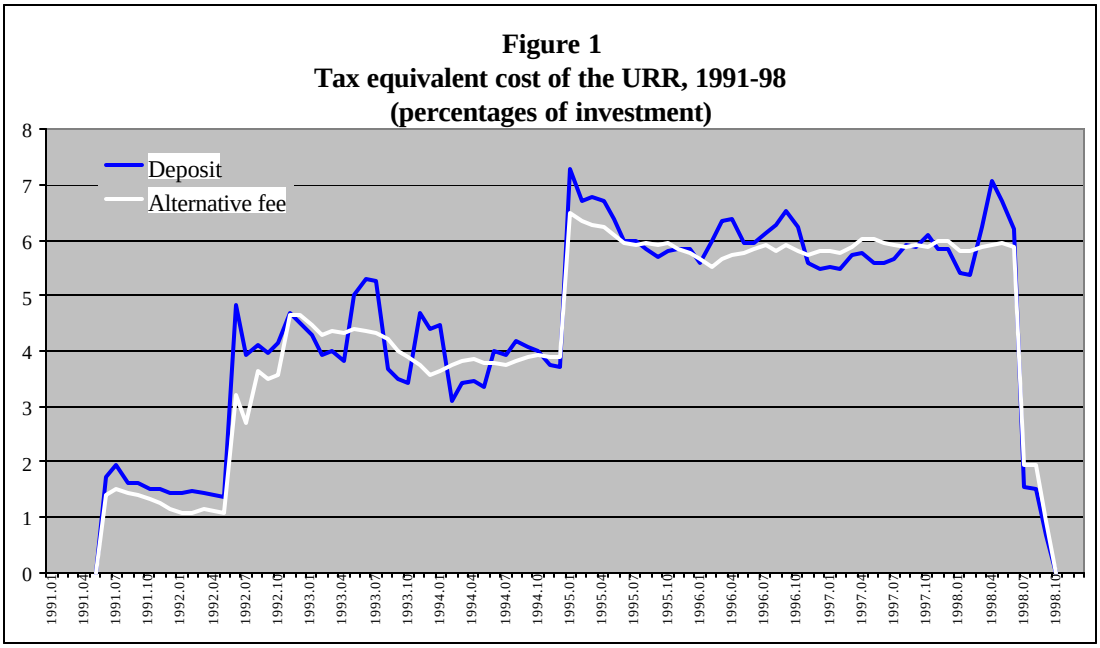
Estimates by Two-Stage Least Squares. Constants are not reported. T statistics are in parenthesis. */**/*** means significant at the 10/5/1 percent level, respectively. Sample: quarterly data, 1988.1-2001.4.

Table 10
Estimation of Gross medium and long term capital outflows flows as a share of GDP

	Dependent variable: Gross MLT capital outflows to GDP				
	(1)	(2)	(3)	(4)	(5)
$r_t - r_t^* - d_t^e$	-0.016***	-0.009*	-0.010**	-0.016	-0.012*
	(-2.72)	(-1.79)	(-2.25)	(-1.58)	(-1.85)
Risk_spread	-0.074**	-0.051**	-0.056**	-0.110	-0.088**
	(-2.45)	(2.06)	(-2.17)	(-1.32)	(-2.31)
F_yield_mt$_{t-1}$	0.012**	0.010**	0.011**	0.014*	0.012**
	(2.20)	(2.24)	(2.51)	(1.89)	(2.23)
D(LIMIT_AFP)	0.265*	0.411***	0.366***	0.406***	0.487***
	(2.00)	(4.14)	(3.38)	(2.99)	(3.98)
M&A$_t$/Y$_t$	0.515***	0.496***	0.506***	0.459***	0.485***
	(6.93)	(7.11)	(7.32)	(5.04)	(6.30)
URR$_t$		-0.004**		-0.007*	-0.007**
		(-2.35)		(-1.91)	(-2.45)
U			-0.024**		
			(-2.19)		
(remit)				-0.012	
				(-0.85)	
(other)*M7/GDP					0.031
					(1.27)
Observations	59	59	59	59	59
Adjusted R^2	0.653	0.727	0.714	0.647	0.695
DW-st	1.58	1.71	1.68	1.68	1.76
Prob(F-st)	0.00000	0.00000	0.00000	0.00000	0.00000
ADF-st	6.01	-6.50	-6.38	-6.36	-6.69

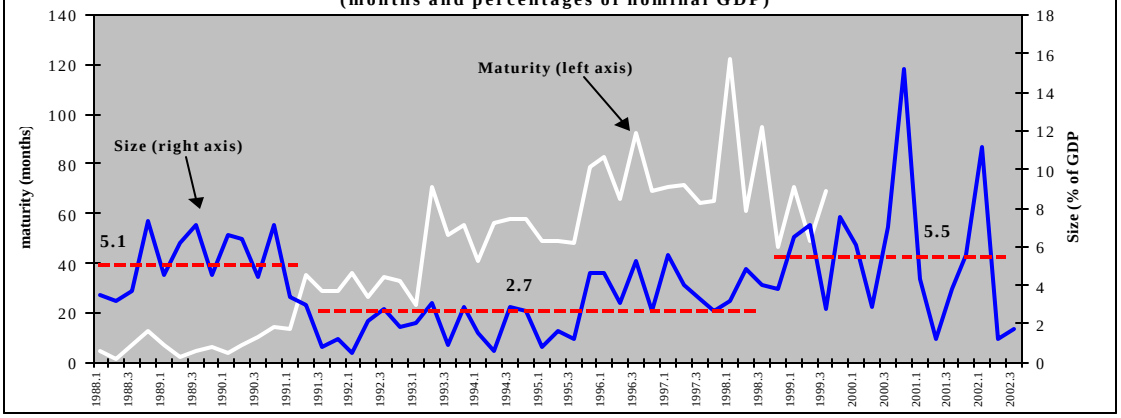
Estimates by Two-Stage Least Squares. Constants are not reported. T statistics are in parenthesis. */**/*** means significant at the 10/5/1 percent level, respectively. Sample: quarterly data, 1988.1-2002.3.

Figure 1
Tax equivalent cost of the URR, 1991-98
(percentages of investment)



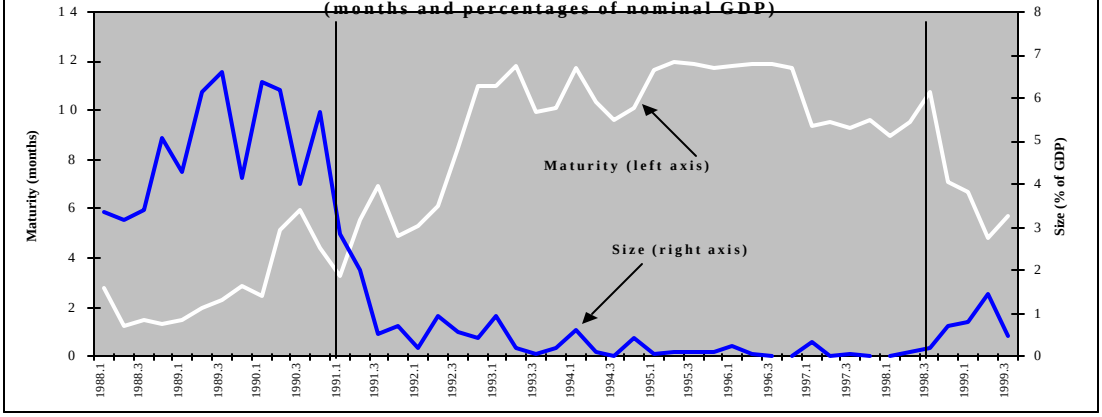
Source: Authors' calculations. The tax equivalent cost of the URR was calculated acording to equation (5) where it was assumed a maturity of 6 months. The talternative fee cost is based on several issues of *Memoria Anual* from the Central Bank of Chile.

Figure 2
Chile: Maturity and size of total financial credits (artículo 14), 1988-2002
(months and percentages of nominal GDP)



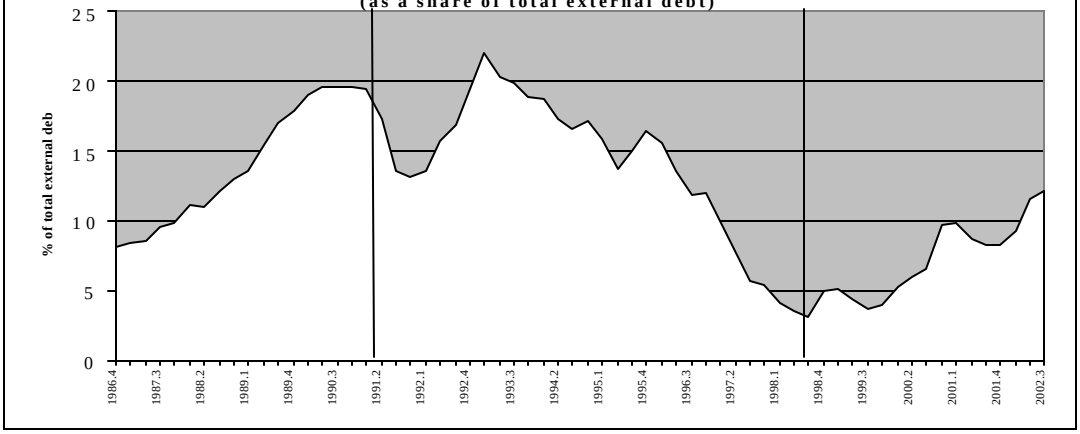
Source: Authors' calculations based on official Central Bank data. Since 1999.IV the variable size corresponds only to Long term credits; therefore, it is underestimated and can be interpreted as a lower bound.

Figure 3
Chile: Maturity and size of short-term financial credits (artículo 14), 1988-1999
(months and percentages of nominal GDP)



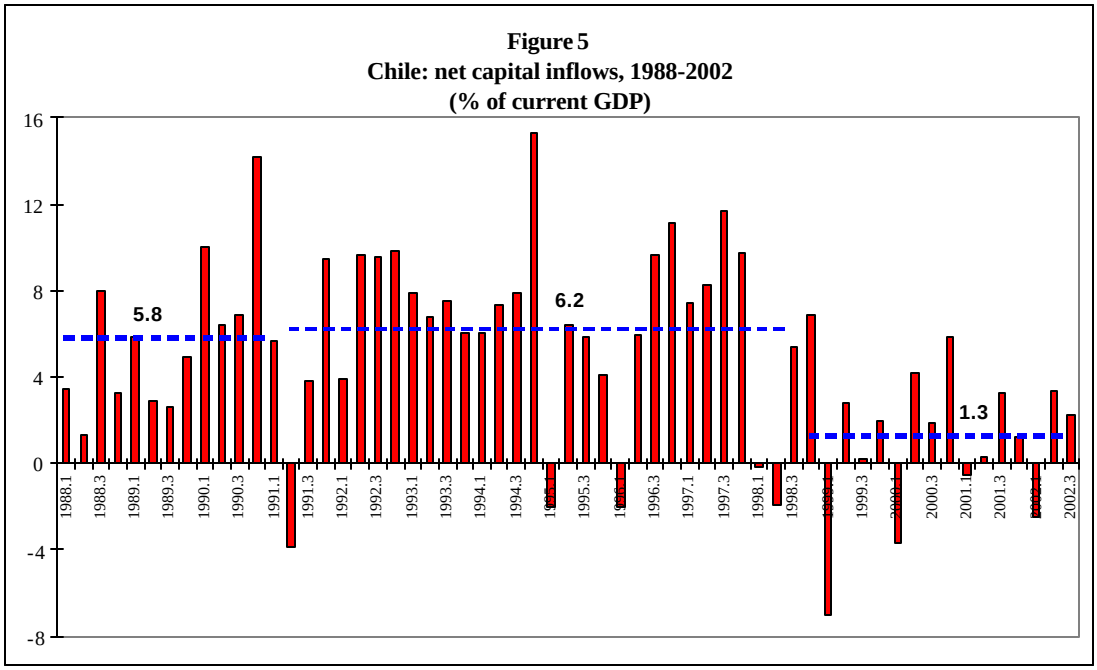
Source: Authors' calculations based on official Central Bank data.
The vertical lines indicate the period when the URR was implemented (see text).

Figure 4
Chile: Short-term external debt, 1986-2002
(as a share of total external debt)



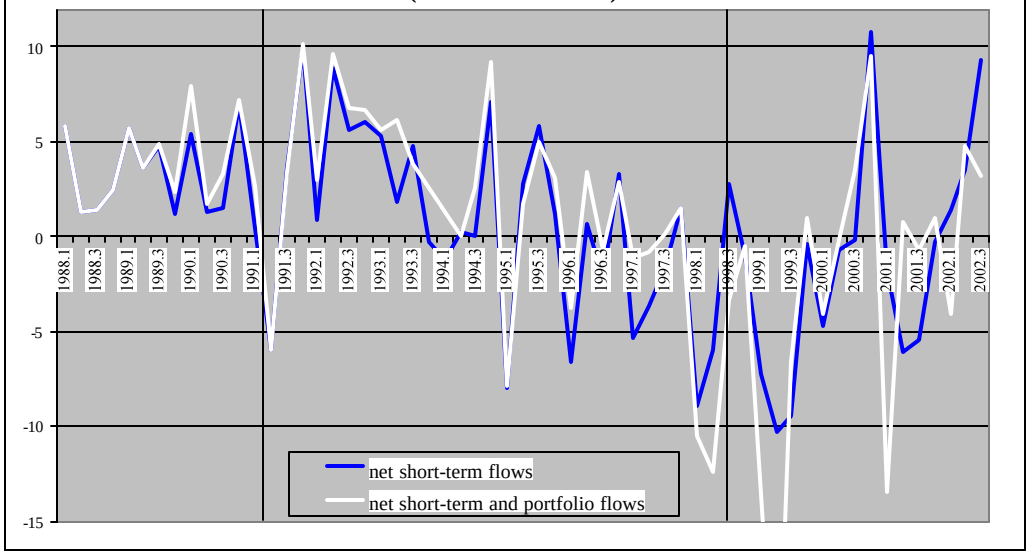
Source: Based on official Central Bank figures in 1986-1999.3. The period 1999.4-2002.3 was estimated by the authors using Balance of payments data.
The vertical lines indicate the period when the URR was implemented (see text).

Figure 5
Chile: net capital inflows, 1988-2002
(% of current GDP)



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

Figure 6
Chile: net short-term and portfolio flows, 1988-2002
(% of current GDP)



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