
financiamiento del desarrollo

A summary of the experiences of Chile and Colombia with unremunerated reserve requirements on capital flows during the 1990's

Daniel Titelman

Cecilia Vera



NACIONES UNIDAS



Santiago, Chile, December 2009

This document has been prepared by Daniel Titelman and Cecilia Vera, Chief and Economic Affairs Officer, respectively, of the Development Studies Section, ECLAC, Santiago, Chile. The authors are grateful to Esteban Pérez Caldentey and Ramón Pineda for their valuable comments and suggestions.

The views expressed in this document, which has been reproduced without formal editing, are those of the authors and do not necessarily reflect the views of the Organization.

United Nations Publication
ISSN printed version 1564-4197 ISSN online version 1680-8819
ISBN: 978-92-1-323365-8
LC/L.3145-P
ORIGINAL: ENGLISH
Sales No.: E.09.II.G.118
Copyright © United Nations, December 2009. All rights reserved
Printed in United Nations, Santiago, Chile

Applications for the right to reproduce this work are welcomed and should be sent to the Secretary of the Publications Board, United Nations Headquarters, New York, N.Y. 10017, U.S.A. Member States and their governmental institutions may reproduce this work without prior authorization, but are requested to mention the source and inform the United Nations of such reproduction.

Contents

Introducción	5
I. Unremunerated Reserve Requirements (URRs) on capital inflows: The case of Chile and Colombia	9
1. General description of the mechanism	9
2. Objectives and rationale behind the use of Unremunerated Reserve Requirements (URRs)	10
II. Context and operational features of Unremunerated Reserve Requirements (URRs) in Chile and Colombia in the 1990's	15
1. Chile	15
2. Colombia	18
III. Effectiveness of the Unremunerated Reserve Requirements (URRs) in Chile and Colombia	23
1. Effectiveness as a liability policy tool: to improve the private sector's foreign liability profile by discouraging the accumulation of short-term liabilities	23
2. Effectiveness as a macroeconomic policy tool: to enhance the ability of monetary and exchange rate policies to act in a counter-cyclical way in periods of capital inflows booms	27
IV. Summary and conclusions	33
Bibliography	35
Annexes	37
Serie Financiamiento del desarrollo: números publicados	41

Figures

FIGURE 1	CAPITAL FLOWS AND ECONOMIC ACTIVITY IN THE LATIN AMERICAN AND THE CARIBBEAN REGION NET PRIVATE CAPITAL FLOWS IN PERCENTAGES OF GDP AND GDP GROWTH RATE, LAC (32).....	6
FIGURE 2	CAPITAL FLOWS AND REAL EXCHANGE RATE IN THE LATIN AMERICAN AND THE CARIBBEAN REGION. NET PRIVATE + OFFICIAL CAPITAL FLOWS IN % OF GDP AND REAL EFFECTIVE EXCHANGE RATE, LAC (32)	12
FIGURE 3	REAL EXCHANGE RATE IN CHILE AND COLOMBIA REER INDEX, JAN-1990=100	28

Tables

TABLE 1	CHILE: OPERATIONAL FEATURES OF THE URR MECHANISM	18
TABLE 2	COLOMBIA: OPERATIONAL FEATURES OF THE URR MECHANISM.....	21
TABLE 3	FOREIGN DEBT STOCKS IN CHILE AND COLOMBIA	24
TABLE 4	SUMMARY OF RESULTS OBTAINED BY EMPIRICAL STUDIES: URRS AS A LIABILITY POLICY TOOL	26
TABLE 5	CAPITAL FLOWS AND THE CURRENT ACCOUNT IN CHILE AND COLOMBIA	27
TABLE 6	SUMMARY OF RESULTS OBTAINED BY EMPIRICAL STUDIES: URRS AS A MACROECONOMIC POLICY TOOL	30
TABLE A7	GDP GROWTH AND INFLATION RATE IN CHILE AND COLOMBIA.....	39

Introduction

Financial integration among countries entails a series of well-known benefits. On the one hand, net inflows of external savings can complement national savings within an economy and therefore raise productive investment and income. On the other hand, capital mobility provides opportunities for portfolio diversification and risk sharing between countries and this may enable investors-both firms and households of particular countries- to achieve higher risk-adjusted rates of return. This in turn could encourage increases in savings and investment and therefore deliver faster rates of growth (Eichengreen and Mussa, 1998).¹

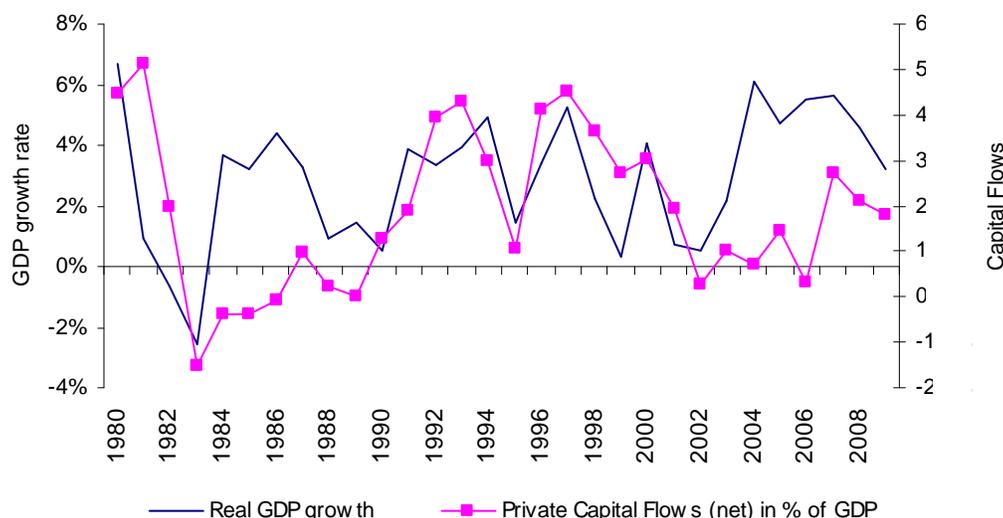
Despite these benefits however, there is also a growing consensus that the opening of the capital account has contributed to economic volatility, especially in emerging economies. Financial integration has frequently led these economies to “import” external financial instability, given the highly volatile nature international financial markets and the strong association between the cycles of capital flows and those of domestic economic activity (Ffrench-Davis, 2007). Hence, for developing countries, capital account volatility has become one of the major sources of real macroeconomic instability (Ocampo, 2008).

In what refers to Latin America, private capital flows have indeed been a lasting source of economic instability due to their highly pro-cyclical nature (Figure 1).² Moreover, according to Ffrench-Davis (2007) the transmission of financial volatility into the region has been a key factor behind its poor economic and social performance since the early 1990’s.

¹ Another potential benefit of financial integration sometimes mentioned in the literature, is that it may contribute to the efficiency and scope of the domestic financial sectors through their exposure to international competition. This in turn may too have positive effects on growth. Klein and Olivei (2005) are among the studies which analyze the existence of these links.

² See for example Titelman, Pérez Caldentey and Minzer (2008).

FIGURE 1
CAPITAL FLOWS AND ECONOMIC ACTIVITY IN THE LATIN AMERICAN AND THE CARIBBEAN REGION
NET PRIVATE CAPITAL FLOWS IN PERCENTAGES OF GDP AND GDP GROWTH RATE, LAC (32)



Source: Own elaboration using WEO database, IMF.

The most damaging effects of international capital movements occur when, after a period of sustained and large capital inflows into an economy, there is a sudden reversal of such flows implying an interruption of external financing (sudden stop).³ While sudden outflows can affect all forms of foreign capital, it is generally capital flows of a short-term nature that are the most unstable and can therefore be the most destabilizing.

Experience has shown that sudden stops are not a rare phenomenon and that many times, after episodes of large capital inflows into an economy, come episodes of large and abrupt reversals and/or currency crises (IMF, 2007). When this happens, the high costs entailed in terms of economic and social variables in the domestic economy may easily outweigh the benefits provided by the previous capital surge (Ocampo and Tovar, 2003).

In this scenario, counter-cyclical macroeconomic policies at the domestic level would be desirable in order to reduce the association between the domestic business cycles and the volatile cycles of capital flows. However, as will be discussed in this paper, in economies that have opened their capital account, counter-cyclical monetary policy faces severe constraints to smooth out the dynamics of business cycles under all types of exchange rate regimes (Ocampo, 2003). Therefore, in the face of pro-cyclical capital flows, countries with open capital accounts are left with a very limited room of maneuver provided by the possibility to adopt counter-cyclical fiscal policies. These policies in turn, also face constraints as developing countries usually find it difficult to finance fiscal deficits during cyclical downturns, and may also find it difficult to argue for restraining public spending growth during booms.⁴ Moreover, fiscal policies are very difficult to fine-tune during capital inflows booms since both tax reforms and active expenditure policies take time to implement (Ocampo, 2008; Ocampo and Tovar, 1999).

The strong pro-cyclical swings of capital flows therefore raise a key challenge for macroeconomic policy in developing countries. The latter should provide mechanisms that help deliver the benefits

³ In this sense it has been mentioned for example by Ocampo (2008) that apart from short-term volatility of capital flows, medium-term cycles can be important.

⁴ See Ocampo (2008) for a more detailed description of the constraints to counter-cyclical fiscal policies posed both by economic and political economy issues.

provided by financial integration while at the same time reducing the vulnerability of domestic economies to capital flows volatility.

In this sense, the capital account regulations imposed by Chile and Colombia in the early 1990's, can be thought of as mechanisms to pursue this double objective. In a context of foreign private capital flowing abundantly into their domestic economies, these two Latin American countries imposed regulations of a type called Unremunerated Reserve Requirements (URRs) on capital inflows. The aim of such regulations was to reduce the domestic economies' vulnerability to capital flows volatility by acting both as a liability policy tool and as a macroeconomic policy tool. As a liability policy tool the URR mechanism was structured as to discourage short-term capital inflows and in this way reduce the vulnerability of the economies to those more unstable flows. As a macroeconomic policy tool the mechanism was aimed at enhancing the ability of domestic monetary and exchange rate policies to act in a counter-cyclical way and thereby reduce the association between the domestic business cycles and the cycles of capital flows.

This paper reviews the experiences of Chile and Colombia with of Unremunerated Reserve Requirements (URRs) on capital inflows during the 1990's. In the first place it makes a brief description of the URR mechanism and reviews the rationale and objectives behind its use (section 2). It then reviews the context upon which these controls were implemented in Chile and Colombia and the details on how they worked in each case (section 3). Next it reviews the available literature in order to assess whether the objectives sought were fulfilled in both countries (section 4). Finally, in section 5, it presents some brief conclusions.

I. Unremunerated Reserve Requirements (URRs) on capital inflows: The case of Chile and Colombia

1. General description of the mechanism

Although capital account controls may take a wide range of forms and may apply to the inflows or to the outflows of foreign capital, they can normally be classified under one of two broad categories; they can either be direct or indirect controls. Direct controls are associated with administrative measures such as direct prohibitions and explicit limits on the volume of transactions while indirect controls, also called market-based or price-based controls, are normally associated with taxation of financial flows— both explicit or implicit— and differential exchange rates for capital transactions (IMF, 2007).

The most well known mechanism of capital account regulation used in Chile and Colombia during the 1990's was an indirect price-based mechanism, the so called unremunerated reserve requirement on capital inflows (URR).⁵

⁵ In addition to the URR, Chile and Colombia attempted to control capital inflows by imposing other types of capital controls. In Chile for example minimum rating and volume requirements for the issuance of equity or bonds abroad by Chilean residents were imposed. Also a minimum stay requirement for FDI and portfolio flows was put in place. In the early 1990s foreign investors had to wait three years to repatriate capital and in 1992 this requirement was reduced to one year (De Gregorio, Edwards, and Valdés, 2000). In the case of Colombia, several other regulations apart from the URR were in place (see Ocampo and Tovar (1999) for a description). Among others for example, the country directly regulated the amount of foreign funds that could be invested in the local equity and debt markets. It also regulated the type of domestic securities that foreigners could buy (Stiglitz et al., 2006). Despite the importance of all these other types of capital controls, in this paper the focus lies on the URR.

The URR was a mechanism through which, for every dollar borrowed from abroad, a certain fraction had to be deposited in a non-interest bearing account at the Central Bank during a certain period of time. This mechanism can be thought of as equivalent to a tax on capital inflows whose rate for funds that enter Chile or Colombia and stay for months is given by the following expression:

$$\tau(k) = \left[r^* \left(\frac{\lambda}{1-\lambda} \right) \right] \left(\frac{\rho}{k} \right) \quad (1)$$

Where r^* is an international interest rate that captures the opportunity cost of the deposited funds, λ is the fraction of the funds that has to be deposited at the Central Bank and ρ is the holding period of the reserve requirement deposit measured in months (De Gregorio, Edwards, and Valdés (2000); Edwards 2006).⁶

As it may be seen from (1), the rate of tax $\tau(k)$ varies inversely with the length of time the foreign funds stay in the country (k). In this sense, both Chile and Colombia structured the URR to penalize short-term inflows more than longer-term flows. Nevertheless, as with any price-based mechanism, the URR was not intended to completely block the way for short-term inflows of capital, but to discourage them at the margin, by turning them more costly in relative terms to longer-term flows (Ffrench-Davis and Villar, 2006). Indeed, in the Chilean system, the average level of the tax implicit in the URR during the period in which it was in place was estimated at 5.2% for inflows of a 6-month maturity compared to 3.6% for those of a one-year maturity (Agosin and Ffrench-Davis, 1998).⁷ For Colombia, the average implicit tax for flows with a one-year maturity was estimated at 13.6% compared to an average of 6.4% for those with a three-year maturity (Ocampo, 2003).

The specific operating rules of the URR mechanism changed along time and were different between the two countries.⁸ However both systems shared some key characteristics: a) they were not quantitative controls but price-based mechanisms, b) they affected capital inflows but not capital outflows c) they were intended to have more impact on short-term than on long-term capital inflows, and d) their goal was to reduce the amount of short-term capital flowing into the country during a surge in the supply of foreign funds, not to stop funds from flowing out of the country during a crisis (Ffrench-Davis and Villar, 2006; Stiglitz et al., 2006).

2. Objectives and rationale behind the use of Unremunerated Reserve Requirements (URRs)

Broadly speaking, the capital account regulations imposed by Chile and Colombia in the early 1990's were conceived as mechanisms to act both as a liability policy tool—discouraging the accumulation of short-term liabilities—and as a macroeconomic policy tool—enhancing the ability of monetary and exchange rate policies to act in a counter—cyclical way in periods of capital inflows booms.

⁶ There are alternative ways to compute the tax-equivalent formula and the assumptions underlying each one may vary. For a detailed derivation of this particular formula see De Gregorio, Edwards, and Valdés (2000). For a less general, and more accurate formula for the case of Colombia see Ocampo and Tovar (2003).

⁷ These are annualized rates estimated by Agosin and Ffrench-Davis (1998) for the period 1991-1996. Gallego and Hernández (2003) on the other hand estimate an average implicit tax of 4.2% for inflows of a 6-month maturity.

⁸ For example, during early stages of operation of the URR, both countries set either λ and/or ρ as functions of the maturity of the flow (k) instead of choosing fixed parameters. Later on however, both countries tended towards a simpler system whereby both λ and ρ became fixed and independent of k .

2.1 URRs as a liability policy tool: to improve the private sector's foreign liability profile by discouraging the accumulation of short term liabilities

While sudden outflows can affect all forms of foreign capital, it is generally capital flows of a short-term nature that are the most unstable and can therefore be the most destabilizing (see for example Agosin and Ffrench-Davis, 1998 and Eichengreen and Mussa, 1998).⁹

In particular, it is straightforward to notice that an economy with a large share of short-term external debt—in the form of foreign deposits in the domestic banking system, loans and credits from abroad, and debt securities issued abroad or sold to non-residents— becomes very vulnerable to a sudden situation of illiquidity if, at a time of uncertainty, the market is not willing to rollover the maturing liabilities. Such rollover risks are minimized by lengthening the maturity structure of the foreign liabilities and by preventing the bunching in time of such maturities.

Portfolio equity acquisitions by foreign investors are another type of capital inflow that can turn out to be very short-term in nature. These investments generally seek short-term capital gains and are sometimes used for speculative purposes. Moreover, as they work with imperfect information, they are prone to herding behavior both for taking positions and for liquidating them and, as this can happen at a moment's notice, they turn out to be a very unstable type of flow (Agosin and Ffrench-Davis, 1998). Due to these bandwagon effects, large portfolio inflows are normally followed by large outflows, implying, for the domestic economy, sharp appreciations in both exchange rates and stock market prices followed by sharp reversals of the latter (Agosin and Ffrench-Davis, 1998).

In view of the above, a key objective of the URR was to work as a liability policy tool to improve the private sector's foreign liability profile. Since the mechanism discourages short-term external financing it helps to gradually tilt the maturity structure of foreign liabilities towards longer-term flows and hence reduces illiquidity and rollover risks.¹⁰

Moreover, if applied to portfolio equity inflows, the URR reduces the magnitude of potential speculative reversals of such flows.¹¹ If there is less of this type of capital going in to the economy during the period of capital boom, then there is less capital that can flow out (capital flight) during times of macroeconomic tension or uncertainty (Edwards, 2006).

2.2 URRs as a macroeconomic policy tool: to enhance the ability of monetary and exchange rate policies to act in a counter-cyclical way in periods of capital inflows booms

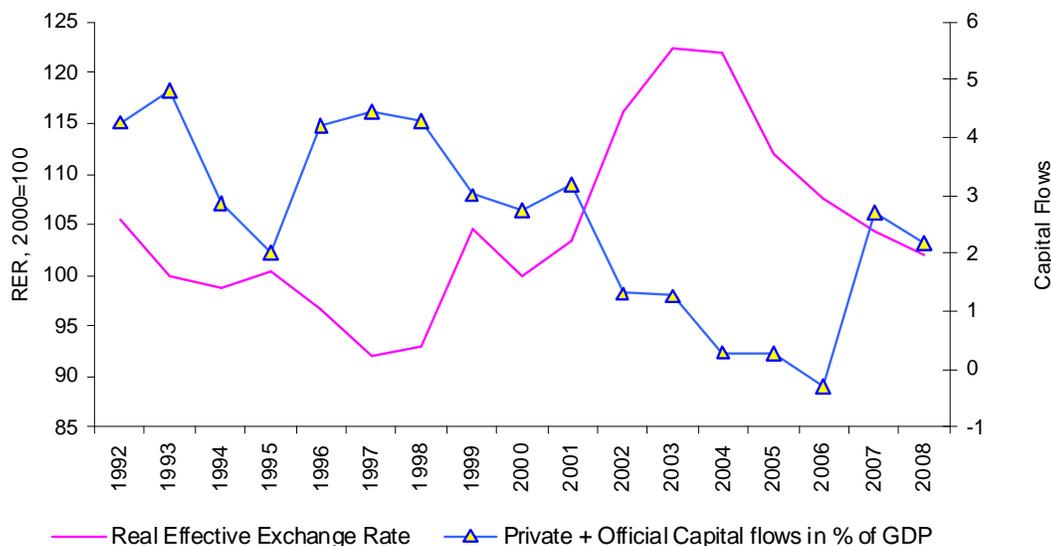
When capital inflows to an economy are very large they push domestic activity into a boom, the real exchange rate (RER) appreciates (see Figure 2) and the current account deteriorates, therefore increasing the domestic economy's vulnerability to an interruption of external financing.

⁹ An exception to this view is held by Claessens, Dooley and Warner (1995) who claim that balance-of-payments categories have little to do with the stability of flows themselves, long-term flows being often as volatile as short-term flows.

¹⁰ Naturally, policies that improve the public-sector liability profiles should be considered as important complements to this mechanism (Ocampo, 2003).

¹¹ As it will be seen in section 3.1 only Chile included some types of portfolio equity among the capital account categories affected by the URR and it did so four years after the mechanism had started to work.

FIGURE 2
CAPITAL FLOWS AND REAL EXCHANGE RATE IN THE LATIN AMERICAN AND THE CARIBBEAN REGION. NET PRIVATE + OFFICIAL CAPITAL FLOWS IN PERCENTAGES OF GDP AND REAL EFFECTIVE EXCHANGE RATE, LAC (32)



Source: Own elaboration using WEO database, IMF and ECLAC Economic Development database.

In this scenario, counter-cyclical monetary policies at the domestic level would be desirable in order to counteract these effects and smooth out the dynamics of the business cycle. However, in economies that have opened their capital account, the capacity of counter-cyclical monetary policy is severely limited.

A contractionary monetary policy of high domestic interest rates would induce a positive interest-rate differential in favor of domestic assets and hence provide endogenous incentives for more interest-rate arbitraging capital to flow into the economy. Moreover, as capital inflows themselves induce appreciation pressures, the positive interest-rate differential is reinforced by expectations of a strengthening domestic currency. In this scenario, the boom in economic activity cannot be avoided, and neither can the real exchange rate appreciation and further deterioration of the current account balance.

The authorities' ability to contain the appreciation pressures in this context is, in turn, also very limited. Interventions in the foreign exchange market fuel monetary expansion and thus lead to a reduction in domestic interest rates. This leads to a pro-cyclical intensification of the activity boom and to inflationary pressures. Again in this case, policy results in real exchange rate appreciation—this time occurring through higher domestic inflation—and in a further deterioration of the current account balance.

Countries do, in theory, have the option to sterilize the monetary (and thus inflationary) impact of interventions in the foreign exchange market but the effectiveness of this policy has also proved to be limited. As the objective of sterilization is to prevent monetary expansion, it in fact prevents the decline of domestic interest rates and hence perpetuates the problem by maintaining the incentives for continuing interest-arbitraging capital inflows. Besides, if prolonged in time, sterilization may imply non-negligible quasi-fiscal costs for the Central Bank given the difference between the interest it earns on its reserves and the one it pays on its sterilization instruments.

In view of the above, capital-account regulations of the URR type can be conceived as a macroeconomic policy tool that enables the authorities to undertake a counter-cyclical monetary policy

during a boom of capital inflows and activity without at the same time inducing a larger volume of interest-rate arbitraging capital and real exchange rate appreciation (Ocampo, 2003).

Because the reserve requirement acts as a tax, it reduces the returns to foreign investors or creditors. The smaller effective differential in favor of domestic assets should reduce the volume of interest-arbitraging capital inflows for every given level of domestic interest rate or, alternatively, should allow the authorities to maintain higher domestic interest rates at every given level of capital inflow (Stiglitz et al., 2006).

In analytical terms, the interest rate parity after the implementation of the URR becomes:

$$r_t = r_t^* + \phi_t + d_t^e + \tau_t(k) \quad (2)$$

Where r_t is the domestic interest rate, ϕ_t is the country risk premium, d_t^e is the expected depreciation of the exchange rate and, as before, $\tau(k)$ is the tax-equivalent of the URR and r_t^* is the international interest rate. In this context, $\tau(k)$ can be expressed as:

$$\tau_t(k) = r_t^{Target} - r_t^* - \phi_t - d_t^e \quad (3)$$

Where r_t^{Target} is the domestic interest rate consistent with the objectives of domestic monetary policy (Ffrench-Davis and Tapia, 2004).

It is clear from (3) that with the URR in place, monetary policy should gain space to “lean against the wind” (i.e. target a higher domestic interest rate) during periods of financial euphoria without attracting further inflows of capital. RER appreciation pressures should be contained and the objective of a competitive exchange rate and a sustainable current account balance should not be compromised (Ocampo, 2003).¹²

¹² Although it is not the focus of this paper, it should be mentioned that capital controls on outflows are also normally conceived a macroeconomic policy tool that enables the application of counter-cyclical monetary policies in the aftermath of crises. At such times they can provide “breathing space” for undertaking expansionary monetary policies while avoiding the reinforcement of outflows and of depreciation pressures (Ocampo, 2003).

II. Context and operational features of Unremunerated Reserve Requirements (URRs) in Chile and Colombia in the 1990's

1. Chile

1.1 Context in which URRs were imposed

After coming out of the debt crisis of the beginning of the 1980's, Chile's growth strategy was based on a rapid expansion of exports through a combination of trade liberalization and the maintenance of a competitive real exchange rate (De Gregorio, Edwards, and Valdés, 2000). To this end, in 1983 the fixed exchange rate regime prevailing was substituted for a crawling peg system directed to maintain the nominal, and through it, the real exchange rate within a range consistent with a sustainable current account position (Laurens and Cardoso, 1998; Budnevich and Le Fort, 1997). This policy conducted to a notable real exchange depreciation and a drastic reduction of the current account deficit from 11% of GDP in 1984 to only 1% by 1988. Economic activity in turn exhibited great dynamism, with GDP growing at average yearly rates of almost 6% in this five year period. Within this scenario the authorities' monetary policy was geared at containing inflation –the Central Bank would rise reference

rates whenever inflationary pressures appeared- and fiscal policy was geared towards bringing public accounts into balance, objective that was attained in 1987 (Laurens and Cardoso, 1998).¹³

By the end of the 1980's, Chile was one of the first Latin American countries to attract a renewed wave of foreign private capital flows.¹⁴ The main component of such flows was foreign direct investment (FDI) although short-term inflows —mainly foreign bank lending but also deposits— also figured prominently, attracted by favorable interest-rate arbitraging conditions (Agosin and Ffrench-Davis, 1998). In the first place, domestic interest rates were high in relative terms due to the disinflationary monetary policy by the Central Bank at a time when international dollar interest rates were low and declining. In the second place, the same as in other countries in the region, there had been a decline in the country risk premium and finally, regarding the exchange rate expectations, these had turned from depreciation to appreciation given the country's growth performance, favorable terms of trade and the reinforcing effect of capital inflows themselves (Agosin and Ffrench-Davis, 1998)

Although smaller in relative magnitude, portfolio inflows also started to gain ground in the early 1990's taking mainly two forms: equities acquisitions by foreign investors —mostly but not only in the way of American Depository Receipts (ADR's)— and bond issues in international markets.¹⁵

The surge in capital inflows affected the capacity to implement monetary or exchange rate policies. There was the risk that the higher interest rates needed to control aggregate demand and inflation would amplify the capital surge putting further appreciation pressures on the real exchange rate and therefore compromising the export-led growth strategy. The authorities, in view of these difficulties reacted with a series of measures between 1989 and 1991. Initially they intervened heavily in the exchange rate market to contain the appreciation pressures and, in that way, reduce part of the incentives for capital inflows seeking for interest rate arbitraging.¹⁶ The Central Bank sterilized most of the intervention in order to prevent monetary expansion and inflationary pressures but this policy resulted in large quasi-fiscal costs.

In an attempt to gain exchange-rate policy space— but also to amplify the ex-ante volatility of the exchange rate and in that way deter speculative short-term inflows seeking capital gains— the authorities widened the exchange rate band in 1989 (Laurens and Cardoso, 1998). They also attempted to directly attenuate net capital inflows through the imposition of a stamp tax on external loans¹⁷ and by means of further liberalizing and easing outflows of capital from the country. Outward FDI, bank lending abroad and institutional investors' ability to invest abroad were gradually liberalized (Nadal-De Simone and Sorsa, 1999). However, this liberalization of outflows didn't have the intended results.¹⁸

It was in this context of continued appreciating pressures on the real exchange rate, and a loss of monetary control, that the authorities introduced, in June of 1991, an unremunerated reserve requirement on selective capital inflows (De Gregorio, Edwards, and Valdés, 2000).

Although with changes (discussed below) this mechanism remained in place for many years, though September 1998.

¹³ From 1987 onwards until 1997 the fiscal accounts exhibited permanent surpluses (De Gregorio, Edwards, and Valdés, 2000). Naturally this is another factor that helped in the direction of keeping the current account deficit contained.

¹⁴ Chile's smooth transition to democracy together with the countries structural reforms were positively evaluated by the international markets. The latter were accomplished well before the rest of the region, and therefore, by the late 1980's were firmly established. This helped explain the fact that capital flowed into Chile before it flowed to other Latin American countries (Chumacero, Labán and Larraín, 1997).

¹⁵ The ADR is a mechanism by which corporations (in this case Chilean ones) issue new shares in the United States stock market. The original or ("primary") issue of ADRs is an opportunity for Chilean firms to expand their capital at a relatively low cost because it tends to be the case that the capital costs in international markets is lower than in Chile (Agosin and Ffrench-Davis, 1998).

¹⁶ This resulted in massive reserve accumulation between 1989 and 1990 (reserves were up by 80% between these years) (Laurens and Cardoso, 1998).

¹⁷ In mid 1990, a stamp tax of 1.2 % annual on operations of up to one year that was being paid was by domestic currency credits only was extended to external loans.

¹⁸ It has been sustained that liberalizing outflows may sometimes encourage additional inflows if it is the case that investors see liberalization as a positive sign which increases confidence in the economy and/or if the policy leads to lower domestic asset prices and therefore attracts foreign investors (see Laurens and Cardoso, 1998).

1.2 Operational features of the URRs in Chile¹⁹

In June of 1991 Chile introduced an unremunerated reserve requirement on selective capital inflows. At the initial stage a non-interest bearing 20% reserve requirement was imposed covering all new foreign borrowing, except for direct trade credit.²⁰ For maturities of less than a year, the holding period of the reserve deposit was matched with the maturity of the inflow with a minimum of 90 days. For maturities longer than a year, the holding period was fixed at one year.

Foreign creditors were given an alternative means of satisfying the URR by paying the Central Bank an up-front fee, determined by the latter, and equal to the financial cost of the reserve requirement.²¹

Over time, and in a context of continuing capital inflows, the coverage of the URR in terms of capital account categories was extended and the system was tightened in general. In many cases this was done to address successive loopholes through which the private sector was finding ways to by-pass the URR.

Already by July 1991 the URR had been extended to borrowing renewals and by the beginning of 1992 to foreign currency denominated deposits by residents and non-residents. As of mid-1992 the reserve requirement rate was raised to 30% and by this time the period during which the deposit had to be held was extended to one year, regardless of the maturity of the flow. This measure further increased the bias against shorter-term flows.²²

In 1995 it was imposed that the requirement deposit should be made in US dollars instead of other foreign currencies.²³ Also the URR was extended to cover some types of portfolio flows, namely bond issues in international markets and the purchases of Chilean stocks by foreigners (“secondary market ADRs”) as the latter had become a large source of short-term capital inflow since 1993 (Desormeaux, 2002; Agosin and Ffrench-Davis, 1998).²⁴

As FDI flows remained exempt from the URR, financial capital started entering the country “disguised” as FDI. Therefore, in 1996 the authorities established a committee to start screening FDI applications and close this loophole through which the reserve requirements were being evaded. In the case of FDI applications judged by the committee as “non-productive”, foreign investors were expected to register their funds at the Central Bank as financial investments and were therefore subject to the URR (Agosin and Ffrench-Davis, 1998).

After these measures, basically no more tightening of the URR took place despite the fact that in 1996 and the beginning of 1997 there was a significant surge of capital inflows and it would have been an option to accommodate the height of the reserve requirement to the increased supply of funding. The result of this less proactive policy towards capital flows was a faster appreciation of the exchange rate and an increase in the current account deficit (Ffrench-Davis and Villar, 2005). This turned the economy more vulnerable to a sudden change in the international environment which in fact occurred when the Asian crisis began in late 1997.

At the very beginning, Chile was able to withstand contagion, but, as the crisis deepened, the country ended up being affected (Laurens and Cardoso, 1998). By 1998 capital had started to flow out of the economy and the domestic currency had come under strong depreciation pressures. The Central

¹⁹ This section is based on De Gregorio, Edwards, and Valdés (2000), Laurens and Cardoso (1998), Agosin and Ffrench-Davis (1998), among others.

²⁰ The condition in the case of trade credit was that the shipment occurred within six months. Later, in 1993 the condition was relaxed so that the shipment should occur within 300 days. This change made it easier to use trade credit to bypass the URR (Gallego, Hernández and Schmidt-Hebbel, 1999).

²¹ This alternative makes explicit the quantitative nature of the URR mechanism, i.e. its tax-equivalence, as discussed in section 2.1.

²² In terms of equation (1) this implies that ρ is no longer a function of k but a fixed parameter irrespective of k . This increases the bias against short-term flows since the effective cost of the URR is higher for the latter. In the case of longer-term flows, the fixed costs of the reserve requirement are spread out over a longer period of time.

²³ During a period of time investors had been allowed to choose the currency denomination of the reserve requirement. This implied that the URR cost could be minimized by choosing the currency which was expected to appreciate (De Gregorio, Edwards, and Valdés, 2000).

²⁴ For a description of secondary market ADR's see Agosin and Ffrench-Davis (1998).

Bank initially sold abundant reserves to maintain the exchange rate in the lower half of the band and in that way prevent inflationary pressures (Ffrench-Davis and Villar, 2006). It also shortened the band in a signal that it would not give in to pressures on the domestic currency but, in the end, it widened it again in late 1998. In this context of capital flowing out of the economy and pressures towards depreciation, the reasons for the existence of a positive URR rate were not present anymore. The authorities reduced the rate first from 30% to 10% in June 1998 and then to 0% in September 1998. They stated, however, that this was only a resetting of the parameters and did not necessarily imply the end of the URR mechanism; the latter could be used again if needed (Ffrench-Davis and Villar, 2006). Later on, by September 1999, the currency band, which by then lacked credibility, was suspended and the exchange rate was allowed to adjust freely.

TABLE 1
CHILE: OPERATIONAL FEATURES OF THE URR MECHANISM

Year	Month	Coverage	Reserve requirement (percentages)	Holding Period of Reserve Requirement Deposit	Reserve requirement denomination
1991	June	All new foreign borrowing	20.0	Flows of maturity less than 1 year: holding period matched with maturity of credit with a minimum of 90 days Flows of maturity greater than 1 year: holding period fixed at 1 year	Same currency as the credit
1992	July	+Renewals of credits			
	January	+ foreign currency deposits by residents and non-residents			
	Mid-year		30.0	Holding period fixed at 1 year regardless of maturity of flow	
1995	January	+secondary market ADR's +bond issues in international markets			US dollars
1996	October	+ "Non-productive" FDI (as judged by an FDI committee)			
1998	June		10.0		
	September	None	0.0	None	None

Source: Own elaboration based on Edwards (2006), De Gregorio, Edwards, and Valdés (2000), Laurens and Cardoso (1998), Agosin and Ffrench-Davis (1998).

2. Colombia

2.1 Context in which URRs were imposed

In Colombia, the same as in Chile, the authorities had tried throughout the 1980's to stimulate export growth by keeping a competitive real exchange rate. This was achieved through devaluations of the nominal exchange rate within a crawling peg system and resulted in a high current account surplus—peaking at nearly 5% of GDP in 1991—which helped accumulate a very large volume of international reserves. Economic activity however, exhibited less dynamism than in Chile, with GDP growing at average annual rates of less than 5% between 1986 and 1990 (Ocampo and Tovar, 1997).

Dissatisfaction with average macroeconomic performance, together with the demonstration effects of similar policies in other countries, led the country to embark in a wide-reaching program of structural reforms during the first half of the 1990's (Ocampo and Tovar, 1997). These reforms included, among others, a major trade liberalization program and in preparation for it, the authorities accelerated the nominal devaluation rate since mid-1989 to make the real exchange rate more competitive.²⁵ However, this measure accelerated the inflation rate and by the end of 1990 the latter peaked at more than 32% (Ocampo and Tovar, 1997). The authorities responded by putting in place a drastic stabilization regime. Restrictive monetary and credit policies were carried out and they resulted in high domestic real interest rates at a time when international rates were low and decreasing.

The stage was therefore set for interest-rate arbitraging capital inflows. The positive interest rate differential, together with a slowdown in the rate of devaluation provided the incentives for capital to enter the economy. Besides, the positive market sentiment towards the structural reforms that were being implemented provided further incentives. Capital flowed into the Colombian economy despite some administrative capital controls that were still in place²⁶ and it induced pressures towards appreciation of the real exchange rate.

The same as in Chile, the newly independent Central Bank adopted a variety of measures in order to attenuate the appreciation pressures. There was a relaxation of monetary policy in order to discourage foreign capital attracted by interest rate arbitraging and the monetary authorities undertook sterilized interventions in the foreign exchange market (Ffrench-Davis and Villar, 2006). This last strategy however had to be abandoned as it failed to stop the appreciation of the domestic currency and entailed a non-negligible quasi-fiscal cost.²⁷ Besides, as sterilization prevents the domestic interest rates from decreasing, differentials in favor of domestic assets were reinforced and therefore, so were capital inflows (Cárdenas and Barrera, 1997).

In September 1993, in a context of appreciating real exchange rate and loss of monetary independence, the authorities introduced an unremunerated reserve requirement on selective capital inflows. This price-based mechanism was introduced to replace some quantitative controls that were still in place and whereby flows were regulated mainly based on their final use.²⁸ In this sense, as Ffrench-Davis and Villar (2005) note, the introduction of the URR mechanism in the case of Colombia may be interpreted as a step towards financial liberalization —or the substitution of a price-based for an administrative mechanism— while this was not the case in Chile.

The URR mechanism remained in place in Colombia for many years, up to 2000, although as it will be seen below it underwent various changes in its operational features throughout the period.

2.2 Operational features of the URRs in Colombia²⁹

In September 1993 Colombia established an unremunerated reserve requirement on selective capital inflows. The system imposed a 47% reserve deposit at the Central Bank for all foreign loans of less than a certain maturity (referred to as the minimum maturity), which at the initial stage was set at 18 months.³⁰ The URR had to be made in dollars and its holding period was fixed at one year.³¹

²⁵ Other reforms included those dealing with labour market regime (1990), foreign investment regime (1991), financial markets (1991), and social security system (1993), (Cárdenas and Barrera, 1997).

²⁶ Colombia maintained between 1967 and 1991 a very strict capital control regime that severely limited private foreign borrowing. The first steps towards removing some of these controls were taken in 1991 as part of the structural reform process but nevertheless some quantitative restrictions on capital flows remained in place until 1993 (Cárdenas and Barrera, 1997).

²⁷ This cost is estimated to have increased from 0.8% of GDP in 1991 to 1.2% in 1993 (Cárdenas and Barrera, 1997).

²⁸ These controls required for example a minimum maturity of 1 year for foreign loans and imposed that the final use of the funds had to be trade or investment financing (Ocampo and Tovar, 2003).

²⁹ This section is based on Cárdenas and Barrera (1997), Ffrench-Davis and Villar (2005, 2006) and Ocampo and Tovar (1997, 1999, 2003) among others.

³⁰ Trade financing remained exempt from the URR.

³¹ The fact that the deposit could be immediately redeemed at preestablished discount rates again shows the tax equivalence of the mechanism (Ocampo and Tovar, 1999).

During 1994, as the economy was experiencing a surge in capital inflows the reserve requirements were tightened. In March of that year, the URR was extended to loans with maturities below 3 years (i.e the minimum maturity was increased to 3 years).

At this time also, the system changed and the rate of the requirement became related to the holding period of the deposit through three different alternatives: the borrower could choose between a 93% deposit to be kept for a holding period of one year, a 64% deposit to be kept for a holding period of 2 years or a 50% deposit to be kept for a holding period of 3 years (Cárdenas and Barrera, 1997; Ocampo and Tovar, 1997). In August of the same year, the URR was extended to loans with maturities below 5 years and the holding period of the reserve deposit was matched with that of the loan. The URR became inversely related to the maturity of the loan through a complex table with a ceiling of 140% for loans maturing in less than 30 days and a floor of 42.8% for loans maturing in five years (Ocampo and Tovar, 2003).

These measures were relaxed during the first semester of 1996 when, as a consequence of a political crisis, the exchange rate was depreciating and the Central Bank was losing reserves (Ffrench-Davis and Villar, 2005). In February, the minimum maturity of the foreign loans to be exempted from the reserve requirement was reduced to 4 years and a new simpler table for the requirement rate was established. In March, the minimum maturity was reduced to 3 years and a unique 18-month deposit of 50% was established independently of the maturity of the loan (Ocampo and Tovar, 1997).

In the last part of 1996, the political crisis had been solved and there was a huge increase in international reserves. The Government reacted by imposing, in addition to the URR, an explicit (Tobin) tax on all capital inflows, in January 1997 (Ocampo and Tovar, 1999). This tax was decreed unconstitutional in March of the same year and in response to this, the authorities tightened the reserve requirements by again raising to five years the minimum maturity of foreign loans to be exempted from the reserve requirement. The URR rate of 50% and the fixed at 18 months holding period of the reserve deposit were kept unchanged.

In May 1997, a simpler system, similar to the one used in Chile, was introduced. The new system left the holding period for the reserve deposit unaltered at 18 months but established a flat reserve requirement rate of 30% in local currency for all loans independent of their maturity. The principle of minimum maturity was thus abandoned but nevertheless, as in the Chilean case the new simpler mechanism still implied that the tax equivalent of the URR was higher, the shorter the maturity of the corresponding loan (Ffrench-Davis and Villar, 2005).

In January 1998, in the context of the Asian crisis, the URR rate was reduced to 25% and the holding period to 1 year. Depreciation pressures had put the exchange rate at the upper limit of the currency band and the Central Bank was forced to sell large amounts of reserves to maintain it within the pre-established limits. In response to this context, in September of the same year, the authorities again reduced the URR rate and holding period, this time to 10% and 6 months respectively. Also, at this same time, an upward shift of the currency band was decided in order to allow more nominal depreciation and prevent the Central Bank from having to lose more reserves. In 1999 depreciation pressures on the exchange rate continued due, among other factors, to the financial crisis, the deeper than expected effect of the crisis on economic activity and the deterioration of the fiscal accounts. After having shifted the band for a second time in June 1999, the latter had lost credibility and was finally dismantled in September 1999. The URR was in turn reduced to 0% in May 2000. As in the case of Chile, however, the authorities stated that they could again turn to the URR mechanism if needed to confront renewed capital surges (Ffrench-Davis and Villar, 2006).

TABLE 2
COLOMBIA: OPERATIONAL FEATURES OF THE URR MECHANISM

Year	Month	Coverage	Reserve requirement (percentages)	Holding Period of Reserve Requirement Deposit	Reserve requirement denomination
1993	September	Loans with maturity under 18 months	47.0	Fixed at 1 year	US dollars
1994	March	Loans with maturity under 3 years according to a table	93.0 Less than 12 months 64.0 Between 12 and 24 months 50.0 Between 24 and 36 months		
	August	Loans with maturity under 5 years according to a table	Maximum 140.0 30 days Minimum 42.8 5 years		
1996	February	Loans with maturity under 4 years according to a table	A new simpler table was established		
	March	Loans with maturity under 3 years	50.0	18 months	
1997	March	Loans with maturity under 5 years			
	May	All loans	30.0		Local currency (Colombian Pesos)
1998	January	All loans	25.0	1 year	
	September	All loans	10.0	6 months	
2000	May	None	0.0	None	None

Source: Extracted from Ocampo and Tovar (2003).

III. Effectiveness of the Unremunerated Reserve Requirements (URRs) in Chile and Colombia

As it was mentioned, the main objectives pursued by the URR mechanism when it was imposed by Chile and Colombia in the early 1990's, was to act both as a liability policy tool and as a macroeconomic policy tool.

1. Effectiveness as a liability policy tool: to improve the private sector's foreign liability profile by discouraging the accumulation of short-term liabilities

Table 3 below shows the behavior of foreign debt in Chile and Colombia during the 1990's. Although no hard evidence can be extracted from the data, it does indeed show a change in composition of private foreign liabilities away from the short-term. This change was not immediate, in part because the URR mechanism acts only on the flow of new liabilities and cannot alter the stock of existing liabilities.

TABLE 3
FOREIGN DEBT STOCKS IN CHILE AND COLOMBIA
(In millions of dollars)

	Foreign Private Debt			Foreign Public Debt	Total Foreign Debt
	Short term	Long term	Percentage of short-term on total		
Chile					
1990	1 398	4 235	25	11 792	17 425
1991	1 135	4 675	20	10 554	16 364
1992	3 027	5 592	35	9 623	18 242
1993	2 999	7 167	30	9 020	19 186
1994	3 339	9 004	27	9 135	21 478
1995	2 816	11 419	20	7 501	21 736
1996	2 285	15 531	13	5 163	22 979
1997	678	20 935	3	5 088	26 701
1998	1 012	24 965	4	5 714	31 691
1999	911	27 374	3	5 827	34 112
2000	2 153	28 802	7	5 522	36 477
Colombia					
1990	1 409	1 113	56	15 471	17 993
1991	1 184	981	55	15 171	17 335
1992	1 612	1 250	56	14 416	17 278
1993	2 587	2 046	56	14 254	18 887
1994	3 213	4 806	40	14 718	22 737
1995	3 920	6 880	36	15 540	26 340
1996	3 151	11 572	21	16 394	31 116
1997	3 436	14 191	19	16 785	34 412
1998	3 002	14 891	17	18 787	36 680
1999	2 267	14 267	14	20 199	36 733
2000	2 315	13 207	15	20 610	36 132

Source: Extracted from Ffrench-Davis and Villar (2005).

Notes: Short-term refers to transactions originally contracted for one year or less.
 Data for Colombia include financial leasing transactions.

More conclusive evidence regarding the effectiveness of the URR as a liability policy tool has been provided by formal empirical studies.

For the case of Chile, for example, Gallego, Hernández and Schmidt-Hebbel (1999) estimate the effect of the URR on the composition of net foreign liability flows and stocks and find that the URR mechanism does have a significant effect in changing the composition of both away from the short-term and towards the medium and long-term. In the same line, Gallego, Hernández and Schmidt-Hebbel (2002) conclude that “the introduction of the URR led to a distribution of external liabilities that was skewed toward long-term liabilities” while Ffrench-Davis and Tapia (2004) conclude that “the URR was very successful in improving the profile of foreign liabilities”.

De Gregorio, Edwards and Valdés (2000) also find a clear impact of the URR on the maturity composition of capital with a change from short-run flows to long-run flows. They find, on the one hand, a significant and economically relevant effect of the URR on short-term inflows by which, the existence of the URR leads to quarterly short-term flows 0.5–1.0 percentage points of GDP smaller than they would otherwise have been (De Gregorio, Edwards and Valdés, 2000). As their study also finds no

impact of the URR on the total volume of inflows, their conclusion regarding the URR is that “at the same time that it decreases short-term flows, it increases long-term flows” therefore only affecting the maturity composition of capital inflows (De Gregorio, Edwards and Valdés, 2000).

A study by Chumacero, Labán and Larraín (1997) focuses on estimating the determinants of long term and short-term net private capital inflows into Chile. It finds that long-term flows tend to respond to structural domestic variables of the economy and are not sensitive to arbitrage conditions while short-term flows do react strongly to arbitrage conditions. The URR affects short-term flows through two main effects. In the short-run, there is a substitution effect away from short-term inflows that are subject to the URR into those that are not. In the long-run however, this substitution effect disappears and the deterrent effect on the ones that are subject to the requirement dominates. Therefore, in the long-run, the URR is effective in reducing the total magnitude of short-term inflows. In this way it reduces the relative share of short-term flows in the total.

The study by Le Fort and Lehmann (2003) estimates the effects of the URR separately for total net flows, short-term flows and medium and long-term flows. It finds that the URR mechanism has a much larger and significant negative effect on the volume of short-term flows than it does on the other types.³² This implies that the URR has important effects regarding the composition of flows by reducing their short-term component.³³

For Colombia, the same as for Chile, most empirical studies coincide in showing that the URR was effective as a liability policy tool.

Among these for example, the study by Cárdenas and Barrera (1997) presented preliminary evidence to suggest that indeed the URR mechanism had been successful in inducing a recomposition of foreign liabilities in favor of long-term maturities.

Later on, the study by Ocampo and Tovar (1999) used data on new foreign debt contracted by the private sector during some of the years in which the URR was in place, and analyzed if the URR affected the relative shares of short, medium and long-term debt contracted. They also analyzed if the minimum maturity regulations had an effect on such shares.

Their results showed that both the tax effect of the URR —the higher tax equivalent for shorter-term loans— and increases in the minimum maturity were important determinants of a longer term structure of private foreign borrowing in Colombia.³⁴ A study by the same authors, Ocampo and Tovar (2003), confirmed the above results.

Also, the study by Rincón (2000) analyzed econometrically the determinants of short-term capital flows and found that the URR mechanism had a significant effect in reducing such flows.

The existing empirical literature therefore strongly supports, both in Chile and Colombia, the positive liability policy effects of the URR mechanism. It agrees on the fact that by discouraging short-term capital inflows the mechanism improved the maturity profile of the countries' external liabilities (Table 4).

³² The authors note that the evolution of longer-term flows is more directly linked with the evolution of fixed capital formation and more influenced by the conditions of the supply of funds.

³³ A few studies on the Chilean experience are less optimistic regarding the effect of the URR mechanism on the composition of flows (see for example Laurens and Cardoso, 1998).

³⁴ Moreover, they find that the cost-of-borrowing effect is more important in determining the relative share of medium-term versus short-term borrowing, but that the minimum maturity is more important in determining the share of long-term borrowing. In this regard, they conclude that the system used since May 1997 —that substituted the minimum maturity principle for a flat reserve requirement on all loans- although simpler to administer, is not a perfect substitute for the previous system (Ocampo and Tovar, 1999).

TABLE 4
SUMMARY OF RESULTS OBTAINED BY EMPIRICAL STUDIES: URRS AS A LIABILITY POLICY TOOL

Chile	
Study	Results
Chumacero, Labán and Larráin (1997)	In the long run, the URR is effective in reducing the total magnitude of short
Gallego, Hernández and Schmidt-Hebbel (1999)	URR mechanism has significant effect in changing the composition of net foreign liability flows and stocks away from the short-term and toward the medium and long-term.
De Gregorio, Edwards and Valdés (2000)	URR has a clear impact on the maturity composition of capital with a change from short-run flows to long-run flows.
Gallego, Hernández and Schmidt-Hebbel (2002)	URR mechanism led to a distribution of external liabilities that was skewed toward long-term liabilities.
Le Fort and Lehmann (2003)	URR mechanism has a much larger and significant negative effect on the volume of short-term flows than it does on the other types. Hence the URR has important effects regarding the composition of flows by reducing their short-term component.
Ffrench-Davis and Tapia (2004)	URR was very successful in improving the profile of foreign liabilities. URR leads to quarterly short-term flows 0.5 – 1.0 percentage points of GDP smaller than they would otherwise have been.
Colombia	
Study	Results
Cárdenas and Barrera (1997)	Evidence suggests that URR mechanism was successful in inducing a recomposition of foreign liabilities in favor of long-term maturities.
Ocampo and Tovar (1999)	The tax effect of the URR together with the increases in the minimum maturity were important determinants of a longer term structure of private foreign borrowing.
Ocampo and Tovar (2003)	Similar results as Ocampo and Tovar (1999) regarding the effect of the URR on the term structure of private foreign borrowing.
Rincón (2000)	URR mechanism has a significant effect in reducing short-term flows.

Source: Own elaboration.

2. Effectiveness as a macroeconomic policy tool: to enhance the ability of monetary and exchange rate policies to act in a counter-cyclical way in periods of capital inflows booms

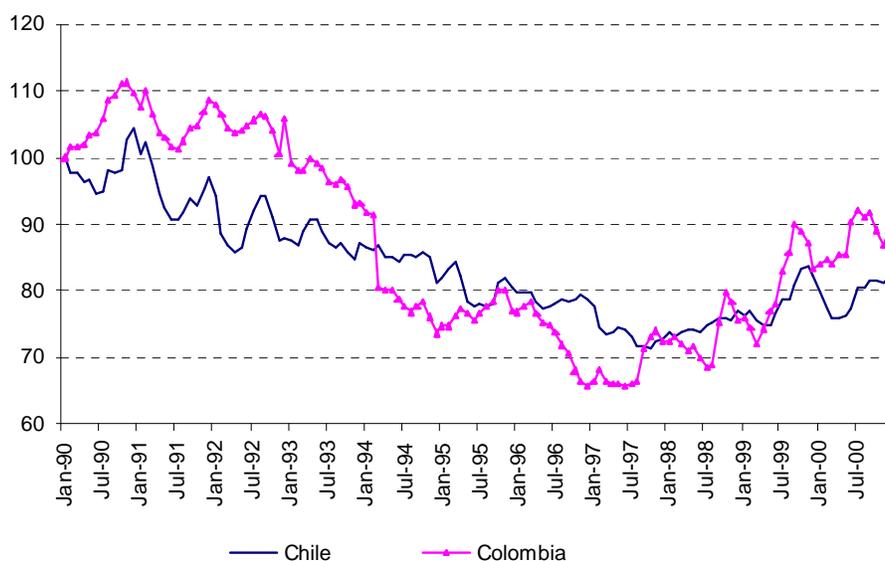
In general, evidence regarding the effectiveness of the URR mechanism as a macroeconomic policy tool is less conclusive. In both countries the volume of capital flows was far from reduced during the periods in which the regulation was being used and the real exchange rate appreciated substantially (Table 3 (column 4), and Figure 3).

TABLE 5
CAPITAL FLOWS AND THE CURRENT ACCOUNT IN CHILE AND COLOMBIA
(In millions of dollars)

	Current Account (1)	Net Foreign Direct Investment (2)	Net Foreign Credit to the Public Sector (3)	Other Flows of Private Capital (4)	International Reserves Accumulation (4)
Chile					
1990	-485	654	-222	2 174	2 121
1991	-99	697	-955	1 406	1 049
1992	-958	538	42	2 723	2 344
1993	-2 553	600	-357	2 483	173
1994	-1 585	1 672	-314	3 146	2 919
1995	-1 345	2 205	-2 086	1 967	741
1996	-3 083	3 681	-1 540	2 064	1 122
1997	-3 660	3 809	-244	3 416	3 320
1998	-3 981	3 144	448	-1 839	-2 165
1999	99	6 203	-416	-6 531	-644
2000	-766	-348	-173	1 624	337
Colombia					
1990	544	484	-45	-373	610
1991	2 347	437	-347	-675	1 763
1992	876	745	-56	-292	1 274
1993	-2 221	865	-158	1 978	464
1994	-3 669	1 298	-1 224	3 795	199
1995	-4 524	712	1 388	2 425	2
1996	-4 632	2 784	856	2 714	1 721
1997	-5 748	4 753	1 146	126	277
1998	-4 852	2 032	1 469	-40	-1 390
1999	671	1 336	647	-2 969	-315
2000	619	1 905	614	-2 268	870

Source: Extracted from French-Davis and Villar (2005).

FIGURE 3
REAL EXCHANGE RATE IN CHILE AND COLOMBIA
REER INDEX, JAN-1990=100



Source: IMF, International Financial Statistics (IFS) database.

However, the coexistence of the URR mechanism with large private capital inflows-cum-appreciation pressures is not proof that the mechanism is not effective.³⁵ The correct question to evaluate the effectiveness of the URR mechanism is what the volume of capital inflows and/or real exchange rate would have been if the URR mechanism had not been in place during periods of intensified capital supply, and given certain levels of domestic interest rates determined by the stances of monetary policy.

Even though counterfactual analysis is very difficult to implement, empirical studies both for Chile and Colombia have tried to answer this question by determining econometrically whether the URR mechanism had effects on the volume of capital inflows for given levels of domestic interest rates or alternatively whether the URR made room for higher domestic interest rates without causing increases in the volume of capital inflows and further appreciation of the real exchange rate.

Some of these studies have dealt more adequately than others with the control for changes (and a possible upward exogenous trend until 1997) in the supply of foreign capital and for simultaneity issues regarding the fact that the URRs and their variations were put in place when most needed, i.e. when capital inflows surge.

For the case of Chile, the study by De Gregorio, Edwards and Valdés (2000), although having found a clear impact of the URR on the maturity composition of capital flows, does not find an effect of the URR on the total volume of flows. Their argument, as it was mentioned, was that at the same time that short-term flows decrease, there is a compensatory increase in longer-term flows. This in turn implies a high degree of substitution between capital inflows of different maturities. For the effect of the URR on the trajectory of the real exchange rate, the study does not find conclusive evidence since it obtains contradictory results under different methodologies. It does find however, that the URR allowed the authorities to target the domestic interest rate at higher levels (implying larger interest rate

³⁵ It may simply reflect a policy reaction function by which the introduction of capital regulations and their tightening were caused precisely by the surge in inflows and appreciation pressures that both countries were facing –and therefore show up simultaneously (Ffrench-Davis and Villar, 2005).

differentials with the rest of the world) without causing increases in the volume of capital inflows. This is a positive result regarding the effect of the URR on monetary policy independence.

This result regarding the effectiveness of capital controls to make room for monetary policy is also supported by other econometric studies like Ffrench-Davis and Tapia (2004) and Gallego, Hernández and Schmidt-Hebbel (2002). The latter study however found that the interest rate differential supported by the URR mechanism was rather small and only temporary.

On the opposite side, the study by Valdés-Prieto and Soto (1998) finds that the URR “failed to contribute to monetary autonomy”. Also on the more pessimistic side, the study by Laurens and Cardoso (1998) does not find an effect of the URR neither on the exchange rate nor on the interest rate. The method they used, however, has cast doubts by other authors regarding the adequacy of their estimations (see for example Gallego, Hernández and Schmidt-Hebbel, 2002).

Regarding the volume of capital flows, a study by Le Fort and Lehmann (2000) obtains different results from De Gregorio, Edwards and Valdés (2000) and finds that the URR does indeed have an effect on the latter. In fact, from a simulation exercise, they conclude that if the URR had been eliminated in 1996, capital inflows would have been almost 6 points of GDP larger in 1996 and 1997 than they actually were. This in turn would have resulted in current account deficits of around 7% of GDP in those same years instead of the values of 5% that were actually registered (Le Fort and Lehmann, 2000).

Also the studies by Chumacero, Labán and Larraín (1997), Ffrench-Davis and Tapia (2004) and Le Fort and Lehmann (2003) do find a negative and significant effect of the URR on the total volume of capital flows. In the case of Le Fort and Lehmann (2003) this effect comes basically from the effect of the URR on the volume of short-term flows as longer-term flows are almost unaffected.³⁶ Also in the case of Ffrench-Davis and Tapia (2004) the negative effect of the URR is stronger for short-term flows than it is for total net flows.

The study by Gallego, Hernández and Schmidt-Hebbel (2002) also finds that the URR leads to a fall in the total volume of capital inflows but the authors state that this effect is temporary in nature due to the eventual loss of power of the URR. Such loss of power is a consequence of the loopholes being continuously found by the private sector to evade the URR, and therefore this result highlights the need for an active approach by the Central Bank in closing loopholes as a necessary condition for the success of the URR mechanism in influencing the volume of inflows (Ffrench-Davis and Villar, 2006).

For the case of Colombia, an early study by Cárdenas and Barrera (1997) used regression analysis with data from 1985 to mid-1996 and found that the URR mechanism was not effective in reducing the volume of capital inflows. However, these results could have been influenced by the fact that the study failed to consider the effects of administrative controls that were in place before 1993 and that were substituted by the URR. The effects of such controls and the regime change introduced in 1993 were analyzed by Ocampo and Tovar (1997) and this study does find that the price-based controls were effective in reducing the amount of external financing.

A later study, Ocampo and Tovar (1999), used data since 1993 when most of the administrative measures had been removed, and also found that the URR mechanism was effective in reducing the total volume of capital flows. The study found that the effects on the volume of external borrowing were due to the additional costs that reserve requirements imposed on the cost of borrowing, as well as to discrete effects of the regulations (e.g. changes in the minimum maturity below which the URR applies).³⁷ The latter

³⁶ The authors emphasize that their results depend critically on the inclusion of a variable to account for changes in the supply of funds in their equations (Le Fort and Lehmann, 2003). This shows the potential implications of not considering properly the effects of the supply of foreign funding in other studies.

³⁷ The discrete effects of regulations are captured by dummy variables for periods when regulations were relaxed (e.g. minimum maturity is shortened) and for periods when they were tightened (e.g. minimum maturity is extended).

are interpreted by the authors as the result of the imperfect substitution of longer-term versus shorter-term borrowing.³⁸ A later study by the same authors, Ocampo and Tovar (2003) obtained similar results.

Also on the optimistic side regarding the effectiveness of the URR as a macroeconomic policy tool is the study by Rincón (2000)-that uses short-term capital flows as the dependent variable and finds that the URR mechanism was effective in reducing their overall volume-and the study by Villar and Rincón (2000) –that concludes that the URRs “allowed to increase the domestic real interest rate and to discourage aggregate demand in the process of stabilization without creating additional pressures towards a real appreciation of the Colombian peso, which would have aggravated the external imbalances”.

The existing empirical literature therefore, is not conclusive on the effectiveness of the URR mechanism as a macroeconomic policy tool. There are contradicting empirical findings regarding the ability of the mechanism to reduce the volume of capital inflows and/or ease pressures on the exchange rate for a given level of domestic interest rate. Also, the ability of the URR mechanism to allow for a higher domestic interest rate, at given levels of capital inflows, has been subject to some controversy (Table 6).

TABLE 6
SUMMARY OF RESULTS OBTAINED BY EMPIRICAL STUDIES:
URRS AS A MACROECONOMIC POLICY TOOL

Chile	
Study	Results
Valdés-Prieto and Soto (1998)	<ul style="list-style-type: none"> • The URR did not contribute to monetary autonomy.
Laurens and Cardoso (1998)	<ul style="list-style-type: none"> • URR has no effect on the exchange rate nor on the interest rate.
Gregorio, Edwards and Valdés (2000)	<ul style="list-style-type: none"> • The URR was not effective in reducing the volume of capital inflows. • Positive effect of the URR on monetary policy autonomy (URR allowed the authorities to target the domestic interest rate at higher levels without causing increases in the volume of capital inflows). • Effect of URR on real exchange rate trajectory is not conclusive.
Le Fort and Lehmann (2000)	<ul style="list-style-type: none"> • The URR was effective in reducing the volume of capital inflows (if the URR had been eliminated in 1996, capital inflows would have been almost 6 points of GDP larger in 1996 and 1997 than they actually were).
Gallego, Hernández and Schmidt-Hebbel (2002)	<ul style="list-style-type: none"> • Positive effect of the URR on monetary policy autonomy (although the interest rate differential supported by the URR mechanism was rather small and only temporary). • The URR was effective in reducing the volume of capital inflows (however this effect is only temporary due to loss of power of URR mechanism).
Le Fort and Lehmann (2003)	<ul style="list-style-type: none"> • The URR was effective in reducing the total volume of capital inflows (however the negative effect of the URR is stronger on short-term flows).
Ffrench-Davis and Tapia (2004)	<ul style="list-style-type: none"> • The URR was effective in reducing the total volume of capital inflows (however the negative effect of the URR is stronger on short-term flows). • Positive effect of the URR mechanism on monetary policy autonomy.
Colombia	
Study	Results
Cárdenas and Barrera (1997)	<ul style="list-style-type: none"> • URR mechanism was not effective in reducing the volume of capital flows.
Ocampo and Tovar (1997)	<ul style="list-style-type: none"> • URR mechanism was effective in reducing the volume of external financing.

(Continues)

³⁸ It is worth noting that this idea would go contrary to the findings of De Gregorio, Edwards and Valdés (2000) for the case of Chile. These authors had found a high degree of substitution between flows of different maturities.

TABLE 6 (Concluded)

Colombia	
Study	Results
Ocampo and Tovar (1999)	<ul style="list-style-type: none"> • URR mechanism was effective in reducing the total volume of capital inflows. This effect was due to the additional costs that reserve requirements imposed on the cost of borrowing and to discrete effects of the regulations (e.g. changes in the minimum maturity)
Ocampo and Tovar (2003)	<ul style="list-style-type: none"> • Similar results to Ocampo and Tovar (1999).
Rincón (2000)	<ul style="list-style-type: none"> • URR mechanism was effective in reducing the overall volume of short-term capital flows.
Villar and Rincón (2000)	<ul style="list-style-type: none"> • Positive effect of the URR on monetary policy autonomy (URR allowed to increase the domestic real interest rate without creating additional pressures towards a real appreciation)

Source: Own elaboration.

In any case, what is not obvious is the capacity that the URR mechanism had, by itself, to reduce the vulnerability of the domestic economies to a sudden change in the international financial conditions. During the Tequila crisis of 1995 the maturity structure of foreign debt in both countries was perceived as a significant strength that helped them avoid contagion. However, during the Asian and Russian Crises, both countries resulted heavily affected and neither avoided the large net capital outflows that resulted from contagion (Ffrench-Davis and Villar, 2005).

This implies that despite the usefulness of the URR mechanism as a liability policy tool and besides its possible effectiveness as a macroeconomic policy tool, other complementary policies might be necessary in order to reduce the domestic economy's vulnerability to capital flows volatility.³⁹

³⁹ In particular, complementary policies may include prudential regulations to address currency and maturity mismatches of domestic agents and a prudent fiscal management that opens the space for the use of counter-cyclical fiscal policies whenever necessary. For a discussion in this respect see Ffrench-Davis and Villar (2005) and Ocampo (2003).

IV. Summary and conclusions

- The benefits of financial integration are often shadowed by the damaging effects that highly volatile international financial markets have on macroeconomic stability and growth.
- Unremunerated Reserve Requirements (URRs) on capital inflows were a type of capital account regulation used by Chile and Colombia during the 1990's that was designed to address the problem of financial volatility.
- The objectives of the URR were to act as a liability policy tool — discouraging the accumulation of short term liabilities— and as a macroeconomic policy tool —enhancing the ability of monetary and exchange rate policies to act in a counter-cyclical way during periods of capital inflows booms.
- The URR was a price-based mechanism designed to penalize short-term capital inflows by turning them more costly in relative terms to longer-term flows. It was equivalent to a tax on capital inflows where the rate varied inversely with the length of time the foreign funds stayed in the country.
- The systems in both countries shared some key common features: they were not quantitative controls but price-based mechanisms, they affected capital inflows but not capital outflows, they were intended to affect short-term capital inflows more than long-term flows and their goal was to reduce the amount of short-term capital flowing into the country during a surge in the supply of foreign funds, not to stop funds from flowing out of the country during a crisis.

- In the Chilean system, the average level of the tax implicit in the URR was estimated at 5.2% for inflows of a 6-month maturity and at 3.6% for those of a one-year maturity. For Colombia, the average implicit tax was estimated at 13.6% for flows with a one-year and at 6.4% for those with a three-year maturity.
- The existing empirical literature, both in Chile and Colombia, strongly supports the positive effects of the URR as a liability policy tool. By discouraging short-term capital inflows the mechanism was successful in improving the maturity profile of the countries' external liabilities.
- The empirical literature is, however, less conclusive on the effectiveness of the URR mechanism as a macroeconomic policy tool. There are contradicting empirical findings regarding the ability of the mechanism to reduce the volume of capital inflows and/or ease pressures on the exchange rate for a given level of domestic interest rate. Also, the ability of the URR mechanism to allow for a higher domestic interest rate, at given levels of capital inflows, has been subject to some controversy.
- Despite the proved usefulness of the URR mechanism as a liability policy tool and besides its possible effectiveness as a macroeconomic policy tool, other complementary policies are necessary in order to reduce the domestic economy's vulnerability to capital flows volatility.

Bibliography

- Agosin, M. and R. Ffrench-Davis (1998) "Managing Capital Inflows in Chile", paper prepared for the expert group meeting: What have we learned one year into the financial crisis in emerging-market economies?, July 1998. <http://www.un.org/esa/policy/pastmeetings/ffrench.pdf>.
- Budnevich, C. and G. Le Fort (1997), "Capital account regulations and macroeconomic policy: two Latin American experiences", Working Paper #06, Central Bank of Chile, Santiago. Available at: <http://www.bcentral.cl/estudios/documentos-trabajo/fichas/006.htm>.
- Cárdenas, M. and F. Barrera (1997), "On the effectiveness of capital controls: The experience of Colombia during the 1990s", *Journal of Development Economics*, Vol. 54 (1997) pp. 27-57.
- Claessens, S., M. P. Dooley, and A. Warner (1995), "Portfolio Capital Flows: Hot or Cold?", *The World Bank Economic Review*, Vol. 9, No 1, January.
- Chumacero, R., Labán R. and F. Larraín (1997) "What determines capital inflows? An empirical analysis for Chile. Available at: <http://econ.uchile.cl/rchumace/papers/capinf.pdf>.
- De Gregorio, J., Edwards S. and R. Valdés (2000) "Controls on capital inflows: do they work?" NBER Working Paper # 7645. Available at: <http://www.nber.org/papers/w7645>.
- Desormeaux, J. (2002) "Regulaciones e Intervención del Banco Central en el Mercado Cambiario", PowerPoint Presentation. Available at: <http://www.bcentral.cl/politicas/presentaciones/consejeros/pdf/2002/desormeauxjunio142002.pdf>.
- Edwards, S. (2006) "Managing the Capital Account" in Ricardo J. Caballero, César Calderón and Luis Felipe Céspedes (eds.) *External Vulnerability and Preventive Policies*, Central Bank of Chile.
- Eichengreen, B. and M. Mussa (1998), "Capital Account Liberalization and the IMF", *Finance & Development magazine*, December, volume 35, # 4, International Monetary Fund. Available at: <http://www.imf.org/external/pubs/ft/fandd/1998/12/index.htm>.

- Ffrench-Davis, R. (2007) "Financial Globalization: From Crises-Prone to Development Friendly?", in Ricardo Ffrench-Davis and José Luis Machinea (eds.) *Economic Growth with Equity, Challenges for Latin America*, Palgrave / Macmillan, January 2007.
- Ffrench-Davis, R. and H. Tapia (2004) "The Chilean-style of capital controls: an empirical assessment", mimeo, ECLAC.
- Ffrench-Davis, R. and L. Villar (2006) "Real Macroeconomic Stability and the Capital Account in Chile and Colombia", in Ricardo Ffrench-Davis (ed.) *Seeking Growth under Financial Volatility*, Palgrave / Macmillan, April 2006.
- Ffrench-Davis, R. and L. Villar (2005) "Capital Account Regulations in Chile and Colombia". Available at: http://www.policyinnovations.org/ideas/policy_library/data/01041/_res/id=sa_File1/
- Gallego F. and L. Hernández (2003) "Microeconomic effects of capital controls: the Chilean experience during the 1990's", Central Bank of Chile Working Papers #203.
- Gallego, F., Hernández, L. and K. Schmidt-Hebbel (2002), "Capital Controls in Chile: Were they Effective?" in L. Hernández and K. Schmidt-Hebbel (eds.), *Banking Financial Integration, and International Crises*. Central Bank of Chile.
- Gallego, F., Hernández, L. and K. Schmidt-Hebbel (1999), "Capital Controls in Chile: Effective? Efficient?", Central Bank of Chile Working Papers #59. Santiago de Chile.
- IMF (International Monetary Fund), IFS (International Financial Statistics) database.
- IMF (International Monetary Fund) (2007), *World Economic Outlook 2007 – Globalization and Inequality*, Chapter 3. Available at: <http://www.imf.org/external/pubs/ft/weo/2007/02/>.
- Klein, M. and G. Olivei (2005). "Capital Account Liberalization, Financial Depth, and Economic Growth", NBER Working Paper # 7384. Available at: <http://www.nber.org/papers/w7384>.
- Laurens, B. and J. Cardoso (1998): "Managing Capital Flows: Lessons from the Experience of Chile", IMF (International Monetary Fund) Working Paper, # 168.
- Le Fort, G. and S. Lehmann (2003) "El encaje y la entrada neta de capitales: Chile en el decenio de 1990", ECLAC (Economic Commission for Latin America and the Caribbean) Review # 81, Santiago de Chile.
- Le Fort, G. and S. Lehmann (2000) "El encaje, los flujos de capitales y el gasto: una evaluación empírica", Central Bank of Chile Working Papers #64. Santiago de Chile.
- Nadal-De Simone, F. and P. Sorsa (1999) "A Review of Capital Account Restrictions in Chile in the 1990s", IMF (International Monetary Fund) Working Paper # 52.
- Ocampo J.A. (2008) "Managing Pro-Cyclical Capital Flows in Developing Countries", paper presented at the symposium "Financial Globalization and Emerging Market Economies" organized by the Bank of Thailand, November 7-8, 2008.
- Ocampo, J.A. (2003), "Capital Account and Counter-Cyclical Prudential Regulations in Developing Countries", *Informes y Estudios Especiales Series # 6*, ECLAC (Economic Commission for Latin America and the Caribbean), Santiago de Chile.
- Ocampo, J.A. and C. Tovar (2003) "Colombia's experience with reserve requirements on capital inflows", ECLAC (Economic Commission for Latin America and the Caribbean) Review #81, Santiago de Chile.
- Ocampo, J.A. and C. Tovar (1999) "Price-based capital account regulations: the Colombian experience", *Financiamiento del Desarrollo Series #87*, ECLAC (Economic Commission for Latin America and the Caribbean), Santiago de Chile.
- Ocampo, J.A. and C. Tovar (1997) "Capital flows, savings and investment performance in Colombia, 1990-1996", *Archivos de Macroeconomía Series # 58*, Unidad de Análisis Macroeconómico, Departamento Nacional de Planeación, República de Colombia.
- Rincon, H. (2000) "Efectividad del Control a los Flujos de Capital: Un Reexamen Empírico de la Experiencia Reciente en Colombia," *Revista de Economía del Rosario*, Universidad del Rosario, Bogotá, Vol. 3, # 1.
- Stiglitz, J., Ocampo, J.A., Spiegel, S., Ffrench-Davis, R. and D. Nayyar (2006) "Stability with Growth: Macroeconomics, Liberalization, and Development", New York: Oxford University Press for the Initiative of Policy Dialogue, Columbia University.
- Titelman, D., Pérez Caldentey, E. and R. Minzer (2008) "Comparación de la dinámica e impactos de los choques financieros y de términos de intercambio en América Latina en el período 1980-2006". *Financiamiento del Desarrollo Series # 203*, ECLAC (Economic Commission for Latin America and the Caribbean), Santiago de Chile.
- Valdés-Prieto, S. and M. Soto (1998) "New Selective Capital Controls in Chile: Are They Effective?" *Empírica* 25(2).
- Villar, L. and H. Rincón (2000) "The Colombian economy in the nineties: capital flows and foreign exchange regimes". Paper presented at the Conference on "Critical Issues in Financial Reform: Latin American-Caribbean and Canadian Perspectives", University of Toronto, June 1-2, 2000. Available at: <http://www.banrep.gov.co/docum/ftp/borra149.pdf>.

Annexes

Annex 1

TABLE A7
GDP GROWTH AND INFLATION RATE IN CHILE AND COLOMBIA
(In percentages)

	Chile		Colombia	
	CPI Inflation Rate	GDP Growth Rate	CPI Inflation Rate	GDP Growth Rate
1982-89	20.7	2.6	22.5	3.4
1990	27.3	3.7	32.4	4.3
1991	18.7	8.0	26.8	2.0
1992	12.7	12.3	25.1	4.0
1993	12.2	7.0	22.6	5.4
1994	8.9	5.7	22.6	5.1
1995	8.2	10.6	19.5	5.2
1996	6.6	7.4	21.6	2.1
1997	6.0	6.6	17.7	3.4
1998	4.7	3.2	16.7	0.6
1999	2.3	-0.8	9.2	-4.2
2000	4.5	4.5	8.8	2.9

Source: Extracted from Ffrench-Davis and Villar (2006).



NACIONES UNIDAS



Serie

Financiamiento del desarrollo

Issues published

A complete list as well as pdf files are available at

www.eclac.org/publicaciones

- 221. A summary of the experience of Chile and Colombia with unremunerated reserve requirements on capital inflows during the 1990 's, (LC/L.3145-P), sales N° E.09.II.G118 (US\$10.00), 2009.
- 220. ¿Existe un modelo de microfinanzas en América Latina? (LC/L.3147-P), N° de venta S.09.II.G.120 (US\$10.00), 2009.
- 219. Diseño y ajuste de los planes explícitos de beneficios: el caso de Colombia y México (LC/L.3131-P), N° de venta S.09.II.G.106 (US\$10.00), 2009.
- 218. Microfinanzas en Nicaragua (LC/L.3135-P), N° de venta S.09.II.G.110 (US\$10.00), 2009.
- 217. Microfinanzas y políticas públicas: desempeño reciente y propuestas para la acción en Venezuela (LC/L.3105-P), N° de venta S.09.II.G.86 (US\$10.00), 2009.
- 216. Ampliación de la cobertura de microfinanzas en el área rural del Estado Plurinacional de Bolivia: un diagnóstico cualitativo de los esfuerzos actuales y desafíos (LC/L.3089-P), N° de venta S.09.II.G.75 (US\$10.00), 2009.
- 215. Microfinanzas en Honduras: realidad y retos para la definición de políticas (LC/L.3088-P), N° de venta S.09.II.G.74 (US\$10.00), 2009.
- 214. Microfinanzas dentro del contexto del sistema financiero colombiano, (LC/L.3080-P), N° de ventas S.09.II.G.67 (US\$10.00), 2009.
- 213. La industria de microfinanzas en Guatemala: estudio de casos, (LC/L.3068-P), N° de venta S.09.II.G.61 (US\$10.00), 2009.
- 212. Microfinanzas e instituciones microfinancieras en Colombia (LC/L.3055-P), N° de venta S.09.II.G.54 (US\$10.00), 2009.
- 211. La industria de microfinanzas en Guatemala: estudio de casos, (LC/L.3044-P), N° de venta, S.09.II.G.46 (US\$10.00), 2009.
- 210. The Latin American experience in pension system reform: coverage, fiscal issues and possible implications for China, (LC/L.3035-P), sales No S.09.II.G.43 (US\$10.00), 2009.
- 209. Banca de desarrollo y pymes en Costa Rica, (LC/L.3016-P), N° de venta S.09.II.G.26 (US\$10.00), 2009.
- 208. Banca de desarrollo y el apoyo al acceso (México) (LC/L. 3007-P), N° de venta S.09.II.G.21 (US\$10.00), 2009.
- 207. El financiamiento de las pymes en México 2000-2007: el papel de la banca de desarrollo, Ramón Lecuona Valenzuela, (LC/L.2997-P5), N° de venta S.09.II.G.4 (US\$10.00), 2008.
- 206. Cambios de los mercados de servicios de salud en la seguridad social en Argentina, Ernesto Báscolo, (LC/L.2991-P), N° de venta S.08.II.G.97 (US\$10.00), 2008.

- Readers wishing to obtain the listed issues can do so by writing to: Distribution Unit, ECLAC, Casilla 179-D, Santiago, Chile, Fax (562) 210 2069, E-mail: publications@cepal.org.

Name:.....
Activity:
Address:
Postal code, city, country:
Tel.:.....Fax:E.mail: