

# EXCHANGE RATE REGIMES IN THE MAJOR LATIN AMERICAN COUNTRIES SINCE THE 1950S: LESSONS FROM HISTORY \*

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## ABSTRACT

The paper analyses exchange rate regimes implemented by the major Latin American (LA) countries since the 1950s, with special attention to the period beginning in the 1970s. The aim is to evaluate the relationship between exchange rate regimes and macroeconomic performance. After an overview of the main trends followed by the major LA countries over the last 60 years, the paper focusses on regimes that were implemented (1) with stabilisation purposes (nominal anchor) and (2) with the aim of targeting competitive and stable real exchange rates. These sections analyse in greater detail some important links between exchange rate regimes and macroeconomic performance. The paper closes with an assessment of the experiences with exchange rate regimes in LA.

**Keywords:** exchange rate regimes, Latin America, economic performance, real exchange rate, stabilisation

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## RESUMEN

El trabajo analiza los regímenes cambiarios implementados por los principales países de América Latina desde la década de 1950, con especial atención al período iniciado en la década de 1970. El objetivo es analizar la relación entre regímenes cambiarios y desempeño macroeconómico. Después de una revisión de las principales tendencias seguidas por los principales países de la región, el trabajo se centra en los regímenes implementados (1) con fines de estabilización (ancla nominal) y (2) con el objeto de mantener tipos de cambio real competitivos y estables. Estas secciones analizan con mayor detalle algunos vínculos entre regímenes cambiarios y desempeño macroeconómico. El artículo concluye con una evaluación sobre las experiencias cambiarias en América Latina.

**Palabras clave:** regímenes cambiarios, América Latina, desempeño económico, tipo de cambio real, estabilización

### 1. INTRODUCTION

The economic history of Latin America (LA) is rich in episodes of interest for macroeconomists. The region has provided substantial material for the study of inflation, unemployment, business cycles, financial and balance of payments crises and, to a lesser extent, episodes of rapid growth. In this article, we make the case that exchange rate policies and regimes have played a significant role in shaping many of these macroeconomic outcomes. We develop a historical narrative and use episode analyses to study the relationship between exchange rate policies and macroeconomic performance of the major LA countries since the 1950s.

The article consists of four parts. After this introduction, Section 2 provides a historical overview of the main trends of exchange rate regimes in LA, focussing on Argentina, Brazil, Chile, Colombia, Mexico and Peru. The narrative covers the period from the 1950s until the unfolding of the subprime crisis in the United States and its effects on LA. Section 3 analyses relevant episodes that highlight important links between exchange rate policies and macroeconomic performance. Section 4 closes with the main conclusions derived from our analysis.

We follow the LA convention defining nominal exchange rate (NER) as the domestic price of a foreign currency (i.e. units of domestic currency per unit of U.S. dollar). A rise in the NER implies a depreciation and a fall an appreciation. The same logic applies for the real exchange rate (RER). Thus, higher values of the RER imply more competitive RERs.

## 2. EXCHANGE RATE REGIMES AND MACROECONOMIC PERFORMANCE: A HISTORICAL NARRATIVE

Exchange rate regimes<sup>1</sup> have been a defining element of macroeconomic policy strategies in the major LA countries. In each particular period, the choice of exchange rate regimes and macroeconomic strategies was influenced by the changes in the international financial conditions. Although these changes affected countries similarly, different choices were made. The adoption of macroeconomic policy strategies was also influenced by countries' own economic policy agendas; namely, the policy objectives that demanded immediate attention and the elements of the economic performance that it was deemed necessary to preserve. As a result, the choice of exchange rate regimes and macroeconomic policy strategies have been determined by both national economic policy agendas, which have a strong path dependent component, and the opportunities and risks brought about by changes in the international financial conditions.

### 2.1. The 1950s and 1960s

The main characteristics of the international financial conditions that LA faced during the post-war period remained virtually unchanged until the late 1960s. The international monetary system followed the Bretton Woods rules, obliging countries to maintain fixed exchange rates against the U.S. dollar in a context of low capital mobility. These parities could be adjusted in the presence of fundamental disequilibrium. Given the virtual absence of private sources, the International Monetary Fund (IMF) was the main supplier of external funding. The IMF's financial assistance was, however, conditional on changes in macroeconomic policy, including the exchange rate.

By the end of the period of high commodity prices associated with the Korean War, many LA countries started to experience balance of payments difficulties and had to rely on NER adjustments agreed on with the IMF. This was the beginning of a period characterised by stop-and-go dynamics resulting from the inconsistency between adjustable peg regimes and high inflation rates. Shortages in foreign exchange (FX) reserves required adjustment of the NER. Devaluations, in turn, transitorily alleviated the balance of payments problems due to the fall in the demand for imports caused by their contractionary effect on aggregate demand. However, they also tended to accelerate inflation due to wage indexation and real wage resistance. RER appreciation resulting from inflation led, once more, to balance of payments difficulties. This cyclical stop-and-go dynamic, caused

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<sup>1</sup> Our classification of regimes essentially coincides with that of the IMF's *Annual Report on Exchange Rate Arrangements and Exchange Rate Restrictions*.

by the inability to maintain a stable and non-overvalued RER, was a stylised fact in many countries in the region until the mid-1960s and the main reason for their mediocre growth record during this period.

In order to deal with high inflation and avoid stop-and-go dynamics, in the mid-1960s an innovative solution was found: the passive crawling peg. This arrangement adjusts the NER periodically according to the inflation differentials with trade partners so to maintain a stable RER. The objective, however, was not only RER stability but also to avoid overvaluation. There was a clear recognition among economists and policy makers at that time that more dynamic exports were required to overcome the FX constraint on growth and that maintaining a stable and competitive real exchange rate (SCRER) was essential to reach this goal. Thus, exchange rate policies conducted via crawling pegs were oriented to achieve SCRERs in several countries. Argentina was a pioneer implementing this regime in early 1964, followed by Chile in April 1965, Colombia in early 1967 and Brazil in August 1968<sup>2</sup>.

Economic performance in these countries exhibited a significant improvement after the adoption of crawling pegs. Between 1965 and 1970, annual growth in Chile accelerated to 4 per cent and non-copper exports increased substantially. Exchange rate policy shifted to a fixed regime in 1970 when Salvador Allende took office. During the first 7-year period after the crawling peg was implemented (1967-1974), Colombia experienced the period of highest economic growth in its post-Second World War history: GDP grew at 6.6 per cent annually and the value of non-traditional exports multiplied by a factor of seven. The implementation of the crawling peg in Brazil also coincided with the initiation of the period of highest growth, popularly known as *o milagre econômico* (economic miracle). Between 1968 and 1973, the economy grew at an average rate of about 11 per cent per year and exports more than tripled, stimulated by the expansion of non-traditional items. Argentina initiated a period of growth acceleration and export diversification with the implementation of the crawling peg. Although the regime was abandoned in mid-1967, the authorities managed to keep a SCRER in the subsequent period through a sharp devaluation in 1968 followed by a NER fixation. A second round of devaluations began in mid-1970, but in this case inflation accelerated and the RER gradually appreciated, prompting a massive balance of payments crisis in 1975. Overall, between 1964 and 1974, GDP grew at 5 per cent per year, non-traditional exports passed from representing less than 5 per cent of total exports to about 25 per cent and the trade balance remained always even or positive.

A negative aspect associated with these experiences was the behaviour of inflation. In Argentina, NER adjustments maintained RER stability during

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<sup>2</sup> The adoption of the crawling peg was not universal. Other countries, most notably Mexico, Peru and Venezuela, did not experience high levels of inflation and maintained fixed regimes until the 1970s.

the 3 years that the crawling peg lasted, but they also contributed to perpetuate high inflation, around 30 per cent per year. In Colombia, inflation gradually moved from figures around 5-10 per cent, before the implementation of the crawling peg, to around 25 per cent by the late 1970s and early 1980s. In Brazil the adoption of the crawling peg did not change inflationary dynamics substantially; inflation remained around 20 per cent and only accelerated after the first oil shock in 1973. Chile was the only case in which inflation was, albeit slightly, reduced.

## **2.2. The 1970s**

Between the late 1960s and the early 1970s, LA countries began to face a significantly different international context: the gradual emergence of the second wave of financial globalisation. Two key events occurred during this period. First, there was a shift in developed countries from fixed to floating exchange rates, which strongly stimulated the development of FX markets and their derivatives. Second, the countries of the Organization of the Petroleum Exporting Countries generated the first coordinated rise in the price of oil. The shock rapidly caused large current account imbalances in oil-importing countries and at the same time supplied the incipient Eurodollar market with abundant liquidity. Since then there has been a secular growth in international capital flows together with a progressive opening of capital accounts and the deregulation of domestic financial systems.

LA countries were part of this process from the very beginning. Brazil started to tap the Eurodollar market in the late 1960s. Argentina, Chile, Mexico, Peru and Venezuela joined in during the 1970s. Since then, integration with global financial markets became a very important factor for the performance of LA economies and their macroeconomic policies. In this new context, two polar cases of financial integration and macroeconomic policy strategies can be identified. One is represented by Brazil and the other by Argentina, Chile and Uruguay.

As mentioned above, Brazil had been growing at very high rates since 1968, with a relatively moderate and controlled inflation rate according to the prevalent view at that time. The oil shock of 1973 enlarged the trade deficit significantly. The Brazilian authorities decided to keep stimulating growth and to take advantage of the international financial conditions to finance not only the increased value of oil imports but also the investment required to deepen the process of import substitution. The government was the main recipient and intermediary of foreign credit, which was used to finance both public and private investment. The passive crawling peg in practice since the late 1960s was maintained. However, both the current account deficit and the foreign debt followed rising trends.

During the first half of the 1970s, Argentina, Chile and Uruguay suffered severe economic and political crises, leading to stagnation and very high

inflation. The military coups that took place were immediately followed by attempts to take advantage of the international financial conditions to introduce radical changes in the economic structures and bring inflation down at the same time. These military governments liberalised domestic financial systems, reduced taxes on trade, tackled fiscal imbalances (with varying degrees of intensity), and opened the capital accounts of the balance of payments. In the second half of the 1970s, all three countries oriented their exchange rate policies towards stabilising prices, adopting active crawling peg regimes. The so-called *tablitas* were schedules of pre-announced rates of devaluation which were meant to function as nominal anchors for inflationary expectations. However, due to an inertial component of inflation, changes in domestic prices tended to decelerate at a slower pace than the pre-announced NER devaluations. This caused substantial RER appreciations and the rapid increase in current account deficits and foreign debts.

Other countries also opened their capital accounts and borrowed from the international capital markets, but did not abandon their traditional pegged exchange rates regimes. This was, for instance, the case of Mexico. Due to an excessively expansionary fiscal policy during the early 1970s, Mexico suffered a severe balance of payments crisis in 1976, forcing the authorities to devalue for the first time in more than 20 years. The NER was fixed again in early 1977. The discovery of voluminous oil reserves at about that time and the perception that the increase in oil prices was a permanent feature encouraged the government to initiate an ambitious industrialisation programme borrowing from the international capital markets. The economy expanded at annual rates of 8-9 per cent between 1978 and 1981, inducing an acceleration of inflation, which averaged about 20 per cent yearly. Given the fixed NER, the RER appreciated and the current account deficit soared.

### 2.3. The 1980s

The rise in international interest rates following the contractionary monetary policy in the United States gradually decelerated capital inflows to LA countries. Given the high and persistent current account deficits, the erosion of foreign finance finally triggered massive balance of payments (and in most cases financial) crises in Argentina, Brazil, Chile, Ecuador, Mexico, Peru, Uruguay and Venezuela in the early 1980s. The immediate reaction of national authorities to deal with this new external scenario was to reorient macroeconomic policies to cope with the effects of the debt crisis. All countries devalued their currencies significantly and conducted monetary and fiscal policies to tackle fiscal and external disequilibria. Colombia was an exception. Since it had followed a more cautious approach to external borrowing during the boom period, the change in the external financial conditions did not have such a harsh impact on its economy. In fact, Colombia was the

only major LA country that managed to get through the early 1980s with positive GDP growth rates.

Between 1982 and 1989, the interaction of major LA countries with the international financial markets was limited to a series of negotiations concerning the external debts inherited from the crisis. Foreign credit was rationed and subject to negotiations with the creditor banks and the IMF. The countries had to make substantial payments to honour at least part of their external commitments. However, not all of them had the same economic performance during this period. Two main elements help explain their different performances: (1) the gap between the external financial needs and the financial aid provided by the international financial institutions; and (2) the inflationary processes that followed the devaluations of the early 1980s. Both factors were substantially more favourable for Chile and Colombia, as compared with Argentina, Brazil, Mexico and Peru.

Colombia's needs for external finance were relatively manageable. Chile, on the contrary, had the highest debt/GDP ratio in the region and its external credit needs were considerable. However, it managed to receive the largest proportion of the disposable resources for the region from the international institutions and also to engineer a favourable debt restructuring. On the other hand, in both Chile and Colombia the inflation rate — although it accelerated after the crises — never went beyond 35 per cent a year. For these reasons, both countries managed to balance their external accounts and avoid sharp devaluations after the first round of external adjustment. In a context of manageable inflation, both countries adopted exchange rate regimes to preserve relatively stable and competitive RERs. Colombia continued with the passive crawling peg regime adopted in the late 1960s and maintained a modest economic performance. Chile put into practice an innovative crawling bands regime in 1984 targeting a SCRER aimed at generating a significant trade surplus to compensate for the lack of external finance. The implementation of this regime coincides with the beginning of the period of highest growth in Chile's history.

The size of the external gap and the acceleration of inflation following the crises affected the economic performance of Argentina, Brazil and Mexico. For these countries, the 1980s was a lost decade. In Mexico, inflation soared from around 30 per cent annually to above 100 per cent after the 1982 crisis. Between 1984 and 1986 annual inflation rates hovered around 60-70 per cent and then accelerated again in late 1986, reaching three-digit rates until mid-1988. In Argentina and Brazil, inflation rates never fell below three digits, except immediately after the launch of the so-called heterodox stabilisation plans in the mid-1980s, when inflation rates temporarily descended to two-digit figures<sup>3</sup>. None of these three countries managed to close the external financial gap and to

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<sup>3</sup> These programs were the Argentine *Austral* plan and the Brazilian *Cruzado* plan launched in 1985 and 1986, respectively.

reach sustainable restructuring agreements with their creditors. All three countries attempted to stabilise prices with programmes that targeted external and financial equilibria. These programmes also included some sort of agreement with the international financial institutions and foreign creditors. However, external credit rationing made it increasingly difficult to maintain external and fiscal equilibria, forcing the authorities to devalue. Devaluations, in turn, accelerated inflation.

After reaching an inflation rate of 165 per cent in 1987, Mexico launched a stabilisation programme in 1988. The *Pacto de Solidaridad Económica* (Economic Solidarity Pact) was a plan that combined fiscal adjustment, NER fixation and incomes policies. The programme was successful in bringing inflation down. One year later, the plan was reformulated. The fixed exchange rate regime was replaced by a crawling peg, which followed a small rate of devaluation. In November 1991, the crawling peg was replaced with a narrow crawling band within which the NER was allowed to fluctuate. The ceiling of the band was increased by small daily adjustments, while the floor remained constant. As a result of the program, the RER tended to appreciate and the economy started to register increasing current account deficits and foreign debt. However, contrary to the experience of Argentina and Brazil with the heterodox plans, Mexico was not forced to abandon the exchange rate regime and devalue its currency to achieve external balance. A new change in the international financial conditions during the late 1980s helped the country maintain its macroeconomic policy strategy.

#### **2.4. The 1990s**

As in the second half of the 1970s, starting in late 1980s LA countries began to face a favourable external environment characterised by high liquidity and low interest rates. In such a context, in 1989 the U.S. government launched the Brady plan, which aimed to help highly indebted countries relieve their debt burden with international banks. The increased deregulation of domestic financial systems in developed economies also contributed to this process by widening the group of institutions demanding assets from these new «emerging market» countries. Overall, these changes in the international context «pushed» capital from developed to developing countries, putting an end to the period of external credit rationing that LA countries had faced during the 1980s. Mexico, Argentina, Brazil and Chile became the main recipients of foreign capital, but Colombia, Peru and other countries also received significant volumes. Capital inflows to LA peaked in 1993, fell in 1995 as a consequence of the Mexican crisis and grew again until the eruption of the Asian crises in 1997-1998.

Once again, national macroeconomic policy strategies adapted to the new international context and countries' economic policy agendas. Two polar



strategies can also be identified in this period. Argentina, Brazil and Mexico, which had unsuccessfully fought against high inflation, suffered from volatile RERs and remained stagnant during the 1980s, welcomed the new international financial conditions which made it viable to instrument stabilisation programmes using the NER as nominal anchors without facing the external credit constraint that had prevailed in the previous decade. As mentioned above, Mexico launched the *Pacto de Solidaridad Económica* based on an almost fixed exchange rate, which led to RER appreciation, current account deficits and foreign debt accumulation.

Argentina did so even more aggressively, launching the «convertibility plan» in early 1991, which was characterised by a fixed NER and the implementation of a currency board system by law. The convertibility plan was instrumented concurrently with an almost complete liberalisation of trade flows and the full deregulation of the capital account of the balance of payments. The programme was very successful at curbing high inflation. After having reached four-digit annual rates during hyperinflationary episodes in 1989 and 1990, inflation fell swiftly and steadily after the first quarter of 1991. The combination of trade liberalisation with NER fixation had an immediate stabilising effect on the prices of tradable goods, which rapidly converged to international inflation. However, as had happened in Mexico and during other stabilisation programmes, the deceleration of non-tradable price inflation was not as fast. The resulting RER appreciation and expansionary effects of stabilisation came together with large current account deficits and growing external debt.

Brazil followed a similar pattern. The new international context became functional to its macroeconomic policy strategy in 1994 when the Real Plan was launched. This stabilisation programme was carried out in three steps. First, a comprehensive adjustment of fiscal accounts was implemented. The second stage included a monetary reform, in which a new unit of account (the Unit of Real Value, URV) pegged to the U.S. dollar was introduced. The goal was to facilitate a gradual re-denomination of existing contracts — with overlapping indexing mechanisms — in the new URV. Since the value of the URV was fixed in terms of U.S. dollars, the conversion of the contractual system into URV helped eradicate indexation mechanisms from the economy. Finally, in July 1994, once the process of re-denomination of the contractual system was concluded, the Central Bank started to issue the URV — subsequently re-named *Real* — which began to circulate as the new currency. Exchange rate policy was conducted through a (narrow) bands regime, which kept the NER virtually fixed in order to provide a nominal anchor for inflationary expectations. As in Mexico and Argentina, the *Real* plan led to RER appreciation and increasing current account deficits and foreign debt accumulation.

The other polar strategy during the 1990s was that of Chile and Colombia. These countries also adapted their macroeconomic policy strategies to the new international financial conditions, but aiming to preserve key elements

of their economic policy agendas: the maintenance of SCRERs and a cautious approach towards foreign debt accumulation. Capital inflows — particularly short term flows — were considered potentially damaging because they could provoke destabilising effects on monetary policy and RER appreciation. Given that inflation was not as severe a problem as in Argentina, Brazil and Mexico, these countries oriented their macroeconomic policy towards the preservation of SCRERs, while providing at the same time enough monetary autonomy to achieve a gradual deceleration of inflation. Two instruments were important in their new strategies. First, a crawling band regime was used to target SCRERs. Second, capital account regulations were adopted to give monetary policy enough room to target a gradual deceleration of inflation. Thus, without using the NER as a nominal anchor, during the first half of the 1990s Chile and Colombia managed to reduce inflation and maintain relatively high rates of economic growth while keeping SCRERs.

Peru represents a singular case in this narrative. During the 1980s, it followed a similar path to those of Argentina, Brazil and Mexico, including the implementation and failure of a heterodox stabilisation programme and the acceleration of inflation that ended in a hyperinflationary episode in 1989-90. Thus, like these three countries, Peru began the decade with high inflation and a stagnant economy. However, as in Chile and Colombia, the macroeconomic policy strategy adopted during the early 1990s managed to reduce inflation significantly without fixing the NER. In 1990, the Central Bank of Peru stopped targeting the NER and implemented a system of monetary targets and managed floating. The restrictive monetary policy between 1990 and 1992 led to a substantial RER overvaluation, which helped decelerate inflation. Up until 2002, when the country adopted an inflation targeting regime with managed floating, the Central Bank maintained this policy relying on interventions in the FX market as the main mechanism to control the quantity of money and manage the NER. The strategy proved to be successful and reduced inflation without generating recessions. Between 1994 and 2002, the economy expanded at about 4 per cent annually and inflation fell from about 40 per cent to 3 per cent.

The rise in international interest rates in early 1994 was an important factor causing the Mexican currency crisis. Given its high current account deficits and external financial needs, speculation against the peso finally forced the authorities to let it float in December 1994. The economy contracted by 9.2 per cent and many domestic banks went bankrupt. The «tequila effect» caused a sudden stop of capital inflows to Argentina, which was also showing signs of external fragility. Granted a voluminous financial assistance package led by the IMF, Argentina managed to preserve the convertibility regime in 1995. This did not prevent, however, the contractionary impact of capital outflows on economic activity (–5.6 per cent) or the severe financial crisis that led many domestic banks to bankruptcy.

The Asian and Russian crises in 1997-1998 affected Brazil, whose external account was showing signs of vulnerability. In 1998, the current account

deficit reached 4.5 per cent of GDP and the RER a level 30 per cent lower than the average of the 1980s. In January 1999, after several months resisting a speculative attack against its FX reserves, the Brazilian authorities decided to let the Real float. The financial contagion of the Asian and Russian crises and the currency crisis in Brazil triggered a prolonged depression in Argentina beginning in the second half of 1998 and ending in a financial and external crisis in 2001-2002. The collapse of the convertibility regime caused a 19.9 per cent GDP contraction and an increase in the unemployment rate to 21.5 per cent, and left half the population below the poverty line. The government also declared a massive default on its debt denominated in foreign currency.

Chile, Colombia and Peru navigated this period better. The RER in both Chile and Colombia followed appreciating trends between the mid-1990s and the unfolding of the Asian crises. These trends were actually induced by the monetary authorities of these countries, who decided to drive the bands downward in the mid-1990s. The fact that the Mexican crisis had not significantly affected capital inflows to these economies combined with a widespread belief during that time that capital flows to emerging markets were a permanent and stable phenomenon, strengthened monetary authorities' conviction that RER appreciations were supported by fundamentals. Nevertheless, the degree of RER appreciation experienced by these countries was moderate and short-lived compared with those in Argentina, Brazil and Mexico. This difference helps to explain their relatively more robust external conditions and their greater degree of freedom to control the NER when the crises hit their economies. Nonetheless, the Asian and Russian crises had a negative impact on Chile, Colombia and Peru. The greater flexibility of the exchange rate regimes in Colombia and Peru did not prevent the negative domestic financial effects of NER depreciation and capital outflows, and both Colombia and Peru suffered financial crises in 1999.

## **2.5. The 2000s**

The Asian and Russian crises induced important changes in the views policy makers and economists held concerning the choice of exchange rate regimes in developing countries. A consensus was gradually formed indicating that developing countries would benefit from letting their currencies float and conducting monetary policy via inflation targeting regimes with an exclusive focus on inflation. In line with this predicament, most LA countries adopted floating cum inflation targeting (FIT) regimes as their macro-economic policy framework during the 2000s.

After the 1995 crisis, Mexico let the peso float while using a policy of monetary aggregates to control inflation. In 1999, it switched to an inflation targeting regime. Also in 1999, Brazil, Colombia and Chile joined the club of

FIT countries. Brazil did so as a result of its currency crisis at the beginning of that year. Both Chile and Colombia had already been using annual targets for inflation since 1990 and 1991 respectively, thus pioneering in the adoption of such a regime in the region. Peru had been using managed floating jointly with a monetary regime based on quantitative monetary targets since the early 1990s. In 2002, the Central Bank formally adopted a «pure» floating and an inflation targeting regime.

Despite their public statements about their exchange rate regime choices, none of the LA FIT countries have let their currency float in the way assumed under a conventional FIT arrangement. Intervention in the FX market has been systematic and gone beyond what is expected in a standard pure floating regime. Moreover, as documented by Chang (2008), central banks in the LA FIT countries have explicitly claimed the right to intervene in the FX market to avoid excessive NER volatility and swings.

The motives of the LA FIT countries to intervene in the FX markets have not always been the same. In the early 2000s, intervention appeared to be driven by the attempt to avoid substantial NER *depreciation*. This type of intervention has been labelled «fear of floating» by Calvo and Reinhart (2002), who identified two main reasons for it. First, depreciations are likely to accelerate inflation and thus FX interventions help curb inflationary pressures. Second, sudden upward movements in the NER can have undesired balance sheet effects in dollarised economies. Both motives seem to have induced FX intervention in LA FIT countries during the early 2000s. For instance, De Gregorio *et al.* (2005) explain that the Central Bank of Chile intervened in the FX market to contain the depreciation pressures during 2001 and 2002 generated by non-fundamental shocks such as the 9/11 terrorist attack, the convertibility collapse in Argentina and the turbulence in Brazil due to the presidential elections. Chang (2008) cites memorandums from the Central Bank of Brazil invoking similar arguments for their FX interventions during the turmoil before the presidential elections in 2002. On the other hand, some analysts, such as Dancourt (2009), have observed that, given the high degree of financial dollarisation, the Peruvian version of the FIT regime has had an explicit focus on ameliorating NER fluctuations that could affect the stability of its banking system.

Between 2004 and 2008, FX intervention by LA FIT countries was oriented, on the contrary, towards avoiding NER *appreciation*. This has been labelled «fear of appreciation» by Levy-Yeyati and Sturzenegger (2007). The buying intervention in the FX markets made central banks accumulate substantial volumes of FX reserves. During this period, Brazil's stock of FX reserves quadrupled, Peru's more than tripled and Colombia's doubled. Although Mexico's stock of FX reserves increased during this period (+50 per cent), this country had a less systematic strategy. Similarly, the Central Bank of Chile only began to accumulate FX reserves persistently in mid-2007, increasing its stock by 50 per cent between that period and the collapse of Lehman Brothers. However, the accumulation of FX by the fiscal stabilisation funds during the

copper price boom since 2004 helped avoid a massive NER appreciation without requiring the intervention of the Central Bank.

There have been two main hypotheses trying to explain fear of appreciation in developing countries. Aizenman and Lee (2007) suggest that the accumulation of FX reserves resulting from buying interventions is precautionary; namely, it is intended to reduce NER volatility and to prevent large swings of the NER due to international capital volatility. Dooley *et al.*, (2007) indicate that it is the consequence of a development strategy targeting a SCRER.

Most analysts have interpreted the buying interventions by LA FIT countries between 2004 and 2008 as motivated by precautionary reasons<sup>4</sup>. There are several elements supporting this interpretation. As documented by Chang (2008), all central banks from these countries made explicit statements that they did not pursue exchange rate targets. They claimed that under their regimes exchange rates were determined by fundamentals and FX interventions were only carried out to avoid excessive transitory deviations from fundamental levels. Certainly, statements may contradict actual actions. However, such statements seem to be backed by the actual behaviour of their RERs. In none of these countries does the behaviour of the RER resemble those observed in countries where authorities explicitly asserted that they were following SCRER strategies, such as Chile with the crawling bands (1985-1995) or Argentina with managed floating after the convertibility crisis (2003-2008), which is commented on below. The RERs in the FIT countries have tended to be significantly more volatile. Table 1 reports the coefficient of variation of the RER as an indicator of volatility. With the exception of Mexico and Peru, the RER has been substantially more volatile in the FIT countries than in Argentina and Chile when targeting a SCRER. The RER has been particularly volatile under the Brazilian FIT regime: it has been 259 per cent and 209 per cent more volatile than under managed floating in Argentina and the crawling bands in Chile, respectively. It is also worth noticing that the switch from the crawling bands to the FIT regime has resulted in more volatility in the RER of Chile (+65 per cent).

Mexico and Peru maintained stable RERs but at substantially appreciated levels, which is at odds with a SCRER strategy. Mexico followed a persistent real appreciation trend between late 1996 and early 2002 with a RER even more appreciated (about 8 per cent lower) than the year before the tequila crisis (1994). Between early 2002 and the fall of Lehman Brothers in September 2008, the RER remained slightly more depreciated than during the pre-tequila crisis, but more appreciated than the 1980-2001 average. In Peru, the RER was relatively competitive during 2002-2007 compared with the 1990s average. However, it remained appreciated if the comparison is made with the 1980s average. These trends can be observed in Graph 1 which describes

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<sup>4</sup> See, for instance, Chang (2008) for the cases of Brazil, Colombia and Peru, Agosin (2009) for Chile and Dancourt (2009) for Peru.

**TABLE 1**  
REAL EXCHANGE RATE VOLATILITY

	<b>Coefficient of variation</b>	<b>Variation (%) against Argentina (2003-2008)</b>	<b>Variation (%) against Chile (1985-1995)</b>
Argentina (2003-2008)	0.068	0%	–
Chile (1985-1995)	0.079	–	0%
Brazil (2000-2008)	0.244	259%	209%
Chile (2000-2008)	0.130	91%	65%
Colombia (2000-2008)	0.153	125%	94%
Mexico (2000-2008)	0.050	–26%	–37%
Peru (2003-2008)	0.066	–3%	–16%

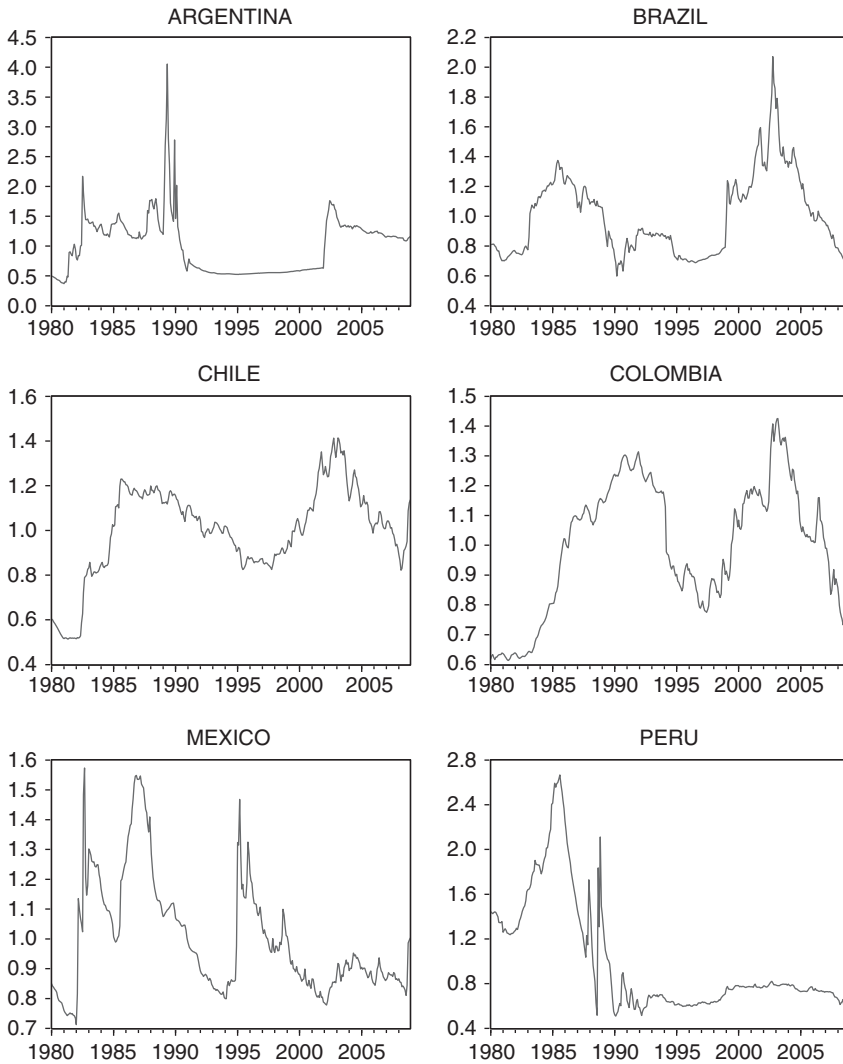
*Source:* Authors' elaboration based on International Financial Statistics, International Monetary Fund.

the behaviour of the bilateral RER with the United States (deflated by CPI indexes) between 1980 and 2008 in Argentina, Brazil, Chile, Colombia, Mexico and Peru.

Significant appreciation trends were also observed as from 2003 in Brazil, Chile and Colombia. When the inflation targets were threatened, their central banks induced NER appreciation to help meet them. This was clearly observed in the wake of rising inflation fuelled by the surge in food and energy prices beginning in 2004. All central banks raised interest rates and allowed the NER to appreciate with the aim of limiting the pass-through from imported inflation. Beginning in early 2003, the RER of Brazil followed a systematic appreciation trend, which was substantially exacerbated as from 2004. This trend lasted until Lehman Brothers' bankruptcy. At that moment, the RER had reached a minimum about 8 per cent lower than the pre-1999 crisis and about 30 per cent lower than the 1980-2008 average. Similarly, the RER in Colombia followed a persistent appreciation trend from early 2003. By mid-2008, it had reached its lowest level in 24 years, 27 per cent lower than the 1980-2008 average. The appreciation trend in Chile was smoother, although it also accelerated after 2004. By mid-2008 the RER level was about 18 per cent lower than the 1980-2008 average.

Several authors have highlighted the greater volatility and the appreciation bias that characterised the behaviour of the RER in the LA FIT countries during this period. Galindo and Ros (2008) show that the FIT arrangement in Mexico had an appreciation bias. Using a VAR model, they find that this resulted from an asymmetric monetary policy, which was tightened when the NER depreciated, but not loosened when it appreciated. Similarly, Barbosa-Filho (2008) claims that the Brazilian Central Bank also followed an asymmetric monetary policy, which was responsible for the appreciation in the RER. He observes that between 2000 and 2006, inflation targets were met

**GRAPH 1**  
 REAL EXCHANGE RATES, 1980-2008 (AVERAGE 1980-2008 = 1)



only in the years in which the RER experienced substantial appreciation. Agosin (2009) estimates a Markov-switching model for the behaviour of the RER in Chile. He finds that the shift from the crawling bands to the FIT arrangement coincides with a regime switch in the model. Similar to the

**TABLE 2**  
GDP GROWTH RATES (IN PER CENT)

	<b>Brazil</b>	<b>Chile</b>	<b>Colombia</b>	<b>Mexico</b>	<b>Peru</b>
FIT period	3.1	4.4	4.2	2.8	6.8
1991-1999	3.1	6.6	3.9	2.7	5.1
1983-1999	2.4	6.9	3.8	2.6	1.5

FIT, floating cum inflation targeting.

Source: Authors' elaboration based on World Development Indicators, the World Bank.

evidence in Table 1, Agosin finds that the volatility of the RER corresponding to the first regime (crawling bands) is substantially lower than that of the second regime (FIT).

Under the FIT regime, Brazil, Chile, Colombia, Mexico and Peru preserved price stability — which had already been achieved before the adoption of these regimes — and also kept their external accounts and financial systems robust. The fact that the strong negative impact of the global financial crisis of 2008-09 — both in terms of capital outflows and the fall in the terms of trade — did not lead to either external or financial crises and did not cause severe GDP contractions is a clear indication that these countries managed to develop stable macroeconomic configurations during the 2000s. Their greater macroeconomic stability, however, does not seem to have translated into noticeable improvements in terms of growth performance. Table 2 reports the least squares (LS) growth rates<sup>5</sup> of GDP experienced in these countries between the implementation of the FIT regime and the eruption of the global financial crisis in 2008<sup>6</sup>. To help assess their economic performance under the FIT regime, Table 2 also reports the LS growth rates over two other periods before the implementation of the FIT regimes: 1991-1999 and 1983-1999. With the exception of Peru, there is no clear indication of growth acceleration during the FIT period. Brazil, Colombia and Mexico grew at very similar rates to those in 1991-1999 and 1983-1999 and Chile actually experienced a substantial deceleration with respect to the period of the crawling bands targeting a SCRER. The acceleration of growth experienced by Peru during the FIT period, on the other hand, coincides with a significant increase in its terms of trade beginning in 2002-2004.

Argentina followed a somewhat different macroeconomic policy strategy during the 2000s. After the 2001-2002 crisis, the authorities developed a

<sup>5</sup> LS growth rates are used to avoid cyclical movements and thus capture the trend of GDP growth. They result from the LS estimation of the growth rate,  $g$ , in the regression:  $\ln y_t = a + gt$ , where  $y$  refers to GDP and  $t$  to year.

<sup>6</sup> Except for Peru, which adopted the FIT regime in 2002, all the others did so in 1999. Thus, «FIT period» in Table 2 refers to 2002-2008 for Peru and 1999-2008 for the rest.



macroeconomic regime similar to that of Chile with the crawling bands. The Central Bank adopted a managed floating arrangement, which aimed to combine a certain degree of short-run NER volatility with the preservation of a SCRER in the medium run. The Central Bank also followed a systematic policy of FX reserve accumulation to protect the economy against external shocks. The SCRER combined with fiscal discipline — to which the public debt restructuring in 2005 contributed substantially — gave the economy a robust macroeconomic configuration. For the first time in its modern history, Argentina simultaneously maintained external and fiscal surpluses for such a long period (2002-2008). This macroeconomic configuration was a key factor explaining the high acceleration of growth. From mid-2002, the economy grew steadily at annual rates of 8-9 per cent, maintaining a relatively dynamic export performance. However, by 2006-07 the economy started to show signs of accelerating inflation.

### 3. EXCHANGE RATE REGIMES AND MACROECONOMIC PERFORMANCE: EPISODE ANALYSES

In this section, we study the link between exchange rate regimes and economic performance through episode analyses. In Section 3.1, we analyse the stylised dynamics of eight stabilisation programmes in LA which used the NER as the main nominal anchor to decelerate inflation. In Section 3.2, we cover two experiences with exchange rate policies which attempted to maintain a SCRER: Chile between the mid-1980s and the mid-1990s and Argentina during the 2000s. The first group of episodes illustrates how exchange-rate-based stabilisation programmes have been successful at curbing inflation but at the cost of inducing RER appreciation which eventually led to balance of payments and financial crises with high negative effects on economic performance. The second set of episodes illustrates how exchange rate policies targeting a SCRER have contributed to accelerate economic growth and, if not coordinated adequately with other macroeconomic policies, have also tended to accelerate inflation.

#### 3.1. The exchange rate as a nominal anchor

As discussed in Section 2, the first exchange-rate-based stabilisation programmes in LA during the second phase of financial globalisation were the so-called Southern Cone stabilisation plans implemented in Argentina, Chile and Uruguay in the late 1970s. They were based on active crawling pegs (*tablitas*), in which central banks pre-announced the future values of the NER over a specified horizon. In all three cases, the schedule described an upward trajectory of the NER, starting with an initial rate of devaluation lower than the ongoing inflation rate and followed by successively decreasing

rates. The decelerating rate of devaluation would eventually converge to zero and from that moment onwards the NER would remain fixed<sup>7</sup>. The schedules were implemented in the context of broad economic liberalisation programmes. All three countries followed, with differing intensities, the liberalisation of both the current and the capital accounts of the balance of payments and the deregulation of previously repressed domestic financial markets. There was also an explicit attempt to balance the fiscal accounts, which was especially successful in Chile and Uruguay. Although the main objective of these reforms was to achieve greater economic efficiency and growth, they were also meant to play an important role in stabilising prices.

The *tablitas* were inspired by the Monetary Approach to the Balance of Payments (MABP). In a context of open trade, a decelerating rate of devaluation has a direct effect on reducing price inflation of tradable goods, according to the purchasing power parity doctrine. This was, however, not the key channel through which exchange rate policy was expected to affect prices. The effect of the pre-announcement would be to lower inflationary expectations. Disclosure of future values of the NER was an attempt to affect expectations of forward-looking contracts and thus provide a nominal anchor for future prices. According to the MABP, a reduction in expected inflation would raise the demand for money, facilitating the absorption of the money supply and, thus, lowering the inflation rate. To succeed, however, the announcement should be credible in order to induce expectations in the right direction. Under the MABP, in which the balance of payments is thought to adjust to money market disequilibria, achieving the desired expected rate of inflation requires consistency between the rate of change of the NER and the creation of domestic credit by the central bank. In particular, a deceleration in the rate of change of the NER also requires a reduction in the creation of domestic credit, for which a deceleration of the monetisation of fiscal deficits is crucial. Thus, the credibility of the announcement depends on the degree of commitment to fiscal austerity<sup>8</sup>.

The implementation of the *tablitas* did not yield the expected results. Inflation decelerated after the programmes were launched, although at a much slower pace than that involved in the devaluation schedules. Inertial inflation remained high due to the effects of backward-looking contracts, including wage indexation, but also due to the indexation of many non-tradables such as housing rents and mortgage payments. The slower speed of deceleration of non-tradable prices compared with that of tradables led to a substantial RER appreciation. On the other hand, the deceleration of expected NER devaluation initially led to a fall in domestic interest rates, as

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<sup>7</sup> Chile was the only country in which the fixation actually occurred (in mid-1979). In both Argentina and Uruguay, the schemes were abandoned before reaching that point.

<sup>8</sup> For an elaboration of the theory behind this kind of stabilisation programmes, see Calvo and Fernández (1982).

the uncovered interest parity theorem would suggest. However, due to inflationary inertia and exchange rate risk, the interest rate did not fall sufficiently to equilibrate the yields between similar domestic and foreign assets. Interest rate differentials initially triggered massive capital inflows to all three countries. The impact of greater liquidity favoured the expansion of economic activity. The economic expansion combined with the appreciation of the RER derived in current account deficits. However, since capital inflows were initially larger than these deficits, central banks managed to accumulate FX reserves during the boom years.

In all three countries, this initial expansionary phase was followed by a second and shorter one in which a gradual increase in domestic interest rates and a deceleration of capital inflows were observed. The higher cost of capital combined with the substantial RER appreciation was a negative combination for the profitability of firms producing tradable goods. The consequent contraction of the manufacture sector had a negative impact on employment, especially in Argentina and Chile. In a context of stagnant economic activity and substantial current account imbalances, the expectation that the exchange rate rule would be abandoned increased. This resulted in a further reduction of capital inflows and liquidity and higher interest rates due to higher risk premia. This situation led to financial distress in the banking system. In all three countries, banking crises occurred about 1 year before the abandonment of the exchange rate rule.

Most analyses of the Southern Cone experiments agree that the crises were brought about by the perverse macroeconomic configuration consisting of high real interest rates and overvalued RER. It is clear that the rise in domestic interest rates, after an initial period of contraction, resulted from increasing risk premia. A popular explanation for the rising risk premia pointed to inconsistencies between the programmed NER devaluations and the creation of domestic credit via public deficit monetisation. This explanation found some empirical support in the Argentine experience, where authorities had little success in reducing the fiscal deficit<sup>9</sup>. It is hard to reconcile, however, with the Chilean and Uruguayan cases, where fiscal balances were achieved before implementing the *tablitas* and maintained throughout these experiences. Thus, the rising risk premia have to be explained by other factors.

A more plausible explanation focusses on the effect of current account imbalances on worsening the expectations regarding the maintenance of the exchange rate rule. Frenkel (1983) develops a portfolio balance model showing that the risk premium increases as an endogenous result of an increase in current account deficits. The model is aimed at illuminating a context similar to those observed in the implementation of the *tablitas*, where financial agents try to take advantage of the significant spreads between the yields of foreign and domestic assets arising from credible fixed

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<sup>9</sup> See, for instance, Calvo and Fernández (1982).

or predetermined NER and capital account convertibility. The behavioural story behind the model is as follows. Given the spreads, a few local players take advantage of the arbitrage opportunities initially, issuing foreign debt to do so. Their exposure to risk essentially depends on the probability that the exchange rate rule is altered. From the viewpoint of the individual investor, engaging in external borrowing to exploit an arbitrage opportunity has no significant effect on the sustainability of the exchange rate rule. However, since the first movers are exploiting significant benefits, other players have strong incentives to jump in, even when by doing so their combined actions may have negative macroeconomic consequences.

The macroeconomic effect of financial arbitrage/speculation is where all the action happens. Capital inflows expand liquidity and credit in the economy. As a result, domestic interest rates and spreads fall, and output and employment grow. The expansion of aggregate demand leads to increases in non-tradable prices and wages, which under fixed exchange rate regimes generate a RER appreciation. The appreciation can be reinforced by the effect of inertial inflation arising from backward-looking behaviours and contracts. The combined effect of RER appreciation and higher economic growth worsens the current account balance. This gradually weakens the credibility of the exchange rate rule. As the probability of devaluation increases, capital inflows decelerate and the risk premium and the domestic nominal interest rate increase. The balance sheet of the domestic financial system — which is short in foreign currency and long in local assets — becomes increasingly fragile and vulnerable to potential NER changes. There eventually comes a point at which no interest rate can attract new external financing. Capital outflows end up forcing the central bank to abandon the exchange rate rule. The final outcome is a sequential or simultaneous twin (financial and external) crisis.

The dynamics described in Frenkel's model fits the stylised facts of all three Southern Cone failed stabilisation attempts. Furthermore, as indicated by Taylor (1998) and Frenkel and Rapetti (2009), it also captures essential elements of other stabilisation programmes during the 1990s in LA that ended in crises, including Mexico in 1994-95, Argentina in 1995, Brazil in 1998-1999, Argentina, once more, in 2001-02 and Uruguay in 2002. In these experiences, the economies followed similar boom-and-bust cycles led by the behaviour of capital movements. As explained in Section 2, all of them started with the implementation of exchange-rate-based stabilisation programmes together with the liberalisation of the current and capital accounts of the balance of payments<sup>10</sup>. The combination of these measures set a macroeconomic configuration which provided a profitable environment for capital inflows. Given the highly liquid environment since the early 1990s, capital indeed flowed into LA economies inducing RER appreciation and

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<sup>10</sup> Uruguay did not actually fix the NER, but used it to decelerate inflation gradually.

**TABLE 3**  
**MACROECONOMIC INDICATORS OF EIGHT CRISIS EXPERIENCES**

<b>Episode</b>	<b>Index of RER undervaluation</b>	<b>External debt/ exports</b>	<b>Current Acc./GDP (3 years)</b>	<b>GDP variation (%)</b>	<b>Fiscal balance/ GDP (3 years)</b>
Argentina 1978-1981	0.69	1.69/4.47	-10.4	-8.7	-9.9
Chile 1978-1982	0.92	2.47/3.71	-26.6	-16.0	12.8
Uruguay 1978-1982	0.98	1.07/2.20	-16.1	-13.3	1.9
Mexico 1988-1994	0.71	2.38/1.71	-18.4	-9.2	7.6
Argentina 1991-1995	0.69	3.74/3.35	-10.2	-5.6	1.7
Brazil 1994-1999	0.68	2.87/4.05	-11.1	-1.6	0.0
Argentina 1991-2002	0.70	3.74/4.48	-8.8	-19.9	-7.3
Uruguay 1991-2002	0.85	1.72/3.19	-7.9	-14.7	-11.8

*Source:* Authors' elaboration based on World Development Indicators, Penn World Tables 6.2 and national official sources.

increasing external fragility in the form of excessive current account deficits and foreign debt accumulation. In all these cases, the widespread perception that the exchange rate rule would hardly be maintained in such fragile contexts triggered capital outflows and balance of payments crises. Except for the case of Brazil, where domestic financial contracts were mostly signed in domestic currency, the high degree of financial dollarisation in these countries turned the external crises into banking crises. With the exception of Brazil, in all these cases the crises occurred with significant GDP contractions.

Table 3 reports some macroeconomic indicators which characterised the stylised facts of the cycle described above for eight episodes of currency crisis in LA. The first column indicates the crisis episodes, including the years in which the stabilisation programmes were launched and the years of the exchange rate crises. The second column reports the value of an index of RER undervaluation for the year before each crisis episode. Values below (above) unity indicate that the RER was overvalued (undervalued)<sup>11</sup>. The third and fourth columns provide two indicators of external fragility: the external debt to export ratio and the accumulated current account balance to GDP ratio during the three years before the crises. The former is a standard measure indicating the ability to repay foreign debt and the latter gives an indication of the pace of net foreign debt accumulation in the years before the crises. For the external debt to exports ratio, we present both the value for the year in which the stabilisation programme was launched and the value for the year of the currency crisis, separated by a slash, «/». The fifth column reports

<sup>11</sup> The appendix at the end of the article explains how this index was constructed.

the GDP variation between the pre-crisis peak and the trough of each episode. Finally, the sixth column shows the government balance as a share of the GDP accumulated for the three years previous to the crises, as an indication of whether countries were running fiscal imbalances before the crises.

In all cases, the undervaluation index was below unity suggesting that before the crises there were signs of overvaluation. In most cases, the RERs appear to be substantially overvalued. For instance, the RER in Argentina before the abandonment of the *tablita* in 1980 was 31 per cent lower than «equilibrium». There are additional indications that these countries were facing fragile external conditions. Almost all countries experienced significant increases of the external debt/exports ratio. The most dramatic example is again that of Argentina during the *tablita*: external debt jumped from 1.69 to 4.47 times exports. This indicator did not worsen in the cases of Argentina and Mexico during the first half of the 1990s; in both cases, the ratios actually decreased. These figures are obscured by the fact that both countries initiated processes of regional trade integration (Mexico, the NAFTA and Argentina, the Mercosur) in those periods. This increased their exports substantially but had an even greater effect on their imports. These trends can actually be seen in their high current account deficits in the years before the crises. Mexico, for instance, accumulated a current account deficit of 18.4 per cent of GDP in the three years before the crisis. Accumulation of significant current account deficits was not exclusively a Mexican trait; it occurred in all these episodes. The most significant one was that of Chile during the *tablita*, where the current account accumulated a deficit of 27.4 per cent of GDP between 1979 and 1981. The fifth column shows that, except for the case of Brazil, which experienced a mild recession, all these episodes ended in currency and financial crises with high contractions in GDP. Finally, the last column of Table 3 suggests that there is no strong evidence indicating that these crises were caused by fiscal imbalances. In fact, in most cases countries had been running fiscal surpluses before the crises.

### **3.2. Exchange Rate Regimes Targeting a SCRER**

As commented in Section 2, the implementation of crawling pegs in Argentina, Brazil and Colombia during the 1960s attempted to maintain SCRERs. With these regimes, the countries avoided the stop-and-go cycles that had characterised their economic performance with adjustable pegs and managed to sustain rapid growth rates for long periods. It is worth highlighting that these three experiences are included in the group of growth acceleration episodes in LA detected in the influential study by Hausmann *et al.* (2005). These authors developed an algorithm to detect growth acceleration episodes, which are defined as cases in which (1) *per capita* GDP growth in an 8-year period is at least 3.5 per cent, (2) the growth rate is at least 2 per cent higher than the previous 8-year period and (3) the post-growth output exceeds the pre-episode

peak. Using this metric, they find that — among a few other cases — Argentina in 1963, Colombia in 1967 and Brazil in 1967 began periods of sustained and rapid growth. Not surprisingly, the initiation years coincide almost identically with those in which crawling peg regimes were adopted in each country.

Our historical narrative identified two other relevant experiences in which exchange rate policy was oriented to maintain a SCRER: Chile with the crawling bands between 1984 and 1999 and Argentina during the 2000s. The case of Chile was also detected by Hausmann *et al.* (2005) as a growth acceleration episode starting in 1986. The Argentine experience was not detected because their study was conducted when the episode was in its initial years. However, if one applies their metric to Argentina's GDP *per capita* series up until 2010, the post-convertibility experience appears as a growth acceleration episode starting in 2002. We analyse the Chilean and Argentine experiences below.

### 3.2.1. *The Chilean crawling bands, 1984-1999*

The collapse of the *tablita* experiment pushed the Chilean economy into a deep depression. Following a pragmatic strategy, based on a significant NER depreciation and tight controls on FX transactions, by late 1983 the government of Augusto Pinochet managed to stabilise the situation. With a RER about 60 per cent higher than that prevailing immediately before the *tablita* collapse, the Central Bank introduced a passive crawling peg in December 1983 to maintain the RER stable around such a competitive level. The lack of foreign credit resulting from the default on external debt and the low terms of trade forced the economy to make a significant current account adjustment, for which maintaining a SCRER was deemed essential.

In August 1984, a fluctuation band of  $\pm 0.5$  per cent was introduced. The NER was allowed to float freely within the band defined around a «central parity», which was in turn determined by a Purchasing Power Parity (PPP)-rule. The bands were subsequently increased several times<sup>12</sup>. From this moment until September 1999, when the Central Bank decided to let the peso float, Chile followed this exchange rate regime based on PPP-adjusting moving bands that has been labelled «crawling bands».

Pursuing a SCRER via a PPP-rule — and occasionally through significant discrete nominal devaluations — entailed a risk of accelerating inflation. But, as Vergara (1994) points out, the drastic scarcity of FX under which the economy was operating left the authorities with no choice: they had to prioritise RER competitiveness over price stability. The potential trade-off between these two objectives, however, was not necessarily binding. Given the high level of unemployment and capital underutilisation, the inflationary

<sup>12</sup> They were widened to  $\pm 2$  per cent in June 1985, to  $\pm 3$  per cent in June 1988, to  $\pm 5$  per cent in June 1989 and  $\pm 10$  per cent in January 1992.

pressures on wages, non-tradable goods and services were mild<sup>13</sup>. Thus, with the objective of reducing the external deficit and given that the economy was operating far below full employment, between 1984 and 1989 the government managed to maintain a SCRER without accelerating inflation. During this period, the RER was on average 75 per cent higher than in 1982, while the inflation rate fluctuated around 20 per cent per year. During this 6-year period, the economy underwent a rapid recovery (6.3 per cent annually), exports grew steadily (about 7 per cent annually) and the current account deficit was substantially reduced.

In late 1989, the Pinochet administration declared the independence of the Central Bank and established explicit mandates for price stability and the maintenance of external sustainability. The latter actually implied the institutionalisation of a mandate for the maintenance of a SCRER. When the democratic government of Patricio Aylwin took office in 1990, the inflation rate had temporarily accelerated to a peak of about 30 per cent and unemployment had fallen to 8 per cent. As from 1990 the Central Bank tackled the price stability mandate through an inflation targeting regime aiming at gradually reduce inflation.

As mentioned in Section 2, the early 1990s was a period in which international capital began to flow into the major LA countries, including Chile. The massive and persistent inflows of capital hindered the Central Bank's ability to attain the SCRER and price stability mandates simultaneously. The situation was an example of the well-known open-economy trilemma. The fact that inflation was still high by international standards implied that the monetary authority had to set domestic nominal interest rates high enough to achieve real interest rates that would induce a deceleration of inflation. Consequently, domestic interest rates were substantially higher than those in the international markets even after adjusting for the expected NER depreciation. This interest rate differential implied a quasi-fiscal cost for the Central Bank, when implementing sterilised interventions in the FX market. At this juncture, the authorities essentially faced three options: (1) let the peso float and therefore appreciate both the NER and the RER, (2) assume the quasi-fiscal cost of the sterilised FX interventions or (3) limit capital mobility. The initial solution was a compromise between the three.

First, in mid-1991, Chile introduced a non-remunerative reserve requirement (*encaje*) of 20 per cent in the Central Bank for a year on loans from abroad and later on some equity transactions. The *encaje* was meant to reduce the return on exploiting the interest rate differential. It was expected that short-term speculative flows would be discouraged and thus the appreciation pressures would relax.

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<sup>13</sup> The constraints on labour unions' activity and the deregulation of the labour market institutions during Pinochet's dictatorship contributed to a great extent to keeping wage inflation under control.



Second, in January 1992, after a year and a half of maintaining the NER on the lower bound of the bands with this strategy, the Central Bank ceded to market pressure and revalued the «central parity». The authorities had resisted the appreciation pressures because they feared that capital inflows would be transitory. However, the persistent inflow of capital ended up convincing them that Chile was facing a more permanent supply of foreign saving than during the immediate post-crisis period. To increase its degrees of freedom, the Central Bank also decided to widen the bands from  $\pm 5$  per cent to  $\pm 10$  per cent.

Finally, in July 1992, after increasing the *encaje* to 30 per cent, the authorities switched the peg against the U.S. dollar to a basket containing the three principal world currencies: U.S. dollar (45 per cent), deutsche mark (30 per cent) and Japanese yen (25 per cent). Besides the greater flexibility, a further motivating factor was to introduce some short-term noise in the U.S. dollar-peso exchange rate and thus discourage speculative capital movements.

These initiatives allowed exchange rate policy to maintain a SCRER during the 1991-1994 period, which in turn stimulated economic activity, particularly that of tradable firms. GDP and exports grew at average rates of 6.8 per cent and 8.5 per cent, respectively, while the current account deficit averaged 1.9 per cent of GDP<sup>14</sup>. The focus on a SCRER did not undermine the goal of reducing inflation. During the same period, the inflation rate went down from 22 per cent to 11 per cent.

Despite this successful performance, the mandate for price stability gradually overshadowed that for a SCRER. The persistence of capital inflows well above the targeted current account deficit persuaded the authorities that the RER needed to appreciate. In November 1994, the central parity was appreciated by 10 per cent. Contrary to Argentina and other emerging market economies, the Mexican crisis of 1994-1995 had no significant effect on Chile. Foreign capital continued to flow systematically and the view favouring a real appreciation was reinforced. Although the crawling band regime was not abandoned, exchange rate policy was reoriented in order to help monetary policy reduce inflation. With that goal, between late 1995 and the contagion of the Asian crises in late 1997-1998, the NER was kept virtually constant within the bands.

After the eruption of the Asian crises, the authorities initially narrowed the bands and intervened in the FX market in order to smooth the NER depreciation generated by the reversion of capital flows. The intervention aimed to avoid an acceleration of inflation above the official target. The narrower bands, however, undermined the credibility of the regime and when the Russian crisis unfolded, the peso suffered an intense speculative attack forcing the authorities to broaden the bands. The emphasis on price stability

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<sup>14</sup> Agosin (1999) documents the positive effect of a SCRER on GDP and exports during this period.

over the SCRER was finally institutionalised in September 1999, when the Central Bank formally switched to a floating regime, eliminated the *encaje* and oriented its action almost exclusively towards the price stability objective.

### 3.2.2. *Managed floating in Argentina, 2002-2008*

Argentina formally abandoned the currency board (AR\$/\\$1) in January 2002 in the midst of a severe crisis. In a context of high political and economic uncertainty, where the Central Bank was running out of FX reserves, the NER skyrocketed and reached a peak close to AR\\$/\\$4 in July 2002. Given the distrust in banks (due to the banking crisis) and in the Treasury (due to the default on the public debt), the economic depression and the accelerating inflation generated by the NER depreciation, the U.S. dollar emerged as the only secure asset in which to allocate savings.

The stabilisation of the FX market started in July 2002. The Central Bank introduced controls on FX transactions and pursued a more active intervention strategy, selling U.S. dollars in the market. Both the NER and RER began a downward trend. Despite this tendency, the RER remained at very competitive levels. In July 2003, when the government started to intervene actively in the FX market in the opposite direction — now to contain the appreciation pressure — the effective RER was 93 per cent higher than during the convertibility regime (1991-2001) and 23 per cent higher than the 1980-2001 period average. The decision to stop the appreciation trend was motivated by the official diagnosis that awarded the SCRER a key role in both the recovery of output and employment and in the improvement of the external and fiscal balances<sup>15</sup>.

As in the Chilean experience, the management of a SCRER during this period faced several challenges. In 2002, when the Congress passed a law revoking the currency board, the government decided to maintain the Central Bank's independence with a principal mandate for price stability. Because the transmission mechanisms of the interest rate were seen as uncertain and weak after the substantial contraction of the domestic financial sector, the Central Bank decided to follow a pragmatic policy based on quantitative monetary targets, instead of a standard inflation-targeting scheme like the LA FIT countries. From 2003 on, targets were announced at the beginning of every year in the Central Bank's monetary programmes, in which the authorities committed themselves to maintaining monetary aggregates within a certain range. Under this regime, monetary targets were meant to operate, at least in theory, as a nominal anchor.

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<sup>15</sup> The positive effect of the competitive RER on the fiscal accounts derived from the tax revenues on agricultural and oil exports introduced at the beginning of 2002, which accounted for about 2.3 per cent of GDP, a magnitude equivalent to almost 55 per cent of the federal primary surplus. See Damill *et al.* (2010) for details.

A stylised fact during this period was that the upper bound of the monetary targets was systematically lower than the monetary expansion that resulted from Central Bank's interventions in the FX market. Since the monetary expansion created by the buying interventions in the FX market to keep a SCRER tended to exceed that in the monetary programme, an «excess» of money creation had to be absorbed every year. To achieve this goal, the Central Bank used sterilisation operations issuing notes (LEBACs)<sup>16</sup>. Given that, during most of this period, the FX market operated with an excess supply of U.S. dollars, the monetary authority managed to reconcile the two policy objectives with two instruments. With interventions in the FX market, the Central Bank controlled the NER as a means to achieve a SCRER. With the sterilisation operations in the money market, it maintained monetary aggregates within the pre-announced ranges, aiming to provide an anchor for the private sector's inflationary expectations.

Following the SCRER strategy, Argentina experienced one of the most successful growth episodes in its economic history<sup>17</sup>. From mid-2002 to mid-2008, the economy grew at an average annual rate of 8.5 per cent. The favourable external conditions — that is, the high international prices of agricultural commodities — were important, but explained only part of the economic performance. It was the expansion of the whole tradable sector that pulled the economy up and put it on a rapid growth path. Volatile economic growth in Argentina has traditionally been associated with external deficits. During the post-convertibility period, on the contrary, the economy expanded while maintaining a stable current account surplus. Analysts tend to agree that the dynamic behaviour of output, employment and investment has been associated with the positive effects of the SCRER on manufactures and other tradable activities<sup>18</sup>.

One negative aspect of the economic performance during this period was the acceleration of inflation beginning in 2005<sup>19</sup>. This was partly due to the global rise in commodities prices, especially during 2007. However, evidence clearly suggests that inflation accelerated as an endogenous result derived from the tightening conditions in the labour market and the excessively rapid expansion of aggregate demand. The initial phase of rapid growth (from mid-2002 to mid-2004) occurred in a context of highly underutilised capacity and

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<sup>16</sup> See Frenkel and Rapetti (2008) for details.

<sup>17</sup> Since the Great Depression of the 1930s, this episode is only comparable with that initiated with the implementation of the crawling peg in 1964, commented on in section 2. See Albrieu and Fanelli (2008) for details.

<sup>18</sup> See, among others, Tavosnanska and Herrera (2011).

<sup>19</sup> The consumer price index (CPI) inflation rate was 6.1 per cent in 2004, 12.3 per cent in 2005 and 9.8 per cent in 2006. In January 2007, the government introduced controversial methodological changes in the construction of the CPI. Since then, the official figures have been systematically lower than private estimates. For instance, according to the private consulting firm Buenos Aires City, the CPI inflation rate for 2007 and 2008 was 25.7 per cent and 23 per cent, respectively, whereas the official estimates were 8 per cent and 7 per cent, respectively.

high unemployment and underemployment in the labour market. As the economy recuperated, aggregate investment reacted with high sensitivity to economic growth. Thus, with the exception of some particular sectors, capacity remained far from fully utilised. However, the reduction of unemployment and underemployment — which moved from 17.3 per cent and 17.1 per cent in 2003 to 7.9 per cent and 8.8 per cent in 2008, respectively — contributed to the rise of wages. A very active wage policy since 2004 also contributed to the rise of wages. As a result, real wage increases went far beyond productivity growth in many sectors, inducing cost-push inflationary pressures.

The acceleration of inflation was also associated with the lack of coordination of macroeconomic policy<sup>20</sup>. Given that monetary and exchange rate policies focussed on preserving a SCRER in order to accelerate growth, fiscal policy could have been used to moderate the pace of aggregate demand when inflationary pressures arose. On the contrary, public spending expanded well above the increase of tax revenues since 2006, thus adding an expansionary fiscal impulse to an already fast-growing aggregate demand.

#### 4. CONCLUSIONS

The most important lesson that can be drawn from our analysis is that the level of the RER has had a significant influence on the macroeconomic performance of major LA countries. We showed that fixed and semi-fixed exchange rate regimes used in stabilisation programmes have typically led to excessive RER overvaluation and balance of payments and financial crises. The Southern Cone experiences of the late 1970s and that of Argentina during the 1990s attest that this type of crisis can reach the dimension of great depressions. The LA experience thus supports the extended view that overvalued RERs have detrimental effects on economic growth<sup>21</sup>. In the case of many LA countries, this relationship has been mediated to a great extent through economic crises.

Our analysis not only provides support to the view that overvalued RERs hindered growth, but it also presents suggestive evidence that competitive levels can stimulate growth. Our historical narrative and episode analyses suggest that major LA economies have tended to perform better when the exchange rate policy was purposely oriented towards preserving a SCRER. For instance, arguably the two most successful growth experiences in LA during the post World War II period have occurred in parallel with the implementation of regimes targeting SCRERs. These experiences are the Brazilian miracle starting in the late 1960s simultaneously with the implementation of the crawling peg, and Chile's experience with the crawling

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<sup>20</sup> On the need for macroeconomic policy coordination when a country simultaneously pursues price stability and a SCRER target, see Frenkel (2008) and Rapetti (2011).

<sup>21</sup> See, for instance, Easterly (2005).

bands between the mid-1980s and mid-1990s. Other important cases illustrating this point include the crawling pegs in Argentina and Colombia between the mid-1960s and mid-1970s and the managed floating in Argentina following 2002. Certainly, this observation should not be interpreted as indicating that exchange rate regimes targeting a SCRER are the only explanation behind the success of these experiences. But as a minimum, our historical narrative and episode analyses support the conclusion reached by a substantive body of econometric research, finding that competitive RER levels tend to foster economic growth in developing countries<sup>22</sup>.

Both because of the negative effects of overvaluation and the positive effects of undervaluation, our analysis indicates that exchange rate policy can make an important contribution to economic development by avoiding overvaluation and preserving a SCRER. In other words, our analysis suggests that exchange rate policy is not neutral for economic growth and development.

A second lesson emerging from our study is that the preservation of a SCRER requires macroeconomic coordination. The level of the RER, by determining the relative price of domestic and foreign goods, affects aggregate demand. Given the unemployment rate, aggregate demand affects the price level. A sustained excessively undervalued RER would ultimately lead to a rise in prices and therefore to a real appreciation. If the exchange rate policy tries to preserve the original RER level by devaluing the domestic currency, the strategy would lead to the acceleration of inflation. Some of the experiences described in this article illustrate this point. During the years that the crawling peg was used in Colombia (1967-1991), the inflation rate followed a gentle but persistent upward trend. Argentina's post-convertibility performance with the managed floating regime, in which the inflation rate accelerated especially since 2007, is another eloquent example.

It would be wrong, however, to conclude that this is an unavoidable result of any exchange rate policy focussed on a SCRER. For instance, the experience of Chile between the mid-1980s and mid-1990s is an example of macroeconomic policy coordination in which a SCRER and declining inflation were simultaneously achieved. This macroeconomic policy strategy combined a crawling band regime, capital controls, countercyclical fiscal policy and an autonomous monetary policy. The combination of crawling bands, sterilised interventions and capital controls allowed the Central Bank to avoid the policy trilemma and simultaneously set the interest rate and the NER. Fiscal policy was additionally used to avoid aggregate demand pressures. With these policies the authorities managed to preserve a SCRER, reduce inflation, promote rapid growth of both exports and GDP, and avoid external and financial crises during turbulent periods. This successful trajectory lasted for more than a decade.

The strategy was abandoned because the authorities understood that the policy of simultaneously targeting the NER and setting the interest rate was

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<sup>22</sup> See, among others, Gala (2008), Rodrik (2008) and Rapetti *et al.* (2011).

incompatible with international financial integration. They interpreted that the quasi-fiscal cost of sterilised interventions of about 0.5 per cent of GDP was an indication that the policy would not be sustainable over time<sup>23</sup>. The authorities switched to a FIT regime to provide macroeconomic policy greater flexibility to deal with international capital movements. Within this new policy orientation, the preservation of the SCRER was sacrificed. Another option would have been to shift to a managed floating regime and preserve the focus on the SCRER. Given that the preservation of this objective may have hindered monetary policy autonomy, the maintenance of capital controls would have been required.

A third lesson that emerges from our analysis is that LA countries have benefited from adopting more flexible exchange rate regimes to deal with international financial volatility. In the 2000s, all major LA countries adopted managed floating regimes. Under conditions of low inflation — as has been the case of all these economies since the late 1990s — this arrangement has shown to be highly valuable because it provides the same flexibility to absorb unexpected shocks as a pure floating regime, while it also entitles the monetary authority to intervene in the FX market and influence the behaviour of the NER when considered appropriate. In developing countries, this option is very valuable given the potentially large effect of capital flows on the NER and the importance of this variable in the determination of others, like inflation and the RER.

Finally, our study shows that FX reserve accumulation in LA has proven to be very useful. There is little doubt that the large stocks of FX reserves — together with the greater NER flexibility — were essential to help central banks handle the impact of the international financial crisis of 2007-2008. Despite the skeptical assessment by some analysts and even the IMF, it would be a hard task to persuade central banks in LA of the inefficiencies of accumulating FX reserves after this experience.

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<sup>23</sup> A common view suggests that sterilised interventions can only be used in the short run and are unsustainable for longer periods. Frenkel (2007) shows the conditions under which they are sustainable in the long run. On a more pragmatic note, Williamson (1996: 30) pointed out, regarding the cost of sterilization in Chile in the mid-1990s, that: «[if paying 1-1.5 per cent of GDP] is the price of preserving a model that works, it would be cheap.»

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## APPENDIX

Using annual data from Penn World Tables 6.2 and following the methodology pursued by Rodrik (2008), we first calculate the actual real exchange rate (RER) as the ratio between the nominal exchange rate (XRAT) and the purchasing power parity (PPP) conversion factor. Both variables are expressed as national currency units per U.S. dollar. Since PPP is calculated over the entire GDP, the basket includes non-tradables for which we do not expect the law of one price to hold. Thus, in order to calculate equilibrium RERs, in a second step we adjust for the Balassa–Samuelson effect, regressing RER on real GDP *per capita* (RGDPCH) in a panel consisting of 188 countries between 1950 and 2004:

$$\ln \text{RER}_{it} = \alpha + \beta \ln \text{RGDPCH}_{it} + f_t + \varepsilon_{it}$$

where  $i$  and  $t$  are country and time indexes, respectively,  $f_t$  accounts for time fixed effects and  $\varepsilon_{it}$  is the error term. Like Rodrik, we obtain an estimate of  $\beta = -0.23$  with a  $t$  statistic of  $-43.72$ . The negative sign of the coefficient is in line with the Balassa–Samuelson prediction. Finally, we define the index of RER undervaluation (UNDERVAL) as

$$\text{UNDERVAL}_{it} = \frac{\text{RER}_{it}}{\widehat{\text{RER}}_{it}}$$

UNDERVAL is the ratio of actual to Balassa–Samuelson-adjusted RER. Defined this way, UNDERVAL is comparable across countries and over time; when it is below (above) unity, the domestic currency is overvalued (undervalued) in real terms.