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How Optimal are the Extremes?

Latin American Exchange Rate Policies
During the Asian Crisis

Ricardo Ffrench-Davis[1]
and Guillermo Larraín[2]

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Abstract

During the Asian crisis, intermediate exchange rate regimes vanished. It has been argued that those regimes were no longer useful and only the extremes remained valid. The paper analyses three foreign exchange regimes: Argentina (pegged), Chile (band) and Mexico (float). The Argentinean currency board delivered low financial volatility while it was credible, but even then it displayed high real volatility. Mexican float performed well in periods of instability isolating the real sector. The Chilean band delivered a mixed outcome as compared to Argentina and Mexico. This is linked apparently to a loss in the band's credibility, associated to policy mismanagement and an over-appreciation in the biennium before the crisis. Optimal exchange rate regimes vary across time and the conjuncture. Exit strategies are part of the election of the optimal system, including a flexible policy package rather than a single rigid policy tool.

[1]Principal Regional Advisor at ECLAC and Professor of Economics at Universidad de Chile. [2]Chief Economist of BBVA Banco Bhif and Associate Fellow, Centro de Economía Aplicada, Departamento de Ingeniería Industrial, Universidad de Chile

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One common feature of countries most affected by the Asian crisis and its waves – such as Thailand, Malaysia, Indonesia, Republic of Korea and Brazil – is that they had exchange rate systems which in different versions where closer to pegged systems rather than floating systems (they were often called 'soft pegs'). Countries with exchange rate bands such as Israel, Chile and Colombia also suffered. On the contrary, floating countries such as Australia, New Zealand and Mexico behaved apparently better. Based on that, many observers have concluded that the intermediate exchange rate systems are dangerous and that optimality would be located in the extremes. This paper will evaluate such a conclusion by analysing three experiences of different exchange rate systems: Argentina, Chile and Mexico. These countries have had diverging exchange rate (ER) policies, at least formally.[1]

A simple observation of recent events is that countries with pegged systems, such as the currency boards Hong Kong and Argentina, did suffer significant contagion in times of international financial stress. Argentina experienced deep recessions during both the Mexican and the Asian crises. Hong Kong suffered a recession as a consequence of the Asian crisis but during the Mexican crisis growth merely decelerated from 5.4 per cent in 1994 to 4.0 per cent in 1995. There are reasons to believe that completely rigid exchange rate systems may amplify external shocks. Apparently, they put too strong and therefore unrealistic requirements on domestic flexibility, in particular on wage and price flexibility. The amplification effect arises because during an external shock agents may consider that a shock that is strong enough can induce authorities to modify exchange rate policy; this is particularly so when the exchange rate appears to be *too* appreciated. Rigid systems are therefore prone to changes in market sentiment and credibility (eventually, with the exception of full dollarization).

In its turn, bands did not behave well during the Asian crisis. In many cases, that was partially induced by the actual management of the band. The huge increase in capital inflows to emerging economies that took place between 1990 and 1997, did put severe upward pressure on the value of domestic currencies. The response in terms of expanding the size of the band or appreciating it induced a credibility loss. Subsequently, bands had trouble in adapting to a new real exchange rate when the Asian crisis appeared and capital inflows suddenly stopped. These facts aggravated the bands mismanagement and therefore induced a further credibility loss. The major benefit of the band system arises in times of normality, without severe or one-sided shocks. In that case, bands induce more exchange rate stability keeping the ability to partially absorb the effects of standard shocks. Consequently, the exchange rate fulfils more efficiently its allocative role between tradables and non-tradables. The main trouble with bands appears in times of financial distress.

After a general discussion (Section 1), the paper will examine the experiences of three symbolic cases of different exchange rate policies. On the currency board side, we consider the experience of Argentina (Section 2) in order to understand the appeal this system has had for other countries, some of which later did dollarize. We examine Chile (Section 3) in the case of intermediate regimes and Mexico (Section 4) in the floating side. The analysis will focus in the period since the Asian crisis.

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[1] See Fischer (2001) and Levy and Sturzenneger (1999) for a classification of ER Regimes.

1　Exchange rate regime and stability of financial and real sectors

The Asian crisis and its aftermath represented a considerable shock not only for Asian countries but Latin Americans as well, whereas with different intensities. Chile was by far the country most directly affected given its significant trade relations with Asia. But as emerging markets spreads increased, especially after the Russian default, Brazil and Argentina also felt its consequences. Later the Brazilian devaluation further introduced uncertainties that affected all Latin America. We are examining therefore a period of *instability* and big shocks.

Table 1 compares the outcome in terms of financial and output volatility of several countries with different initial exchange rate regimes, in the specific period immediately after the explosion of the Asian crisis. In order to compare financial and real volatility, we construct a *financial volatility index* (FVI), which can be computed independently of the exchange rate regime.[2] If CV denotes the coefficient of variation, the index is defined simply as

$$FVI = CV(ER) + CV(Reserves) + CV(Nominal\ interest\ rates)$$

Table 1

Volatility in selected countries during international financial turmoil

(Period 1997Q3–1999Q4)

Coefficient of variations of the levels

Country	Initial exchange rate system	Nominal exchange rate %	International reserves %	Interest rates %	Index of financial volatility %	Volatility of GDP %
		(a)	(b)	(c)	(a)+(b)+(c)	
Argentina	Fixed	0.0	7.9	13.1	21.0	5.3
Hong Kong	Fixed	0.1	3.9	23.0	27.0	5.5
Australia	Float	5.7	14.5	14.2	34.4	0.6
Mexico	Float	8.5	5.6	22.6	36.7	1.9
New Zealand	Float	7.8	5.7	27.4	41.0	2.3
Chile	Band	8.2	8.2	31.1	47.5	5.3
Colombia	Band	16.7	8.2	26.4	51.3	4.5
Thailand	Soft Peg	9.4	9.0	42.1	60.5	7.3
Malaysia	Soft Peg	9.8	19.0	37.9	66.7	7.8
Brazil	Soft Peg	25.1	26.8	26.4	78.3	1.6
Korea	Soft Peg	14.8	36.4	30.7	81.9	8.5

Source:　Own calculations based on IMF data.

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[2]　See a recent discussion on sources of volatility in Latin American American economies in Rodrik (2001).

When a country faces a period of stress, it normally reacts by depreciating the exchange rate, selling international reserves or increasing interest rates. In fixed ER regimes, volatility appears in reserves and interest rates, while in a pure float volatility should appear in the exchange rate and interest rates. Bands or dirty floating systems combine all three elements. Real sector volatility is captured using the standard deviation of GDP growth.

The table ranks countries after their *financial volatility index*, and we obtain five important and to some extent surprising conclusions about the role of exchange rate policy during the Asian crisis:

a) the ranking following the *financial volatility index* groups countries according to their exchange rate system,

b) fixed systems appear to have delivered more nominal stability than alternative systems, but they display more volatility in real variables, namely GDP growth,

c) floating regimes present the lowest volatility in GDP, while they have a higher financial volatility than fixed systems,

d) soft pegs display the worst combination of financial and real volatility,

e) bands belong to an intermediate ground, with higher financial volatility than credible fixed systems and more real volatility than floating regimes.

Some qualifications are required at this point. First, the apparent smaller financial volatility in fixed exchange rate regimes is probably due to the fact that *in this particular period (1997Q3–1999Q4)* there were no serious challenges in Argentina or Hong Kong to the stability of the exchange rate policy.[3] Therefore, the right conclusion is that a *credible* fixed exchange rate policy delivers high financial stability. But from this observation it also follows that, despite having had credible ER policies, Argentina or Hong Kong also had high output volatility. In the case of Argentina, some observers have signalled that the problem is the rigidity in the labour market, but the fact that in this period Hong Kong displayed a worse volatility record leads to think that such an argument may be overplayed. Moreover, if we compare inflationary records, they are not so dissimilar. Moreover, in this same period the *cumulative* annual inflation in Argentina was –0.4 per cent while in Hong Kong it was was 1.8 per cent. Prices therefore had been contributing towards a real depreciation in Argentina more intensively than in Hong Kong.[4]

Second, as we shall see, the Chilean band was already suffering lack of credibility over the period considered. Hence, faced to a shock as strong as the Asian crisis, when the stabilising properties of the rigid part of the band mechanism should have appeared, they did not because credibility had been lost. Hence, once again, the right conclusion is that when faced to a shock, a *non-credible* band delivers high volatility, both financial and real. What cannot be argued is that the lack of credibility is inherent to the band system.

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3 That becomes evident when we consider Argentina in 2001.

4 However, we are not controlling here by the degree of overvaluation of the exchange rate in each country. It is evident that because in Argentina the ER was used explicitly as an anti-inflationary device and did appreciate sharply in 1991–92, the required fall in domestic prices and wages was notably stronger than what effectively took place.

Figure 1

GDP Volatility versus different financial volatilities
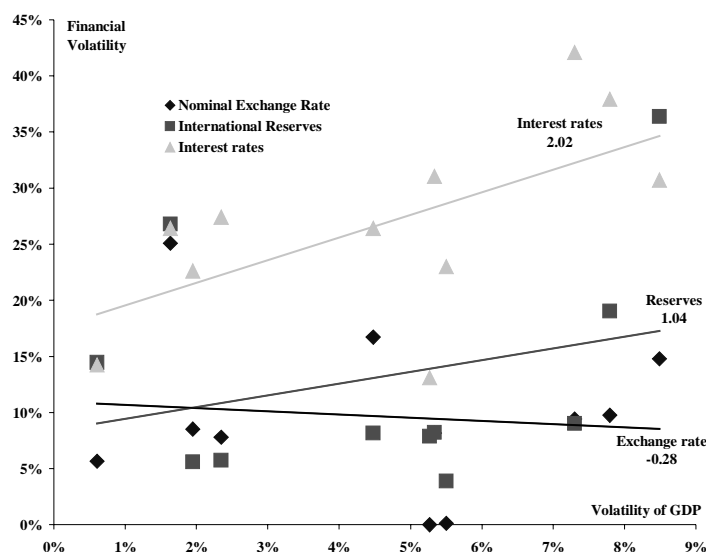
Third, soft pegs displayed the worst behaviour. Analysed ex post, soft peggers all had repressed exchange rates and in some cases the market did not have enough information concerning fundamentals (short-term external liabilities, for instance). When a currency is overvalued and there is pressure for correction, soft peg systems are prone to speculation and, henceforth, financial volatility.

Four, floating regimes did better in terms of real variables but less so in terms of financial volatility. Beyond exchange rate volatility inherent to a floating system, interest rates did swing in floating countries as much as they did in countries with pegged systems. Flotation could not avoid interest rate volatility. As is clear from Table 1, policy reactions differ considerably across countries. For instance, despite the float, Australia used quite intensively its international reserves, which is less so the case for New Zealand that used more intensively interest rates. Within the floaters, Mexico was the one that more intensively did rest on the exchange rate.

Table 1 also suggests that each country chose different combinations of nominal depreciation, reserve accumulation or interest rate changes when facing shocks. It appears that, for the countries in the sample, in the given period, the less harmful financial response in terms of growth was volatility in the exchange rate, as may be seen in Figure 1. This may imply that the exchange-rate was an effective policy for producing the necessary expenditure-switching that allowed reducing the net demand for tradables and minimizing its impact on non-tradables.[5] Second, it appears that the most harmful are interest rate responses. This shows that the adjustment of the external

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[5]   This feature does not tackle the problem posed by the negative effect of real exchange-rate instability on the production of tradables and on the diversification of exports. See Caballero and Corbo (1990) and ECLAC (1998).

disequilibria tended to work as a global demand-reducing tool, generating unemployment of labour and capital in non-tradable sectors.

Beyond the exchange rate system, the country's ability to smooth the cycle is associated to the sort of financial integration that countries do have with the rest of the world. The US may run an enormous current account deficit but the market does not ask for its immediate correction (and the authorities do not think either it is necessary), as has happened in many events in Latin America. Among others, two reasons can be mentioned. One is that foreigners have a demand for dollar-denominated assets. The other is that the US does not need to make its financial obligations contingent on commodity price movements as its economy is so diversified that the negative covariance of shocks is probably strong enough to stabilise overall risk.

Hence, to better smooth the domestic impact of external shocks, it appears necessary to improve the quality of Latin American financial links with the rest of the world. Three channels have being discussed more recently. One is creating foreign demand for assets denominated in the national currency inspired in the Australia and New Zealand cases. The degree of international financial integration of these two OECD countries is not comparable with a typical emerging economy. Among other things, they have offshore markets for securities issued in domestic currencies (Hawkins 2002). They are therefore more able to hedge their exposure to exchange rate risk in their non-tradable sectors[6]. Second, Caballero (2001) has developed formally an argument: Financial instruments are incomplete in the sense that they are not contingent on the main shocks faced by these economies. If Chilean bonds were contingent on the price of copper, an external shock would be less demanding in terms of current account adjustment.[7] It is not obvious that a typical emerging economy may move quickly in any of these two directions. Third, quality of financial links can be improved with macroeconomic prudential policies concerning excessive short-term or liquid external liabilities, the size of the external deficit and the appreciation of the RER in periods of capital surges.[8]

The main benefit of the floating regime appears when significant long-lasting shocks emerge abruptly. In that case, a pure floating regime delivers a rapid adjustment in the exchange rate and authorities stay out of the scene keeping its credibility intact, except when depreciation leads to inflation and the country uses *inflation targeting*. By increasing the exchange rate risk perceived by the public, it also better prepares agents to sudden shocks. But on the other side, floating regimes deliver significantly higher exchange rate instability across the cycle, which may have harmful effects on growth, with inefficient allocative signals. In particular, a floating regime cannot avoid overvaluation in episodes of capital surges.

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[6] A recent effort to move in this direction concerns Chile. There have been two bond issues, one by the IADB and another by the Government of Uruguay in instruments denominated in Chilean pesos indexed to Chilean inflation.

[7] Chile developed an efficient proxy by establishing a copper stabilization fund. Other countries have also utilised funds, such as the Fondo Cafetero in Colombia, or the Oil Stabilization Funds in Chile, Mexico and Venezuela.

[8] RER misalignment can also result in developed economies such as the huge swings of the US dollar in the 1990s and the sharp appreciation *vis-à-vis* the Euro since 1998 (Williamson 2000). For emerging economies, see Ffrench-Davis and Ocampo (2001).

Now we analyse briefly the behaviour of ER regimes in period since the Mexican crisis and up to 1999, using our measures of financial and real volatility. In Figure 2 the country sample is disaggregated according to three different subperiods: one around the Mexican crisis defined as 1994Q4 until 1996Q1, a 'normal' one between 1996Q2 and 1997Q3, and one from 1997Q4 until 1999Q4, the Asian crisis.

Figure 2 suggests that, in crisis periods, there is a higher correlation between financial and real volatility than in normal periods. In normal periods, the correlation between financial and real variables is almost zero. However, such a correlation varies between crisis and, surprisingly, it indicates that it was higher in the Mexican than in the Asian crisis. This may be explained by the fact that the degree of contagion was quite reduced during the Mexican crisis as among the countries in the sample it only affected Argentina, beyond Mexico itself.[9] Hence, the high R2 reflects more a statistical issue rather than an economic one.
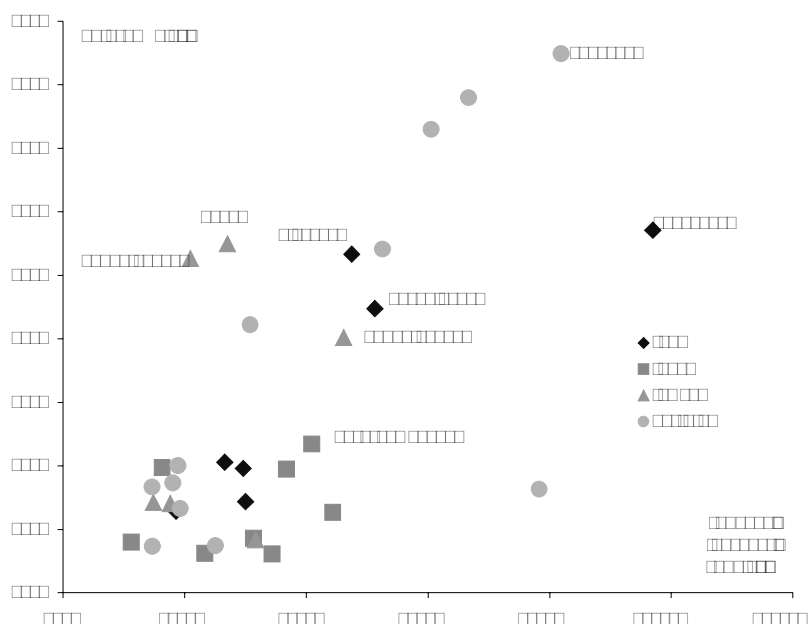
Figure 2
Real and financial volatility in three episodes
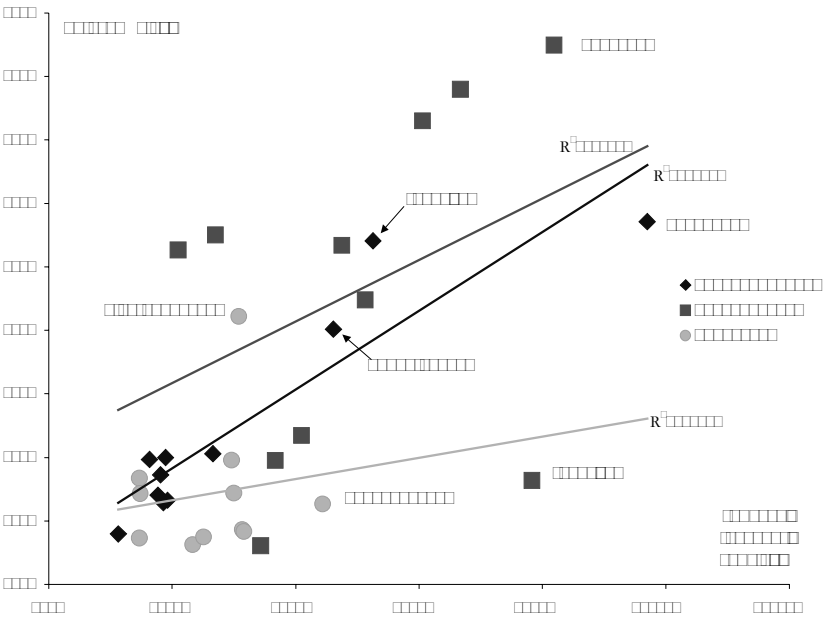
Source: Authors elaboration based on IMF data. Periods: Mexican crisis, 95=1994Q4–1996Q1. No crisis, 96–97=1996Q2–1997Q3. Asian crisis, 98=1997Q4–1999Q4.

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[9] Countries not included in the sample were also subjects of contagion, like Peru and Uruguay.

Figure 3

Exchange rate regimes since 1994

Source: Authors elaboration based on IMF data.

Another look at the data is to decompose them according to the exchange rate regime prevailing at the beginning of each period. This means that Mexico appears in the group 'band' in one period and as a 'float' in the latter two. Figure 3 illustrates this decomposition. It shows that, across crises, the more stable behaviour in financial and real terms is delivered by floating regimes. When negative shocks arrive, all systems but floating deliver high financial and real volatility. In this sense, soft pegs show the worst behaviour. Pegged systems appear with a curious property: without negative shocks, they display low real and financial volatility, but when there is a shock, financial volatility remains grossly the same and the shock basically translates into real sector volatility. Bands show a similar behaviour with respect to real volatility in stress periods but with a higher financial volatility.

It is interesting to note that in 'normal' times, floating delivers relatively more financial volatility that the rest of the systems. During crisis, overall volatility is reduced in floating regimes.[10]

From the perspective of the above considerations, an 'ideal' but crude exchange rate system that would seek to minimize real sector volatility could involve a two stepped approach. In normal times, when shocks are small and uniformly distributed, managed flexibility or a crawling-band increases stability and therefore growth. When big shocks appear and their distribution is biased, in the same negative direction (terms of trade fall, external financing declines, etc...), then ideally one should switch to a floating regime temporarily. How to implement such a system is complex, starting with the

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[10] Braga et al. (2001) praise for *Don't fix, Don't float* is in line with this sort of argument.

trouble of identifying when shocks are big or small, temporary or permanent.[11] Moreover, since to be successful, fixed exchange rate regimes need full credibility independently of the shock suffered, such an ideal switching exchange rate system is incompatible with a fixed rate system.

2 Argentina: low inflation and output volatility under the currency board

After hyperinflation in 1989 and 1990, Argentina adopted an extreme exchange rate policy, the currency board. This system shares with a traditional fixed exchange rate system that the national currency, in this case the peso, is linked in a given proportion to a foreign currency. In Argentina, the parity was fixed on a one-to-one basis with the US dollar. In the traditional fixed exchange rate system, the Central Bank has the ability to realign the parity at discretion and the freedom to control the quantity of high-powered money. In the Argentinean currency board instead, the parity was fixed by law (the *Convertibility Law*), and the Central Bank is forced to back any increase in high-powered money with an accumulation of international reserves. In this sense, it is an extreme version of a fixed exchange rate system, with no space for domestic macroeconomic policy. Of course, the most radical option is simply to suppress the domestic currency and fully dollarize.

The main reason behind the adoption of the currency board in Argentina was to fight hyperinflation in 1991. In this sense, the strategy was deliberately to use the exchange rate as an anti-inflationary device. Between 1975 and 1990, the smallest inflation rate in Argentina was 90 per cent in 1986 and during the hyperinflation years it reached 3,079 per cent in 1989 and 2,314 per cent in 1990. Associated with the currency board, annual inflation went down below 5 per cent since 1994. The average annual inflation rate between 1996 and 2000 was –0.3 per cent.

At the same time that inflation was collapsing, GDP growth was accelerating. After an average rate of –0.9 per cent in the eighties, growth resumed and averaged 4.1 per cent in the nineties. The average result was the outcome of three main factors.

First, around the time Convertibility was adopted, international liquidity increased significantly. Until 1994, Argentina was able to attract a huge amount of capital flows, further encouraged by its massive privatisation program. This, in combination with the mechanics of the convertibility described before, resulted in a significant stimulus to aggregate demand, expectations and economic activity.[12] Average GDP growth in the period 1991–94 was 7.9 per cent. At the end of 1994, Mexico devalued its currency and the suspicion that Argentina would follow suit increased its sovereign risk from 434 bp over Treasuries in 1994 to 1259 in 1995 (Table 2). Net capital inflows of US$ 4.3 billion in the last quarter of 1994 reversed abruptly to outflows of US$ 3.3 billion in the first quarter of 1995. The result was a severe recession in which GDP fell 2.9 per cent in 1995 and open unemployment rose to 18 per cent. However, in the period 1996 to 1998

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[11] This proposal is consistent with the content and title of Frankel (1999).

[12] In the meantime, the real exchange rate appreciated sharply, the deficit on current account rose and gross capital formation recovered only modestly (Frenkel et al. 1998).

Table 2

Argentina: Capital flows, real exchange rate and macroeconomic performance, 1994–99

	1994	1995	1996	1997	1998	1999
Current account balance (US$ Million)	-11,158	-5,191	-6,843	-12,497	-14,603	-12,312
Net foreign direct investment (US$ Million)	2,620	4,112	5,348	5,503	4,546	22,665
Net portfolio investment (US$ Million)	8,389	1,893	9,832	10,887	8,337	-6,323
All others (US$ Million)	341	-1,100	-3,451	835	4,990	-1,637
Change in reserves (US$ Million)	-675	-2,311	3,258	3,162	4,090	2,013
Total capital inflows (US$ Million)	10,484	2,879	10,100	15,659	18,694	14,325
Without FDI (US$ Million)	7,864	-1,233	4,752	10,156	14,148	-8,340
Average spread over FRB	434	1,259	635	301	608	726
Growth of money supply (%)	11.6	-1.8	14.4	12.3	-0.9	-2.9
External debt/exports (%)[a]	540.8	470.1	461.0	471.3	530.6	606.9
External debt/GDP (%)[a]	33.3	38.2	40.3	42.5	46.9	50.1
Terms of trade index (annual average)	101.5	101.8	109.8	108.4	102.5	96.4
GDP growth (%)	5.8	-2.9	5.5	8.1	3.9	-3.0
Real exchange rate (average 1987–90=100)	58.6	66.0	67.9	66.1	64.2	56.6

Note: a   Outstanding public and private debt at year end, as a share of annual exports and annual GDP, respectively.

Source: BBVA, IMF/EFI.

capital flows returned and together with it came output recovery. Between September 1998 and February 1999, the Russian default and the Brazilian devaluation took place, which again induced capital outflows and a longer recession lasting over three years. Hence, the Argentine experience since 1995 is one of low growth accompanied by a significant volatility, associated to the instability of capital flows.

Second, the acceleration of growth in the first half of the 1990s was not only the result of capital inflows but also the outcome of some important structural reforms, two of which merit specific mention, trade reform and privatisation. Trade policy in Argentina took place under the framework of MERCOSUR; the free trade agreement Argentina signed with Brazil, Paraguay and Uruguay. Associated to this trade liberalisation, exports soared from US$ 18 billion in 1990 to a peak of US$ 34 billion in 1998. Concerning privatisation, as described in Larrain and Winograd (1997), given the initial size of the public sector and the low productivity levels in public companies, the massive program undertaken in the first half of the nineties resulted in huge gains in the average value added per worker in privatised firms, specially in the non tradable sector.

The result was not only a positive impact on growth but also it collaborated in partially correcting the over-appreciation of the real exchange rate.[13,14]

Third, a most relevant and usually ignored factor, the acceleration of growth in Argentina is linked to the poor recessive starting point. Take as a benchmark 1974, the year when real GDP per capita reached its peak. Since then, there was a steady deterioration in this indicator. By 1990, the year before convertibility was adopted, real GDP per capita was 16 per cent *below* that of 1974, and GDP had decreased sharply since 1988. Two readings can be made henceforth. One is that Convertibility and the structural reforms already mentioned were able to change the path of a long-standing loss in output per capita. The second one is that growth was relatively easy to achieve initially, due to the significant wedge between actual GDP and potential GDP.[15]

The growth recovery in the early nineties and the impressive drop in inflation are probably the main reasons why Convertibility was able to attract so much attention in the international economy. However, the currency board exhibited pitfalls, mainly its dependence on international capital flows, a variable that is far off the sphere of influence of the domestic authorities. On top of that, volatility has increased due to a relatively new phenomenon in the international economy: financial contagion and the 'globalization of financial volatility' (Ffrench-Davis and Ocampo 2001). But contagion attacks all countries more or less equally, the difference among them being the differential in economic fundamentals and the capacity to correct them, particularly when they are misaligned. A fixed exchange rate system adds another potential risk, namely forced realignment, normally preceded by efforts to avoid it. In this sense, fixed exchange rate systems may amplify the original external shock.

In Table 2 it is shown that in the recession years, 1995 and 1999, capital flows received by Argentina decreased significantly. The other side of the coin is the significant increase in sovereign spread. Between 1994 and 1995, as said above, the differential cost of borrowing for the public sector increased by 825 bp. After a sharp drop in 1996 and again in 1997, during the Asian crisis the spread increased to 608 bp in 1998 and 726 bp in 1999. In the context of an open capital account, this implies in its turn an increase in the domestic cost of borrowing.

Both the reduced capital inflows and the more expensive cost of borrowing resulted in sudden stops in money supply growth. All this led to two significant recessions, one relatively short in 1995 with a loss of 2.9 per cent in real GDP and another quite long, 1999 and 2000 in which GDP fell 3.0 per cent and 1.0 per cent respectively. Indeed,

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[13] Most of the privatised companies belonged to the non-tradable sector. In these firms, average productivity per worker rose after privatisation. The link to real exchange rate is because, contrary to the Balassa-Samuelson effect, in which a net productivity growth in the tradable sector induces a real appreciation of the currency, the transmission mechanism is through a reduction in the real cost of the services produced by that companies.

[14] This productivity gain does not consider that all unemployed had zero productivity. As such, overall productivity growth, measured considering not only employed people but all the labour force, increased by much less.

[15] As a matter of fact, annual growth in 1988–2000 was merely 2.3 per cent. The GAP between effective and potential GDP in 1991 can be assumed to have been notably large.

Argentina and Uruguay are the only two Latin-American countries, which have suffered a domestic recession in both recent international financial crises.[16]

3   The crawling-band approach in Chile

In the early 1990s, in a context of massive capital inflows, Chilean authorities identified two main priorities for macroeconomic management and particularly exchange rate policy. First, in an economy prone to huge cycles,[17] it was crucial to achieve sustained macroeconomic stability. Second, it was also crucial to emphasise growth as the dominant criteria to lead policy-making. This meant assigning exports a strategic role, both in terms of its expansion and diversification.

Several works, including Caballero and Corbo (1990) and more recently ECLAC (1998, ch. IV) document that in order for exports to be an engine of growth, the level and stability of the real exchange rate (RER) are crucial. Chilean authorities considered that this objective could be placed in jeopardy if capital surges cause excessive RER appreciation and greater future volatility if the direction of net flows goes into reverse.

Authorities opted in the early 1990s to regulate the foreign exchange market and capital inflows in order to prevent large misalignments in the RER relative to what they assumed to be its long-term trend. The option chosen was to try to make long-term fundamentals prevail over short-term factors. The underlying assumption was that there existed an asymmetry of behaviour between the market and monetary authorities: the latter should have a longer planning horizon when they seek a sustainable real macroeconomic stability, in contrast with private agents who operate more intensively at the short-term end of the market and are rewarded for profits in that term. In order to deal with market uncertainty, rather than a unique price, authorities used a crawling-band centred on a reference price; this price was linked to a basket of the dollar, the deutsche mark and the yen, with weights associated to their share in Chilean trade.[18] The centre of the band crawled according to inflation differential criteria, hence, following a PPP rule adjusted by estimates of net productivity improvements in Chile.

The changes taking place in global financial markets, the increasing international approval of Chilean economic policies, high domestic interest rates, and a smooth transition to democracy stimulated a growing capital inflow towards Chile since mid-1990, earlier and relatively stronger than to other emerging economies.

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[16] Several LACs experienced a recessive GAP (GAP between effective and potential GDP), but absolute GDP kept rising. Actually, average GDP growth dropped from 5.2 per cent both in 1994 and 1997, to 1.1 per cent in 1995 and 0.3 per cent in 1999).

[17] In 1975 and 1982 Chile had experienced the sharpest recessions in all of Latin America; see Ffrench-Davis (2002, chs 1 and 6).

[18] Chile was a pioneer in implementing exchange rate policies that belong to the family of crawling-peg approaches (Williamson 1981). This happened between April 1965 and July 1970. Subsequently, from October 1973 to June 1979 a second experience of this kind was carried out. Finally, in the 1980s, after the 1982 crisis, a crawling-peg was reinstated that evolved to a crawling-band and survived until September 1999 (Ffrench-Davis 2002, chs 4 and 10).

The events were quickly reflected in an appreciating RER. Beginning in July 1990, the market rate was in the appreciated extreme of the band. During the next months economic authorities designed a new macroeconomic policy. The policy reform, against the fashion in multilateral institutions and financial agents of an across-the-board opening of the capital account, was based on the perception that the large external supply of financing was not to be sustainable and short-term factors affecting the current account, such as a high price of copper, would tend to be reversed in the medium term.[19]

A set of policies followed, directed to provide a 'prudential' macroeconomic environment in order to achieve sustainable equilibria. In June 1991, a non-interest bearing reserve requirement of 20 per cent was established on foreign loans. Reserves had to be maintained at the Central Bank for a minimum of 90 days and a maximum of one year.

Proponents of a dirty float within the central bank argued that the prevailing rules, with a pure band, an increasingly active informal market, and a more porous formal market, would lead to an observed exchange-rate leaning toward either extreme of the band (on the ceiling in 1989–90; on the floor later). This recognition led the Bank in taking the decision to initiate the dirty floating in March of 1992. The rate fluctuated since then, for several years, within a range of 1 to 8 percentage points above the floor, with the Bank continuing to make active purchases but also some sales (however, with a significant net accumulation of reserves).

In the ensuing months, US interest rates continued to decline, encouraged by the recession it was experiencing, exerting pressure on the Central Bank of Chile. However, the Chilean economy was booming, and its GDP growth rate had risen into two digits. Consequently, for reasons of macroeconomic equilibrium, the Central Bank wanted to increase rather than lower domestic interest rates. In order to make space for monetary policy in the context of continued capital inflows, the reserve requirement was tightened. In May 1992, the reserve requirement was raised to 30 per cent and was extended to time deposits in foreign currency and in 1995 to purchases of Chilean 'secondary ADRs' by foreigners. The period during which the deposit had to be maintained was extended to one year, regardless of the maturity of the inflow. Subsequently, there was a permanent monitoring in order to identify loopholes, which were then closed. In general evasion was rather limited (Le Fort and Lehmann 2000, Zahler 1998).

The system of reserve requirements and taxes on foreign lending was directed to affect relative market prices. The implicit tax rate on inflows increased dramatically as maturities shortened. For instance, by 1995, for inflows with a one year term it stood at 4 per cent, while for 90 days terms it represented a cost of 13 per cent (Agosin and Ffrench-Davis 2001). With the Asian crisis, and the subsequent sharp scarcity of financial inflows, the reserve requirement rate was reduced to 10 per cent and then to zero in 1998.

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[19] Additionally, Chile was coming out of a profound debt crisis, which had been accompanied by sharp exchange rate depreciation. Consequently, there was space for some equilibrating appreciation. However, as agents changed expectations from pessimism to optimism, they seek to reach a new desired stock of investment in 'the emerging market' over a short period of time. This was expected to imply excessively large transitory inflows.

Table 3

Chile: Capital flows, exchange rate and macroeconomic performance, 1990–2000

	1990–95	1996–97	1998	1999	2000
Actual GDP growth (%)	7.8	7.4	3.9	-1.1	5.4
Productive capacity growth(%)	7.8	6.8	7.3	5.9	4.2
Investment ratio (% of GDP)	26.1	31.6	32.2	26.9	26.6
Inflation (%)	14.7	6.3	4.7	2.3	4.5
Current account balance(% of GDP)	-2.5	-5.7	-6.2	-0.2	-1.6
Fiscal balance(% of GDP)	1.8	2.1	0.4	-1.5	0.1
Terms of trade (% of GDP)	0.2	-1.4	-3.0	0.2	0.0
Net capital inflows (% of GDP)	6.9	8.0	2.8	-0.9	1.7
Real exchange rate (1986=100)	99.5	81.4	78.0	82.3	85.9

The terms of trade effect are expressed in current prices.
Source: Central Bank of Chile, and Ffrench-Davis (2002).

As a result of the policy mix implemented in 1990–94 plus the improved terms of trade in 1995, when the Tequila crisis exploded in late 1994 and its contagious effect reached Argentina, Chile exhibited a solid external sector (a small deficit on current account, a sustainable exchange rate, and a limited amount of short-term external liabilities).

Therefore, the across-the-board cut-off in liquid funding for Latin America did not dampen the Chilean economy. Towards mid-1995, capital flows began to return to the region, and with special intensity to Chile.

Given the expectations of currency appreciation, when the Tequila shock was apparently left behind, the large interest rate differential between the peso and the dollar gave foreign portfolio and short-term investors a profitable one-way bet, in spite of the toll they had to pay for entering domestic financial markets (in the form of the reserve requirement). This trend toward appreciation could have been softened by intensifying price restrictions on inflows (i.e. increasing the height of the reserve requirement; Le Fort and Lehmann 2000). However, the authorities kept rather unchanged the intensity of policy tools they were using in 1996–97. As a consequence, capital inflows overwhelmed the domestic market. Then, the Central Bank was unable to prevent a significant real appreciation of the peso. The ensuing appreciation contributed to a widening of the current account deficit, which climbed to 5.7 per cent of GDP in 1996–97 (Table 3).

In the negotiations for a free trade agreement with Canada, Chilean authorities successfully defended the permanence of the reserve requirement as a policy tool regulating financial inflows. But the generalized overoptimism in domestic and foreign financial markets and the widespread expectation that crises had been left behind and the risky temptation to speed the reduction of domestic inflation with exchange-rate appreciation, weakened a successful policy of sustainable macroeconomic equilibria.

Some traces of the exchange-rate management did not help to deter speculative inflows after 1995. In spite of its formal adhesion to a crawling band in 1996–97, in order to appreciate the band (beyond a formal broadening of the band to ± 12.5 per cent), the authorities tinkered in 1997 with the weights assigned to each currency, making the peg to a currency basket rather than the dollar less credible. In November 1994, the weight of the US dollar had been reduced from 50 to 45 per cent, reflecting the falling incidence of that currency in Chilean trade. In January 1997, it was arbitrarily raised to 80 per cent. Also, the external inflation used to correct the referential exchange rate was over-estimated by 10 percentage points between 1995 and 1997, generating considerable additional revaluation. Furthermore, an annual 2 per cent appreciation of the reference rate had been set in November 1995, based on the assumption that Chilean productivity was growing faster than that of its main trading partners.

The Asian crisis notably worsened terms of trade in 1998–99 and found Chile with an overvalued real exchange rate and a deficit on the current account over twice as large as the average for 1990–95.[20] Subsequently, capital outflows began in late 1997 and accelerated in 1998–99, inducing an exchange rate depreciation, in the context of a relative price correction process, after the significant macroeconomic imbalance created in 1996–97.

Since 1991 capital outflows were facilitated as a way of alleviating appreciating pressures on the exchange rate. Pension funds were allowed to invest abroad, in gradual steps, up to 16 per cent of their total assets. However, higher rates of return on financial assets in Chile than abroad and expectations of peso appreciation discouraged foreign investment by Chilean institutional investors. By mid 1997, pension funds had invested abroad merely 0.5 per cent of their funds. Outflows mushroomed only with the Asian crisis, when the contagion to Chile reversed expectations from appreciation to depreciation. Within a short period, outflows by pension funds were equivalent to 4.8 per cent of GDP. This worsened the Chilean external position and was an important source of a sharp monetary contraction in 1998–99.

The Central Bank had been soft with the appreciating pressures in 1996–97, but then asymmetrically turned to sharply repress the depreciating pressures by the end of 1997, arguing that in an overheated economy devaluation would be too inflationary. This way, only when the economy was already in recession, the Central Bank announced the suspension of the exchange rate band in September 1999 in order to allow for a substantial devaluation under a freely floating rate.

The stabilising properties of a band appear when there is credibility in its parameters, namely the level of the central parity, the rate of crawl and the band's width. The crawling band – the intermediate regime in force in Chile until 1999 – gradually lost credibility due to its mismanagement.[21] Indeed, the lack of active intramarginal

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[20] An enlarged deficit on current account in 1995–97, duly adjusted by the trend terms of trade, is a revealed proof of a too appreciated exchange rate, that adjusted faster than productivity improvements. We contend that actual appreciation in 1990–94 had been equilibrating (given the moderate deficit on current account and an appreciation softer than in all other emerging LACs). See Ffrench-Davis (2000, ch. 10).

[21] The band and its centre had been credible for a long period. Magendzo et al. (1998) using data until 1997, before the Asian crisis reached Chile, found that credibility in the band had decreased. They do not refer as to what extent there was enough credibility prior to it.

intervention designed to enforce the band, the various realignments to the central parity and/or the width of the band, the arbitrary changes in weights used to determine the central parity, all gave the signal that the parameters could change on demand.[22] Finally, the monetary authority recognized only lately the need to correct an excessively appreciated real exchange rate.

The period of active policy towards capital inflows and management of the RER is correlated with a high rate of use of productive capacity. The negligible GAP between effective and potential GDP achieved in 1991–97 proved to be a determinant factor behind the significant increase in capital formation and potential GDP (Agosin 1998). In fact, the investment ratio rose 10 points in 1990–98 with respect to 1982–89, and GDP growth jumped from 2.9 per cent per year to 7 per cent (Table 3).

With the recessive adjustment in 1999 and the lack of vigorous recovery in 2000 and 2001, the investment ratio lost, nearly, one-half of its previous gain. Our interpretation is that the intensity of what was an unavoidable downward adjustment, was associated to the disequilibria built in 1996–97, first with an excessive appreciation and then with the delay in allowing a depreciation in 1998. Subsequently, the authorities did not exploit all the positive features of the Chilean economy that would allow moving toward the production frontier, thus encouraging economic employment and capital formation.

4   Mexico: the oldest floating in Latin America

The adoption of a floating exchange rate regime was not an option in Mexico. It was the outcome of a full-scale balance of payment crisis in December 1994. Before that, since October 1992, Mexico had an exchange rate band policy where the floor was fixed in nominal terms and the ceiling crawled daily. In spite of the fact that the economy was growing at an average of only 3.8 per cent per year between 1989 and 1993, Mexico attracted a lot of attention because of two main elements. First, it became a leading country in terms of privatisation with revenues of 3.3 per cent of GDP in both 1991 and 1992. Second, in 1993 it was approved NAFTA, the free trade agreement of North America which also led Mexico to become member of the OECD. The two associations determined a rapid liberalisation of capital flows.

Markets reacted with a positive mood, which is reflected in that 49 per cent of total capital inflows to Latin America were directed towards Mexico in 1990–93. The country received US$ 23.6 billion on average per year, 83 per cent of which were flows other than foreign direct investment (FDI). In the domestic front, higher expected returns eventually led to a boom in private expenditure. As a result, the deficit of the current account passed from US$ 7 billion in 1990 to US$ 30 billion in 1994 and the real bilateral exchange rate with the US appreciated 30 per cent in four years.

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22 In Krugman (1991), there is exogenous full credibility in the band's parameters without intramarginal intervention. The 'honey moon effect', that is, stabilising speculation, appears because of such credibility. In practice, credibility and reputation need to be built by the Central Bank. Intramarginal intervention directed to enforce the limits of the band is crucial since when that is not the case, speculation will tend to be destabilizing.

Ros (2001) states that the crisis was not the outcome of pure inconsistency in economic policy, nor a pure self-fulfilling mechanism. He emphasises (a) the role played by an ill-conceived perception that the shock being faced by Mexico, higher interest rates in the US and political turmoil at home, was temporary and (b) the perception of a high cost involved in tightening monetary policy early in 1994 or in modifying exchange rate policy. These two considerations led the government to react to those shocks selling international reserves and increasing the issuance of dollar denominated short term Tesobonos for exchange of the peso denominated Cetes. Reserves fell from US$ 26 billion in the first quarter of 1994 to US$ 16.5 billion three months later. At the same time, the debt not only changed denomination but the average term shortened as well. By the end of 1994, US$ 28.6 billion in Tesobonos were to mature during 1995, 35 per cent of which during the first quarter of 1995 (Ros 2001). Given international reserves, this put the country in the wake of default and eventually led speculative attacks against the peso. The new government tried to change the band by devaluing the ceiling by 15 per cent, but it was too late. It was forced to quit the band system, while at the same time interest rates skyrocketed. It was the start of the sharp and costly Tequila crisis (Calvo and Mendoza 1996).[23]

According to Carstens and Werner (1999), the crisis had three different aspects. One was that short-term capital inflows encouraged and financed the overspending that caused the before-mentioned current account deficit. Second, even if the public debt and the fiscal balance suggested a healthy public sector, the short maturity of the stock of government debt 'exposed the country to a financial panic'. In that context, any doubt about the will by markets to continue rolling-over the existing debt would cause a self-fulfilling attack on Mexican external debt. Finally, a severe banking crisis appeared. As the exchange rate band was abandoned in December 1994 and a float was adopted, there was an abrupt devaluation of about 95 per cent between just before the crisis and March 1995. To avoid the inflationary consequences of such a devaluation, the Central Bank tightened monetary policy by raising the interest rate from 16 per cent in December 1994 to 86 per cent one quarter later. Fiscal policy was tightened by 2.6 per cent of GDP in 1995. This entire contractionary package resulted in a sharp recession in 1995 in which GDP fell 6.2 per cent and domestic demand 12.9 per cent.

Just after the crisis, there was a brief experience with monetary targeting, but as inflation came down and there was significant evidence of instability in the demand for money, the Central Bank started adopting annual inflation targets. According to Ortiz (2000), since 1997–98 the Central Bank was converging towards inflation targeting. The main elements of the current framework include (a) a medium term goal of reducing inflation towards international levels in 2003, with annual inflation targets, (b) monetary policy actions based on an assessment of inflationary pressures, and (c) a transparent system based on the publication of a quarterly inflation report.

A basic difference in the Mexican case, against other 'targeteers', concerns the policy instrument. While most inflation targeteers use a short-term interest rate target, the Mexican Central Bank uses a reserve operating procedure, known as the 'corto'. This system induces significant short term volatility in nominal interest rates, a feature

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[23] Larraín et al. (2000) show that credit risk agencies also failed to play a countercyclical role. The main two agencies down-graded their rating only after the devaluation took place.

desired by authorities in order to have a more stable exchange rate and, hence, a more stable inflationary environment.

Between 1996 and 2000, Mexico lived a relatively prosperous period in which GDP growth averaged 5.3 per cent; however in 2000, the economy was clearly overheated. Indeed, GDP grew 6.9 per cent, well beyond estimated potential GDP growth, the real exchange rate had appreciated 13 per cent since 1997 and the deficit on current account more than doubled with respect to the same year, despite high oil prices (Table 4).

In terms of the behaviour of the float, it was not a pure float as a complicated rule regulated intervention in the foreign exchange market. The rule included a two stepped approach in which an option mechanism was used to accumulate reserves and a contingent sale was used when the Central Bank wanted to minimise a sudden depreciation.

This approach was conceived to fight peso appreciation and accumulate international reserves. Had the Central Bank intervened directly in the spot market the outcome could have been more similar to an exchange rate band or a soft peg. The mechanism, nowadays finished, was asymmetric in that it gave more emphasis in stopping a sudden depreciation than in stopping a sudden appreciation (Galán et al. 1999).

This intervention mechanism and the surrender to interest rate volatility rather than to exchange rate volatility have determined that Mexico enjoyed significant degree of exchange rate stability. The adoption of the floating regime coincided with a period of high and relatively stable GDP growth and a significant financial stability. Of course, a substantial part of the story was due to the fact that Mexico's by far largest trading partner, the US, lived until 2000 a dynamic growth cycle, with an accelerated increase of imports (particularly from Mexico). The story changes, sharply for both, since late 2000.

Table 4

Mexico: Capital flows, real exchange rate and macroeconomic performance, 1992–2000

	1992	1993	1994	1995	1996	1997	1998	1999	2000
Current Account Balance (US$ Million)	-24 442	-23 400	-29 662	-1 575	-2 330	-7 448	-16 090	-14 325	-17 690
Net capital inflows (US$ Million)	26 187	30 632	12 465	-14 735	6 190	21 447	19 300	18 602	24 800
Changes in reserves (US$ Million)	-1 173	-6 057	18 398	-9 648	-1 806	-10 512	-2 138	- 592	-2 824
GDP Growth (%)	3.6	2.0	4.4	-6.2	5.2	6.8	5.0	3.8	6.9
Terms of Trade (1995=100)	105.0	104.9	103.3	100.0	102.8	104.0	100.4	102.3	107.4
Real Exchange Rate (average 1987-90=100)	74.0	70.3	72.1	106.0	95.4	83.5	84.0	76.7	71.6
External Debt/GDP (%)	32.0	32.4	33.2	57.9	47.3	37.2	38.1	34.7	25.9

Source: ECLAC

5   Concluding remarks

In the context of a more integrated world economy, ER policy is crucial as it is the variable that links national prices to foreign prices. This policy affects how returns evolve in many significant sectors of the economy, such as the production of exportables. Also, being the outside world one of benchmarks for the opportunity cost to domestic investors, ER policy also affects relevant shadow prices. In this sense, ER policy is of most importance.

The review of the Argentinean, Chilean and Mexican experiences shows that a policy that was suitable for a given macroeconomic environment, may not be so in another. Each ER system has its logic and requires measures so as to enhance the system's credibility. In this sense, one crucial element to bear in mind when adopting a given ER policy is how costly it may be to switch to an alternative policy. However, in some cases a public discussion about an exit strategy may have a negative effect on the credibility of the policy, for example in fixed ER regimes.

Credible pegged systems promise more (nominal) financial stability and to some extent that was the case in Argentina during the particular period under examination. But the required complementary policy is high price level flexibility in order to adjust to negative real shocks cutting prices down. Long term credibility in this system hence require more flexibility in labour markets and fiscal policy in order to respond adequately to negative shocks. Without these measures, pegged systems are prone to more real sector volatility.

Floating systems induce more real stability but at the price of more financial instability. This may induce costs in terms of growth as the RER loses power to allocate resources. Hence, a complimentary policy if the RER loses allocative capacity is to consider the use of other policy instruments to promote exports such as technology policy, trade policy, etc. Floating systems are useful in times of financial distress when authorities have doubts concerning the level of the RER, the nature of the shock they face and its response to it; flotation allows them not to put in jeopardy its reputation defending the wrong level of the ER.

Finally, bands are useful in times of 'normality', without big shocks in the horizon. In that context, bands contribute to stabilise the nominal exchange rate and by this mean, the RER. Stability in the real exchange rate has a positive effect on the quality of exports and on growth. But bands suffer a weakness if a 'big shock' appears and authorities fail to have a prompt and adequate response. In that case, they open the way to speculation inducing significant financial instability. Probably, the required policy to accompany the band concerns an active intramarginal intervention within the band. Interventions are likely to be more effective when the ER is kept far from the edges of the band (Mundaca 2000). This suggests that there may be some optimal width of the band, as the Chilean experience shows.

Corner solutions do not have symmetric consequences. ER policy makes the difference when significant capital surges appear and subsequently shocks cause sudden reversals of these flows (Ffrench-Davis and Ocampo 2001, Williamson 2000). Most significant increases in the supply of external financing are not one-shot events but a process that take time: 1977–81, 1990–94 and 1996–97. When capital inflows appear, the current account deteriorates, asset prices increase and the real exchange rate appreciates. Each ER policy will deliver different combinations of those three elements. With pegged systems,

an upward surge in foreign capital flows creates a demand boom, with consequences in asset prices, probably a crowding-out of domestic savings and a worsening of the external balance. Inflation in non-tradables may lead to real appreciation. With floating regimes, a nominal appreciation will take place making the process of real appreciation faster (and henceforth potentially more disruptive if the increased liquidity is transitory) than with the pegged system. In fact, when the force leading the direction of the capital surge is external, small economies may suffer from significant overvaluation.

Pegs tend to work better in the upward phase of the cycle but after the inflection point the float does it better in terms of the necessary expenditure switching. As shown in Wyplosz (1999) and Ros (2001), in these types of cycle there is the possibility of multiple equilibria based on self fulfilling beliefs: expectations of more inflows (outflows) may further appreciate (depreciate) an already appreciated (depreciated) currency.

Exchange rate instability is not costless, as well as large deviations from equilibrium levels of the RER are not costless either. Exports, both in terms of its growth rate and of its diversification, benefit from more stable environments (ECLAC 1998, ch. IV). Therefore, the contribution that ER policy can make to improve overall growth performance is twofold. On the one hand, to maximise real exchange rate stability, without pegging the currency, and on the other, to avoid significant currency misalignments, and floating does not impede that. Bands, the underlying obvious solution, may combine both but they are sensible to realisations of 'big shocks'.[24] Independently of the policy adopted, Central Banks cannot avoid being concerned with both the level and the stability of the exchange rate. In this sense, despite what has happened since the Asian crisis, crawling-bands are still a policy to consider by policymakers.

Latin American financial instruments suffer at least two kinds of incompleteness. One is linked to instruments themselves, as they lack contingency on shocks common to Latin American countries. Another is linked to markets, as there is a lack of sustainable foreign demand on instruments denominated in local currencies. Macroeconomic policies may advance in terms of completing both instruments and markets, but it is not clear at all that countries will be able to do both things in significant ways in the short run. In the meantime, policymakers need to be careful with across-the-board liberalisation of the capital account, as the behaviour of capital flows may tend to be inconsistent with macroeconomic stability, particularly in terms of the stability of the exchange rate and economic activity. In this sense, authorities need to follow closely the developments in different markets and have flexible policy packages rather than single rigid policy tools.

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[24] Wyplosz (1996), commenting a paper by Leiderman (1996), signals that the arguments in favour of bands were so strong that it was difficult to be skeptic about it. However, he mentioned some of the elements that ultimately led bands to trouble, among which it was the 'level' of the band, that is, how could it cope with changes in the real exchange rate (e.g. because of a shock) that lied out of the limits of the band.

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