Sudden Stops, the Real Exchange Rate and Fiscal Sustainability: Argentina's Lessons

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1. Introduction

The fall of the Convertibility Program (i.e., the currency board regime) in Argentina has stirred a lively discussion about the causes for its collapse. Several explanations have been offered. The most popular one relates to the unholy combination of a fixed exchange rate and large fiscal deficits that led to a rapid growth in public debt, severe fiscal sustainability problems, and eventually, a loss of access to the credit markets. Another popular view stresses the impact of a fixed exchange rate regime coupled with a devaluation by Argentina's major trading partners as an important cause of real exchange rate (RER) misalignment, which reduced profitability in the tradable sector. This, in turn, slowed down investment and led the economy into a protracted recession as it deflated away the RER disequilibrium.

The purpose of this paper is to provide a different interpretation of the collapse of Convertibility, which shares with the previous views the acknowledgement of fiscal sustainability problems and RER misalignment. However, our view places special emphasis on financial and political economy considerations. In particular, we argue that the impact of RER misalignment went beyond trade-competitiveness considerations. It played a major role in the fiscal and financial problems that eventually Argentina had to confront. Moreover, fixed exchange rates helped to conceal those problems and, as a result, necessary fiscal measures were postponed, thereby intensifying the crisis. As financial imbalance became apparent, a stock adjustment was necessary, which called for

massive wealth redistribution. Implementation of the latter triggered a "war of attrition" situation which seriously deepened the extent of the crisis.

Our view starts with the observation that unexpected stops in capital flows of a persistent nature can generate substantial swings in the RER, which may lead in turn to fiscal sustainability problems and related political economy complications, particularly in relatively closed, highly indebted and dollarized emerging markets (EMs).

This argument will help to shed light on the following puzzle: Why was a country like Argentina, which displayed a fiscal deficit and a level of debt well within the bounds set by the Maastricht Treaty, subject to high risk premia? One possible answer is that the comparison is meaningless, given that Argentina never had a chance to become a member of the European Union. But, granting that, why did Argentina have to pay a risk premium higher than its Latin American peers, who in terms of fiscal deficits and debt levels were facing similar conditions?

Our point of departure is the Russian crisis of August 1998, which drastically changed the behavior of capital markets. We believe that developments at the center of capital markets were key to producing an unexpected, severe, and prolonged stop in capital flows to EMs, and Latin America was no exception.

We will argue that in the case of Argentina the following three considerations played a crucial role in magnifying the effect of a sudden stop in capital flows:

1) A small share of tradable goods output relative to domestic absorption of tradable goods led to a big swing in the RER;

2) Liability dollarization in non-tradable sectors (including the government), made them highly susceptible to big balance sheet effects following RER depreciation; and,

3) High initial public debt, denominated in foreign currency, became unsustainable after RER depreciation, especially when taking into account political economy considerations.

These weaknesses can remain hidden for a long period of time if the exchange rate is fixed or tightly managed (e.g., displaying *Fear of Floating*, see Calvo and Reinhart, 2002). As a result, politicians and the general public become largely unaware of the gravity of the situation, thus undermining the political support for the necessary fiscal and financial adjustment and reform. In this context, we will analyze policy decisions that were made during the couple of years prior to the Argentine crisis. We will assess them in light of the potential fiscal solvency problem that emerges once the effects of a sudden stop on the RER and debt valuation are taken into account. This in turn will provide insights to the key policy lessons that can be learned from this experience.

The paper is organized as follows: Section 2 examines capital market trends in Latin America following the Russian crisis of 1998 and provides a rationale for sudden stop behavior. Specifically, we show that the nature of sudden stops has typically been large and far from temporary. Section 3 dwells on conditions under which sudden stops lead to a sharp depreciation of the RER, and ranks a set of Latin American countries in terms of vulnerability to these shocks. Section 4 focuses more closely on Argentina. It discusses sustainability issues (some of which are useful in explaining political developments) and determines sources of vulnerability to swift moves in the RER. Section 5 dwells on the

effects of RER adjustment on the materialization of contingent liabilities (particularly those arising from mismatches in the banking sector), that further deteriorate fiscal sustainability and are key in understanding the "war of attrition" impasse. Section 6 briefly touches upon the concealment of fiscal disequilibrium under a fixed exchange rate regime in Argentina, and analyzes likely performance under a floating exchange rate regime following a sudden stop in capital flows. Section 7 presents a conceptual wrap up of the discussion. Under the framework that we have developed, section 8 analyzes policies followed by Argentina to discuss the extent to which domestic factors contributed to the development of the crisis. It concludes with policy lessons for Latin America.

2. The World Scene after Russia

Russia's August 1998 crisis represents a milestone in the development of emerging capital markets. Massive capital inflows that set sail to Latin America in the early 1990s, financing high growth rates and large current account deficits, came all of a sudden to a standstill following Russia's partial foreign debt repudiation in August 1998. It was hard to imagine how a crisis in a country with little if any financial or trading ties to Latin America could have such profound effects on the region. This puzzle seriously questioned traditional explanations for financial crises (based on current account and fiscal deficits) and led analysts to focus on the intrinsic behavior of capital markets. Thus, it was argued that prevailing rules for capital market transactions may have been responsible for the spread of shocks from one country to other regions (Calvo, 1999).[1]

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[1] As the argument goes, to the extent that there exist large fixed costs (relative to the size of projects) in obtaining information about a particular country, resulting economies of scale lead to the formation of

In Figure 1, spreads measured by the EMBI+ index show a dramatic increase following the Russian crisis. Although they have since decreased, spreads exhibit a substantial gap compared to pre-crisis levels, exceeding 250 basis points for 2001.[2] This gap was much higher for 1999 and 2000 (over 700 basis points and 300 basis points, respectively, see Table 1).

Latin American markets were not the only ones hit by the higher cost of capital. For most EMs higher interest rates were accompanied by a large reduction in capital inflows. Figure 2 and Table 2 show that for the seven biggest Latin American economies the decline was sharp, particularly for portfolio flows, mimicking the sharp interest rate hike. The fact that the root of this phenomenon lied in Russia's crisis indicates that the capital-inflow slowdown contained a large *unexpected* component. "Large and highly unexpected" are the two defining characteristics of what the literature calls Sudden Stop (see Calvo, 2000).

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clusters of specialists, or informed investors, who lead capital markets. These investors leverage their portfolios to finance their investments and are subject to margin calls in the event of a fall in the price of assets placed as collateral. Remaining investors, the uninformed, observe transactions made by informed investors, but are subject to a signal-extraction problem, given that they must figure out whether sales of the informed are motivated by lower returns on projects or by the informed facing margin calls. As long as the variance of returns to projects is sufficiently high relative to the variance of margin calls, uninformed investors may easily interpret massive asset sales as an indication of lower returns and decide to get rid of their holdings as well, even though the cause for informed investors' sales was indeed due to margin calls.
[2] We compare the lowest 1998 pre-crisis spread level to yearly averages of the spread measure in following years.

Figure 1

External Financial Conditions

(EMBI+, Spread over US Treasuries)
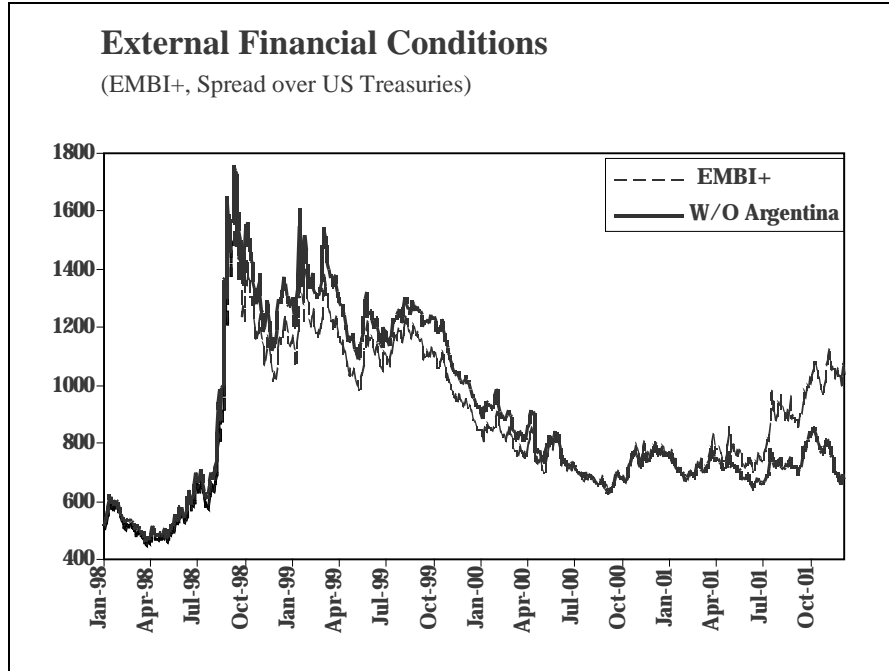
Source: JP Morgan Chase.

Table 1

Difference in Bond Spreads with Minimum Pre-Crisis Levels

	1999	2000	2001
EMBI +	666	307	393
EMBI + w/o Argentina	757	315	259

Source: JP Morgan Chase. Note: Values are yearly averages.

Figure 2

Sudden Stop in LAC

(Capital flows, % of GDP)

Includes Argentina, Brazil, Chile, Colombia, Mexico, Peru, and Venezuela
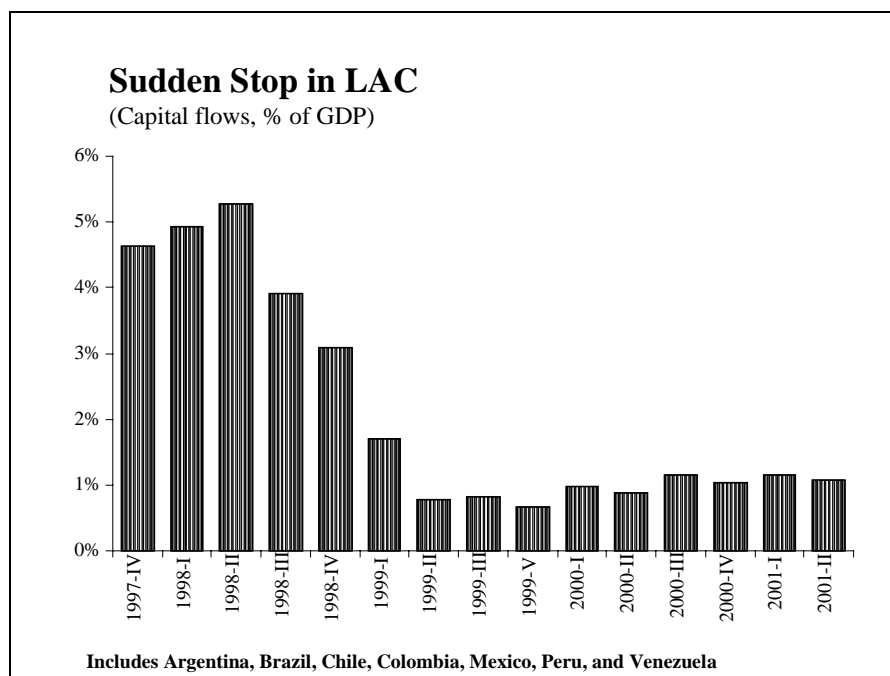
Source: Corresponding Central Banks.

Table 2

Capital Flows, % of GDP

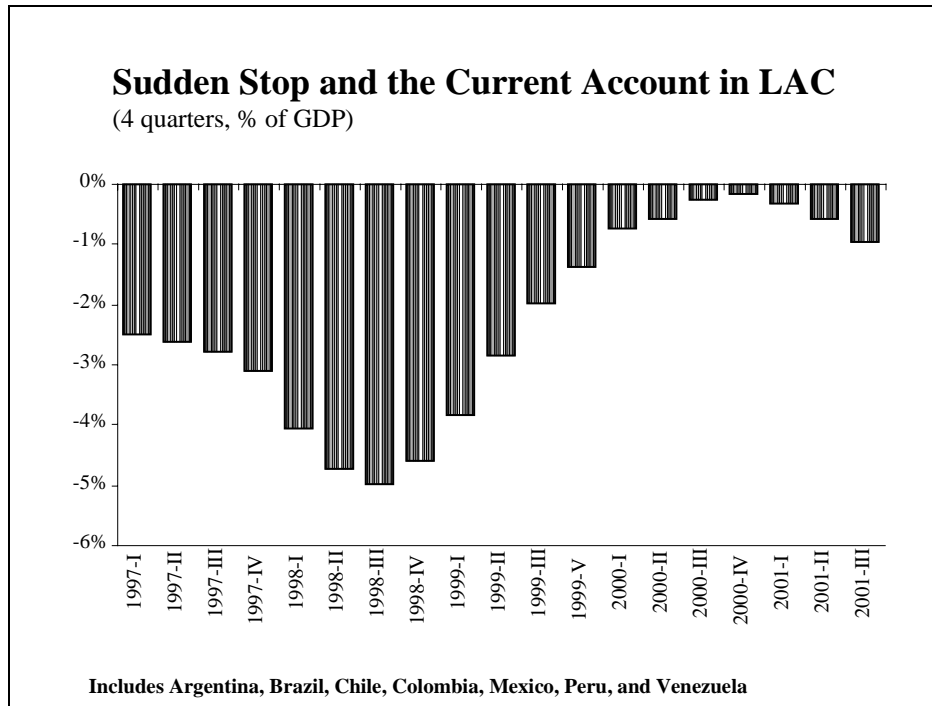|	**1998.II**	**2001.III**	**Reversal**
Capital Flows	5.6	1.6	-4.0
Non-FDI Capital Flows	2.0	-0.9	-2.9
FDI	3.6	2.5	-1.1

Note: Includes Argentina, Brazil, Chile, Colombia, Mexico, Peru, and
Venezuela. Source: Corresponding Central Banks.

To the extent that the slowdown in capital flows was unexpected, it forced

countries to a drastic adjustment of their current account deficits to accommodate the

shortage of external credit. Starting in the fourth quarter of 1998, key Latin American

countries showed a steady decline in their current account deficits, which eventually

reached a zero balance by the end of 2000.[3] This adjustment of the current account was

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[3] Although FDI flows fell on average in the aftermath of the Russian crisis, they did increase significantly
in Brazil, where FDI flows rose 80 percent in dollar terms from the second quarter of 1998 to the second
quarter of 2001. We follow up on this fact because it may be an important element behind the resumption
of capital flows to Brazil. A possible explanation is that higher interest rates led to sharp declines in

on average equivalent to 5 points of GDP for the seven biggest Latin American economies (see Figure 3).

Figure 3

Sudden Stop and the Current Account in LAC
(4 quarters, % of GDP)

Includes Argentina, Brazil, Chile, Colombia, Mexico, Peru, and Venezuela

Source: Corresponding Central Banks.

3. Sudden Stops and Real Exchange Rate Adjustment

So far we have made a case for the large external component accounting for the observed fall in capital inflows. But what are the consequences of this event in terms of RER behavior and debt sustainability analysis? Two key elements in this discussion are the unexpected component of the sudden stop and its duration. It is clear that expectations prevailing before the Russian crisis are unlikely to have factored in the widespread effects on EMs that followed, so the unexpected element required for a sudden stop is

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domestic collateral, adding to the perception that this asset class was more risky than expected. Thus, domestic firms found it more difficult to finance the current operations and expansion plans, further depressing their plants' market value. This may have opened attractive investment opportunities for G7-based firms whose collateral was insulated from EM financial turmoil, leading to a sharp increase in FDI.

met. A different question is whether this shock was perceived as temporary or highly persistent, which is quite relevant from a policy perspective. With the benefit of hindsight it is easy to argue that the shock had a large permanent component, since the stalling in capital inflows has taken more than three years now. But it is not clear that it was perceived as such from the very beginning (this is an important point that we will revisit when we discuss Argentina in greater detail). Indeed, investors and policymakers had witnessed a quick recovery of capital flows following the Mexican (Tequila) crisis in 1995, which could have led them to expect a similar quick recovery after the Russian collapse. But things turned out to be different. Figure 4 shows that two years after the Mexican crisis there was more than a complete recovery of capital flows, whereas there has been no recovery in capital flows to the region since 1998 following the Russian crisis.

Figure 4

Sudden Stop in LAC
(Net private capital flows, US$ billions)
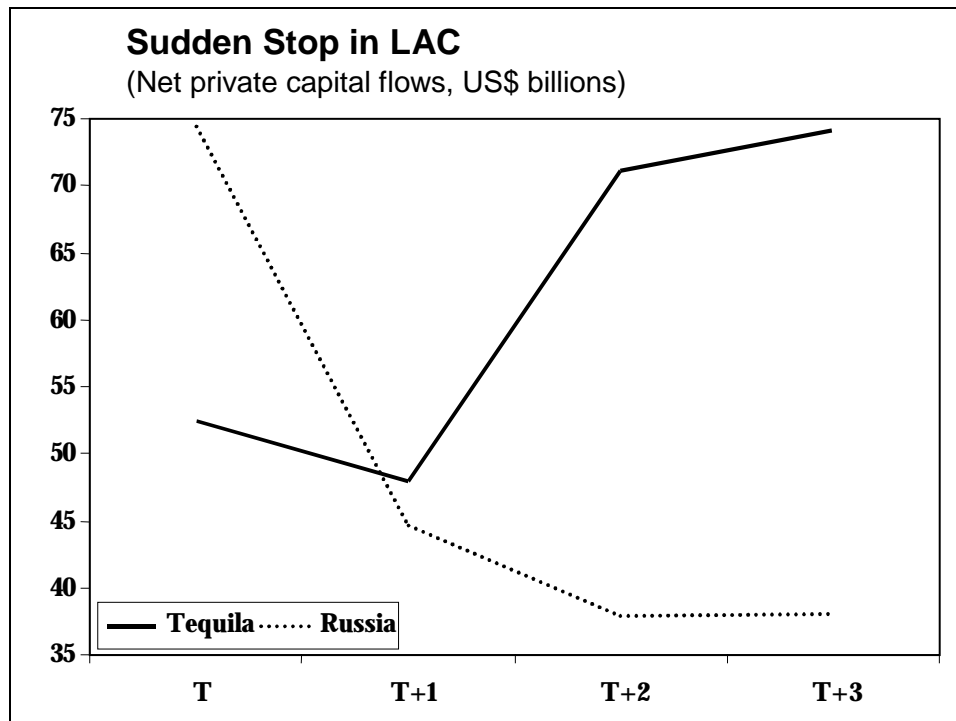
Note: "LAC" refers to Western Hemisphere countries, according to IMF definition.. *"T"* denotes the year of occurrence of the crisis. Source: World Economic Outlook (IMF), December 2001.

Sudden stops are typically accompanied by large contractions in international reserves *and* declines in the relative price of non-tradables with respect to tradables (i.e., real currency depreciation). By way of illustration, consider the case of a small open economy that experiences a current account deficit before a sudden stop takes place. By definition:

$$CAD = A^* + S^* - Y^*, \tag{1}$$

where *CAD* is the current account deficit, A^* is absorption of tradable goods, S^* represents net non-factor payments to foreigners, and Y^* is the supply of tradable goods. If financing of the current account deficit is stopped, the full amount of that imbalance needs to be cut. Table 3 shows that current account adjustment can be sharp. Indeed, it is

not uncommon to see an abrupt adjustment towards current account balance within a year following the sudden stop.

Table 3

Current Account Balance, US$ billions					
	ARG	BRA	CHL	COL	ECU
1998	-14.5	-33.4	-4.1	-5.2	-2.2
1999	-11.9	-25.4	-0.1	0.2	0.9
2000	-8.9	-24.6	-1.0	0.3	0.7
2001	-5.6	-23.2	-0.9	-2.1	-0.8

Current Account Change, % of 1998 Imports					
	ARG	BRA	CHL	COL	ECU
1999 vs 1998	6.1	10.6	18.8	31.3	49.0
2001 vs 1998	21.1	13.5	14.9	18.0	21.3

Source: World Economic Outlook (IMF), April 2002.

A measure of the percentage fall in the absorption of tradable goods needed to restore equilibrium is given by:

$$\eta = CAD / A^* = 1 - \omega, \tag{2}$$

where ω is a measure of the un-leveraged absorption of tradable goods, defined as:

$$\omega = (Y^* - S^*) / A^*. \tag{3}$$

Notice that this measure captures the share of absorption of tradable goods that is financed by the supply of tradable goods[4]. The lower this value, the higher will be the share of absorption of tradables financed from abroad. In other words, relatively closed economies with a small supply of tradable goods running a current account deficit will be highly leveraged. As we will see later, this is an important consideration regarding RER behavior after a sudden stop in capital flows.

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[4]   Net of non-factor payments.

In order to obtain an estimate for η that can be used for cross-country comparisons, we proxy A^* by imports. We use the observed current account adjustment for different periods, taken as a share of imports at the time of the crisis, in order to illustrate the observed percentage fall in absorption of tradable goods that was required to accommodate the change in the current account. Results are shown in Table 3 for 1999 and 2001. Countries like Chile, Colombia, and Ecuador, where the percentage fall ranged anywhere from 18.8 to 49 percent, experienced a quick and substantial adjustment in absorption of tradable goods by 1999. Adjustment in Brazil and Argentina has taken longer, a phenomenon that we will analyze in more detail later.

Having shown that the percentage fall of tradable goods absorption can be substantial after a sudden stop, we now consider effects on non-tradable goods. A common assumption in the literature is that preferences are homothetic, implying that the income expansion path of tradable vis-a-vis non-tradable goods is linear. Under this assumption, for a given RER, consumption of non-tradable goods is therefore proportional to that of tradable goods.[5] As a result, a decline in demand for tradable goods of size η must be matched by a proportional fall of equal size in the demand for non-tradable goods. Now consider the effects of this fall in demand on the RER. Given that the price of tradable goods is determined from abroad, all we need to take into account is the behavior of the non-tradable goods market. Define demand for non-tradables as:

$$h = a - \chi p, \tag{4}$$

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[5] In what follows we abstract from investment. This is indeed a major omission, which is, however, likely to be less misleading in a steady state context such as the present one. Catena and Talvi, 2001, reach similar results in terms of a full-fledged dynamic model.

where h is (the log of) demand for non-tradable goods, and p is (the log of) the relative price of non-tradable to that of tradable goods, i.e., the inverse of the RER, and a is a parameter. Then, for a given RER, the fall in demand following a sudden stop is simply:

$$da = \eta = 1 - \omega. \tag{5}$$

Assuming, for simplicity, that the supply of non-tradable goods is fixed (so that $dh = 0$), then the required percentage change in the real exchange, after differentiation of (4), is given by:

$$dp = (1 - \omega)/\chi; \tag{6}$$

That is to say, the higher is the leveraged absorption of tradables, i.e. the lower is ω, the higher the impact on the RER needed to restore equilibrium after a sudden stop. The intuition for this result is that, in the short run, the ability to generate purchasing power in terms of tradables is exports minus debt service. Thus, a Sudden Stop that requires a greater external surplus, implies a larger *proportional* sacrifice in absorption in terms of tradables, the smaller is ω. Another element that affects our measure of absorption leverage is non-factor payments (S^*), typically composed of interest payments, which implicitly captures indebtedness levels. High external indebtedness therefore reduces available resources to finance absorption of tradable goods, requiring greater RER realignment following a decline in capital flows. Given these characteristics, ω is a good summary statistic to measure the impact on RER realignment. A further simplifying assumption we make is that the supply of tradable goods can be measured by exports whereas, as earlier noted, imports serve as a proxy for absorption of tradables[6]. Table 4

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[6] A scenario which is more plausible in the short run.

contains a list of Latin American EMs ranked by this measure in 1998.[7] Chile clearly

leads the ranking in terms un-leveraged absorption. Argentina, although not the lowest

ranked in the group, stands 15 percentage points below Chile, indicating that it would

need greater RER realignment following a sudden stop.

Table 4

Un-leveraged Absorption Coefficient (ω)				
BRA	ARG	ECU	COL	CHL
0.56	0.66	0.66	0.70	0.81

Source: World Economic Outlook (IMF), and own
estimates. Note: Values are given for 1998.

Another key element in determining the size of the required change in the RER is

given by the price elasticity of the demand for home goods, χ. Estimates for developing

countries are typically much lower than those for industrial countries, implying that

sudden stops can be much more devastating for EMs. Thus, not only are sudden stops a

much more common feature of developing countries (see Calvo and Reinhart, 2001), but

their effects can be more dangerous as well. Actually, the higher vulnerability of EMs to

sudden stops could partly explain their higher recurrence.

Given this framework, we ask next what should be the size of RER realignment

following a sudden stop that requires a full adjustment of the current account deficit,

using 1998 as a starting point. To compute this, we make use of equation (6), taking a

value of $\chi = 0.4$ (the lowest point estimate in the literature). Given that we measure the

RER as the inverse of p, we compute the rate of depreciation for $1/p$. Obviously, these

figures should not be taken at face value, but as a way of ranking the effects of a sudden

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[7] Except for Mexico, where values are computed for 1994.

stop across countries.[8] Table 5 shows the results. As it stands, this exercise indicates that Argentina would have needed to depreciate its RER by 46 percent in order to bring down its current account to a value of zero, whereas Chile, for example would only have needed to depreciate its RER by 32 percent. This means that Argentina would have needed to depreciate its RER about 43 percent more than Chile in order to close the current account gap.

Table 5

Required % Change in Equilibrium RER

BRA	ARG	ECU	COL	CHL
52.5	46.2	46.1	43.0	32.4

Source: World Economic Outlook (IMF), and own estimates. Note: Values are given for 1998.

As a matter of fact, since the Russian crisis, Chile has depreciated its currency vis-à-vis the dollar by about 45 percent in real terms, and closed a current account gap of almost 19 percent of imports. Chile's current account deficit was equivalent to 6 percent of GDP in 1998 and fell to zero in 1999. In this respect, it would look like Chile's adjustment was bigger than that of Argentina, where the current account deficit fell from 4.9 percent of GDP in 1998 to 2.4% of GDP in 2001. However, if Argentina's reduction in the current account gap is measured as a share of imports (the relevant measure from our perspective), the reduction was also 19 percent, similar to the adjustment observed in Chile. According to our model Argentina's depreciation should have been at least as large as that of Chile (45 percent), clearly indicating that the depreciation of the RER that effectively took place in Argentina (around 14 percent) was far from sufficient given the

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[8] Here we have abstracted from several factors, such as the fact that we have kept the supply of both tradable and non-tradable goods constant, and we have assumed that the price elasticity of demand of non-

underlying adjustment in the current account.[9] The slow adjustment of RER observed in Argentina can be explained by the combination of a fixed exchange rate and price stickiness (a relevant feature given the weight of public wages and public utility fees in price behavior), which retarded the adjustment of the RER.

4. Debt Valuation and Fiscal Sustainability

We now turn our attention to the effects of RER depreciation on fiscal sustainability. It is not uncommon to find countries where public sector debt is largely denominated in terms of tradables (see Table 6) and government revenue comes to a large extent from non-tradable activities. This introduces a currency mismatch in the public sector balance sheet, which makes any sustainability analysis highly susceptible to RER swings.

Consider the typical sustainability calculation, where the size of the primary surplus necessary to keep a constant ratio of debt to GDP is computed, given a cost of funds, and a growth rate for the economy. Take the standard asset accumulation equation:

$$b_{t+1} = b_t \frac{(1+r)}{(1+\theta)} - s_t, \tag{7}$$

where b_t is the debt to GDP ratio, r is the real interest rate on debt, θ is the GDP growth rate, and s_t is the primary surplus as a share of GDP. To obtain a constant debt to GDP ratio ($\bar{b}$), the budget surplus must satisfy, assuming constant r and θ:

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tradables is low and the same across countries. Again, these figures do not attempt to match observed figures. Instead, they aim to reveal the main transmission channels behind sudden stops.
[9] Had Argentina reduced its current account balance to zero, the required adjustment should have been higher than that of Chile, as illustrated in Table 5.

$$s_t = \bar{b}\left[\frac{(1+r)}{(1+\theta)} - 1\right].$$
(8)

Key to this analysis is the initial debt to GDP ratio ($\bar{b}$), as well as its denomination in terms of tradables vis-a-vis non-tradables. This ratio can be expressed as:

$$\bar{b} = \frac{pB + B*}{pY + Y*} = \frac{B + eB*}{Y + eY*},$$
(9)

where e is the real exchange rate (defined as the price of tradables relative to non-tradables), p is the inverse of the real exchange rate, B is debt payable in terms of non-tradables, $B*$ is debt payable in terms of tradables, Y is output of non-tradables, and $Y*$ is output of tradables. Obviously, debt composition, as well as output composition, matter a great deal for sustainability analysis, because mismatches between debt and output composition can lead to substantial differences in valuation of the debt/GDP ratio following RER depreciation. For example, consider the limit case in which $b = eB*/Y$, where all valuation effects take place on debt only. This is the worst scenario in which RER depreciation hits fully on sustainability. Another case that is particularly relevant is that in which $(B/eB*)/(Y/eY*) = 1$, i.e., when the composition of debt and output is perfectly matched. When this condition holds, RER depreciation has no effect on fiscal sustainability. Table 6 shows how countries ranked in terms of mismatch at the time of the Russian crisis[10]. A value of 1 would indicate a perfect match, and a value of zero would indicate the highest degree of mismatch. Clearly, the highest mismatch holds for Argentina, something that may very well be its biggest vulnerability. On the other side of the spectrum lies Chile, the best matched economy, with a value of 0.45.

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[10] We proxy output of tradable goods ($Y*$) with exports. This measure is particularly relevant in the short run, although it could underestimate tradable output in the long run.

Table 6

Public Sector Debt Mismatch Measure

	ARG	ECU	COL	BRA	CHL
B/e B*	0.08	0.02	0.59	1.76	1.30
Y/e Y*	8.63	2.94	6.36	12.34	2.85
(B/e B*)/(Y/e Y*)	0.01	0.01	0.09	0.14	0.45

Source: Own estimates. Note: Values are given for 1998.

For comparison purposes, we consider the effects of a depreciation of the RER of 50 percent on debt valuation and fiscal sustainability for all the countries we selected, as of 1998. The results are presented in Table 7[11]. We see clearly that under this scenario, Argentina, together with Ecuador, would be the hardest hit country in terms of debt valuation as a share of GDP. Just because of the relative price adjustment (holding the assumption that interest rates on public debt and GDP growth remain unchanged), Argentina's debt/GDP ratio would jump from 36.5 percent of GDP to 50.8 percent of GDP, an increase of near 40 percent on impact, putting heavy pressure on its fiscal position. Quite a different scenario plays out for Chile, where the debt revaluation effect is minimal: public sector debt as a share of GDP increases from 17.3 percent to 18.7 percent. It is interesting to see that in the case of Brazil, a 50 percent depreciation of the RER only affects the debt/GDP ratio by 14 percent. As we shall see later, in our view this was a key element, together with a substantial adjustment in the primary surplus, to explain Brazil's success in controlling its fiscal position after the RER depreciation it experienced in 1999.

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[11] Calculations were made assuming that debt is issued either in terms of tradable goods, or in terms of non-tradable goods. When debt is issued in domestic currency, the relevant price index for valuation purposes is the price level, which typically includes a share of tradable goods in the basket it values. In this respect, a RER depreciation should affect the valuation of domestic currency denominated debt through the tradable component of the price level, making the effects of a RER depreciation larger than estimated here.

Table 7

Fiscal Sustainability Under a 50% RER Depreciation

	ARG	BRA	CHL	COL	ECU
(a) Base Exercise					
Observed Public Debt (% of GDP)	36.5	51.0	17.3	28.4	81.0
Real Interest Rate	7.1	5.8	5.9	7.3	6.3
Real GDP Growth	3.8	2.0	7.5	3.6	2.6
Observed Primary Surplus (% of GDP)	0.9	0.6	0.6	-3.0	-0.2
i. Req. Primary Surplus (% of GDP)	1.2	1.9	n.a.	1.0	2.9
(b) Change in Relative Prices					
Real Exchange Rate Depreciation	50.0	50.0	50.0	50.0	50.0
Imputed Public Debt (% of GDP)	50.8	58.1	18.7	34.9	107.2
Real Interest Rate	7.1	5.8	5.9	7.3	6.3
Real GDP Growth	3.8	2.0	7.5	3.6	2.6
ii. Req. Primary Surplus (% of GDP)	1.6	2.2	n.a.	1.2	3.9
NPV of ii - i (% of GDP)	14.3	7.1	n.a.	6.5	26.3
Corresponding Debt Reduction (%)	28.2	12.2	n.a.	18.7	24.5
ii - i (% of Government Expenditures)	2.3	1.0	n.a.	1.3	4.5

Source: Own estimates. Note: Values are given for 1998. n.a.: Not applicable given that the real interest rate is smaller than the growth of GDP, so sustainability is not a concern.

We also consider the effects on the required primary surplus following RER depreciation. Making use of equations (8) and (9), we calculate the required primary surplus after revaluation of the debt/GDP ratio.[12] It is important to note that these calculations implicitly assume that the shock is permanent. Had the shock been temporary, the effects on sustainability would be a lot less relevant than stated here and the need for adjustment would be smaller. But as it became apparent after the 1998 Russian crisis, this shock contained a large permanent (or at least highly persistent) component, implying that the adjustment in the RER and its effect on debt valuation was

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This can be interpreted as the case where a portion of this debt is issued in terms of tradable goods, so that the valuation effects of RER depreciation are larger.

large as well. Of course, this was not absolutely clear at the time of the crisis, something that we have already stated as a reason for the policy dilemma that ensued after the crisis, i.e., whether the size of adjustment that was needed for sustainability was small or large.

Taking as a benchmark the case in which the RER depreciation is permanent, we estimate changes in the required primary surplus needed for sustainability. The biggest correction is that for Ecuador (about 1 point of GDP). Argentina, for example, would require an adjustment of 0.4 points of GDP. In order to assess the significance of this adjustment, we estimate the net present value of the difference between the required primary surplus before and after the RER depreciation, which is equivalent to the change in debt before and after the shock, measured in percentage points of GDP [13]. This figure would be equivalent to 14.3 points of GDP for Argentina, and as much as 26.3 points of GDP for Ecuador. Besides, these figures only represent changes in the required primary surplus, and, in most cases, countries had much lower observed primary surpluses than those required, meaning that the need for adjustment was much higher. In summary, once again we see that highly indebted, dollarized and closed economies are bad candidates to accommodate real exchange rate swings that will be fiscally sustainable. These characteristics not only determine the size of RER fluctuations, but they also determine the size of the impact of RER depreciation on fiscal sustainability.

Given that we have used exports as a proxy of tradable goods output in these calculations, we run the risk of overestimating the effects of RER depreciation because

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[12] Assuming interest rates and GDP growth remain at initial levels, which underestimates the required primary surplus.

[13] This is computed as $(s^* - s)(1 + \theta)/(r - \theta)$, where s^* is the required primary surplus after RER depreciation, s is the required primary surplus before RER depreciation, r is the real interest rate, and θ is the growth rate of the economy. This is obtained by solving (7) forward and taking the difference between the stream of flows valued at s* with respect to the stream of flows valued at s. In other words, it measures the change in debt (in percentage points of GDP) that corresponds to the permanent increase in the primary surplus.

tradable goods output could indeed be higher than exports. In order to assess the

significance of this shortcut, we compare results against a more thorough measure of

tradable output typically used for this calculation. This measure defines a category of

output as tradable when imports plus exports of goods similar to those produced in that

category exceeds output by more than 5 percent. This is performed for categories defined

by the national accounting system at a one digit level. Results are shown in Table 8[14].

Table 8

Fiscal Sustainability under a 50% Depreciation					
	ARG	BRA	CHL	COL	ECU
(a) Base Exercise					
Observed Public Debt (% of GDP)	36.5		17.3	28.4	81.0
Real Interest Rate	7.1		5.9	7.3	6.3
Real GDP Growth	3.8		7.5	3.6	2.6
Observed Primary Surplus (% of GDP)	0.9		0.6	-3.0	-0.2
Req. Primary Surplus (% of GDP)	1.2		n.a.	1.0	2.9
(b) Change in Relative Prices					
Real Exchange Rate Depreciation	50.0		50.0	50.0	50.0
Imputed Public Debt (% of GDP)	47.2		18.1	32.3	98.9
Real Interest Rate	7.1		5.9	7.3	6.3
Real GDP Growth	3.8		7.5	3.6	2.6
Req. Primary Surplus (% of GDP)	1.5		n.a.	1.1	3.6
NPV of i - ii (% of GDP)	10.7		n.a.	3.9	17.9
Corresponding Debt Reduction (%)	22.7		n.a.	12.1	18.1
i - ii (% of Government Expenditures)	1.7		n.a.	0.8	3.1

Source: Own estimates. Note: Values are given for 1998.

As can be seen by comparing Table 8 with Table 7, although there are some

differences in debt to GDP ratios, the required primary surplus following a change in

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[14] Results for Brazil could not be computed, given that national accounts data is not split according to standard classification.

relative prices does not change substantially, implying that our first approximation is indeed a good one to evaluate the effects of a sudden stop[15].

Now that we have provided examples of the effects on the RER of closing the current account gap, and examples of debt revaluation for a given depreciation of the RER, we put both pieces together for the case of Argentina, and analyze the effects of a sudden stop in capital inflows in 1998 (results are summarized in Table 9). In our example, following a sudden stop, Argentina would have had to depreciate its RER by about 46 percent. Had this depreciation occurred, the country would have displayed a debt/GDP ratio of 49.7 percent, a considerably larger value than that observed in 1998 (36.5 percent). Under favorable growth and interest rate assumptions,[16] the *permanent* primary surplus needed to keep a constant debt/GDP ratio would have been equivalent to 1.6 points of GDP, 0.7 percentage points of GDP higher than the observed figure (0.9% of GDP). Still, one could argue that primary expenditure was not completely out of line as initially suspected. An additional adjustment of 0.7 percentage points of GDP does not seem like a whole lot. But it must be remembered that a proposed cut in expenditures of a similar size was all it took to topple a key minister in 2001.[17]

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[15] Even more thorough measures that split national accounts data at 2 or more digit levels may yield different results, but that information was not available for all countries in our sample, so we rely on calculations at a one digit level instead.

[16] The growth rate used for this exercise is the geometric average of the previous 10 years. Interest rates are average rates on public debt prevailing in 1998. Both measures do not account for the fact that following a sudden stop in capital flows interest rates typically increase and growth prospects decline. Thus, sustainability calculations are less demanding than those that would prevail had these additional effects been incorporated. We account for this later on.

[17] Minister López Murphy proposed expenditure cuts of about US$3.4bn in March of 2001.

Table 9

	Debt to GDP Ratio (%)	*i*. Adjustment in Prim. Surplus /a	NPV of *i*. (% of GDP)	*i*. (% of Gov. Expenditures)	Debt Reduction (%)
Fiscal Sustainability in Argentina Under Alternative Scenarios in 1998					
(a): *Baseline /b*	36.5	0.3	9.3	1.5	25.6
(b): *Change in Relative Prices to close current account deficit (RER depreciation of 46.2%)*	49.7	0.7	22.6	3.6	45.4
(c): (b) + 200 *BPS Increase in Real Interest Rate*	49.7	1.7	32.8	8.3	66.0
(d): (c) + 1% *Reduction in Real GDP Growth*	49.7	2.2	35.6	10.8	71.7
(e): (d) + *Contingent Liabilities*	58.6	2.7	44.5	13.5	75.9

Source: Own estimates.
a/ The observed primary surplus for 1998 was 0.9 percent of GDP. b/ The baseline scenario assumes a long run rate of growth of 3,8% and a 7,1% real interest rate.

Besides, this analysis relies on two other highly volatile factors: interest rates and economic growth. On the one hand, if our hypothesis that the Russian crisis changed investors' perceptions about the risk associated with EM bonds were to hold, then sustainability deteriorates with the associated increase in interest rates. On the other hand, the fact that GDP growth rates fell all over Latin America may have increased expectations of much lower growth than originally expected. Besides, the fact that RER adjustment in Argentina proved to be a very costly process involving recession and unemployment, may have also worsened growth prospects.

Another issue to keep in mind[18] is that under credit constraints based on the value of collateral (a typical characteristic of recessions), RER depreciation leads to lower valuation of domestic assets and subsequent cuts in credit in the private sector, which in turn lead to output collapse (see, for example, Izquierdo (2000)). The overshooting in output may take time to fade away as agents need sufficient time to save and eliminate prevailing credit constraints.

[18] Although we do not quantify its effects here.

Given all these considerations, once Wall Street made up its mind and deemed Argentina a lower growth economy, sustainability was allegedly questioned. Re-computing our estimates under the assumption that interest rates remain 200 basis points higher than in 1998 (an increase similar to the observed increase in EMBI spreads in 2001 compared to pre-Russian crisis levels) and growth estimates fall by one percent, the primary surplus needed to achieve fiscal sustainability following a sudden stop, goes all the way to 3.1 percent of GDP, or about 2.2 percent of GDP above the observed value for 1998 (see Table 9). The needed adjustment is equivalent to 13.5 percent of total expenditures, an overwhelming figure from a political perspective. Alternatively, the size of debt reduction required for sustainability, given the observed primary surplus of 1998, exceeds 75 percent once we factor in all the different elements of a sudden stop that affect the fisc.

It is worth noticing that under the 1998 baseline scenario[19] it is not evident that Argentina's fiscal position was out of control. Indeed, standard sustainability analysis indicates that the difference between the required and observed primary surplus was 0.3 percentage points of GDP at prevailing RER, growth and real interest rate levels (see Table 9). Undoubtedly, Argentina was quite vulnerable to RER swings, but it was not clear before the Russian crisis that Argentina's fiscal position was out of hand in the absence of a sudden stop. This warns about the need to obtain risk-weighted measures of fiscal sustainability that account for the occurrence of events such as a sudden stop. This type of tools could prove beneficial to internalize the need for more conservative fiscal policy.

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[19] That is when we take the prevailing average interest rate, growth rate and RER instead of imputed post-shock levels.

Another issue that we revisit here is the expected duration of the Sudden Stop and expectations about Argentina's fiscal insolvency. As it has already been argued, all sustainability calculations presented here were made under the assumption that the shock was permanent, but it is not clear that the shock was initially perceived as such by capital markets. Figure 5 shows Argentina's public bonds spread measured by the EMBI index relative to the EMBI average for emerging markets. The fact that for the period starting with the Russian crisis through early August of 2000, Argentina's relative spread was lower than the average spread, indicates that the market had not yet declared Argentina insolvent.

Figure 5

**Argentina: Relative External Financial Conditions**
(EMBI Arg - EMBI+)
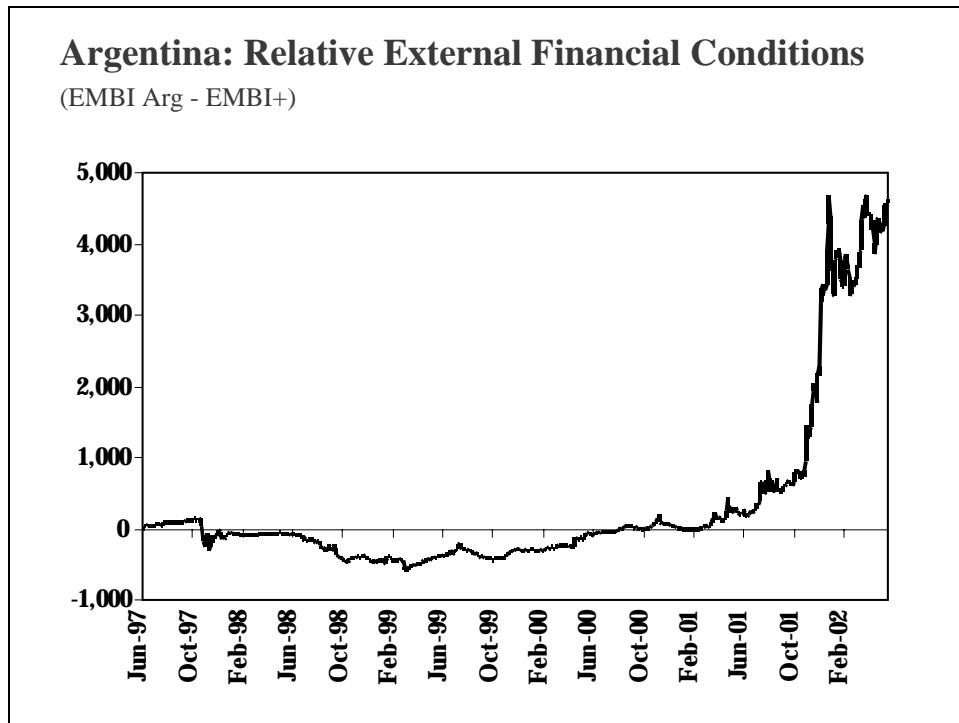
Source: Bloomberg.

Although private capital flows had already dried up by early 1999 (see Figure 6), two factors may have contributed to avoiding bankruptcy expectations. First, it was not

clear that the shock would be permanent (introducing uncertainty about the size of the required adjustment in relative prices), and therefore, it was not clear that Argentina would become insolvent. But to the extent that investors updated expectations about the duration of the shock based on past and present behavior of capital flows, the observed persistence of the initial Sudden Stop deteriorated expectations about Argentina's fiscal solvency, thus contributing to the increase in spreads. Second, although lower output levels resulting from the private sudden stop in capital flows impacted directly over tax collection, putting additional strain on fiscal accounts, multilaterals provided financing to the public sector during this period. Had the shock been temporary, then this additional financing would have been sufficient to cover the government deficit and avoid default since there would be no underlying solvency problem. But as time went by and it became clear that capital inflows were not returning, RER depreciation was unavoidable and sustainability was at stake.

When judging sustainability under the assumption of a permanent shock, it would become apparent that by 2000 Argentina had acquired a large debt problem. When we compute the effects of a sudden stop using the same methodology described above, the debt/GDP ratio rises to 57.6 percent. This implies that the new primary surplus needed for sustainability would have been around 3.3 points of GDP in 2000. Once we take into account the standards set by the new equilibrium RER, the de la Rua administration fiscal adjustment was by all means not sufficient.[20] Thus, the answer to the question as to why De la Rua's adjustment failed to restore Wall Street confidence is that the fiscal adjustment implemented during his administration was not large enough.

Figure 6

Sudden Stop in Argentina
(Private Capital flows, % of GDP)
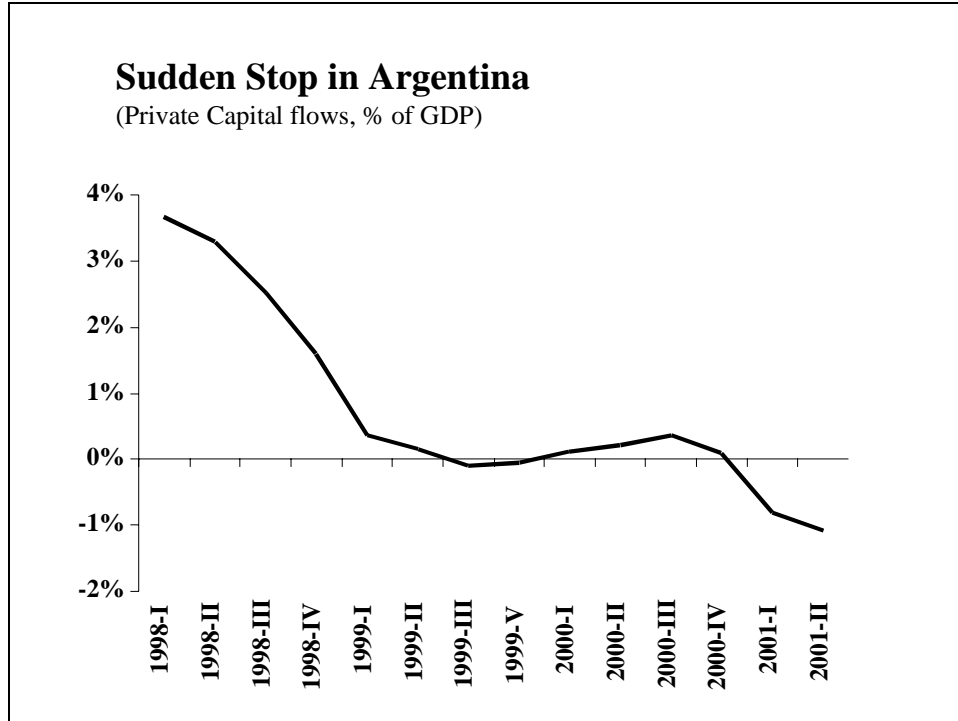
Source: Central Bank of Argentina (BCRA).

The Chilean experience is very useful to contrast with that of Argentina in terms of sustainability. Chile was subject to a sudden stop that forced the country to bring the current account to almost a zero balance, an adjustment equivalent to 18.8 percent of imports. Yet, it fared much better in terms of fiscal sustainability. Chile differed from Argentina in two respects. First, as we already argued in the previous section, Chile required a smaller RER realignment given the country's openness and low indebtedness position. Second, recalling our exercise on the valuation effects of a depreciation of 50 percent in the RER (close to Chile's effective depreciation of 45 percent) described in Table 7, it is clear that Chile's debt/GDP ratio remained almost unchanged. Chile's relatively high share of tradables in GDP, and relatively low ratio of debt in tradables to

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[20] The primary surplus reached 1 percent of GDP in 2000.

total debt, helped dampen the effect of RER depreciation on sustainability. Thus, very little changed in terms of sustainability for Chile after the sudden stop. Morover, the real exchange rate shift was successful in switching production to tradables (something that we do not consider in our model), thus compensating in part the standstill in capital flows. Table 10 shows the change in exports relative to the change in the current account deficit observed one year and three years after the Russian crisis, as an indication of the contribution of exports in closing the current account gap. It clearly shows that Chile was highly successful in switching production to tradables, something that did not occur in Argentina, in part because the RER misalignment was providing little incentive to do so.

Table 10

Exports Change / Current Account Change, %					
	ARG	**BRA**	**CHL**	**COL**	**ECU**
1999 vs 1998	-127.5	-47.6	11.1	8.7	8.0
2001 vs 1998	-1.8	82.7	79.1	43.8	41.8
Exports Change, %					
	ARG	**BRA**	**CHL**	**COL**	**ECU**
1999 vs 1998	-10.6	-6.5	2.4	3.5	5.0
2001 vs 1998	-0.5	14.3	13.4	10.2	11.3

Source: World Economic Outlook (IMF), April 2002.

Another interesting case to contrast with Argentina is that of Brazil. Why was the depreciation of the RER in Brazil successful? Three factors contribute to its explanation. First, by 1999, the country's adjustment of the current account was equivalent to only 10.6 percent of imports, far below the 44.2 percent that would have occurred had the current account deficit been completely eliminated. So what made Brazil avoid a bigger adjustment? Contrary to the experience of other countries, the sudden stop in Brazil was short lived and quickly compensated by FDI flows, which increased 80 percent in dollar

terms between the second quarter of 1998 and the second quarter of 2001. According to our view, this prevented a major currency meltdown[21]. Second, Brazil's level of indebtedness was quite high by 1998 (51 percent of GDP) and a sustainability analysis along the lines presented here would have shown that fiscal adjustment was needed. After the 1999 crisis and in contrast to Argentina, Brazil responded with a severe fiscal adjustment, which increased its primary balance considerably by 3.5% points of GDP in 1999. And third, a crucial difference with Argentina is that by 1998, although higher as a share of GDP than in Argentina, Brazil's debt was not highly dollarized, as Table 6 shows. Therefore, revaluation effects of a depreciation of the real exchange rate over the debt/GDP ratio were not substantial.

5. Real Exchange Rate Adjustment and Contingent Liabilities

So far we have not discussed another issue that further raises the hurdle for any type of sustainability analysis following a sudden stop, namely, the existence of contingent liabilities of the public sector. Here the financial system becomes an element of extraordinary importance. It is not uncommon, as was the case of Argentina recently (and cases like Thailand, for example, in previous crises), to find that commercial bank loans are heavily dollarized, whereas a large proportion of debtors obtains income from non-tradable activities. This currency mismatch between debtors' revenues and liabilities can easily lead to financial distress following large swings in the RER, as balance sheets are highly deteriorated by the increased value of loans, which usually render these sectors

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[21] One can only conjecture that to the extent that FDI flows were due to opportunities facing foreign investors given the low valuation of Brazilian firms after the devaluation of the real (a one time shot), Brazil should be ready for additional fiscal adjustment in case FDI flows do not proceed at the previously observed pace.

bankrupt. To the extent that expectations concur that the public sector is willing to bail out banks and/or bank debtors in the event of a crisis (another common feature of recent crises), then this bailout ought to be added to the sustainability analysis of the fisc. The combination of big RER swings, highly dollarized public debt, and the materialization of contingent liabilities of this sort can send debt/GDP ratios to skyrocketing levels, rendering public sector accounts bankrupt. Argentina suffered from all of these. Rough estimates of the bank bailout yield anywhere between US$7bn and US$13bn, and this excludes previous rediscounts and repos placed with public banks to finance their deposit losses equivalent to about US$6bn. Putting it all together yields an additional burden of US$13-19bn, which raises the debt/GDP ratio after the shock to anywhere between 55.8 and 58.6 percent, almost two thirds higher than the pre-crisis 1998 measure!

This brings us to another point that we will not discuss in detail here, but that could be relevant in explaining why the sudden stop has been so prolonged. New information that a standstill in the capital account can materialize for rather exogenous reasons (and for a whole region) such as the Russian crisis, generating such drastic effects on government sustainability (either because of debt revaluation effects or the emergence of contingent liabilities), may reduce the appetite for holding assets of countries that may be subject to big swings in the RER and are highly dollarized in their liabilities. Thus, this realization can bring the capital account to a lengthy standstill. In this respect, much of the reinstatement of capital inflows would depend on the ability of countries in the region to implement policies that reduce vulnerability to large RER fluctuations, the effects of debt revaluation, and the materialization of contingent liabilities.

6. Nominal Exchange Rate Issues

We now briefly turn to the implications of having kept a fixed exchange rate regime in place when the sudden stop in capital flows hit Argentina (requiring substantial changes in the RER), and contrast this against a scenario where the exchange rate is allowed to float. The Argentine experience shows that under certain conditions, fixed exchange rates can help to conceal fiscal disequilibrium. In particular, if prices are sticky, the RER may take time to reach its new equilibrium, revealing very little about the true magnitude of the necessary fiscal adjustment. The problem is that under those circumstances, it would be politically very hard to justify the need for a substantially larger fiscal retrenchment. This would be true even if we assume (unrealistically) that the International Monetary Fund and policymakers were aware of the yawning misalignment. The fact that the true magnitude of the fiscal adjustment was not evident may also be relevant in explaining the political turmoil that took place in 2000 in Argentina. Faced with the dilemma of deciding whether it was necessary or not to proceed with fiscal adjustment, the ruling alliance experienced substantial tension. This may very well have been the underlying force behind the resignation of several cabinet members and its implicit breakup following the vice-president's resignation.

This consideration immediately raises the question: Would it have been very different had Argentina floated its exchange rate instead in January 2000? Leaving any initial overshooting aside, the floating rate may have revealed that Argentina was in the dumps. The de la Rua administration would have faced some of the same difficulties currently faced by Duhalde's administration, such as dealing with a banking system

bailout. However, remedial measures may have been taken then, avoiding the costly financial engineering that was undertaken later in 2001. Moreover, the alliance was supported by a strong popular vote. This power endowment would have been instrumental in finding an expedient resolution to the crisis, something that the current administration would very much relish.

However, the above scenario is unrealistic. Authorities would likely have been reluctant to let the exchange rate go as far up as required to reach equilibrium RER. Be it because of high liability dollarization, high pass-through from the exchange rate to inflation, or lack of credibility, "fear of floating" would likely have been present (see Calvo-Reinhart, 2002). For these reasons, we conjecture that devaluation would have gone only half way. Thus, although the RER would have adjusted more rapidly at the beginning, interest rates would have exhibited a sharp increase. Surging interest rates are the result of incomplete devaluation and, thus, the expectation of more devaluation to come (*peso problem*). Higher future devaluation could bring about an Indian Summer in aggregate demand but, eventually, boom gives way to bust. The lower price of consumption today vis-à-vis the future may lead to an increase in aggregate spending, but inevitably this gives way to bust in the future as the wealth constraint binds. Therefore, it is unclear that a more flexible exchange rate system would have successfully cleared the air in 2000. Even if the nominal exchange rate had been allowed to float freely, results would not have been much different. Argentina's high vulnerability to big swings in the RER following a sudden stop and its detrimental effects on fiscal sustainability were there to stay regardless of whether the exchange rate regime was fixed, or allowed to float.

7. Wrap-up and Conceptual Discussion

According to our discussion, Argentina January 2000 contained all the economic ingredients for serious trouble. However, its inevitability was not apparent because financial analysts did not fully appreciate: (1) the persistence of Sudden Stop after the Russian 1998 crisis and (2) the political costs of implementing the necessary fiscal adjustment. As time went on, these factors became apparent, which was reflected in a gradual and unyielding increase in the country risk premium. In our view, the Sudden Stop played an even greater role than fiscal imbalance. This is explained by two factors: Argentina is (1) a relatively closed economy and (2) highly dollarized. Being closed implies that the Sudden Stop may call for a sharp increase in the equilibrium real exchange rate. Dollarization, in turn, entails dollar-denominated debt in "peso producing" sectors (mostly non-tradables). Thus, these two factors represent a dangerous financial cocktail. Sharp real devaluation under liability dollarization, per se, pushes up the share of non-performing loans. But, perhaps more importantly, it lowers the collateral of non-tradable sectors, which, by and of itself, brings about a *stock* retrenchment of credit to the non-tradable sector. Hence, to the first exogenous Sudden Stop, a second round follows, which validates and likely deepens the impact of the first. It is important to note that, at that stage, there is little that interest rates can do to trigger desperately needed funding, and output crash becomes an inevitable outcome.

Consequently, Argentina's Fall from Paradise could be rationalized by its commercial closed-ness, and penchant for dollar indexation. The tragedy needs no fisc to grab your imagination. However, this does not exonerate the fisc from any responsibility.

On the contrary, a strong fisc could have come to the rescue by *effectively* socializing

private debts or providing additional collateral (like in Korea's IMF-orchestrated bank

negotiations with external creditors in 1997).   As argued in Calvo (2002), the

government can play an important role in cases in which the economy is hit by *low-*

probability shocks, like the aftermath of the Russian 1998 crisis.[22] Thus, in our view

fiscal weakness in Argentina is a crucial ingredient for explaining the crisis' depth and

persistence.

As noted, a sharp increase in the equilibrium real exchange rate could trigger a cut

in the *stock* of credit available to the non-tradable sector. This kind of shock can only be

met by a sale of assets or the initiation of bankruptcy procedures. No flow "belt

tightening" program can do the trick. The problem here, though, is that the shock hits a

whole sector, not just an individual firm. Prospects for individual firms are hard to assess

when they belong to a network immersed in financial difficulties. Thus, assets can only

be sold at rock-bottom prices, and bankruptcy procedures are especially hard and time

consuming. Under these circumstances, cries for help will likely rise from every corner,

and it will be politically very difficult for the government to do nothing and wait for the

dust to settle.

Given the credit constraint and the stock nature of the problem, the government is

forced to engage in *wealth redistribution* policy across sectors (including the external

sector, e.g., default on external debt). The latter sets the stage for economy-wide *rent*

seeking, or, rather, *protection (from capital levies)-seeking* activities. These activities

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[22] The Russian crisis was not a low probability event. Savvy investors knew that sooner or later a crisis was likely to erupt. Our claim, however, is that it was hard to even imagine, ex ante, that a crisis in a country that represents less than 1 percent of world output would have such devastating effect on the world capital market.

will take precedence over all productive activities (no positive rate of return can match losing a chunk of capital to the taxman's ax!) and, even more worrisome, bring about a grinding stop to all investment projects, except for those few that can be safely shielded from the bloodbath. As a result, tax revenue will fall and show no sign of recovery, further weakening the government's fiscal situation. This, in turn, sets in motion a new wave of devaluation and credit cuts. It is worth noting that this possibly enormous stock problem is the result of an initial Sudden Stop of capital *inflows*, i.e., a flow. Thus, our discussion shows that **credit market complications could transform a *flow* into a *stock* problem**. This implies, among other things, that an economy running a current account deficit could enter into an Argentina-type implosion cycle even though capital flows entirely take the form of Foreign Direct Investment: the cycle could be simply triggered by a discontinuation of those flows.

The above discussion shows that if faced with the need to implement *stock* transfers, the government has to respond with *stock* instruments, e.g., privatizations, obtaining fresh credit from financial markets or international financial institutions, etc. Increasing the fiscal primary surplus will not be enough, unless it triggers higher capital inflows. Actually, in absence of a surge in capital inflows, a higher fiscal surplus will likely deepen the recession. Argentina was especially weak in this respect because it virtually had nothing left to privatize (as opposed to Brazil, for example), and the G-7 was not anxious to provide new money.

No matter how deep the implosion is, a V-shaped recovery is always possible. However, politics enters into economics, and phenoma like War of Attrition could develop. Wealth redistribution sets in motion a tug-of-war in which decisions are

delayed and, as the War of Attrition literature shows (see Sturzenegger and Tommasi (1998)), the delay could be individually optimal. Thus, unless a supranational entity generates a *cooperative* equilibrium, the impasse may take a long time to resolve.

The macroeconomist is likely not to be fully satisfied by our explanation. Macroeconomists do not like large discontinuities unless the *fundamentals* show a similar pattern.[23] That possibly explains why the view that "Argentina was a very bad boy" is so appealing. In our view, however, Emerging Market Economies, EMs, may display equilibrium discontinuities. When distortions are important enough, convexity is lost and discontinuities happen (see below for an example). Under these circumstances, EMs may be pushed into the abyss by a slight change of wind. Of course, no sensible policymaker will place the economy next to the abyss if the change of wind is likely to happen. But the situation is quite different if the wind change turns out to be a low-probability event (as was the aftermath of the 1998 Russian crisis).

An example of equilibrium discontinuity could be developed on the base of Calvo (1998). In that model, and due to fiscal distortions, growth is a declining function of government indebtedness. In an intermediate range, though, growth could be high or low, i.e., there exists equilibrium multiplicity. Suppose that IFIs are effective and can always help implement the high-growth equilibrium if it is just a matter of equilibrium indeterminacy. Clearly, under those circumstances there will be a critical debt level where growth will switch from high to low as debt increases beyond that threshold. In

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[23] Some macroeconomists would be willing to entertain the possibility of multiple equilibria, in which case discontinuities could take place with no change in fundamentals (e.g., Obstfeld, 1994). However, it is probably fair to say that this view is still not the dominant one among macroeconomists.

other words, growth will suffer a discontinuous collapse as debt increases beyond some well-defined critical level—which is the kind of situation we wanted to rationalize.

The main problem with the phenomena we are trying to understand is that they are very complex and, thus, causal relations are hard to establish. At the end of the day, all of these crises exhibit an unsustainable fiscal situation. Thus, the conclusion that "the fiscal deficit did it" is, prima facie, hard to reject. However, our analysis shows that fiscal imbalance *could be a consequence* of financial vulnerabilities, which do not go away as fiscal imbalance vanishes. A strong fiscal situation may help the quick resolution of the economic impasse provoked by financial vulnerability, but the root of the problem lies in the latter, not in fiscal imbalance. Besides, a strong fiscal stance is socially costly. It is obtained at the expense of *not borrowing* even though the rate of return in EMs may far exceed that in developed economies. Thus, crisis avoidance on the basis of a strong fisc may ex ante be dominated by economic brinkmanship.

These notes should not be taken as an apology for high fiscal deficit or unsustainable debt. We argue, instead, that in the case of Argentina and other EMs one should look for deeper underlying causes, which, in our experience, often lie in the financial sector. Our conjecture is that much of these problems are rooted in a vulnerable financial system, coupled with a fiscal structure that relies on highly distorting taxes or suffers from rampant tax evasion. Those are the issues on which reformists, with the aid of IFIs, should aim their canons. As they do so, they are likely to find much room for improvement in financial regulation, fiscal reform, and the development of a legal network that protects private ownership and speeds up bankruptcy procedures.

A word about the exchange rate. First, notice that the Sudden Stop is a *real* phenomenon. Thus, exchange rate policy, for instance, helps to the extent that it contributes to revert a Sudden Stop. If not, devaluation will speed up adjustment towards equilibrium, but will have no effect on the associated credit market disruption. Actually, if the economy is heavily liability dollarized, a currency devaluation could magnify financial crisis.

8. Policy Issues

We can now take stock and use what we have learned from the previous analysis for two purposes. First, we focus on the attempts made to escape crisis in Argentina in order to understand why they failed. Second, we infer some of the policy lessons for Latin America that can be drawn from this analysis, and develop a list of desirable policies that should reduce vulnerability to sudden stops.

Domestic Policies under the Perspective of the Sudden Stop

The view that we have developed thus far allows us to deliver much clearer judgement on the policies that took place in Argentina during the three years prior to the fall of Convertibility. We proceed with the analysis of the policies that were pursued, and provide insights as to why we think they failed, in an effort to understand the impact of domestic factors on the onset of the crisis that materialized in December 2001.

Fiscal Policy. From the previous discussion, it is clear that fiscal restraint introduced during end-1999/early-2000, although in the right direction, was not sufficient to cope with the sustainability demands raised by the new equilibrium RER. The Fund

was not immune to this misunderstanding. Under the assumption that Argentina was facing a liquidity problem, the initial program agreed with the de la Rua administration was followed by the *blindaje*.[24] Fiscal policy was relaxed and the original program was buttressed by a larger package. This failed, as the program was now shooting in the wrong direction. This mistake in diagnosis could be key in understanding why there was a lack of consensus about the degree of fiscal adjustment needed to restore credibility. When the size of adjustment reaches the magnitude required by the sudden stop, it is easy to see why a heterogeneous political alliance can break up. This was exacerbated by the fact that economists did not offer a clear explanation to politicians about the reasons and urgency for adjustment, and particularly about the need to regain solvency if the capital flow standstill was ever to be reversed. This political maelstrom was a clear source of uncertainty for the private sector about the future. In this respect, it is not surprising that investment projects were suspended, resulting in higher unemployment.

An attempt to introduce a fiscal package in early 2001 by a new minister[25] (which again would not have been sufficient to recover solvency) was quickly ruled out given that an agreement could not be reached either with some members of the alliance or with the opposition party. After this failed attempt, fiscal adjustment was rejected by the new incoming minister[26] (a big error in a situation in which sustainability was at stake), and replaced by a bewildering variety of stimulating fiscal arrangements (competitiveness plans), which were subject to several changes (another big error regarding credibility). Fiscal policy was swiftly changed in mid-2001, when it became clear that no additional

[24] A package of about US$40bn to be provided by official creditors.
[25] Mr. Ricardo Lopez Murphy, a respected macroeconomist known for being fiscally strict was appointed to the Ministry of Economy.

external financing was going to materialize, by adopting a zero-deficit rule, and cutting transfers to provincial governments. Both measures put the political system to the test, and came too late to stop the crisis.

Debt Management. On the debt management side, under the perception that the country was only facing liquidity problems, the government engineered a massive debt swap in June 2001 to extend the maturity of the debt profile, but ended up validating extremely high interest rates which, in turn, confirmed expectations about an unsustainable fiscal position. This quickly led to expectations of a balance of payments crisis, which in the case of Argentina would be much more devastating given the existence of highly dollarized liabilities in the banking system.

Another measure aiming at improving the fiscal position was the "voluntary"[27] debt exchange introduced in late 2001, which reduced interest rates and extended debt maturity. But again, all this came too late, even if it was the right way to go. By then, the attack on the banking system and reserve loss was on its way.

Exchange Rate Policy. To correct for RER misalignment, the *convergence factor* was introduced in mid-2001, basically a peg to a basket composed of dollars and euros in equal proportions[28] that would become effective for all transactions when the parity between these currencies reached one. For trade transactions, though, dollars were exchanged at the ongoing dollar/euro basket rate, which amounted to a (fiscal)

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[26] Mr. Domingo Cavallo, the father of the convertibility plan introduced in 1991, who had been highly successful in reducing the fight against inflation and making the economy grow fast during the first presidency of Carlos Menem.

[27] Banks and pension funds were the main bondholders of the debt to be exchanged. Banks were persuaded to enter the exchange under pressure that their assets would otherwise have to be marked to market, something that could threaten their net worth position. Pension fund limits for holdings of public debt were increased to allow for placement of additional bonds.

[28] But surprisingly, not the real, which would have been a key price to include if the main reason behind this change was to increase trade competitiveness.

devaluation of about 8 percent. Unfortunately, the prevailing view was that misalignment

stemmed exclusively from trade factors like the devaluation of the real and the euro—

which ignored misalignment due to country risk considerations. From the previous

analysis, it is clear that the depreciation of the RER obtained by the fiscal devaluation,

although in the right direction, was far from enough to correct the existing misalignment.

The implementation of the convergence factor also had implications for exchange

rate policy that may have contributed to the deposit run that would take place later, and

the emergence of contingent liabilities that would further compromise the fiscal position.

The policy change by which the Currency Board rule was replaced by the *convergence*

factor, was mired in messy implementation, as there was no clear indication about when

this new rule would become operational for all transactions. All that agents knew was

that it would materialize whenever the dollar and the euro reached a parity of one to one.

Moreover, this policy signaled to the market that the government was ready to loosen the

shackles of the currency board and devalue. Fearful about the detrimental effects on

bank assets that a devaluation would cause via massive bankruptcies, depositors figured

out that their assets (even if dollarized) were at stake, particularly given that the burden of

a bank bailout was probably perceived as too big for the government to handle with its

own resources. In this context, the signal given by the change in the currency board

contributed to worsening expectations, something that would later lead to a massive

deposit withdrawal and even larger loss of international reserves.

Monetary Policy. Perhaps the policy that most swiftly precipitated the balance of

payments crisis (which, in turn, would weaken the fiscal position even further with the

materialization of contingent liabilities), was the expansionary monetary stance held by

the administration, even when the Currency Board kept the exchange rate firmly tied to the dollar.[29] Expansionary reserve requirement policies were introduced,[30] but quickly compensated for with IMF pressure. The second tool available was domestic credit to commercial banks, which was sharply increased (see Figure 7). Central bank credit expansion explains about 53 percent of the staggering loss of reserves that took place from April to December 2001.[31] Not all credit expansion reflected the heterodox monetary position. As it turns out, soon after the government gave these expansionary signals, deposits began to decline sharply (about 18 percent between April and December 2001), which allegedly demanded central bank intervention in order to prevent a massive crash of the banking system. But, in any case, the question still remains as to what led the central bank to accommodate deposit withdrawal so swiftly, when the dominant theory was that foreign-owned banks would provide the necessary liquidity.

As crisis brewed, deposits fled the system and composition changed in favor of private banks, most of which are foreign-owned. Thus, depositors seem to have bought the theory—which constituted the intellectual basis behind bank denationalization since at least 1995—that foreign-owned banks would not let their subsidiaries go under. The central bank responded by providing support to the official sector. Deposits in those banks far exceeded international reserves. Thus, the realization that the central bank was ready to bail out state-owned banks reinforced the expectation that the currency board's days were numbered. To further complicate matters, the central bank increased the

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[29] This policy was implemented after the dismissal of the central bank president, Pedro Pou. Although Convertibility required that the monetary base be backed by foreign assets, a share of these foreign assets could be composed of government paper in foreign currency, thus providing room for expansionary monetary policy.

[30] Bank excess reserves were accepted as part of reserve requirements, implying an expansion of lending capacity, but this was compensated for by increases in reserve requirement rates.

reserve requirement of deposit-receiving banks in order to sterilize credit expansion

(marginal reserve requirements were set at 75 percent). This sent a clear signal to foreign

banks that they might be differentially treated, and their assets eventually confiscated,

completely neutralizing the "lender of last resort" role that those banks were supposed to

play.

Figure 7

Increase in Domestic Credit and Foreign Reserves Loss
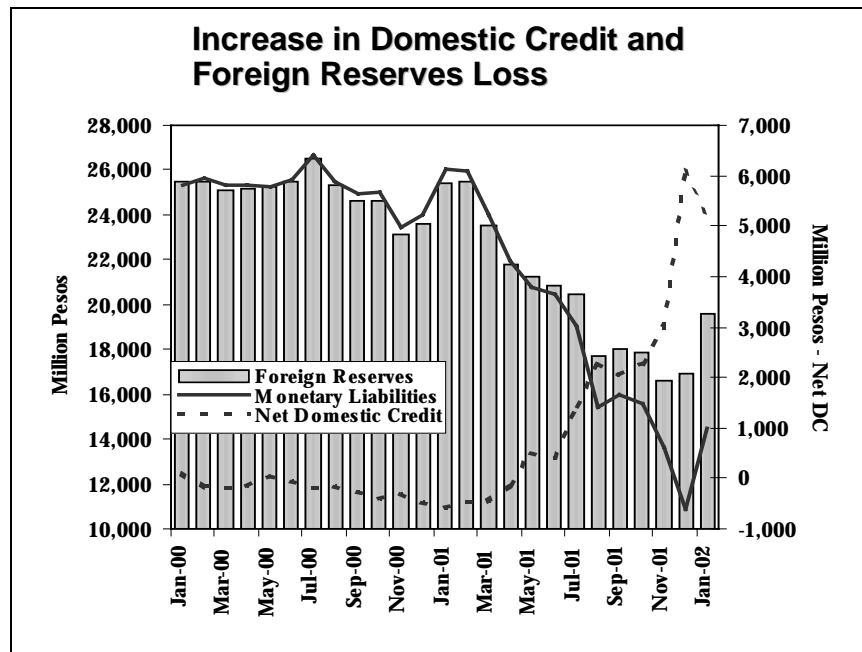
Source: Central Bank of Argentina (BCRA).

Lessons for Latin America

Argentina was extremely vulnerable to a sudden stop in capital inflows such as the

one that followed the Russian crisis: extremely closed to international trade (*C*), a sizable

external and public debt (*D*), a high degree of *de facto* dollarization both in the public and

private sector and as a result, large financial mismatches (*M*). For future reference we

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[31] Reserves are net of US$4 billion in IMF loans.

will call an economy with these characteristics a *CDM* economy. Without any pretense of being exhaustive, in what follows, we list the main policy lessons that logically emerge from our analysis.

1. CDM economies are vulnerable to changes in international conditions that require an adjustment in the current account deficit since they may require correspondingly large changes in equilibrium RER.

2. Large changes in the RER could turn a sustainable fiscal position into an unsustainable one and lead to major solvency problems. Solvency problems can, in turn, precipitate liquidity problems if public debt has short maturities or if they precipitate a run on banks (either because banks are themselves exposed to RER changes or because they are exposed to the public sector through large holdings of public debt).

3. Solving a solvency crisis involves wealth redistribution across sectors. The way and the speed at which that redistribution is made are crucial in determining how fast a crisis is resolved.

4. In *CDM* economies it is dangerous to have high levels of public indebtedness. Rules that allow governments to have a creditor position that create the necessary space for the public sector to be able to respond in times of crisis should be given serious consideration.

5. CDM economies are vulnerable, independently of the exchange rate regime that is adopted.

6. Exchange rate flexibility could play a useful role if the *C*, *D* or *M* are dropped. Otherwise, however, exchange rate flexibility could give rise to non-transparent policies, which might do more harm than good.

7. In the short run, the *C* is hard to drop, and dropping *D* or *M* could be traumatic (as exemplified by Argentina's default and pesoification).

8. Dropping the C may be relevant not just because it reduces the size of RER swings after a Sudden Stop, but also because, from a financial perspective, a higher share of tradable sectors in output composition may reduce the risk of mismatches in private sector balance sheets. This effectively reduces the vulnerability of the banking sector following RER swings, as well as the size of potential bailouts that may worsen the fiscal position. Although the literature has focused on the benefits of openness for growth, the financial channels described above may be equally important.

9. Countries like Brazil, Chile and Mexico are much less dollarized than Argentina and, therefore, have more leeway to use the exchange rate as an instrument. However, "fear of floating" will still be present to a greater or lesser extent, since all of them may find it difficult to issue debt other than in foreign currency or indexed to a foreign currency. In this respect, efforts should be made to create markets for the issuance of debt in domestic currency not indexed to the exchange rate. But this must be done in such a way that two common weaknesses are avoided: First, debt should be issued under terms that eliminate incentives to inflate it away through money creation (such as CPI indexing). Second, issuance should be made at sufficiently long maturity to avoid vulnerability to liquidity shocks. Typically, attempts to issue debt with these characteristics have not been successful. But a recurrent characteristic of these attempts has been the fact that issuance was made under domestic law instead of international law. Thus, there may be a significant difference in risk other than that associated with exchange rate risk, which may further complicate debt-matching strategies.

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