

Hard Money's Soft Underbelly:
Understanding the Argentine Crisis*

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July, 2002

* Paper prepared for the *Brookings Trade Forum*. We are grateful to Joyce Chang, Susan Collins, Michael Gavin and Dani Rodrik for comments. The Center for International Development at Harvard provided generous support.

Introduction

Argentina has imploded, and among policy gurus and op-ed writers there is no shortage of simple reasons why. Some blame the IMF, others the *neo-liberal model* (whatever that may be), yet others a singularly corrupt and incompetent batch of politicians. The implication is often clear: had Argentina just done this or that differently, the tragedy could surely have been averted.

If only life were that simple. Argentina's was not a crisis that caught people by surprise. Instead, it was a protracted affair that, as it marched inexorably towards a catastrophic demise, attracted the attention of some of the best minds in Washington, Wall Street and Buenos Aires for months on end. During this long agony, many well-trained economists proposed various diagnostics and innovative policy initiatives; the country's much-maligned politicians and parties supported austerity policies (such as cutting nominal public sector wages) that would be very hard to swallow in most democratic societies; and, until late in the game, the international community provided ample financial support. Yet the catastrophe proved impossible to avoid.

It may seem like ancient history now, but not long ago Argentina was thought to be a development model. Through much of the 1990s, Wall Street and Washington toasted Argentina's success in axing inflation, privatizing, deregulating, and linking its currency to the dollar through the so-called *convertibility* system. This was not pure ideology. In 1991-97 the Argentine economy grew 6.7 percent per year (on average), a performance second only to Chile's within Latin America. Most important, Argentines themselves relished this new combination of low inflation and strong, if erratic, growth. In 1995 they reelected Carlos Menem—the president who had first applied the reform policies—in spite of double-digit unemployment and of Menem's penchant for fast cars and tainted associates. And in 1999 they elected Fernando de la Rúa, who promised to be like Menem minus the antics: a solid if boring politician committed to responsible, market-friendly policies. It was not until very late (the crucial date is October 2001, when congressional elections were held) that Argentine voters reacted with dismay at the deteriorating economic situation.

True, Argentina's *convertibility* had been in trouble before. During the Tequila crisis of 1995 the system had been tested by a massive collapse in capital inflows and deposit demand. But the economy came out roaring in 1996-1997 without any changes in its currency regime. Moreover, Argentine authorities used the experience to lengthen the maturity of public debt, improve the liquidity of the Treasury, upgrade banking regulation and create a novel liquidity policy that helped reassure investors and kept deposits growing through the recession started in 1999 and until as late as February 2001¹.

The theories put forward as the crisis deepened spanned the whole scope of the academic literature. For some, the problem had a fiscal origin and required a fiscal response (IMF, Tejeiro (2001), Mussa (2002)). Proponents argued a fiscal contraction could even be expansionary, since it would eliminate fears of insolvency and make capital markets more forthcoming. These ideas led to a series of fiscal adjustment efforts that in fact increased the non-social security national primary fiscal surplus by over 2 percentage points of GDP in spite of the recession². They involved raising taxes, and by the summer of 2001, even cutting nominal public sector wages, pensions and mandated inter-governmental federal transfers.

For others, it was a multiple equilibria story, in which self-fulfilling pessimism kept interest rates too high and growth too low for the numbers to add up. Analysts pointed to liquidity needs and rollover risks. In order to reassure the markets and reestablish access, the government negotiated a 40 billion US\$ lending package³ led by the IMF in November 2000, and negotiated a 30 billion dollar debt exchange in May 2001. Neither had the expected effects.

In this same vein, some analysts blamed the pessimism of investors on the lack of conviction of policymakers, and demanded a more forceful leader. This

¹ For a description of Argentina's banking reforms see Calomiris and Powell (2001)

² The de la Rúa administration started in January 2000 with a major fiscal adjustment – the *impuestazo* – that did not generate an expansionary contraction but instead was later blamed for having killed an incipient recovery in its bud. Three additional attempts at this strategy were made in 2001 without any expansionary consequences.

³ The program never added up to US\$ 40 billion. This number included unidentified operations with markets for US\$ 20 billion. The main component was a 14 billion US\$ loan from the IMF and 5 billion from the IDB and World Bank. The latter amount was mainly previously planned lending and not much in additional finance.

concern lead to the return of Domingo Cavallo, the architect of the Convertibility Plan of 2001 and allegedly a legend in the minds of Argentines and Wall Streeters alike. He demanded and was granted special powers to fix the economy by decree. The market reacted with a sharp rise in country risk.

Other students of the Argentine situation blamed the exchange rate, which had moved in the wrong direction because of the dollar's strength and the *Real's* weakness. Fearful of the balance sheet and credibility consequences of an exchange rate move, the government in 2001 engineered a *fiscal devaluation* (i.e. a tariff for imports accompanied by a subsidy for exports, leaving financial transaction and hence balance-sheets untouched) of about 8 percent⁴. It accompanied this measure with a planned gradual transition away from a pure US dollar basket and into a 50-50 dollar-euro peg. The markets reacted very negatively.

For others yet –including Doming Cavallo in one of his incarnations-- the problem was growth and required a supply response. Here again, a massive attempt was made at fostering competitiveness through assorted sectoral plans. Markets again remained unimpressed.

Finally, there have been many who blamed the Argentine crisis on political gridlock. But this is a hard case to make. In spite of an unrelenting recession and with little to show for their efforts, the government consistently got from Congress an unprecedented level of delegation of power. All major policy requests were granted: labor market reforms (albeit in watered-down form), several tax increases, a special powers act in April 2001, and a zero-deficit rule in the summer of 2001 that involved cutting wages and pensions and making their recipients junior to bondholders. And yet, as in a Greek tragedy, destiny proved unavoidable.

Which of these stories makes more sense? Even though there were elements of self-fulfilling pessimism in the Argentine debacle, it is hard to make the case that multiple equilibria alone were to blame. The reestablishment of enough confidence to assure moderate growth, given hard-to-change relative prices, would have required maintaining a current account deficit in excess of 5 percent of GDP and an

⁴ This idea was originally proposed for Argentina by Calvo (1997). It is analyzed by Fernández-Arias and Talvi (2000).

accumulation of an additional 20 billion dollars in external debt between 1998 and 2001. Perhaps in an idealized world of perfect capital markets such a path would be feasible. In a more realistic setting of sovereign risk and imperfect commitment to repay, it seems like a pretty unlikely bet indeed.

In spite of the strong temptation to blame everything on the politicians and their irresponsibility, the simple fiscal explanation is also inadequate. There is no evidence of a spending boom: as a share of GDP, primary government expenditures remain roughly constant in 1993-2001. True, public debt grew rapidly. But below we show the accumulation of debt was driven to a significant extent by the transition costs of the social security system, the recession and the recognition of pre-existing debts, not by a lack of adjustment effort.

Below we sketch a framework for understanding the nature of the Argentine crisis. To make sense of what went wrong one has to focus on the interaction between two factors: the real exchange rate, which became grossly misaligned in the run-up to the crisis, and the country's capacity to borrow abroad, which went from ample in the early 1990s to nil by 2001. In our framework, export prospects determine the access of financially-constrained countries to external resources. Starting in 1999, expectations of future export growth arguably declined sharply: expected returns to capital in this sector fell along with low export prices and an appreciating real multilateral exchange rate. The drastic tightening of the financing constraint explains the onset of Argentina's investment decline and recession. Thereafter negative factors fed on each other: higher risk premia and smaller capital flows meant less demand for domestic investment, which in turn depressed aggregate demand and output, further curtailing creditworthiness and the ability to borrow.

True, other countries in the region suffered similar capital account shocks, and were forced to undertake rapid current account reversals. But those countries, especially Chile and Brazil, could rely on sharp changes in relative prices to help speed up the adjustment. And those countries were much less dollarized than Argentina, a fortunate factor that reduced the significance of negative balance sheet effects. Since relative prices could not adjust quickly (deflation did its painful job, but very slowly), quantities had to. The economy began contracting sharply in 1999, and has remained on that course ever

since. In this sense, Argentina's financial crisis is a *growth* crisis: if incomes keep dropping, at some point debts become impossible to pay.

Something similar can be said of Argentina's public finances, which deteriorated sharply since 1999. True, there was a spending blip late in Menem's term, as the President attempted to gain political backing to run again. But the bulk of fiscal problems were a consequence, not a cause, of the overall mess: as the economy went on a tailspin, balance could only be maintained by ever rising tax rates and spending cuts, which would only further the collapse. In this context, spreads charged on loans to Argentina went from the huge to the obscene. This drove up the deficit, which then spooked investors who demanded even higher spreads, and scared consumers who spent even less (causing revenues to decline yet again), all of which enlarged the deficit further.

The situation presented policymakers with an unusually nasty menu of options. Standard fiscal contraction ran the risk of further contracting an already depressed economy, while having a highly uncertain impact on expectations, investment and future growth. Using the exchange rate as textbooks recommend was no easier. Argentina clearly suffered from exchange rate overvaluation. But given the large stock of dollar-denominated debt, both private and public, devaluation by itself would have most likely made matters worse. Arguably a devaluation accompanied by a *pesification* of financial claims might have resolved the overvaluation while minimizing the negative balance sheet effect. We analyze this possibility below.

The paper is in five parts. The first lays out a bare outline of what happened. The next --entitled "what did not happen"-- analyzes the limitations of the three major paradigms with which actors and analysts tried to understand events as they unfolded. The third section describes our analytical framework for making sense of the crisis. With that framework we ask in the following section what might have happened, i.e. what were useful policy options the authorities might have pursued. A final section asks how reasonable a picture this is of the Argentine crisis, and ponders some troublesome issues an understanding of which might help forecast (and perhaps even prevent?) the next emerging market financial crisis.

I. What happened

Argentina collapsed into hyperinflation in the late 1980's, but was able to right itself by adopting a radical market-oriented reform anchored by a currency board. The reforms delivered rapid growth in the early 90s, with a very rapid recovery of investment (Table 1 and Figure 1). Then came the Tequila crisis in 1995. Financial flows from abroad and investment collapsed, causing a deep recession. Notice, however, that during the crisis exports skyrocketed, growing at real rates in excess of 30 percent in 1995. The subsequent period of 1996 and 1997 brought what seemed like very healthy export- and investment-lead growth. Concerns over the competitiveness of the country were (temporarily) laid to rest as the economy was able to extricate itself from the Tequila crisis and rebound back to high growth through exports, without the disruptive devaluation that the Mexicans had undergone. Also in contrast to Mexico, Argentina's banks were able to weather the storm, in spite of a drastic but short-lived decline in deposits.

That was the happy part of the story. It was not to last. The East Asian crisis caused a fall in the terms of trade in the second semester of 1997 (Figure 2). Then came the Russian crisis in August 1998 and later the Brazilian devaluation of January 1999. Just as under the Tequila, output declined, led by a collapse in investment. Optimists hoped that the economy would soon turn around, just like the last time. But this time export volumes stagnated and investment continued to decline. The recovery never came. The earlier magic was not repeated.

For much of the period after the Russian 1998 crisis, in which the economy was deteriorating, financial markets seemed convinced that the situation was under control. It is striking that until the Brazilian devaluation in January 1999, markets perceived Argentina as just another Mexico –as Figure 3 indicates, spreads for the two countries were close. After that the dangers were seen as somewhat larger, yet Argentina's country risk was well below that of Brazil, Venezuela or the EMBI+ average (Figure 3). It was only in the summer of 2001 that asset prices began to reflect an ominous future.

The IMF was equally sanguine, arguing it was just a matter of keeping heads cool and policies focused until the economy turned around. This was the view expressed by the IMF board in May 1999:

"Argentina is to be commended for its continued prudent policies. As with a number of other countries in the region, Argentina has had to bear the adverse consequences of external shocks, which have taken a significant toll on economic performance. Nevertheless, the sound macroeconomic management, the strengthening of the banking system and the other structural reforms carried out in recent years in the context of the currency board arrangement, have had beneficial effects on confidence, and have allowed the country to deal with these challenges." IMF, News Brief No. 99/24, May 26, 1999

Why the difference between Argentina's performance in 1995-96 (during the Tequila effect) and in the late 1990s? Part of the explanation has to do with bad luck. The terms of trade were negatively impacted after the Asian crisis in the second semester of 1997. Financial markets dried up after the Russian default in August 1998. Brazil abandoned its crawling band and massively depreciated its currency in January 1999. The euro sank by over 20 percent in 2000, further weakening Argentina's competitiveness vis à vis the important European market. The world entered into recession in 2001, not only weakening commodity prices and export prospects, but creating additional turmoil in financial markets after the bursting of the high tech bubble. Throw in underwhelming new authorities at the US Treasury and the IMF and the implications of September 11 and you have the makings of a perfect storm.

But any complete explanation must also recognize that, while large, these adverse shocks were not much worse than those suffered by other Latin American countries –at least until the Argentine endgame of 2001 played itself out. Country risk rose for all after Russia, yet Argentina risk remained below the EMBI+ average until mid 2000. And, as we have seen, in 1998-2000 Argentina was perceived as a much safer bet than either Brazil or Venezuela until the first quarter of 2001.

The evolution of the terms of trade implies a similar story. After a rise in 1996-97, Argentina's terms of trade fell by over 10 percent in the following two years, and recovered thereafter. Other countries in the region fared much worse. Oil exporters like

Ecuador, Mexico and Venezuela suffered more during the oil price slump of 1997 and 1998. And over the last five years the terms of trade deterioration has been larger and more persistent for Chile and Peru.⁵

In all of these countries investment and growth slowed down. But none, except Ecuador, crashed. It is not hard to understand why adverse capital and current account conditions can trigger a recession. But they ordinarily do not cause a fiscal and financial crisis, a default on foreign and domestic debt, the collapse of the exchange rate system, a meltdown of the domestic banking system, and the downfall of a succession of governments, as it has happened in Argentina. What else was at work in Argentina to render it so vulnerable to adverse external conditions? What had changed between 1995 and 2000, so that the old medicine of holding tight, sticking to the fixed exchange rate and hoping for the best could no longer work? To such question we turn next.

II. What did not happen

As the drama unfolded, three major views developed as to the nature of the problem and the appropriate policy response. The dominant view put the accent firmly on self-fulfilling bad expectations. A second view – not completely unrelated – emphasized problems of fiscal sustainability. Yet another view stressed lack of competitiveness and the rigidity of the exchange rate regime. Each of these views was influential in policy circles and led to important changes in actual policies.

Self-fulfilling pessimism

The self-fulfilling pessimism paradigm probably became dominant as it was seen as the most convincing explanation of the 1995 Tequila crisis, which was associated with a sudden and systemic collapse in capital inflows and in the demand for deposits in the banking system. Without a lender of last resort, the country was vulnerable to liquidity crises. To avoid future similar crises the authorities developed after the 1995 crisis a highly-praised liquidity policy which involved imposing high liquidity requirements on banks, negotiating contingent credit lines with foreign banks,

⁵ See the detailed discussion in Perry and Servén (2002).

lengthening the maturity of the public debt and keeping a liquid fiscal position. These policies were handsomely rewarded by the markets through improved confidence and market access. In fact, these policies together with the currency board were seen as providing robust institutions to cope with financial turmoil⁶. They proved their mettle during much of the subsequent crisis: deposits in the banking system kept growing until February 2001.

With the banking system under control, self-fulfilling negative expectations were seen as potentially originating from roll-over problems in the public debt. To avoid such bad equilibria, the authorities negotiated a major expansion of international official support in November 2000 – the so-called “*blindaje*”. They repeated this strategy in the spring of 2001 with a 30 billion dollar debt exchange designed to lengthen the maturity of debt coming due in the subsequent three years and achieving a temporary reduction in interest payments.

Negative expectations were also seen as becoming self-fulfilling not just through liquidity channels but also through fiscal conduits. Pessimism would lead to high interest rates, which would depress growth and weaken the fiscal position, complicating debt service and thus justifying the initial pessimism. The IMF itself seemed to take this view:

“Despite substantial efforts by the Argentine government to implement the economic program it had announced in December 1999, and which the IMF has supported with a stand-by credit since March 2000, economic performance in 2000 was worse than expected. A major disappointment was the failure to recover from the recession affecting economic activity since mid-1998. After a short-lived pickup in the last quarter of 1999, the economy again stagnated. This reflected in part the impact of the fiscal tightening on domestic demand, but was mainly the result of a drop in business and consumer confidence, and the progressive hardening of financing conditions in international markets, that resulted in rising borrowing costs and reduced market access for Argentine private and official borrowers.” IMF, Press Release No. 01/3, January 12, 2001

⁶ “Argentina's convertibility regime and the liquidity defenses of the banking system are important pillars of the country's economic strategy and have been vital in helping withstand turbulent financial conditions. The Fund, therefore, welcomes the authorities' reaffirmation of their commitment to these policies.” IMF Press Release No. 01/37 September 7, 2001.

In designing a strategy to deal with the crisis the IMF program – revised in May 2001- argued as follows:

"Argentina's program aims at *strengthening confidence* through fiscal consolidation to achieve the program's targets for 2001 and fiscal balance by 2005, while promoting the recovery of investment and output through fiscal incentives and regulatory changes. Firm implementation of the program is needed *to initiate a virtuous circle of stronger public finances, lower interest rates, and a recovery of economic activity.* (italics added). IMF News Brief No. 01/44 of May 21, 2001.

To check some implications of this story we ran a simple simulation. We assumed that enough “confidence” was reestablished to secure a 3 percent growth rate starting in the fourth quarter of 1998. This simulation intends to illustrate a possible counter-factual path, had the Russian crisis not affected the availability of finance and a move towards a “bad” equilibrium. The simulation intends to use very crude relationships, just to gauge the potential implications of alternative paths. We are not taking account of other real shocks that the economy experienced throughout this period.

To keep things simple, we include a minimum number of behavioral equations but we keep the identities required by the national accounts. First, we incorporate the impact of the higher output on a higher demand for imports. We calculate the marginal propensity to import by running a regression between imports and output. The econometrically estimated coefficient was 0.261, but we did our simulations with a more modest 0.2. We also include the higher external debt needed to run the wider current account deficit and we service the additional accumulated debt in future years. We also take account of the impact of the higher output on the primary balance. We calculate the marginal propensity to save the additional fiscal revenues from the data by running a simple regression. The estimated effect is 0.088. We leave all other fiscal variables as they are, except that we count the impact of the lower path for public debt on the interest burden. We do not include the potential impact of the higher domestic demand on a lower level of exports, as this would only make our story even more compelling.

The simulations are presented in Figures 4a, b, and c. As can be clearly seen, the increased activity would have been enough to maintain the public debt to GDP ratio relatively stable, below 40 percent of GDP instead of rising as it did up to almost 50 percent of GDP by the first quarter of 2001. However, in order to achieve this path, the current account deficit would have had to average in excess of 5 percent of GDP instead of declining to a 4-quarter moving average of 3.1 percent of GDP by the first quarter of 2001⁷. This larger deficit implies that external obligations would have had to rise by an additional 12 percent of GDP, even after correcting for the larger denominator, given the higher growth. This implies an increase in the debt-to-export ratio of over 100 percentage points.

Hence, leaving all other shocks aside, the “good equilibrium” –that is, a reestablishment of enough confidence to maintain growth at 3 percent-- would have done away with the fiscal imbalance but would have required the funding of sustained 5 percent current account deficits and the accumulation of an additional 12 percent of GDP in external obligations. Of course this assumes that external financial constraints do not bind. If for some reason this amount of financing were not available, then the good equilibrium would not be feasible.

Fiscal unsustainability

A second view of the crisis put the accent not so much on self-fulfilling pessimism and multiple equilibria, but on the more banal problem of fiscal solvency. After all, the public debt went from 80.3 billion dollars at the end of 1994 to 144 billion dollars in 2001. Is this not proof that the fiscal accounts were on an unsustainable path? True, the fiscal problem had been aggravated by the recession, but the debt had increased by 15 billion dollars in the three boom years of 1996-1998.

⁷ Some would argue that if the fiscal adjustment had translated into a lower country risk, interest rates on new debt would have declined, making the debt dynamics less unfavorable. However, much of the old debt in Argentina was long term and had been contracted at rates well below those that even countries like Mexico faced post-Russia. In the simulations we assume that the additional debt pays an 8 percent interest, which is about 300 basis points over the US Treasury, a spread significantly below that of the average EMBI+, let alone the 700+ spread that Argentina faced during this period. Moreover, the bulk of the additional debt is explained by the trade deficit accumulated between the fourth quarter of 98 and the second quarter of 2001 (US\$ 19.9 billion) and not to the additional interest payment (US\$ 1.8 billion).

Was this not proof that the country could not enforce a budget constraint? (Mussa, 2002).

The need for fiscal balance was paramount in the minds of the authorities and the IMF throughout the evolving crisis. In fact, that was the diagnosis with which Minister Jose Luis Machinea defined the economic situation in early 2000 in order to justify his so-called *impuestazo*. It was also the interpretation of Minister Ricardo Lopez Murphy who took office briefly in March 2001. When Minister Domingo Cavallo took over after him he immediately implemented a financial transactions tax to improve the fiscal situation. He later adopted the zero deficit policy in the summer of 2001.

The view that Argentina was somehow irresponsible in its fiscal management and that this may have been a major cause of the crisis --and not just one of its consequences-- has become a dominant story *ex post* (Mussa, 2002; Tejeiro, 2002). We do not share this view. The fiscal imbalance was not large and was backed up to a significant extent by increased savings of the privatized pensions system. Moreover, as the simulation above illustrates, the fiscal imbalance that emerged was related to the recession and hence is best understood as a consequence rather than a cause of the crisis. It is hard to make the case that a more forceful fiscal adjustment would have made a very significant difference. In this section we will just present the facts in a way that supports a rather different interpretation.

Table 2 contains the basic fiscal accounts. The numbers quickly dispel any argument based on a spending feast. Government spending remained remarkably flat as a share of GDP from 1993 onwards. If we exclude social security payments and transfers to the provinces, other national primary spending actually declined by 1.9 percent of GDP (from 8.0 to 6.1 percent) during the pre-crisis period 1993-1998.

It is important to understand the dynamics governing the fiscal accounts in Argentina. First, there was a rising interest burden of the debt. As shown in Table 2 factor payments increased from 1.3 percent of GDP in 1994 to 4.1 percent of GDP in 2000. This was due mainly to three reasons:

- Some of the Brady Bonds issued during the early 1990s had rising interest rates.

- The increase in the official public debt exceeded the accumulated deficit flows between 1994 and 2000 by about 21 billion dollars, half of which was the recognition of pre-existing debts and the rest represented the purchase of financial assets (see Table 4 below).
- After the Russian crisis, the country faced an interest rate on new debt which was higher than the average rate paid on the existing stock.

A second force affecting the fiscal accounts was the social security reform. This caused revenues to the Social Security system to be diverted towards the new private fund administrators. Social security revenues declined from 5.6 percent of GDP in 1993 to 3.8 percent by 2000 (Table 2). This did not represent a reduction in the economy's contributions to the system, only a change in the mechanism of allocation and administration. By December 2000, the private pension fund administrators had assets totaling 20.3 billion dollars. By contrast, social security payments rose from 5.3 percent to 6.1 percent of GDP by 2000. This caused the social security balance to swing from a surplus of 0.4 percent in 1993 – before the reform – to a deficit of 2.4 percent of GDP by 2000. The cumulative deficit of the social security component of the budget between 1995 and 2000 was US\$ 30.9 billion.

Finally, the provinces maintained fairly flat spending and revenue levels, except for a spurt in spending in 1998-99. However, this meant that they were running consistent primary deficits between 0 and 1 percent of GDP, making them unable to service their growing debt without recourse to more financing.

In order to confront these pressures on the budget, the national authorities pursued a policy of improving the primary surplus of the remaining parts of the budget (excluding the social security system and the provinces). This surplus increased from 1.3 percent of GDP in 1995 to 3.3 percent in 2000. In this sense, excluding the social security system, the primary surplus achieved by Argentina is comparable to that achieved by Brazil, a country that has not privatized its social security system.

Did the authorities really tighten fiscal policy when they found themselves in trouble in 2000 or was it all just talk? Table 3 explores this issue by running regressions of government revenues and primary spending as a function of GDP and

including a dummy for the post-*impuestazo* period, i.e. the period starting in the second quarter of 2000. Several features merit highlighting. First, tax revenues show much more buoyancy than spending. The estimated elasticity of tax revenues to GDP is 1.47, while it is only 0.72 for primary spending excluding social security. This implies that during the booming years of 1996 and 1997 government spending was kept subdued relative to revenues⁸. Second, after the fiscal adjustment in the first quarter of 2000 – the *impuestazo* – revenues are estimated to have been 11 percent (1 billion dollars per quarter) higher than would have been expected given GDP changes. By contrast, the dummy variable for spending is not statistically significant, meaning the government was essentially just able to cut spending by the expected amount. During the recession revenues would have fallen more than spending, but the significant policy reaction prevented this from happening and secured a continued improvement of the non-social-security primary surplus.

Bringing it all together (see Figure 5) it appears that one way to describe the situation emanates quite naturally from the data: the government was able to improve the (ex-social security) primary surplus to accommodate a large proportion of the increase in debt service, while the overall deficit was essentially explained by the deficit of the social security system and to a smaller extent by that of the provinces. However, the savings of the privatized pension system backed two thirds of the social security deficit.

These calculations account for the published deficits. What about the assertion that the growth of debt was out of control? While we acknowledge that the provincial debt was growing in an unsustainable fashion, the debt of the federal government supports a different interpretation. Table 4 shows the increase in federal debt during the 1995-2000 period. As can be seen, the total increase in debt of 42.7 billion exceeds the cumulative deficit by 20.9 billion dollars. A bit over half of the difference is explained by the accumulation of assets (11.7 billion), while some 10.4 billion can be explained by the recognition of pre-existing debts. Note that the cumulative overall

⁸ This fact is also clear in Figure 1 where government consumption appears as the least dynamic component of aggregate demand during the boom periods. It does tend to show less downward adjustment in recessions.

deficit is 10.1 billion dollars larger than the cumulative social security deficit, and is equal to the accumulation of assets in the pension system.

In conclusion, excluding the social security system, the national government was able to generate a primary fiscal surplus in excess of 3 percent of GDP. This would have been sufficient to cover the increased cost of debt service of the national debt. In fact the primary surplus was of the same magnitude as that of Brazil, in spite of the deeper recession. The overall deficit was affected by the growing deficit of the social security system and by a moderate primary deficit in the provinces. In addition, there was a significant accumulation of assets and documentation of pre-existing debt.

Obviously, the country could have tried to run a tighter fiscal ship. But the numbers here are not those of a profligate country, and hard to square with the catastrophe that followed. Where is the dramatic shift in fiscal outcomes between the time when Argentina was perceived as one of the safest emerging markets (say, in 1999) and its eventual demise?

Exchange rate rigidity

The third influential theory was associated with the peculiar exchange rate system chosen by Argentina: a currency board with the dollar and a bi-monetary financial system, one in which both the US dollar and the Argentine peso were legal tender. The system achieved price stability, but left the country vulnerable to inconvenient movements in the multilateral exchange rate. This possibility became a reality after the Brazilian devaluation of January 1999 and the euro slide of 2000. The story is clearly evident in the data.

It is clear that the nominal appreciation of the multilateral nominal exchange rate of Argentina took place at a most inconvenient time. The Brazilian devaluation of 1999 had caused an appreciation of Argentina's multilateral nominal rate of 14 percent. Between January and July 2001, this rate appreciated a further 13 percent. An increasing real exchange rate misalignment developed: the worsening external conditions called for a depreciated equilibrium exchange rate, while the actual rate appreciated. Perry and Servén (2002) have estimated the underlying *equilibrium* real exchange rate, taking into account changes in Argentine productivity, as well as the

country's deteriorating net foreign asset position. Their index appears in Figure 7, plotted along with the actual multilateral real exchange rate. The result is striking: if Perry and Servén are right, in 2001 the Argentine peso was overvalued by more than 40 percent.

The misalignment, coupled to the adverse external conditions and a rising cost of capital, wreaked havoc on the profitability of the export sector and thus on its ability to expand supply. Export volume growth, which had averaged over 14 percent per year between 1993 and September 1998, stalled and never again managed to recover its earlier dynamism, in spite of the declining levels of domestic absorption (Table 1 and Figure 2).⁹

This standard logic can explain the protracted recession and the increasing tension between the achievement of external balance and full employment. But why would it lead to a *financial* crisis? As we showed in the simulations described in Figures 4a, b and c, at the prevailing real exchange rate even modest growth of 3 percent could only be achieved at the expense of large current account deficits and rising debt ratios. Argentina thus found itself in a bind: if it tried to grow it risked accumulating debt to the point of insolvency; if it chose to achieve external balance, it would have had to achieve strongly negative growth rates, which would also have imperiled its solvency.

Markets increasingly began to fear this latter risk, as shown in Figure 6. The multilateral exchange rate tracked remarkably well the evolution of the spread between the country risk of Argentina relative to that of Mexico, especially after the Brazilian 1999 devaluation. We take Mexico as a benchmark since both economies had very similar country risk spreads until the 1999. Both countries suffered a common shock when emerging markets floundered after the Russian default, but after the Brazilian devaluation, Argentina started to move in a different direction¹⁰.

⁹ Argentina still managed a 3.8 percent growth from the third quarter of 1999 to the third quarter of 2001, roughly in line with the export performance of other countries in the region.

¹⁰ Skeptics might wonder whether this correlation says anything about the perceived risk of exchange rate misalignment. An alternative interpretation of Figure 1 is that both variables respond to a common driving force, namely Brazilian risk. Under this interpretation Argentine risk moves with Brazil's because both countries are economically intertwined, while the multilateral exchange rate moves mainly because of fluctuations in the dollar price of the Real, which also reflects Brazil risk. This sounds sensible, but does

There is an unmistakable sense then, in which Argentina did have an exchange rate *problem*. What is much less clear, however, is whether it had an exchange rate *solution* available to it. It was the combination of relative price misalignment with increasingly scarce financing that made the situation vulnerable. And, with a large accumulated dollar debt, both private and public, the competitiveness gains of a potential devaluation had to be weighed against the balance sheet damage it would inflict, and the additional market access this would bring. Putting these different factors together, and trying to assess the policy tradeoffs involved, is what we try do in the next section.

III. How to think about what happened?

If the conventional stories alone do not account for the Argentine crisis, what other factors do? How did the fiscal and current account deficits, exchange rate overvaluation and borrowing limits interact to constrain policy alternatives? What policy options were available to Argentina? Might fiscal contraction, devaluation, or dollarization have worked, and under what circumstances? Here is a model to help us tackle such questions.

Imagine a world that has two periods, current and future; two goods, foreign and domestic;¹¹ and two kinds of people, entrepreneurs and workers. Workers only consume. Entrepreneurs' own capital, which they lend to firms, and also consume. They finance investment in excess of their own net worth by borrowing from foreigners. Government may also run a deficit and attempt to finance it abroad. A key point in the story is that such public and private borrowing may be constrained.¹²

not fit the facts. The correlation between the EMBI spreads of Brazil and Argentina, which had been very high from 1996 to 1998, is only 0.75, 0.68 and 0.39 for 1999, 2000 and 2001 respectively.

¹¹ These are both tradeable but imperfect substitutes, so their relative price is endogenous. We will refer to it as the real exchange rate.

¹² In its treatment of borrowing constraints the model resembles the work by Krugman (1999) and Aghion, Bacchetta and Banerjee (2000), though the precise specification of collateral is forward-looking rather than backward-looking as in those two papers. The model also borrows liberally from Céspedes, Chang and Velasco (2000), a paper with a different financial imperfection but whose modeling of labor and goods markets is very close to that found here.

Production of domestic goods is carried out using capital and labor with the Cobb-Douglas technology

$$Y_t = K_t^\alpha L_t^{1-\alpha}, 0 < \alpha < 1 \quad (1)$$

Capital depreciates fully, so that the final period capital stock equals investment I . Firms are competitive: total payments to capital are αY_t and total payments to labor are $(1-\alpha)Y_t$.

Workers consume and supply labor. The consumption quantity C_t is an aggregate of home and imported goods, with shares γ and $1-\gamma$ respectively. Let the foreign good have a price of E_t in terms of the domestic good --which we can think of as the *real exchange rate*—so that the cost of one unit of consumption is $E_t^{1-\gamma}$. To make things simple, assume that workers cannot borrow or lend abroad. Then, their consumption is

$$E_t^{1-\gamma} C_t = W_t L_t - T_t \quad (2)$$

where T_t is a lump-sum tax paid by workers.¹³

To describe the behavior of entrepreneurs it is necessary to distinguish explicitly between the initial and final periods. Let no subscript indicate an initial period variable, while a subscript 1 indicates a final period variable. Investment, like consumption, is an aggregate of domestic and foreign goods, with the same shares γ and $1-\gamma$. Hence, the price of investment in terms of domestic goods is $E^{1-\gamma}$. At the beginning of the initial period, entrepreneurs collect the income from capital (equal to αY), pay taxes, invest and repay foreign debt. As a consequence, their budget constraint is

$$ED_1 = IE^{1-\gamma} + (1+r)ED + T - \alpha Y, \quad (3)$$

where D is inherited foreign debt and r is the international real interest rate.¹⁴ The size of the debt will play a crucial role.

¹³ What about the labor supply decision of workers? If their period utility function is $\log C_t - \xi v^{-1} L_t$, where $v > 0$ is the elasticity of labor supply and ξ is a constant, then labor supply is set to equate the marginal disutility of labor to its marginal return, and is therefore equal to $L_t = 1$ whenever real wages are flexible and the labor market clears.

¹⁴ For simplicity, entrepreneurs do not pay taxes. Little would change if they did.

If they are not financially constrained and can borrow as much as they want, entrepreneurs choose an amount of investment such that the percentage return to capital is equal to the domestic goods' expected cost of borrowing, so that¹⁵

$$\frac{\alpha Y_1}{E^{1-\gamma} I} = (1+r) \left(\frac{E_1}{E} \right) \quad (4)$$

Next introduce government. In the initial period government spends G on home goods only, receives tax revenue T and repays its inherited foreign debt B . Its budget constraint is¹⁶

$$EB_1 = G - T + (1+r)EB \quad (5)$$

Market clearing for home goods requires that domestic output be equal to demand. Domestic consumption of home goods is a fraction γ of the value of total consumption. The same is true of investment. In addition, the home good may be sold to foreigners: the value of home exports in dollars is exogenous and given by some fixed X ¹⁷. This implies that in the first period the market for home goods will clear when

$$Y = G + \gamma(C + I)E^{1-\gamma} + EX \quad (6)$$

Using the workers' budget constraint (5) to eliminate consumption we obtain

$$\beta Y = \gamma E^{1-\gamma} + G - \gamma T + EX \quad (7)$$

where $\beta = 1 - \gamma(1 - \alpha)$. This is the IS the schedule, which slopes up in Y, I space: higher investment leads to higher aggregate demand and output.

Since by assumption there is no investment and government spending in the last period, market clearing yields $\beta Y_1 = E_1 X_1$. Using this in (4) we have

$$I = \frac{E^\gamma X_1}{\beta(1+r)} \quad (8)$$

¹⁵ This is optimal if entrepreneurs consume in the closing period only. To make things simple, we assume that, in true capitalist style, they consume only imports.

¹⁶ We are agnostic as to which taxes are raised, if necessary, to repay this debt. One possibility—the simplest in this case—is to levy a lump sum tax on entrepreneurs only, so that $T_1 = E_1(1+r)B_1$.

¹⁷ This is similar to the assumption in Krugman (1999), and can be justified by positing that the foreign elasticity of substitution in consumption is one, but that foreigners expenditure share in domestic goods is negligible.

This is the quantity entrepreneurs would like to invest if unconstrained. By analogy with the Mundell-Fleming framework we call this the BP schedule: along it the balance of payments is in equilibrium. This schedule is vertical in Y, I space.

Turn finally to the national borrowing constraint. Consolidating the private and public sectors yields the evolution of total foreign debt:

$$EF_1 = G - T + IE^{1-\gamma} + (1+r)EF - \alpha Y \quad (9)$$

where $F = D + B$ is total foreign liabilities. Assume that, because of limitations of sovereignty, court jurisdiction and the like, lenders can seize at most a portion $\mu < 1$ of national income in case of non-payment. Hence, they will not lend at the initial period an amount generating obligations larger than the resulting collateral¹⁸: $(1+r)E_1F_1 \leq \mu Y_1$. Combining this with (9) and market clearing for next period one arrives at

$$\alpha Y \geq IE^{1-\gamma} + G - T + E \left\{ (1+r)F - \frac{\mu}{\beta} \frac{X_1}{1+r} \right\} \quad (10)$$

We term this the FC (financial constraint) schedule. It slopes up in Y, I space: investing more requires that national income be higher today if the constraint is to be satisfied. Notice that the tightness of the financial constraint depends on the size of old debts, because for a given level of output, higher payments on old debt mean less investment today.

It is easy to check that the FC is always steeper than the IS. They cross in the positive quadrant if the IS cuts the vertical axis above the FC, meaning that initial debt is not so large that the country is bankrupt: investment can only be zero at any level of income.¹⁹ This is the case depicted in Figure 8: a constrained but not-yet-bankrupt economy finds its equilibrium at a point such as A.

Notice that we treat the real exchange rate E as an exogenous variable. This is sensible over the short run if the nominal exchange rate is fixed and goods' prices

¹⁸ Notice this formulation implies that, after being used for production in the terminal period, total installed capital $K_t = I$ be used for anything else, and hence has no market or collateral value.

¹⁹ This requires $(1-\alpha)G - T < (1-\gamma)^{-1} E \left\{ \alpha X + \mu \frac{X_1}{1+r} - \beta(1+r)F \right\}$. Hence, inherited total debt cannot be too large. If this intersection is to the left of the BP curve, we have a constrained equilibrium. That is the case depicted in Figure 6.

are sticky, as was the case in Argentina. This means that domestic output is demand-determined, and therefore pinned down by the intersection of IS and FC.²⁰ Below we ask what happens to this equilibrium if the government unexpectedly devalues, raising the real exchange rate E in the initial period.

IV. What might have happened

We are now ready to tell Argentina's story using this framework. Two things arguably happened after the Russian crisis of August 1998 and again after the Brazilian devaluation of February 1999. First, international investors lost some of their appetite for emerging country securities generally. In the setup above this can be thought of as a fall in μ : for every future level of output and exports, foreigners are willing to lend less. Second, external conditions facing Argentina worsened considerably, leaving the country less likely to export and grow: again in terms of our toy model, this represents a fall in expected X_1 .

Figure 8 also depicts the consequences of this shock. The FC shifts up, because with less financing, higher domestic output is now necessary to fund a given level of investment.²¹ The new equilibrium is at point B. Investment and output fall: with less capacity to borrow domestic entrepreneurs invest less, which in turn depresses demand for domestic output and the quantity produced in equilibrium.

This account fits Argentina's experience in several important respects. One is the startling decline in export dynamism observed starting in the fourth quarter of 1998,²² which stood in sharp contrast to the buoyant exports Argentina had displayed since 1993. Some of the export decline was caused to the shock to the terms of trade

²⁰ Technically, if output is demand-determined, then workers must be supplying more labor than condition 6 requires. Over the longer haul --that is, in the final period-- it seems sensible to assume that price adjust, rendering the real exchange rate endogenous for any nominal exchange rate. In this case labor supply is given by 6 and domestic output is supply-determined: $Y_1 = I^\alpha$.

²¹ The BP shifts left, because even if unconstrained domestic entrepreneurs would like to invest less. *Ceteris paribus*, lower future exports mean a more depreciated future real exchange rate, which makes repaying foreign loans more expensive. But as long as this shift is not too large, the economy remains financially constrained.

²² Documented above. See Figures 1 and 2.

and to other adverse international developments. Another portion was arguably caused by the sharp appreciation in the multilateral real exchange rate. Cautious observers, unsure of how much of this shock was transitory and how much was permanent, must have attributed at least some persistence to it. This meant that future Argentine exports would be lower than they had been previously forecasting, and so would be Argentina's capacity to repay debt. It made some sense then to curtail lending.

Why was Argentina hit so badly by this shock? One factor had to do with initial debt levels and the role of the exchange rate. We explore this point below. Another key factor is the degree to which Argentina was a closed economy. It is easy to show with a bit of algebra that the fall in output is given by

$$\Delta Y = \left(\frac{\gamma}{1-\gamma} \right) \left(\frac{\mu}{1-\gamma(1-\alpha)} \right) \left(\frac{1}{1+r} \right) E\Delta X_1 \quad (11)$$

so that the size of the contraction is increasing in γ , the share of domestic goods in domestic consumption and investment spending. The more closed the economy, the larger is the fall in domestic investment and output necessary to equilibrate the external accounts after the tightening of the borrowing constraint. This magnifies the home effects of disturbances to the capital account.²³

The other dimension along which this story seems to fit the Argentine facts has to do with the behavior of investment. As Table 1 shows, investment growth became strongly negative in 1999. The correlation across time of investment and GDP is also exactly that suggested by Figure 9, which shows how this pair of variables evolved over time. As borrowing capacity collapsed so did investment, pulling down demand and domestic output.

Was fiscal tightening the right policy response?

One often-suggested option to deal with these nasty developments was to tighten fiscal policy: for the many observers who felt a fiscal laxity was at the heart of the problem, the solution entailed curtailing current government spending and

²³ Calvo, Izquierdo and Talvi (2002) make the same point in the context of a different model.

borrowing, thereby increasing the room the private sector has to borrow and invest. If this *crowding in* was sufficiently large, advocates of this policy claimed, one could even have a case of *expansionary fiscal contraction*: private spending rises so much as to more-than-fully offset the fall in government spending, causing an increase in demand and output. This was an explicit justification of the *impuestazo* (tax increase) put into place by Economy Minister Machinea in the early days of the de la Rúa administration, and of the *zero deficit* policy pursued by Domingo Cavallo very late in the game.

But the *expansionary fiscal contraction* argument stands on shaky ground. The model here is predisposed to generate this result, since private borrowing capacity rises by the same amount government spending falls –that is, there is full crowding in. In spite of this, total demand for domestic goods does not rise in response to a cut in government spending. That is because investment typically has a larger component of imports than does government spending. In the model a portion $\gamma < 1$ of all investment spending goes to domestic goods, while all government spending falls on domestic goods. The net result of a contraction in fiscal policy is that demand for domestic goods falls, and so does output. The comparative statics are depicted in Figure 10. The intercepts of both the FC and the IS shift downward, but the FC shifts farther. The new equilibrium has lower output and higher investment.

How large is the fall in domestic output, and what does this depend on? It is easy to show that $\Delta Y = \Delta G$, which might seem surprising at first: isn't the reduction in government borrowing allowing the private sector to borrow and invest more, thereby offsetting (at the very least) the fall in government demand for output? Yes indeed. Holding investment constant, it is easy to see from the IS schedule that $\Delta Y = \beta^{-1} \Delta G$, where $\beta^{-1} > 1$ is the standard Keynesian multiplier. The increase in investment offsets the “extra bang” of the multiplier, making current output fall one-to-one with government spending. Investment does rise, but less than proportionately, in response to the cut in government spending: it is easy to show that $\Delta(E^{1-\gamma} I) = -(1-\alpha)\Delta G$, where $IE^{1-\gamma}$ is the domestic goods value of I units of investment.

Does this account leave out anything crucial? Perhaps. An advocate of fiscal tightening might claim that less spending today would mean more investment today, leading to higher output *in dollars* tomorrow, and hence to a looser borrowing constraint today; that in turn could increase investment sufficiently to avoid a short-run recession, perhaps yielding even an immediate output increase as a result of the fiscal cut. That mechanism is absent from the model so far, because output *in dollars* tomorrow is pinned down by future export demand, which is exogenous. Greater current investment and output simply yield a more depreciated real exchange rate tomorrow, so that repayment capacity in dollars does not rise.

The appendix shows how the model can be expanded to include the kinds of effects fiscal contractionists arguably had in mind. Figure 11 depicts a situation with that flavor. The FC curve is now non-monotonic, with positively and negatively sloped segments. If initial government spending is sufficiently high, then the FC cuts the vertical axis above the IS. This situation gives rise to two potential equilibria. There is a good (though constrained) equilibrium at a point such as A, and a bad one at B. Here the economy is bankrupt: investment is zero, the financing constraint is violated, and equilibrium output is at the point where the IS cuts the vertical axis. Pessimistic expectations can trigger a crisis: if investors believe domestic investment and output will collapse, leaving the economy unable to repay its debts, they will curtail lending. The result will be precisely the fall in Y and I they had anticipated. If government spending is sufficiently high so that, at the new level of income private and public debts cannot be serviced, then lenders will be glad they fled the country in question.

In this situation, contractionary fiscal policy can play a crisis-preemption role. A cut in spending shifts the intercepts of both the FC and the IS down, but the FC shifts farther. If the fall in G is sufficiently large, so that the FC now cuts the vertical axis below the IS, the bad equilibrium vanishes, and the only possible outcome is at a point such as D. But notice: one can show that D is always below A, so that if the starting point was indeed the constrained but non-bankrupt equilibrium, output has to fall as a result of the spending cut.

In this story, whether fiscal contraction is a good or a bad policy depends crucially on two factors, both of which are hard to quantify. The first is that initial spending and inherited debt have to be sufficiently high so that, if investment and output collapse, debts do become impossible to service. The second is that the probability of going to the bad equilibrium, if one exists, must be sufficiently high; only in that case is the actual contraction in output (between the two good equilibria) actually worth enduring. On both counts, Argentina seems to have been vulnerable. We know *ex post* that at heavily recessionary levels of output the public and private debt situations are indeed a mess. And the country's checkered financial history made it a prime candidate for self-fulfilling bouts of pessimism.

In this sense, then, there may have been a role for fiscal tightening among policies for dealing with the Argentine crisis. But it is a very different role most of its advocates probably envisioned. It is preemptive: lower spending prevents even worse things from happening.

One must also wonder how realistic is the very strong rationality the story assumes. To begin with, this model assumes that all domestic output is exportable. In real life, an increase in investment is likely to impact to be only partially reflected in increased export capacity, especially when relative prices do not make those activities particularly profitable. In addition, it is not obvious that investment would rise as much as the model assumes. Whether in a single or multiple equilibrium context, tight fiscal policy works by releasing funds for private investment, thereby making higher investment and future output possible, even at the cost of lower output today. But can domestic investors and foreign lenders really be expected to risk funds if the economy is sinking today? There is surely an element of extrapolation in everyone's decisions. In a situation of limited information and great uncertainty, low output today may be signaling something about a host of adverse factors (declining productivity, weak export demand, etc), most of which are likely to be persistent. Therefore any policy strategy that bets on an expansion tomorrow made possible by a mega-contraction today is a risky strategy indeed.

This is not just an academic conjecture. There is some evidence that it was recession, not simple fiscal misbehavior, that prompted worsening expectations and

rising country risk. Powell (2002) runs a vector autoregression analysis for 1997-2001 and reports that imports (a close proxy for activity) drive both the EMBI spread and fiscal revenues, and not the other way around. And, of course, there is the striking fact that on the day (July 15th 2001) Domingo Cavallo announced the zero-deficit policy, implying an immediate cut in public sector wages and pensions of around 13 percent, Argentina's country risk spread rose from 1200 to 1600 basis points. No country can be run on that basis, investors plausibly conjectured. Events thereafter proved them right.

Devaluation: contractionary or expansionary?

What about the exchange rate? An abandonment of the currency board and a drastic realignment of relative prices was advocated by many observers, and their numbers grew as time passed and the situation deteriorated. From some perspectives this made perfect sense. In the story we have been describing so far, there is one sense in which there is indeed an exchange rate problem: output is low because aggregate demand is insufficient; if both exports and investment can be stimulated by changing relative prices, then the economy can be pushed toward recovery.

But can it? Is devaluation expansionary in a financially constrained economy, just as it is in the textbook model? Maybe yes and maybe no, depending on the size of old debt vis à vis current and future exports. It is easy to show that

$$\Delta Y = \left[X + \frac{\gamma \mu}{\beta} \frac{X_1}{1+r} - \gamma(1+r)F \right] (1-\gamma)^{-1} \Delta E \quad (12)$$

where the term in square brackets could be positive or negative. It is negative if total initial debt is large relative to current and future exports.²⁴ In that case a devaluation is contractionary: the increase in the current debt service costs causes investment demand to fall by more than current export revenues increase, curtailing total aggregate demand. Investment also falls, as one can readily check.

Comparative statics appear in Figure 12. With an unexpected devaluation the IS shifts up and becomes steeper. The slope of FC rises by more than that of IS, and

²⁴ Notice that if the equilibrium is interior and investment is positive, then 18 still has to be satisfied. For this to be true and for the devaluation to be contractionary, it must be the case that $(1-\alpha)G < T$.

its intercept shifts up if initial debt is sufficiently high. It is clear that depending on parameter values the devaluation could increase output and investment or decrease them. As drawn (and as will happen in the case of a high debt-to-exports ratio), the FC moves farther up than does the IS, so a contraction takes place.

The intuition should be clear: the change in relative prices is expansionary insofar as it increases the domestic output value of current and future exports. But it also increases the domestic output value of debt service, making the FC constraint tighter. With enough debt relative to exports, the latter effect outweighs the former, causing the devaluation to reduce investment and output.

Was this the relevant case for Argentina? Opponents of abandoning the currency board certainly thought so, arguing that a drastic change in relative prices would render debt impossible to pay, bankrupting the government as well as many corporates. But what does the data suggest? Table 5 computes debt service-to-exports ratios for a number of so-called emerging markets. One column shows total debt service (gross) and the next shows interest payments, both as a share of total exports of goods and services. The table reveals that, along with Brazil, Argentina is an outlier in this regard.

The nasty side effects of devaluation in a context of large dollar debt prompted one of us to call for the *pesification* of all debts, domestic and foreign, coupled with the floating of the currency. The mechanical logic behind this proposal are apparent from equation (12): once debts are denominated in pesos, the term involving $(1+r)F$ drops out of that expression, making devaluation unambiguously expansionary. But this is far too simple, charged many critics. Pesification plus devaluation clearly meant a fall in the rate of return to holders of old debt. Why should these same lenders (or others much like them) be willing to provide new debt? And why should domestic investors be willing to acquire additional real assets if they too could be expropriated in the future?

Those are all sensible objections. But whether a *suitably engineered* pesification-plus-float²⁵ is unbearably painful depends on the alternatives. Start from

²⁵ We emphasize *suitably engineered*, because in the last three months both pesification and floating have been tried, but in a manner so confusing and chaotic that not much good can be expected to come of it.

the situation in Figure 13, where the economy is already bankrupt, in the sense that at those levels of exports and debt, new lending and investment are zero and some of the old debt—whether private or public—is not being serviced. From that starting point the counterfactual is not full payment at the initial real exchange rate, but less (probably substantially less) than that. In that situation, pesification of debt, coupled with a substantial change in relative prices, has the following effects: the IS shifts up as before, and the FC becomes steeper but now shifts down. The result is a potentially large recovery in output and investment, leading to a point such as A. There debt can be serviced in full, but at a depreciated exchange rate.

Whether this situation is preferable or not to the counterfactual of no pesification and devaluation depends on a host of factors: how large was the share of debt that was not being serviced in the initial equilibrium, how sizeable is the devaluation and how much output rises in response. But pesification creates a scenario in which the output gain is potentially large. If lenders are capable of displaying a stiff upper lip, providing new funds even though their old loans are not being fully serviced, then the actual dollar value of debt service could well be higher than it would be if they just walked away from the country, refusing to accept pesification. In language that was popular in the late 1980s—when debt crises were the order of the day—there may exist a debt Laffer curve: by accepting a cut in the face value of the obligations owed them, creditors may well increase the value of debt service accruing to them.²⁶ Argentina was arguably in such a situation by the second half of 2000. Pesification-plus-floating might have helped, had it been done earlier and better.

Dollarization

The last of the simple and popular policy alternatives, advocated among others by former President Carlos Menem and central bank chief Pedro Pou, was an outright abandonment of the currency. With no devaluation risk, dollarization advocates reasoned, country risk would also fall, capital flows would resume, and so would

²⁶Krugman (1989).

investment and growth. In this view, country risk is essentially bankruptcy risk, arising from the possibility that a real devaluation might render public and private dollar debts impossible to pay.

In contrast, in the story we have been telling external shocks cause borrowing and investment to be constrained, and output to fall, even if the real exchange rate does not move at all. All adjustment takes place via quantities, not prices, and it is precisely the fall in output that is associated with a tighter borrowing constraint. For dollarization to matter in this context one would have to believe that doing away with devaluation risk raises μ —that is, it increases the amount foreigners are willing to lend for every level of domestic output. Why that might be so, at least in the simple model, is unclear, since repayment capacity depends on output, which in turn is proportionate to future export capacity. The exchange rate plays no role.

This is not to say, of course, that it is impossible to come up with a conceptual framework in which dollarizing increases borrowing capacity. If bad states of the world are associated with real devaluations, and these in turn impair repayment capacity, then a risk averse investor might react to lower variance of the exchange rate by raising the average amount lent. But notice that this result only holds if lowering the variance of relative prices does not increase the variance of output, or of other variables relevant to repayment capacity.²⁷

The scant empirical evidence we have in this regard is mixed at best. Panama has used the dollar for nearly a century, and its experience is no reason for optimism. case study, does not provide an encouraging precedent. Goldfajn and Olivares (2001) conclude: “The main conclusions drawn from the case of Panama are that ... the elimination of currency risk does not preclude default risk or the high volatility of sovereign spreads.” Ecuador dollarized in 1999, and that experience does not encourage one to be hopeful either: country risk spreads have remained the highest in Latin America (second after Argentina recently) and the country remains virtually cut off from international capital markets.

²⁷ Suppose (the log of) repayment capacity in dollars is proportional, say, to $y - e$, which are the (logs of) the real exchange rate and output. Then the variance of (the log of) repayment capacity is given by $\text{Var}(y) + \text{Var}(e) + 2\text{Cov}(y, e)$. Hence, reducing $\text{Var}(e)$ brings down the volatility of repayment capacity only if there are no more-than-offsetting changes in $\text{Var}(y)$ and $\text{Cov}(e, y)$.

V. What we do not know

One conclusion that emerges from the previous sections is that, given the magnitude of the shocks experienced in 1998-2000 and the inherited debt stocks, Argentina's policy options were very limited indeed. Monetary policy was unavailable by design, fiscal contraction and dollarization wouldn't have helped much, and without pesification, depreciation was probably contractionary. All of which begs the obvious question: how could Argentina end up in such a dire situation? Were there things that could have been done earlier (in the mid-1990s, say) that might have prevented, or at least minimized the probability of, such a tragic outcome?

Our model helps organize the discussion. Starting in late 1998, and especially as of early 2001, Argentina found itself financially constrained: international markets were unwilling to provide the funds the economy needed to invest and grow. A key question, then, is how that constraint came to bind so tightly. Recall our FC schedule, which can be slightly extended to read

$$IE^{1-\gamma} < \alpha Y + \frac{\mu}{\beta} \frac{EX_1}{1+r} - (G - T) - (\delta + r)EF \quad (13)$$

so that, for a given output level Y , the value of investment is constrained. The addition is the parameter δ ($0 < \delta < 1$), which is the share of outstanding debt that has to be amortized in the current period. Clearly, the higher the average maturity of outstanding debt, the smaller is δ .

The extent to which this constraint binds and how much policy can loosen it depends on a long list of factors, among them export prospects and competitiveness; the currency denomination of debt; the performance of output growth; the size of outstanding debt, both gross and net; the tightness of fiscal policy; and the availability of financing coming from the Washington multilaterals. We discuss each of these in what follows.

Mundell lives

In a very basic sense, constraint (13) above binds because export prospects are “too low,” at least relative to accumulated debt. Why did this come to pass in Argentina. One answer is bad luck: adverse terms of trade, weakening capital flows, an erratic performance in Brazil, etc. But another unavoidable answer is bad policy – bad exchange rate policy, more precisely. What made the Argentine currency board ultimately unsustainable was not just that it involved a peg, but that it involved a peg to a strong dollar only. Add to that a weak *Real* and you have the ingredients for a lethal uncompetitiveness brew. We saw above that Perry and Servén (2002) of the World Bank estimate that by 2001 the Argentine peso was overvalued by more than 40 percent –and much of that was due to movements in the multilateral nominal exchange rate. It is hard to envision a misalignment of that order of magnitude not affecting export performance, and in turn the country’s creditworthiness. And as misalignment became long-lived and the perceived profitability of exporting fell, productivity-enhancing investments did not take place, making the situation worse over time.

None of this, of course, would have come to a surprise to the Robert Mundell of the early 1960s. Argentina is not Mexico: it satisfies few of the requirements of an optimal currency area with the U.S. When Mexicans speak of the colossus to the North, they mean the United States; when Argentines do, they increasingly mean Brazil. In the 1990s, Argentine exports to the U.S. never reached 20 percent of the total, and were dwarfed by exports to Mercosur and to the European Union. And, as events of the late 1990s left sufficiently clear, the Argentine business cycle could be woefully out of step with that of the United States.

Original sin

A basic problem here is the existence of dollarized liabilities. With debts denominated in units of domestic goods, the real exchange rate would not multiply the inherited debt stock in (13). In that case, standard policy would work: a depreciation would move the FC (and the IS) in the right direction, stimulating both investment and output.

This is a problem of missing markets: South Africa has been the only so-called emerging economy to be able to borrow in its own currency, for reasons that have much to do with historical accident. The consequences are dire, for the co-movements work in exactly the wrong direction: regardless of the nominal exchange rate regime, the real exchange rate is likely to weaken in bad times, increasing debt-service and reducing credit-worthiness at precisely the time when a country most needs access to international capital markets. A second shock (lost ability to borrow) piles on top of the first one, paving the way to an eventual crisis.²⁸

Whether there is anything Argentina could have done about this problem *ex ante* is debatable: the room for borrowing in an emerging market's own currency (or even in indexed units, as Chile has tried to do) is very limited indeed. But if new crises like this one are to be avoided, other kinds of debt –whose value in terms of home output need not rise precisely in bad times-- have to be found. An alternative is to rely less on debt and more on equity, which does not oblige the debtor to pay in bad times.

There are many ways to die

Policymakers, analysts and academics were well aware of the dangers of sharp movements in relative prices in the face of dollar liabilities. Therefore, during much of the 90s policy efforts were focused on reassuring investors that there would be no wild swings in the exchange rate, and that therefore the solvency of domestic corporates and banks was well protected. The inception of the currency board was central to this effort to build credibility for Argentina, as were measures to make the central bank more independent, strengthen banks and improve their supervision, etc. But Argentina showed that financing constraints –and, eventually, bankruptcy-- can hit even if relative prices never move. For that all you need is a deep enough decline in activity: as the FC curve above shows, if Y falls sufficiently the constraint will bind and investment will suffer, even if other variables do not move. In this sense,

²⁸ The theory literature on why countries have trouble borrowing in their own currencies is in its infancy, and there is no broadly accepted account of why this is so. See the recent work by Burnside, Eichenbaum and Rebelo (1999), Schneider and Tornell (2000), Caballero and Krishnamurthy (2001), Jeanne (2001) and Chamon (2001).

Argentina faced a tradeoff between stabilizing the exchange rate and stabilizing output –it did at least until the endgame, when so much debt had been accumulated that real devaluation was arguably contractionary. This begs the question of whether early abandonment of convertibility –after overcoming Tequila, say — might have saved Argentina. At the time, this option was unthinkable, as the economy was able to extricate itself from the crisis without the disruptions suffered by Mexico; in retrospect, it seems very much worth thinking about.

But one should not exaggerate this point. During a good part of the crisis and until the early summer of 2001, Brazil looked just as vulnerable as Argentina if not more, in spite of its flexible exchange rate (events in the summer of 2002 confirm this point). A weakening *Real* in 1999 and 2001 was causing the domestic cost of the foreign currency debt service to jump, while the need to raise interest rates in order to maintain some semblance of a nominal anchor was raising the real cost of local-currency obligations. The sense of impending doom was aggravated by the fact that Brazil was so much less liquid than Argentina. The absence of a credible nominal anchor in Brazil severely shortened the duration of domestic-currency debt, which was to a large extent indexed to the overnight rate. This reduced the credibility of monetary policy by complicating the fiscal arithmetic of a monetary contraction. Seen from Argentina in early 1999, the Brazilian way did not seem like a panacea.

Liquidity is not all

After the run on the short-term Mexican Tesobonos in 1994-95, avoiding self-fulfilling liquidity crises became another obsession of the policy community, both in Buenos Aires and in Washington. Argentina took the lesson to heart both in fiscal management and in financial sector policies. On the fiscal front the most obvious thing to do was to lengthen the maturity of debt, and Argentina did this with a vengeance. After the Tequila crisis the Menem administration deliberately focused on issuing long-term bonds; in 2001 Domingo Cavallo took this logic to the extreme, swapping debts coming due for longer maturity (and higher yielding) obligations, in the controversial *megacanje*. Did it all help? In a sense, yes: as the FC schedule in equation (13) above shows, the smaller is δ , the share of debt coming due, the less

likely is the constraint will bind in the current period. But this policy did not cure Argentina's ills: at the low levels of output and profits that resulted after 3 years of recession, the debt simply became impossible to pay, regardless of maturity. Argentina's agony began, in retrospect, with the Brazilian devaluation in February 1999, and ended with de la Rúa's resignation in December 2001. The earlier policy of maturity lengthening could delay the eventual and painful denouement, but beyond giving time to the rest of the world to right itself, it did not generate the incentives for the economy to avoid the crisis.

Too much debt?

The last three points suggest that it was the size of the debt, both private and public, that did it. But was total external debt actually so large? Enough to sink a nation that half a decade earlier had been the toast of Wall Street? A first glance does not suggest so. By the end of 2001, total external debt stood at 55 percent of output, very much in the ballpark of what other emerging market economies have. In the eight years from 1993 to 2000, the cumulative current account deficit was 29 percent of 2001 GDP; again, not tiny, but not at all out of line for an economy whose capital labor ratio is far below that of rich nations, and which should naturally be a capital importer. But Argentina sank nonetheless, which seems to suggest that traditional standards for measuring debt sustainability may be sorely inadequate for countries with dollarized liabilities and potentially large real exchange rate swings.

In retrospect, then, perhaps Argentina should have accumulated less external debt. How to have achieved this, however, is not clear. A simple answer is that the government should have borrowed less. But much of the foreign debt was private, and private sector borrowing decisions are made without consulting government bureaucrats. One possibility was a strongly counter cyclical fiscal policy, which increased the government surplus every time the private sector borrowed, so as to leave the current account unchanged. But notice: this is exactly the opposite of what the Barro principles of optimal debt management call for. An alternative is to meddle with private borrowing directly, perhaps taxing it to discourage excessive debt accumulation. Some countries have done this, arguing that there is an externality in

private borrowing decisions. But Argentina's strategy in the mid 1990s was to increase integration into world capital markets, not to limit it²⁹. At the time, taxes on foreign borrowing were also unthinkable.

Gross or net debts?

Private Argentine citizens and corporates borrowed heavily abroad, but also accumulated a large stock of assets overseas. This makes the point that Argentina arguably did not have a private external debt problem: once you subtract over 90 billion in foreign assets held by Argentine residents³⁰, the overall external private net debt burden is negative.

But is such netting out reasonable? In a standard model with well-functioning financial markets, of course it is: it has to be net not gross debt that matters for the ability to repay. But in a world with market segmentation and below-the-counter transactions the answer is more complicated. In constraint (13) above we did not say whether F stands for gross or net liabilities. But suppose that it is domestic corporates and banks that do the bulk of the gross borrowing (as it happened in Argentina), while their stockholders and their uncles keep personal deposit accounts in Miami. Could or should foreign creditors net out these assets in determining how much they want to lend to Argentina-based banks and companies? The answer is probably no.

This suggests that financial globalization may bring along its discontents. A country like Argentina that tries to integrate itself fully into international markets will doubtless see gross flows increase even if net flows stay put. Once you are fully integrated (think Switzerland) this is just fine. But if you are still credit-constrained and crisis-prone, this can be problematic. The fact that Argentines or Venezuelans had massive dollar holdings abroad did not make international lenders any more willing to lend to those countries during the debt crisis of the 1980s, and the same has

²⁹ Argentina did impose liquidity requirements on all bank liabilities including foreign borrowing. This was seen as part of its liquidity policy and was thought at the time as addressing what was thought to be the fundamental externality, i.e. the multiple equilibria associated with bank runs.

³⁰ Argentina's balance of payments for 2000 shows 6.5 billion in interest earned on foreign assets. This represents 52 percent of the national external debt payments. Assuming an improbably high interest rate of 7 percent, this amounts to some 93 billion dollars in interest-earning assets. In addition, the balance of payments reports a further 1 billion dollars in profits and dividends earned abroad by Argentine residents.

been true this time around. And the fact that those Miami accounts cannot be taxed does not help the fiscal solvency of cash-strapped governments.

And once a crisis erupts, the funds held abroad are not much help either. In a pinch, an Argentine businessman may repatriate a few dollars to prop up his own consumption or to keep his company running over the short term. But the incentives not to spend or even disclose those dollar holdings are huge: the helping hand of the fisc only helps those companies that claim to be unable to help themselves. Indeed, in today's Argentina, many of the same people who held dollars abroad have seen their domestic debts pesified while the exchange rate depreciates massively –that is, they have gained on all sides.

Making implicit debts explicit

One interesting issue that is raised by this experience is the question of whether documenting a pre-existing debt or transforming an implicit social security liability into negotiable bonds affects in some fundamental way the fiscal stance. This is an important issue as so much of the increase in net debt between 1995 and 2000 can be attributed to these changes (Table 4). Does it matter if the debt of the pension system is just a pay-as-you-go obligation or is a bond instead? Will the market see through the equivalence?

One could think of pay-as-you-go debt as having Arrow-Debreu characteristics. In Argentine history, the government paid it in good states of nature but not in bad (a common trick was to let nominal pension readjustments lag and then let inflation do its dirty deed). This was extremely convenient for a government that finds itself financially constrained in bad states: pensioners are de facto lenders of last resort to the fisc. In this setup all risk is borne by pensioners, who have little bargaining power and do not get to set the rate of interest. Hence, the government does not have to compensate them for bearing that risk, as implicit actuarial debt is non-negotiable and uncertainty over the ability of the government to pay the pension obligations is borne solely by the prospective retiree. The same is true of implicit bank debt and other kinds of skeletons in the closet which have been turned into explicitly and tradable debt in Argentina and elsewhere.

Aside from enlarging the stock of explicit debt, which in itself may scare some actual and potential creditors, documenting implicit obligations changes the risk profile of the obligations. The bond issued is no longer a state-contingent liability, and the question arises of who will bear the risk of non-payment. Conceivably, the government will have to issue negotiable interest-bearing debt that pays an interest rate higher in order to compensate bondholders for the risks previously borne by the trapped creditors. This means that the reform will lead to an increase in the interest burden of the obligation that will be larger the greater is the country risk. In Argentina, the social security reform and the documentation of debt probably had the effect of increasing the total real interest burden of the debt and weakened fiscal balance significantly.

Another role for fiscal policy?

In a trivial sense, equation (13) shows that fiscal policy matters for creditworthiness: the less is the government borrowing (the smaller is $G-T$), the less tight the constraint on investment and growth is. But in a more complicated sense, a lesson from our analysis above is that fiscal policy in financially constrained economies may be much less effective than is often thought. True, some countries have been able to adjust their fiscal accounts in a recession: Turkey, Russia and even Brazil were able to adjust their *primary* fiscal deficits in a significant manner and were “rewarded” by the markets via lower country risk. For example, on April 24 2002 the EMBI spread of formerly bankrupt Russia amounted to a mere 468 basis points while that of still troubled Turkey reached only 581.

Is this not an indication that fiscal adjustment works? Not really, if what you have in mind is that fiscal adjustment should allay sustainability fears and increase the country’s access to external finance. The EMBI spread data does not show that the supply of funds to these countries increased. On the contrary, both Turkey and Russia today exhibit large current account surpluses, which suggests that the overall flow of funds to those economies declined. In some sense, the lower country risk just indicates that the economy was able to adjust to a collapse in capital flows through

recession and real depreciation, not that it was able to displace the FC curve so as to run larger deficits.

Yet this is what was hoped from fiscal policy in Argentina. As the simulation presented in Figures 4a-4c indicate, given the international context, what Argentina required to achieve moderate growth was a sustained current account deficit of 5 percent of GDP (and that, in itself, would have gone a long way toward solving the perceived fiscal problem). This is far from the experience of Russia or Turkey. If anything, it resembles the experience of Brazil. In that country, fiscal adjustment and real depreciation did not cause a major shift in the current account deficit, which remained large. But note that even in Brazil the current account deficit actually declined. From this perspective, it is really hard to see how Argentina could have extricated itself from its predicament through fiscal tightening alone.

Moral hazard and the role of the IMF

If imperfections in world capital markets are at the heart of the crisis story in Argentina and elsewhere, what is the international community doing about it? After the East Asian and Russian crises, support for large financial rescue packages among the G-7 dwindled. Talk instead moved to bail-ins, burden-sharing and the more euphemistic concept of *private sector involvement*. The arguments against financial rescues were based on moral hazard: each bailout might be locally successful, but to give the wrong sense of confidence to markets would lead to more imprudent lending and additional crises down the road. Conservatives often argued at the time that the cause of the East Asian crisis was the moral hazard generated by the Mexican bailout.

But there is scant evidence moral hazard is that big a deal (see for example Eichengreen and Hausmann (1999), Fischer (2000)), so the justification for the policy shift away from large rescue packages was debatable. Worse, there was no clearly articulated new policy to replace the old policy. Disagreements between the US and Europe as to whether they should adopt a set of rules for dealing with troubled countries or instead adopt a case-by-case approach have turned out to be inconclusive. Dozens of meetings with the private sector have led nowhere.

In this context, the perception that the public sector was abandoning a coordinating role in crisis resolution almost surely lead to the perception of increased systemic risk in emerging markets. After Russia, capital flows to developing countries collapsed: the current account deficits on non-fuel exporting developing countries continuously declined from 105.5 billion US\$ in 1996 to 28.8 billion in 2001 (IMF, 2002).

The new approach reduced the amount foreigners were willing to lend for any set of local macroeconomic conditions. In the context of our model, this can be interpreted as a decline in μ , leading to a downward movement in the FC curve, less investment and less growth. The sequence of blowups that followed in several countries is arguably the local consequence of the new systemic policy. The US Treasury and the IMF may have tried to make the world safe for capital flows. In practice, they rendered the world safer for crises.

Appendix: the extended model

The only change to the model is to introduce a non-unitary demand for exports, so that now in the final period dollar output is not uniquely pinned down by exogenous X_1 . In that period market clearing is now

$$\beta Y_1 = E_1^{1/\sigma} X_1 \quad (1)$$

where $\sigma^{-1} > 1$ is the price elasticity of export demand. We know $Y_1 = I^\sigma$. Using this in 1 and rearranging we find the real exchange rate in the final period is

$$E_1 = \left(\frac{\beta I^\alpha}{X_1} \right)^\sigma \quad (2)$$

Recall the borrowing constraint is $(1+r)E_1 F_1 \leq \mu Y_1$, which using 2 becomes

$$(1+r)F_1 \leq \mu \beta^{-\sigma} I^{\alpha(1-\sigma)} X_1^\sigma \quad (3)$$

Hence, substituting in for the value of F_1 , the FC schedule can be written as

$$\alpha Y \geq G - T + (1+r)EF + \left\{ IE^{1-\gamma} - \mu \beta^{-\sigma} I^{\alpha(1-\sigma)} \frac{EX_1^\sigma}{1+r} \right\} \quad (4)$$

In turn, using 2 the BP schedule can be easily shown to be

$$I^{1-\alpha(1-\sigma)} = \beta^{-\sigma} \frac{E^\gamma X_1^\sigma}{1+r} \quad (5)$$

Finally, the IS schedule is now just as before, but with the real exchange rate raised to the power σ^{-1} in front of export demand:

$$\beta Y = \gamma E^{1-\gamma} + G - \gamma T + E^{1/\sigma} X \quad (6)$$

These last three equations complete the description of the extended model.

It is straightforward to show that the FC is now non-monotonic and convex, with a minimum at

$$I^{1-\alpha(1-\sigma)} = \alpha(1-\sigma) \mu \beta^{-\sigma} \frac{E^\gamma X_1^\sigma}{1+r} \quad (7)$$

which is smaller than the unconstrained level of investment shown in (5). Notice also that the slope of the FC is

$$\frac{\partial Y}{\partial I} = \alpha^{-1} E^{1-\gamma} \left\{ 1 - \alpha(1-\sigma)\mu\beta^{-\sigma} I^{\alpha(1-\sigma)-1} \frac{E^\gamma X_1^\sigma}{1+r} \right\} \quad (8)$$

so that as investment becomes arbitrarily large, this slope converges to $\alpha^{-1} E^{1-\gamma}$, precisely the slope of the FC in the simpler model presented in the text.

Finally, notice that the intercept of the FC is $[G - T + (1+r)EF]\alpha^{-1}$, while the intercept of the IS is $[G - \gamma T + E^{1/\sigma} X]\beta^{-1}$. Hence, the IS cuts the vertical axis above the FC if

$$G(1-\alpha) - T < [\alpha E^{1/\sigma} X - \beta(1+r)EF](1-\gamma)^{-1} \quad (9)$$

which is the same as the condition for the IS to cut above the FC in the simpler model, except that now we have E raised to the power σ^{-1} . It follows that sufficiently large G causes this condition to be violated, bankrupting the economy in a crisis where investment goes to zero.

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Table 1

GDP and its components: annual rates of growth, constant 1993 prices.

	1994	1995	1996	1997	1998	1999	2000	2001
GDP	5.8	-2.8	5.5	8.1	3.9	-3.4	-0.8	-4.5
Private Consumption	6.1	-4.4	5.5	9.0	3.5	-2.0	-0.7	-5.8
Public consumption	0.4	0.8	2.2	3.2	3.4	2.6	0.6	-2.1
Investment	13.7	-13.1	8.9	17.7	6.5	-12.6	-6.8	-15.9
Exports	15.3	22.5	7.6	12.2	10.6	-1.3	2.7	2.9
Imports	21.1	-9.8	17.5	26.9	8.4	-11.3	-0.2	-14.0
Export prices 1/	2.9	5.7	6.5	-3.5	-10.4	-11.2	10.2	-3.5

1/ Annual rate of growth in US dollars.

GDP component growth

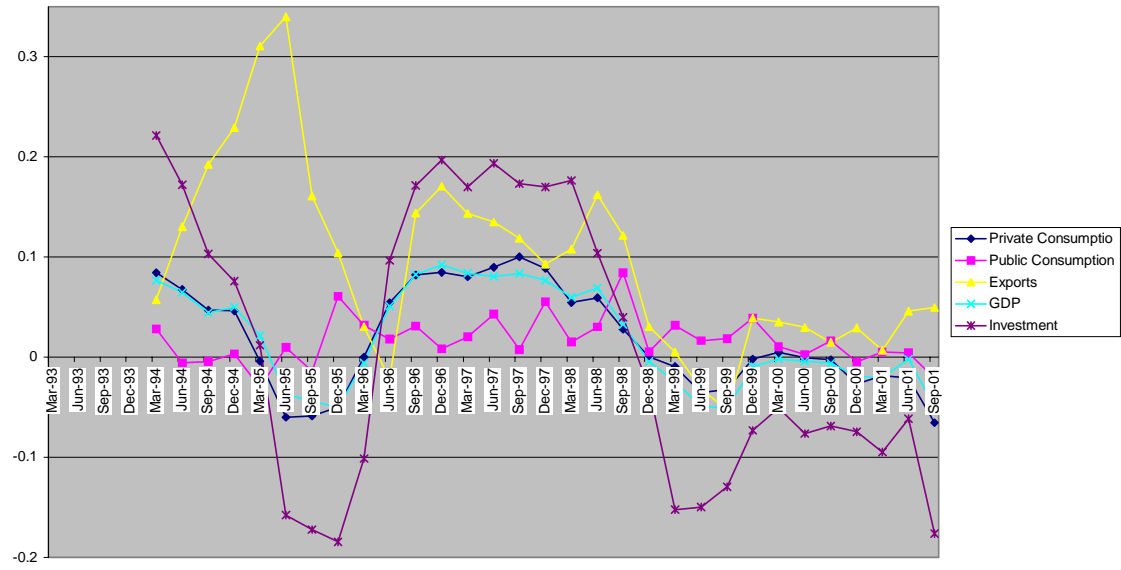


Figure 1

Export price and volumen growth

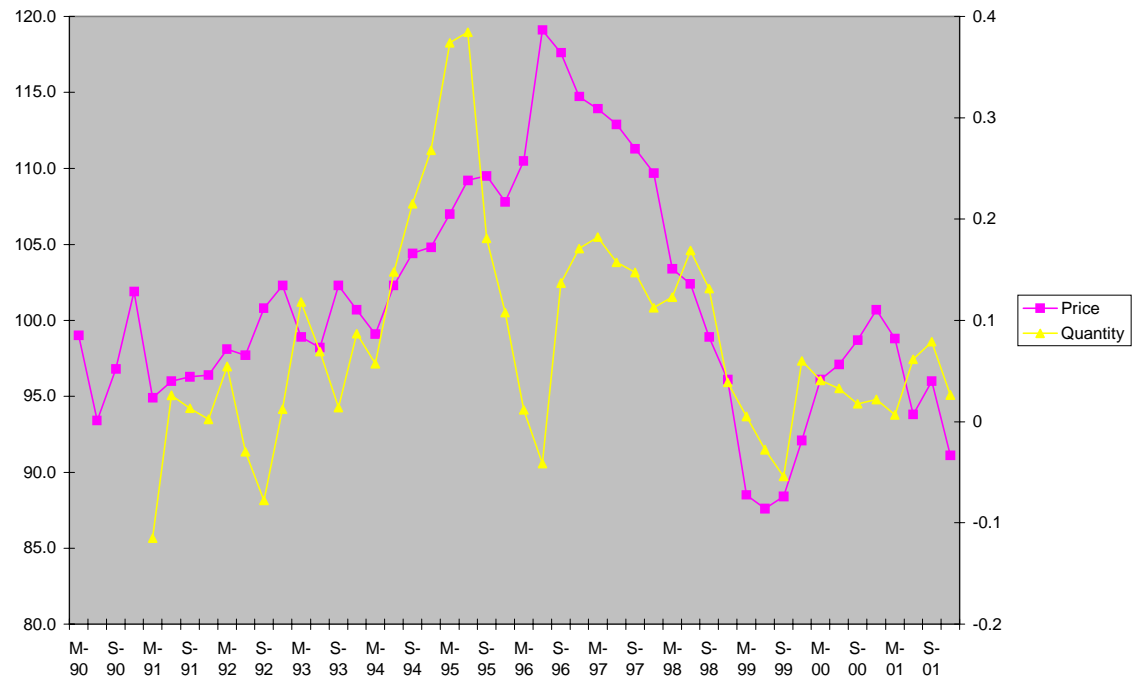


Figure 2

Spreads Argentina

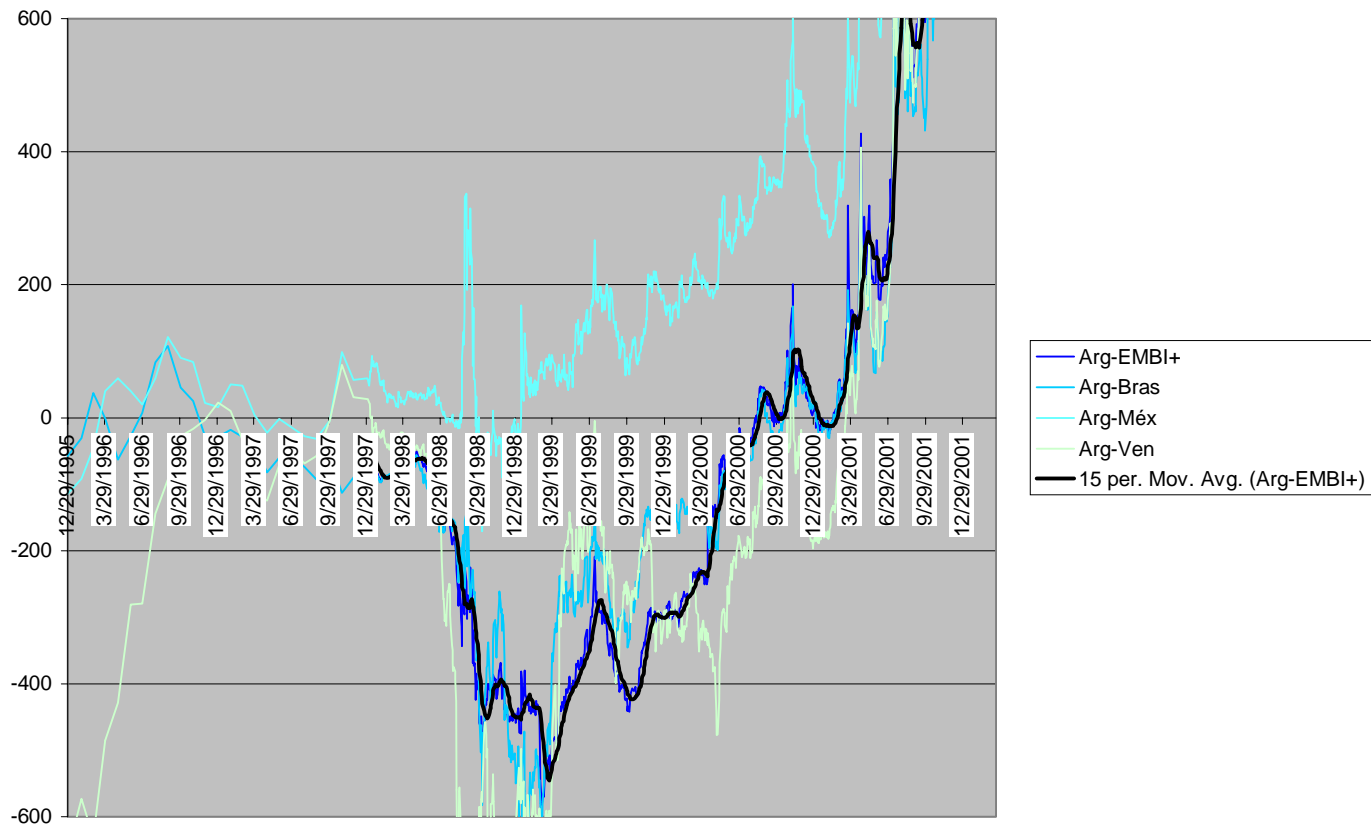


Figure 3

Figure 4a: Debt to GDP ratios

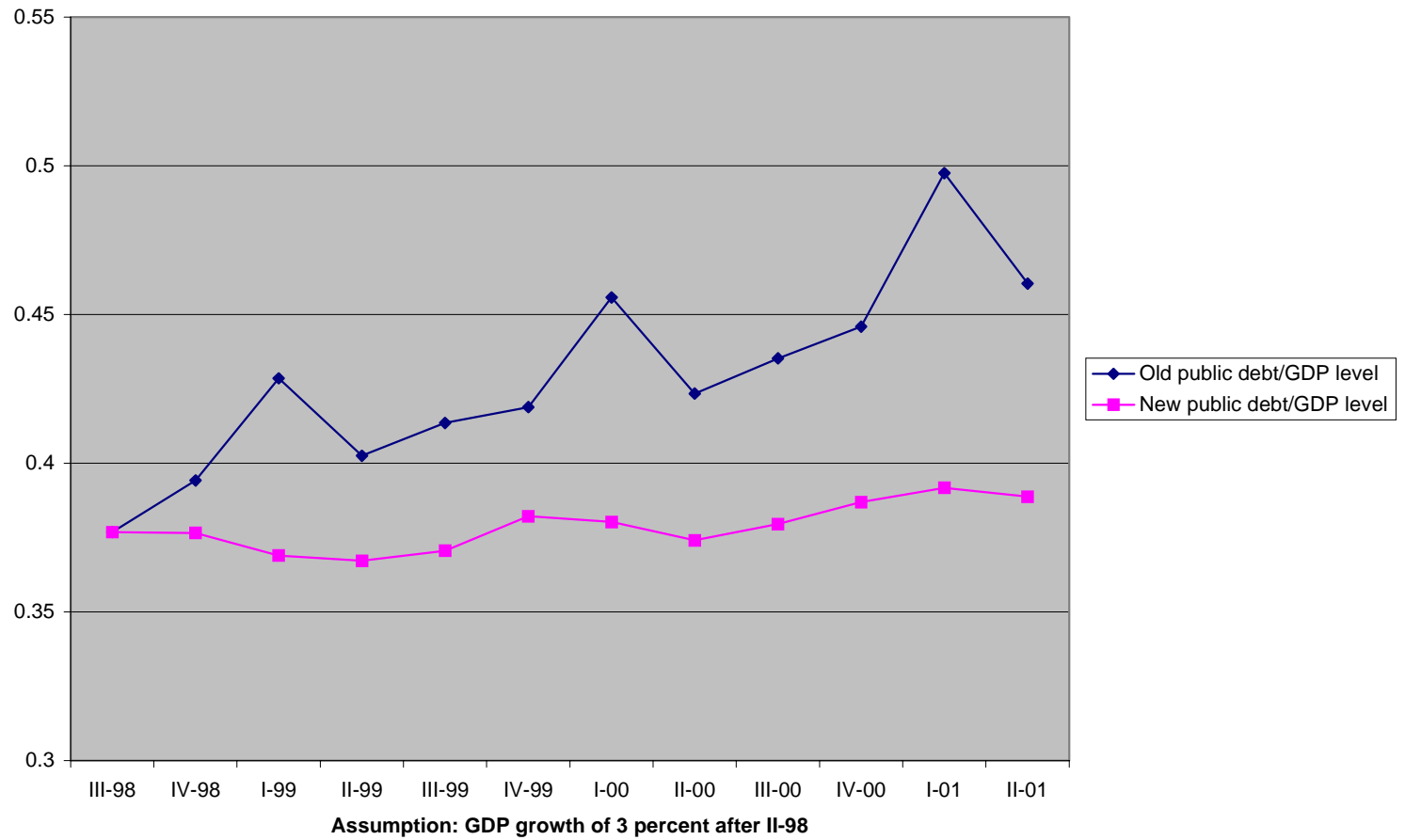


Figure 4b: Current account

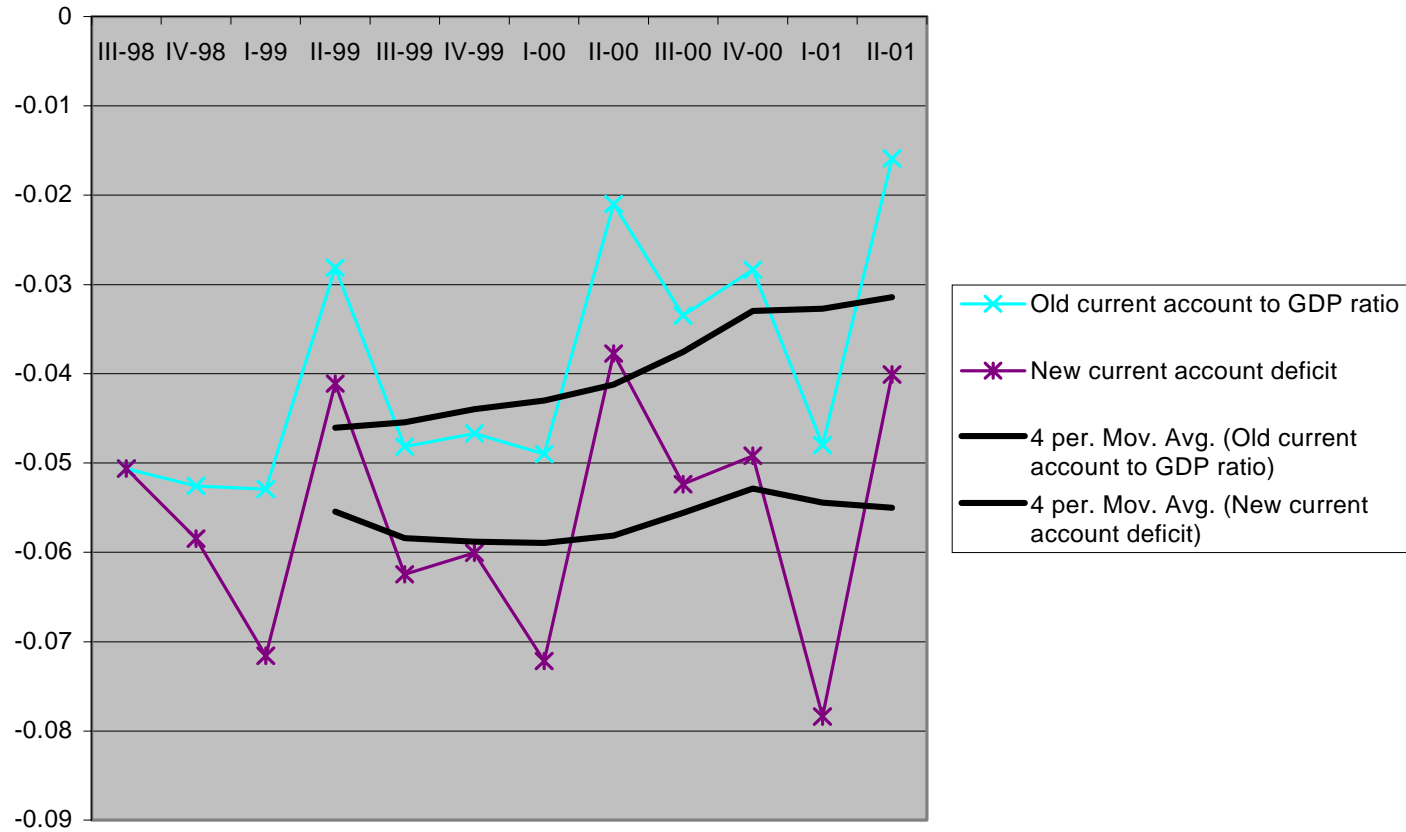


Figure 4c: Additional external debt

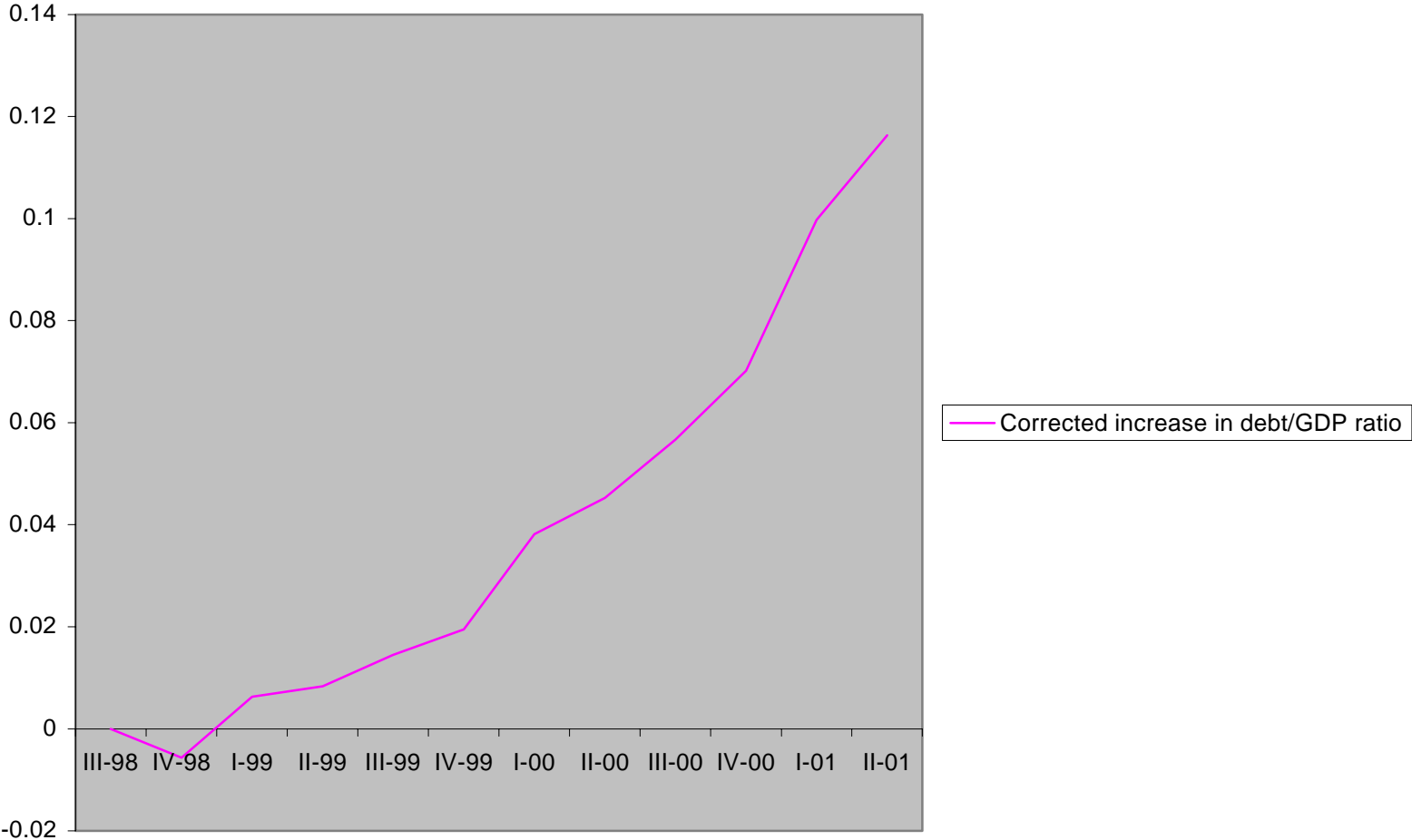


Table 2. Fiscal accounts

	1,993	1,994	1,995	1,996	1,997	1,998	1,999	2,000	2,001
Primary Spending	24.6	24.3	24.1	22.7	23.2	23.3	25.4	24.5	24.4
Provinces	11.3	11.3	11.3	10.8	10.8	11.3	12.3	11.9	12.0
Social security	5.3	5.9	6.1	5.7	5.9	5.8	6.1	6.1	6.1
Rest of the National government	8.0	7.1	6.8	6.2	6.5	6.1	7.0	6.4	6.3
Ordinary Revenues	26.0	24.4	23.6	21.8	23.3	23.6	24.5	24.9	23.9
Provinces (excludes transfers)	4.9	4.8	4.6	4.6	4.7	4.8	4.9	5.1	5.1
Social Security	5.6	5.5	5.3	3.8	4.2	4.0	3.8	3.8	3.5
Rest of the National government	15.5	14.1	13.7	13.5	14.5	14.8	15.8	16.0	15.2
Primary Balance	1.5	0.1	-0.5	-0.8	0.3	0.4	-0.8	0.5	-0.5
Social security	0.4	-0.4	-0.7	-1.9	-1.7	-1.8	-2.3	-2.4	-2.6
Provinces	-0.7	-0.7	-1.1	-0.3	-0.1	-0.4	-1.1	-0.5	-1.0
Rest of the National government	1.8	1.3	1.3	1.4	2.1	2.7	2.6	3.3	3.1
Debt service	0.8	1.3	1.4	2.7	2.3	2.6	3.4	4.1	4.6
Overall Balance	0.7	-1.2	-1.9	-3.5	-2.0	-2.2	-4.2	-3.6	-5.1
memo: transfers to provinces	5.8	5.7	5.6	5.8	6.0	6.1	6.3	6.3	5.8

Source: Ministry of Economy, Argentina and UBS-Warburg for the consolidation of provincial data.

Table 3. Accounting for changes in primary revenues and spending

	Tax revenue		Primary spending	
	Levels	Logs	Levels	Logs
GDP	0.19 (10.6)	1.47 (10.7)	0.09 (5.5)	0.72 (5.5)
Dummy post 2000.1	1000 (4.9)	0.11 (4.7)	185 (0.5)	0.015 (0.7)
R ²	0.84	0.84	0.54	0.53
N	31	31	31	31

Source: Own calculations based on data published by the Ministry of the Economy. T-stats in parenthesis

Fiscal balance and its components

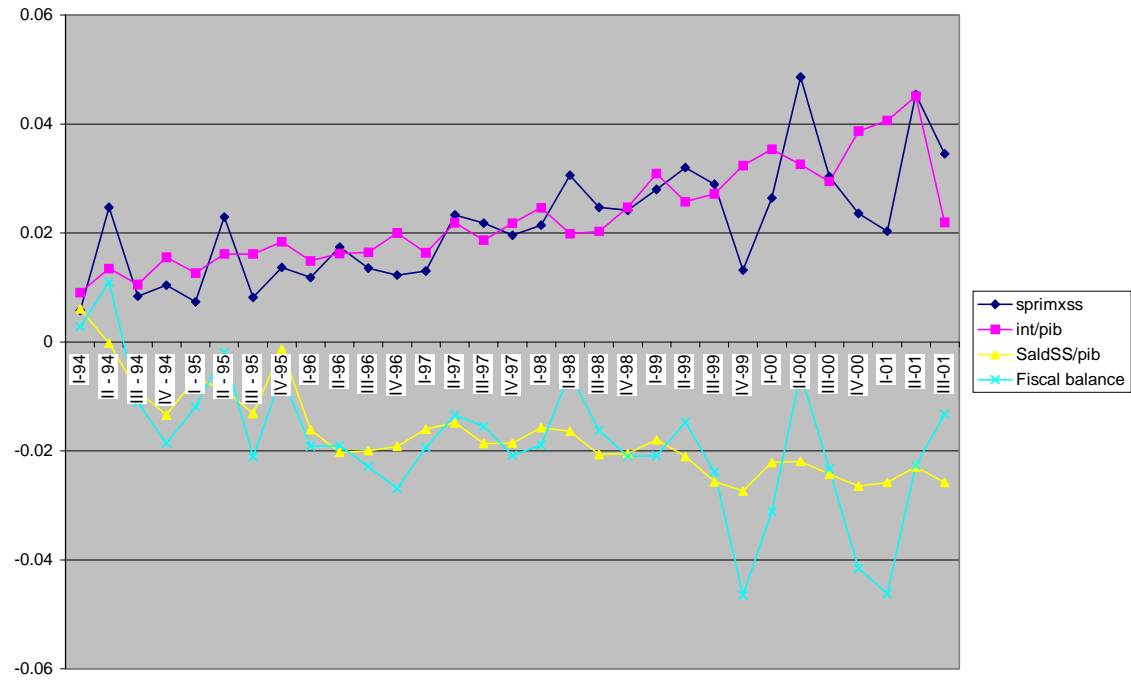


Figure 5

Table 4

Accounting for the increase in national public debt

Debt as of 12/94	80.3
Debt as of 12/00	128.0
Total increase in gross debt	47.7
Increase in gross assets (collaterals and cash)	11.7
Increase in net debt	36.0
Cumulative deficit 1995-2000	21.8
- of which social security deficit	30.9
Capitalized interest and valuation changes	-1.2
Recognized debt, provinces and other	16.4
Memo: assets of the private pension funds 12/00	21.0

Multilateral exchange rate and spread between Argentina and Mexico

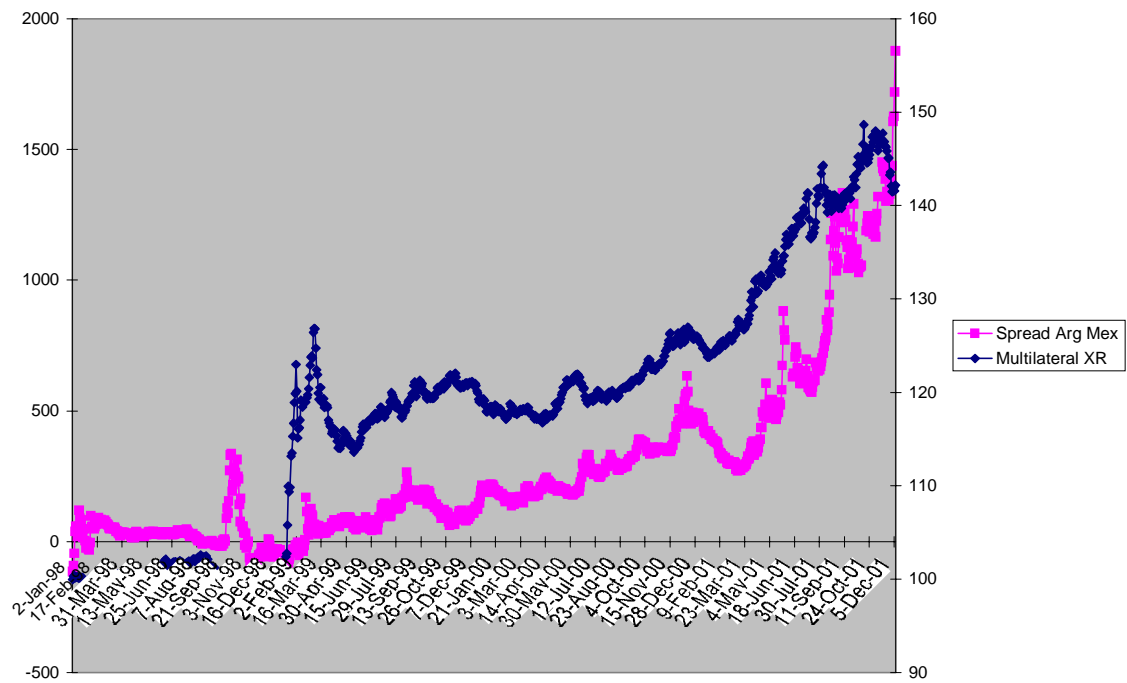


Figure 6

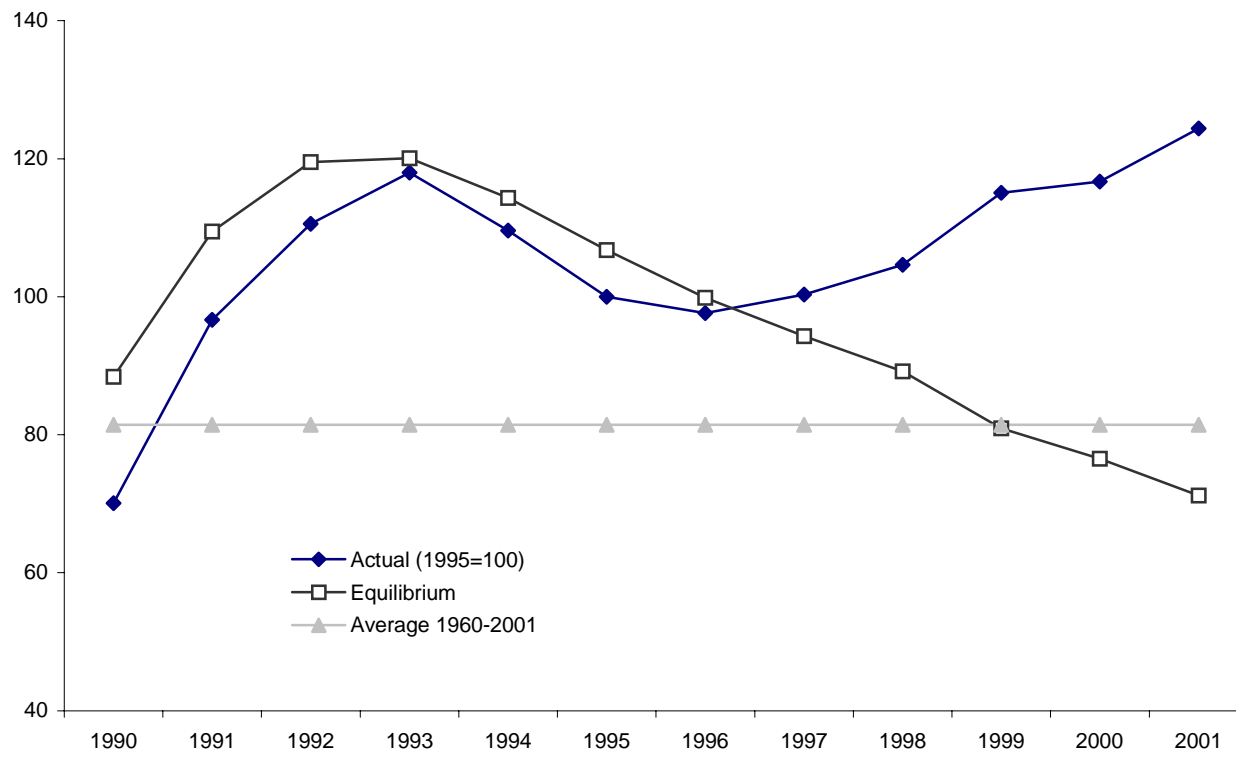


Figure 7: Real Exchange Rate Misalignment
 Source: Perry and Servén (2002)

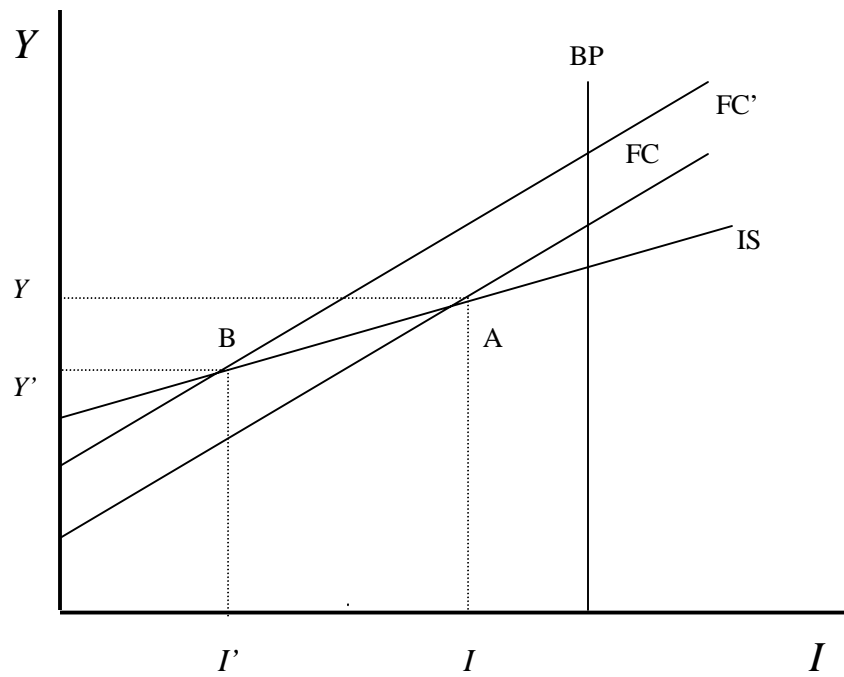


Figure 8: Before and after the sudden stop

**GDP and
Investment**

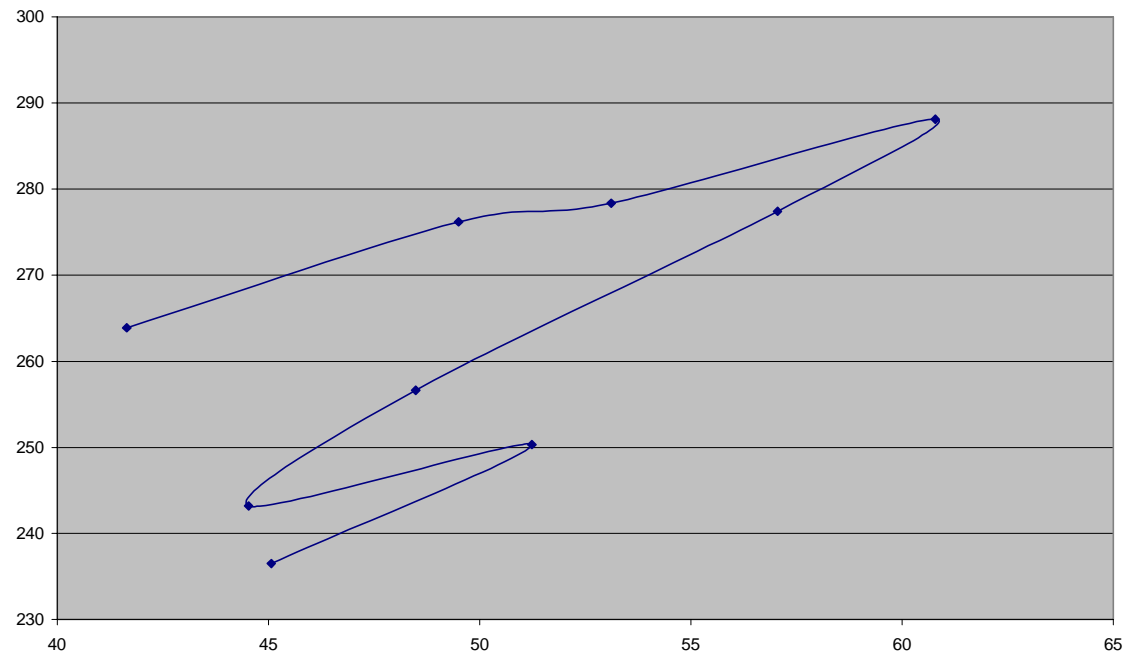


Figure 9

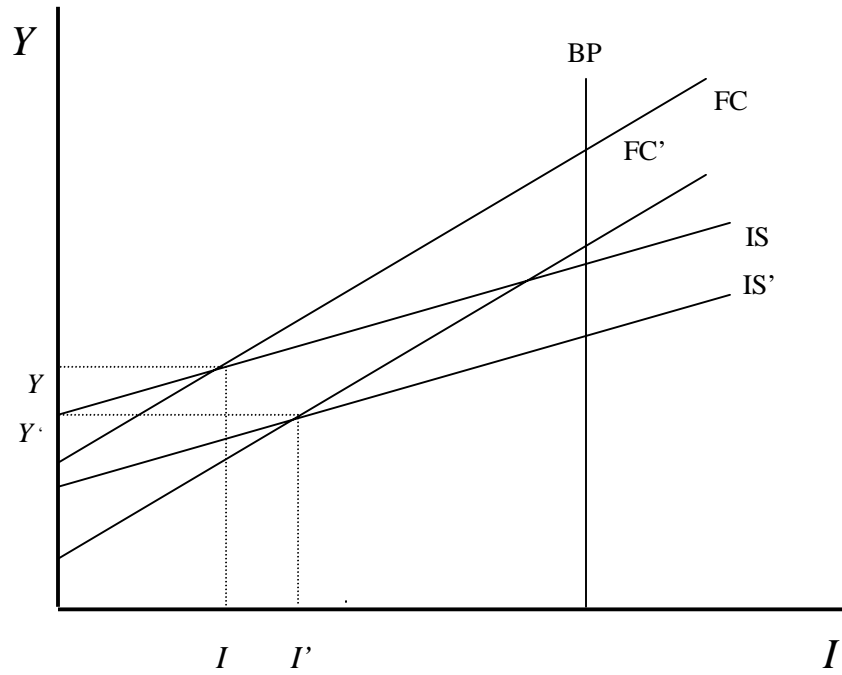


Figure 10: Contractionary Fiscal Contraction

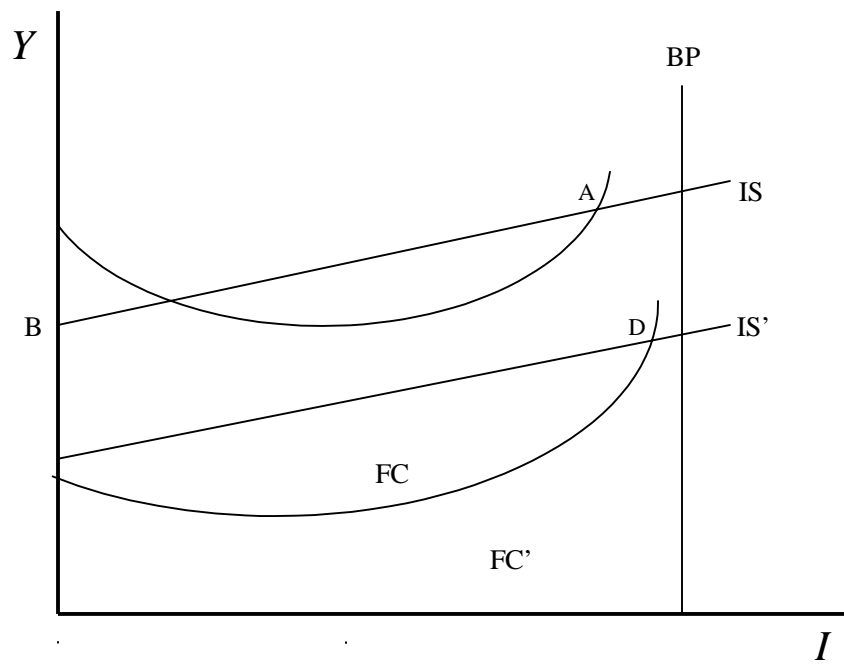


Figure 11: Fiscal contraction and self-fulfilling pessimism

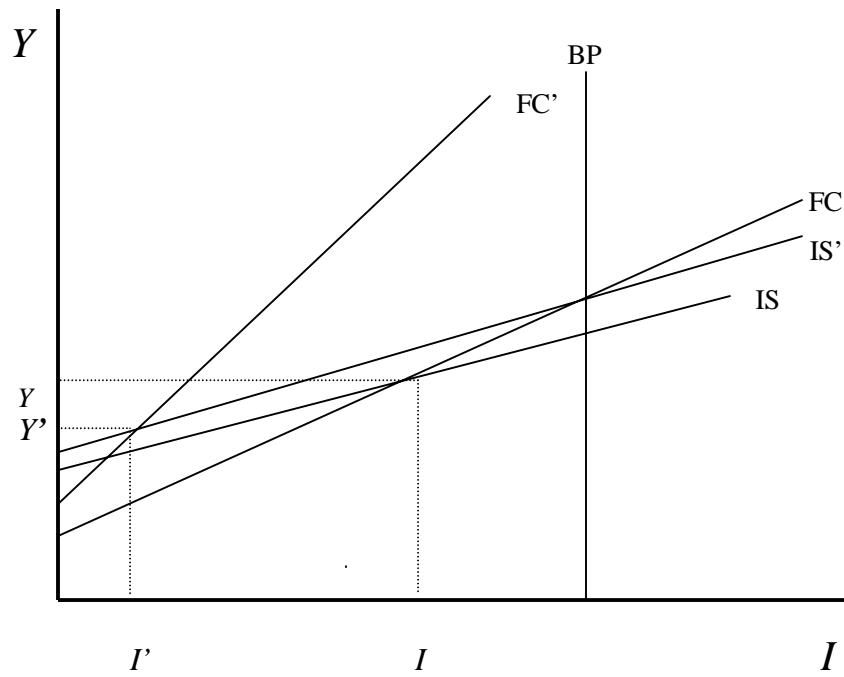


Figure 12: Contractionary Devaluation

Table 5
Debt-Service / Exports Ratios
Selected Countries
(percent, 2000)

Country	Total Debt Service/Exports	Interest Payments/Exports
Argentina	71.3	30.3
Bolivia	39.1	11.1
Brazil	90.7	21.8
Chile	26.0	9.4
China	7.4	2.6
Czech Republic	12.7	3.7
Ecuador	17.6	8.4
Estonia	8.7	2.5
Hungary	24.4	4.6
India	12.8	5.0
Indonesia	25.3	10.1
Korea	10.9	2.7
Malaysia	5.3	2.0
Mexico	30.2	7.1
Pakistan	26.8	9.2
Panama	10.1	5.0
Peru	42.8	16.7
Poland	20.9	5.2
Russian Federation	10.1	4.8
South Africa	10.0	3.2
Thailand	16.3	5.6

Source: *Global Development Finance 2002*, World Bank. Notice the numerator refers to 2002 data and the denominator to an average of 1998-2000.

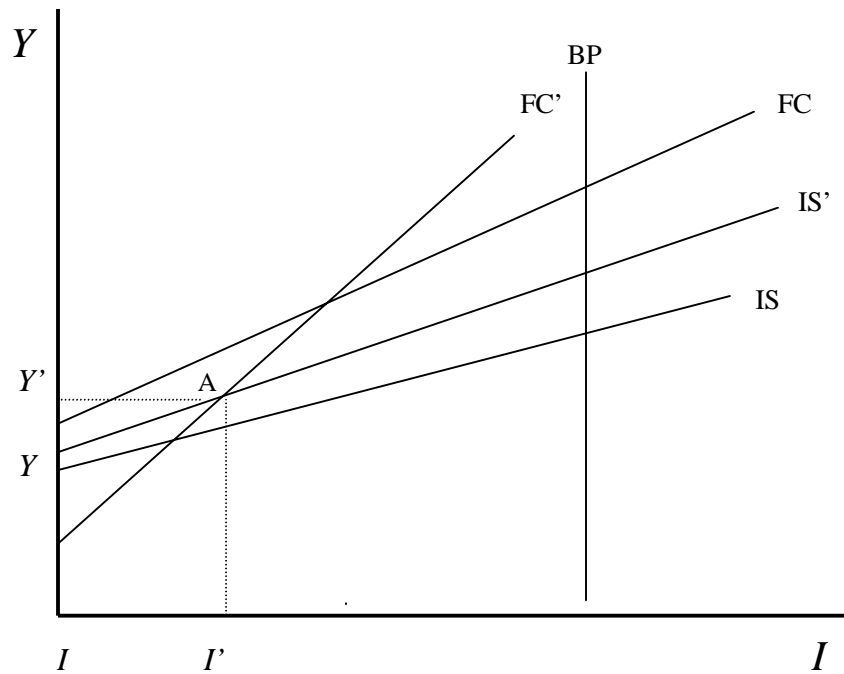


Figure 13: Devaluation plus pesification.