

Living and Dying with Hard Pegs: The Rise and Fall of Argentina's Currency Board  
[with Comments]

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Source: *Economía*, Spring, 2003, Vol. 3, No. 2 (Spring, 2003), pp. 43-107

Published by: Brookings Institution Press

Stable URL: <https://www.jstor.org/stable/20065441>

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## Living and Dying with Hard Pegs: The Rise and Fall of Argentina's Currency Board

**A**rgentina's currency board was a textbook model of a rigid exchange rate regime for more than ten years. The subsequent collapse of the financial system yields important lessons for the debate on exchange rate regimes for developing countries.<sup>1</sup> As expected, the Argentine case has already generated much debate on the causes and policy implications of the crisis.<sup>2</sup> Current explanations, however, concentrate too much on the last years of the experiment and do not pay enough attention to the underlying logic of the currency board and its implications for the financial system and the economy at large.

In this paper, we study the Argentine experience from a perspective that links money (in its function as a store of value) and financial intermediation. This approach has important advantages. By organizing the discussion of the different intervening factors around a main motive, it allows us to balance the breadth of a comprehensive survey with the focus needed to

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An earlier version of this paper was circulated as "Argentina's Financial Crisis: Floating Money, Sinking Banking." We are grateful to Alberto Ades, Javier Bolzico, Jerry Caprio, José De Gregorio, Graciela Kaminsky, Paul Levy, Sole Martínez Pería, Guillermo Perry, Andrew Powell, Roberto Rigobon, Luis Servén, Federico Sturzenegger, Ted Truman, Andrés Velasco, and Charles Wyplosz for helpful comments. We thank Tatiana Didier, Mariano Lanfranconi, Ana María Menéndez, Josefina Rouillet, and particularly Marina Halac for excellent research assistance. We thank Laura D'Amato, Fernanda Martijena, and María Augusta Salgado for help with the data. The views expressed in this paper are entirely those of the authors and do not necessarily represent the views of the World Bank.

1. See Frankel and others (2001) for a brief history of this debate.

2. See, among others, Feldstein (2002); Calvo, Izquierdo, and Talvi (2002); Perry and Servén (2002); Mussa (2002); Hausmann and Velasco (2003); Powell (2003).

extract lessons. This approach also enables us to highlight the role played by the currency board in the development of the financial sector during the 1990s and in the genesis of its collapse. In particular, Argentina fell into a currency-growth-debt (CGD) trap in the late 1990s, which eventually led to a currency and bank run and a devastating economic crisis.

The Argentine experience suggests that the benefits of hard pegs have been much overstated. To be sure, a credible hard peg ensures nominal stability and boosts financial intermediation by providing savers with the dollar as the store of value, either directly under dollarization or via the peg under currency boards. Even if credible, however, a hard peg does not automatically lead to the emergence of alternative nominal flexibility (particularly in wages, fiscal spending, and financial contracting) to compensate for the loss of the nominal exchange rate as a policy instrument. This is particularly problematic in the case of hard peg countries that, like Argentina, do not meet the classical conditions for an optimal currency (dollar) area. Partly as a result, hard pegs *per se* do not induce fiscal or even monetary discipline. The monetary framework of a hard peg, although typically protected by a heavy legal and institutional armor, can be dismantled more easily than is usually thought by the emergence of quasi-monies. These arise, in turn, from extreme budgetary pressures stemming from insufficient nominal flexibility in fiscal spending and public sector wages. Moreover, because the credibility of a hard peg is a positive function of its exit costs, a hard peg creates powerful incentives for the government to raise exit costs further (redouble the bet) when the hard peg is under pressure. Hard pegs endogenously raise exit costs by fostering dollarization—including dollarization of the liabilities of debtors in the nontradables sector—since the government would rather not explicitly adopt measures to discourage dollarization for fear of undermining the credibility of its commitment to the hard peg.

Exiting a hard peg is inherently very painful, but some ways of exiting can be more disastrous than others. The Argentine experience offers lessons on alternative exit strategies. With the benefit of hindsight and the caveats of any counterfactual analysis, we argue that the forcible pesification of existing financial contracts (stock pesification) was the most costly choice, for it was bound to cause excessive destruction of property rights with long-lasting consequences for financial intermediation. It was also likely to rekindle the deposit flight and exacerbate the exchange rate overshooting by creating a massive peso overhang in the midst of a currency

run. By contrast, an early (before 2001) exit into full dollarization (of both financial contracts and money in circulation) might have averted the bank run, thus protecting financial intermediation and the payment system, but it would have done nothing to mitigate the deflationary and recessionary costs of a protracted adjustment of the real exchange rate to a more depreciated equilibrium level. In this light, we find support for an intermediate exit option: dollarization of existing financial contracts (stock dollarization) to respect the widespread use of the dollar as a store of value, combined with pesification at the margin (for instance, the consolidation of the existing pesos and quasi-monies into a new national currency) to exploit the use of the peso as the means of payment and unit of account, since the peso remained extensive and resilient throughout the convertibility period and even during the run.<sup>3</sup> This alternative would not have completely spared Argentina from significant banking system stress and even some individual bank failures, as debtors in the nontradables sector would have seen their balance sheets and payment capacity adversely affected by the real exchange rate correction. It might, however, have provided a margin of nominal flexibility while avoiding a systemic financial collapse and the unnecessary destruction of property rights.

In terms of the exchange rate debate, the failure of the Argentine currency board is sure to elicit two reactions. On the one hand, bipolar proponents may conclude that currency boards are not hard enough and that sustainable pegs have to go all the way to formal dollarization. On the other, hard peg critics may interpret the case as evidence that the regime debate has been settled in favor of fully floating regimes. We argue that a one-dimensional emphasis on pure fix versus float is insufficient and can even be misleading. It would be more productive to focus on the weak currency problem that plagues most emerging economies and on the need to build healthy links between money (in its function as a store of value) and financial intermediation, while establishing adequate flexibility, including in financial contracting, to facilitate adjustment to shocks.<sup>4</sup>

3. We do not favor redollarization of contracts once the costs of pesification have been largely incurred, as a previous version of the paper might have mistakenly led some to believe (see “Argentina’s Bottomless Pit,” *Economic Focus, The Economist*, 8 August 2002).

4. This view stems from the need for institutional building irrespective of the exchange rate regime of choice. The case of Argentina clearly illustrates the difficulties of importing monetary institutions through the adoption of a peg. Unilateral dollarization would not have bypassed these difficulties.

The rest of the paper is organized as follows. The next section analyzes the rise and fall of convertibility, distinguishing between the good times of financial deepening, which were, nonetheless, accompanied by persistent and rising financial dollarization; the bad times when the Argentine economy fell into a CGD trap from which it could not break free; and the resulting meltdown, triggered by a massive run on the currency that evolved into a deposit run. The subsequent section draws lessons from the Argentine experience on hard pegs: their limitations as commitment mechanisms, their specific prudential concerns, and the alternative exit strategies. The final section offers some concluding remarks.

## **The Rise and Fall of Argentina's Currency Board**

The rigid peg of the peso to the dollar under convertibility was a highly inconvenient choice from the point of view of Argentina's trade and productive structure. In effect, Argentina is far from meeting the conditions for an optimal currency (dollar) area. It is typically subject to different shocks than the United States, it has a substantial share of its foreign trade with countries whose currencies fluctuate vis-à-vis the U.S. dollar, and as a relatively closed economy with a large nontradables sector, it could benefit much more (compared with open economies with relatively small nontradables sectors) from nominal exchange rate adjustments to correct for misalignments in the relative price of tradables to nontradables.

Convertibility was chosen in Argentina despite these conditions and not even in light of long-term growth considerations. It was a decision understandably driven by overriding monetary and financial considerations. Convertibility arose as an extreme response to hyperinflation and the consequent implosion of financial intermediation that had taken place in the 1980s, together with a much longer history of repeated episodes of fiscal mismanagement and debasement of the domestic currency.

From its introduction in April 1991, however, convertibility was much more than a simple peg or an expedient exchange rate arrangement to conquer inflation. For starters, the peg was embedded in a broad monetary arrangement that featured, at its heart, a money issuance rule that legally precluded the creation of pesos not backed by hard dollars, except within

a very limited range.<sup>5</sup> Convertibility was intended to produce a non-reversible break from monetary and financial instability. It was expected to mark for the Argentine psyche a point of no return and a one-way path forward, much as Hernán Cortés's decision to burn the ships represented a decisive turning point for his crew. Moreover, convertibility was from the outset envisioned to have implications well beyond the pure monetary sphere. It aspired to become an institutional axis that would help bring order to other institutions and align incentives among agents, particularly in the economic sphere (fiscal process, bank regulation, labor markets, and so forth) but also in the social and political spheres. Convertibility indeed became a central component of the social contract, a key institution in the economic and political life of the country. Convertibility was not a contract like any other; rather, it was a core or master contract on which other financial and nonfinancial contracts depended.

Domingo Cavallo, Argentina's Economy Minister at the beginning and end of the convertibility decade (1991–96 and 2001), used to insist that there was, by design, only one way to exit convertibility in accordance with the law—that is, once the Argentine peso had established itself as an international currency, and a strong one at that. In effect, the convertibility law stated that the central bank would stand ready to buy and sell dollars at no more than one peso per dollar. By implication, the central bank could eventually buy dollars at less than one peso per dollar. Obviously, the catastrophic manner in which convertibility collapsed in January 2002 was a far cry from the glorious exit envisioned by its framers in April 1991.

What explains this massive departure of reality from vision? In the remainder of this section we set forth an explanation. Convertibility did broadly deliver on its promise to deepen the financial system, albeit at the cost of a persistent and rising level of financial dollarization.<sup>6</sup> It failed to

5. The law allowed for up to one-third of disposable international reserves to be composed of internationally traded, dollar-denominated Argentine sovereign bonds, valued at market prices. This proviso enabled a very limited role for the Central Bank as lender of last resort—it could create and provide peso liquidity to the banking system in exchange for sovereign Argentine bonds, rather than hard dollars.

6. By financial dollarization, we refer to the holding by residents of assets and liabilities denominated in foreign currency. As argued in Ize and Levy Yeyati (2003), financial dollarization mostly reflects asset substitution (that is, the use of a foreign currency as a store of value), as opposed to currency substitution (that is, the use of the foreign currency as a unit of account and means of payment).

deliver, however, on the expectation that as a permanent monetary straightjacket, it would, by itself, discipline the fiscal process and induce reforms that would endow Argentina with adequate nominal flexibility (particularly in fiscal spending and wages) to compensate for the absence of nominal exchange rate flexibility. This failure became particularly taxing after 1998, as the country was increasingly caught in what we label a currency-growth-debt trap that ultimately precipitated the collapse.

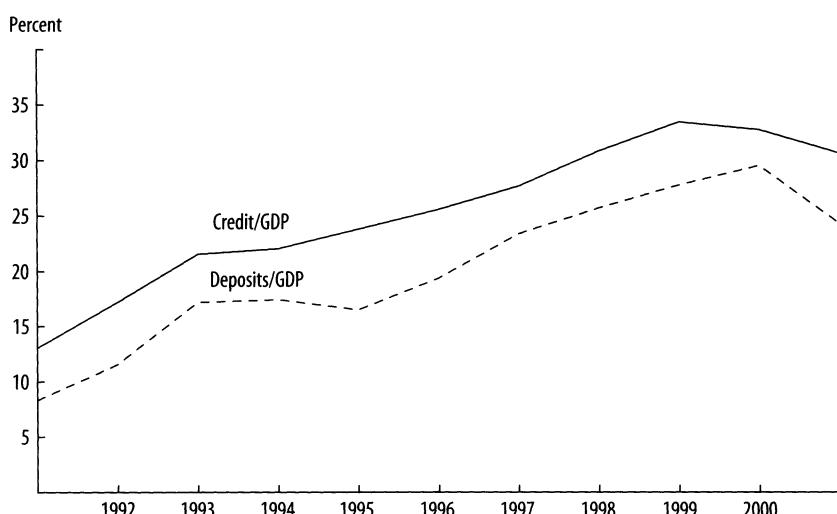
### *Good Times: Financial Deepening and Increased Dollarization*

Out of the ashes left by hyperinflation and financial disarray in Argentina in the 1980s, the one-peso-one-dollar rule of convertibility quickly restored money's function as a store of value, thereby enabling a rapid regeneration of financial intermediation as reflected in the steep growth of bank deposits and loans throughout 1999 (figure 1).<sup>7</sup> Moreover, the rapid taming of inflation brought about by convertibility greatly enhanced the political viability of a number of first generation reforms that the nominal instability of the past had rendered infeasible. Rapid changes thus swept the Argentine economy in the first phase of convertibility, particularly with the restructuring of the external debt (under the Brady Plan), a tax reform centered on the value added tax, a series of privatizations, social security reform, and the deregulation of financial markets. Argentina also shared in the wave of capital flows to emerging economies, and these two processes together fueled aggregate demand and boosted growth in gross domestic product (GDP) to a brisk average of 6.4 percent per year during 1991–98 (9.1 percent in 1991–94), well above the Latin American average of 3.7 percent in 1991–98 (4.3 percent in 1991–94).

The sustainability of convertibility's early successes was transitorily but severely questioned during the Mexican (or tequila) crisis of 1995. The tequila contagion led to a major run on the Argentine peso and bank deposits. Deposits fell by almost 20 percent in a few weeks, nearly bringing down the financial system and convertibility with it. This crisis marked a turning point in financial sector policy. The authorities responded by

7. After a major increase between 1991 and 1994, bank deposits continued rising steadily, from 17 percent of GDP by the end of 1994 to 26 percent by the end of 1998. Calomiris and Powell (2001) compellingly show that convertibility is indeed key to understanding the rapid growth and strengthening of the financial system in the 1990s.

**FIGURE 1. Financial Deepening<sup>a</sup>**



Source: Central Bank of Argentina; World Bank.

a. Credit includes loans to the private sector, loans to the public sector, loans to residents abroad, and private and public securities held by the financial system. Deposits include demand deposits, savings deposits, time deposits, and other deposits, by the private sector, the public sector, and residents abroad. Figures correspond to year-end values.

affirming convertibility, while recognizing that its viability required a particularly resilient financial system given the limits imposed by the currency board on the central bank's ability to act as lender of last resort. They launched a series of ambitious financial sector reforms to realize this conviction, as illustrated in appendix A.

The results were impressive by any standard.<sup>8</sup> The banking system consolidated and became internationalized, while many public banks were

8. By 1998 Argentina ranked second in terms of the quality of its regulatory environment (after Singapore, tied with Hong Kong, and ahead of Chile), according to the CAMELOT rating system developed by the World Bank. This system combines separate rankings for capital requirements (C); asset quality (A), based on loan loss provisioning requirements and definition of past-due loans; management (M), defined by the extent of high-quality foreign bank presence; liquidity requirements (L); operating environment (O), measured by rankings with respect to property rights, creditor rights, and enforcement; and transparency (T), measured by whether banks are rated by international risk rating agencies and by an index on corruption. Argentina ranked first for C (tied with Singapore), fourth for A, third for M, fourth for L, seventh for O, and second for T. For details, see World Bank (1998, pp. 39–61 and appendix A).

**TABLE 1. Consolidation and Internationalization of the Banking System<sup>a</sup>**

<i>Bank information</i>	1994	1998	2000
Total number of banks	166	104	89
Foreign banks			
Number of banks	31	39	39
Number of branches	391	1,535	1,863
Share of total assets (percent)	15	55	73
Public banks			
Number of banks	32	16	15

Source: Central Bank of Argentina.

a. Figures correspond to year-end values.

privatized (see table 1). By the end of the 1990s, a resilient banking system was the crown jewel of convertibility-induced reform. Convertibility did not lead to strong fiscal institutions, but few doubted that it had led to a shock-resistant banking sector.<sup>9</sup>

The banking system was arguably in a very solid position before the Brazilian devaluation of January 1999, and it was still reasonably healthy through the end of 2000, despite the continued post-1998 economic contraction. Common indicators of financial health, shown in table 2, depict a well-capitalized, strongly provisioned, and highly liquid banking system through 2000, although the system experienced losses and was increasingly burdened by bad loans after 1998.<sup>10</sup>

The aftermath of the tequila crisis affirmed convertibility as a central piece in the social contract, with post-1994 reforms creating a banking system that, though costly, appeared convertibility compatible in most respects. Toward the end of the decade, the financial system's prudential buffers were sufficient to withstand sizable liquidity and solvency shocks—including a flight of about one-third of the deposits and further significant decay in the loan portfolio—without endangering convertibility.<sup>11</sup> The important presence of reputable foreign banks (which accounted for over 70 percent of total banking assets in 2000, as shown in table 1)

9. See Gavin and Perotti (1997); Tornell and Velasco (2000).

10. Profits turned negative in 1998 and became deeply negative in 1999–2000, partly because of the need to constitute provisions in the face of rising bad loans. Nonperforming loans rose to 11.6 percent of total loans in 2000, from 10.5 percent the year before (table 2).

11. Table 2 puts systemic core liquidity (disposable international reserves of the central bank plus foreign exchange in cash or near-cash held abroad by banks) at about 39 percent of banking system deposits at the end of 2000. However, the distribution of such liquidity

**TABLE 2. Selected Banking System Indicators<sup>a</sup>**

Percent, except as indicated

<i>Indicator</i>	1997	1998	1999	2000
Net worth / assets	12.1	11.4	10.7	10.5
Capital / risk-weighted assets	18.1	17.6	18.6	21.2
Nonperforming loans / total loans <sup>b</sup>	10.1	9.1	10.5	11.6
Provisions / total loans	6.2	5.5	6.1	7.3
Provisions / nonperforming loans <sup>b</sup>	60.9	60.4	58.4	63.3
Systemic core liquidity <sup>c</sup>	43.0	39.6	40.9	38.7
Return on equity before provisions	22.6	10.6	8.4	7.8
Return on equity after provisions	7.4	-2.2	-6.7	-9.4
Return on assets after provisions	1.0	-0.3	-0.8	-1.0
Leverage ratio (not in percent)	6.1	7.3	7.7	8.3

Source: Central Bank of Argentina.

a. Figures are year-end values.

b. Nonperforming loans are the sum of problem loans, high-risk loans, and nonrecoverable loans.

c. Defined as the ratio of international reserves of the Central Bank in foreign currency and other liquidity requirements held abroad by banks to total deposits.

was broadly perceived as implicitly augmenting these liquidity and solvency cushions. These banks were expected to stand behind the capital and liquidity of their affiliates in Argentina, at least in the context of bad states of the world associated with bad luck. (Few were thinking then of bad states of the world caused directly by confiscatory government policy.)

The remarkable strengthening of the banking system was accompanied by a persistent and rising level of financial dollarization. This phenomenon was not part of the intention of the framers of convertibility, but it was an almost inevitable corollary of policy incentives created by convertibility coupled with a stubborn market perception of exchange rate risk that convertibility could not remove, despite its heavy institutional and legal armor.

The founders of convertibility envisioned a strong peso as the means for an elegant and almost natural exit from the one-peso-one-dollar rule. Such an aspiration could not be easily translated into measures to discourage financial dollarization, however, because the market might interpret such measures as an indication that the authorities themselves did not think that the one-peso-one-dollar rule was to endure under most states of

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varied significantly across banks. This may explain why the *corralito* was imposed at the end of 2001 before deposits had fallen by 30 percent.

the world. The authorities thus faced incentives not to adopt prudential norms (such as loan classification and provisioning rules or liquidity requirements) that would explicitly discourage the use of the dollar in financial contracts.<sup>12</sup> Similarly, the government did not issue peso debt in domestic markets not just because dollar debt was less costly, but also because incurring the additional cost could only have been interpreted as a hedge against a future devaluation, undermining confidence in the one-to-one rule.

At the same time, markets did not fully take to heart the mantra of “no more than one peso for one dollar, forever.” Instead, they continued to attach a nontrivial probability to the risk of a nominal devaluation of the peso. This perceived currency risk was a key factor behind a peso problem that persisted throughout the 1990s, spiking during turbulent times, as shown in figure 2.<sup>13</sup>

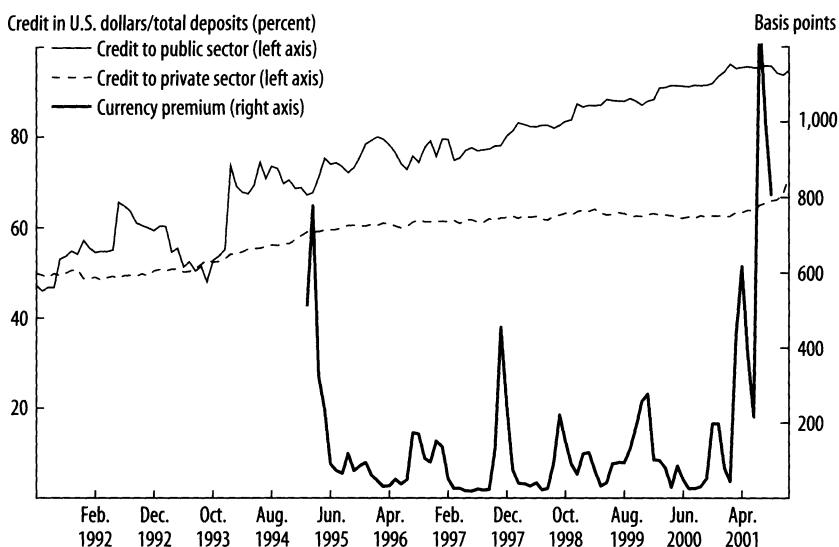
The lasting perception of a residual risk of nominal devaluation and the mentioned incentives faced by the authorities (which resulted in an essentially currency-blind prudential framework) together largely explain why financial dollarization rose throughout the decade.<sup>14</sup> Dollarization permeated both private and public sector financial assets and liabilities, and it was very significant in loans to the nontradables sector. Figure 2 shows the steady rise in the share of dollar credit in total credit to the private and public sectors. The first panel of figure 3 shows that dollarization of mortgage loans (that is, loans to an important nontradables sector) increased significantly after 1994, while the second panel shows that dollar debt, as indicated by firms’ balance sheets, was even higher for firms in the nontradables than in the tradables sector.

Dollarization of public sector debt also rose significantly, and not just in terms of bank credit to the public sector. In particular, the public debt made explicit as a result of the reform in the social security system was denominated in dollars. At the same time, certain other policies taken by the public sector encouraged real dollarization. For instance, public utility

12. We come back to this point in the next section.

13. The interest rate differential reflected not only exchange rate risk, but also default risk, as discussed in Broda and Levy Yeyati (2003a, 2003b) and Schmukler and Servén (2002).

14. The peso problem was not independent of the degree of financial dollarization, as explained at the end of this section.

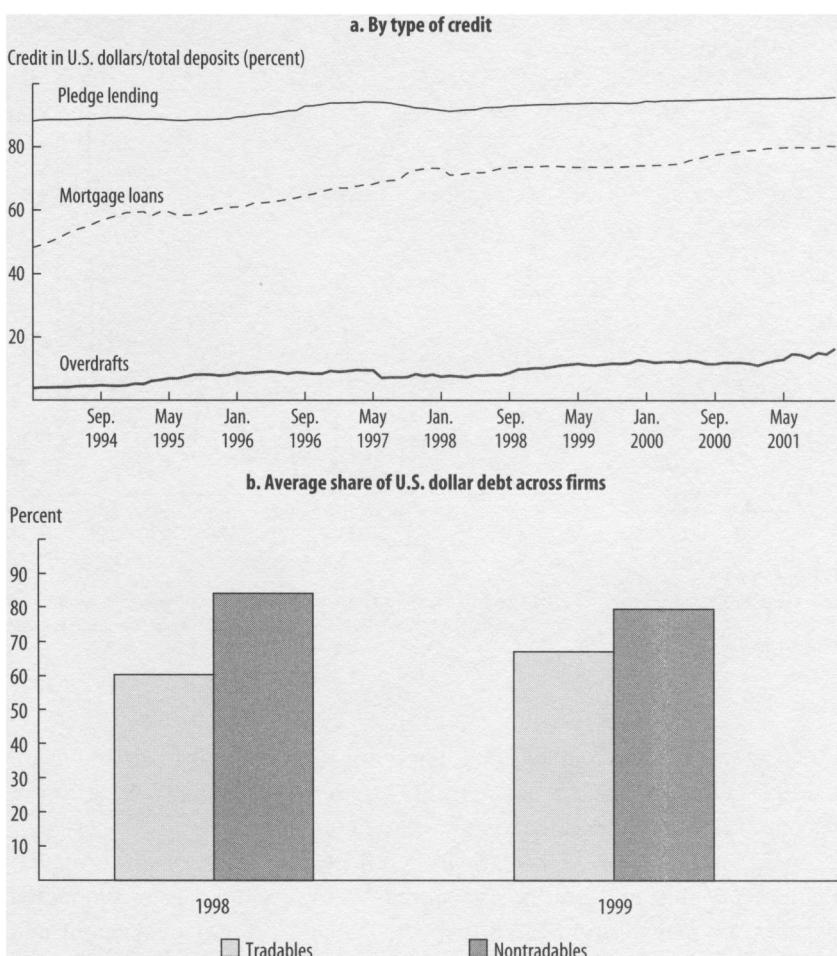
**FIGURE 2.** Loan Dollarization and Currency Premium<sup>a</sup>

Source: Central Bank of Argentina.

a. The currency premium is measured by the differential between peso and dollar interbank deposit rates, using the daily one-month interest rate premium. Credit to the public and private sectors corresponds to end-of-period values, and the currency premium is the monthly average.

tariffs could be denominated in dollars; this decision was made to ensure a dollar income to the privatized utility companies, because convertibility was not fully credible in the view of these companies.

In Argentina, financial dollarization reflected an asset substitution phenomenon (a shift to the dollar as a store of value), and it was accompanied by currency substitution (a shift to the dollar as a unit of account and means of payment) only to a minor degree. Dollar pricing was limited mostly to internationally traded goods and big-ticket items such as real estate, and use of the dollar for everyday transactions was rather marginal, as reflected in marked differences in dollarization ratios for different types of bank deposits (figure 4). Time deposits became increasingly dollarized during convertibility, whereas the degree of dollarization of passbook savings accounts, albeit high (about 40 percent), remained relatively stable throughout the eight years ending in 2000. The degree of dollarization of

**FIGURE 3. Private Sector Dollarization**

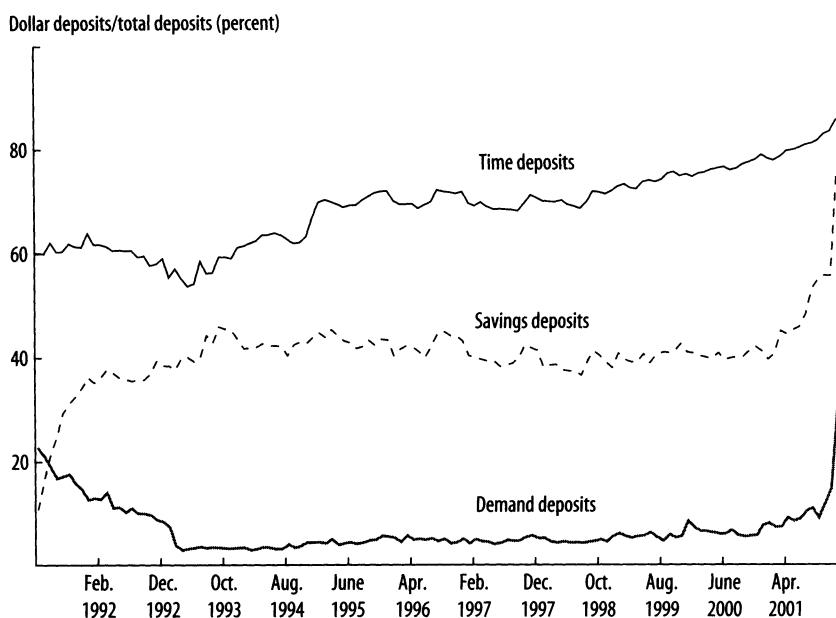
Source: Central Bank of Argentina; Buenos Aires Stock Exchange.

demand deposits was strikingly low (well under 10 percent) and stable during most of the decade.<sup>15</sup>

To be sure, the authorities tried an indirect avenue to deal with the currency risk associated with financial dollarization through prudential

15. The evidence of a resilient transactional demand for pesos was ultimately confirmed by the stability of real peso balances following the abandonment of convertibility, as we

**FIGURE 4. Dollarization by Type of Deposit**



Source: Central Bank of Argentina.

norms.<sup>16</sup> As explained in appendix A and shown in table 3, regulatory capital requirements for credit risk not only were determined in line with the typical Basel-type procedure of applying higher weights to riskier loan classes, they also tried to take into account the risk of individual loans within each loan class. This was implemented by increasing the weight applied to individual loans that charged higher interest rates—that is, by adding a so-called interest rate factor. The underlying assumption was that if banks price risks correctly, these should be fully reflected in the lending interest rate. The norm was initially designed to take into account different interest rate scales and thresholds depending on the currency of loan denomination (table 3). This innovative system was probably effective in capturing some risk differences across loans, but it failed to capture the

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show below. Even after the *corralito* was lifted in December 2002, M1/GDP remained slightly above historical levels. The distinction between currency and asset substitution plays a crucial role when we come back to the exit strategy problem in the next section.

16. We thank Andrew Powell for raising this point.

**TABLE 3.** Risk Indicators<sup>a</sup>

Date	Annual interest rate (percent)	Annual interest rate (percent)	Risk
1 July 1993	<i>Peso financing</i>	<i>Foreign-currency financing</i>	
	up to 24	up to 18	1.00
	more than 24 to 27	more than 18 to 21	1.20
	more than 27 to 30	more than 21 to 24	1.40
	more than 30 to 33	more than 24 to 27	1.60
	more than 33 to 36	more than 27 to 30	1.80
1 February 1996	more than 36 to 39	more than 30 to 33	2.00
	up to 18	up to 14	1.00
	more than 18 to 21	more than 14 to 17	1.20
	more than 21 to 24	more than 17 to 20	1.40
	more than 24 to 27	more than 20 to 23	1.60
	more than 27 to 30	more than 23 to 26	1.80
1 January 2000	more than 30 to 33	more than 26 to 29	2.00
	<i>Peso and foreign-currency financing<sup>b</sup></i>	<i>All other financing</i>	
	up to 26	up to 16	1.00
	more than 26 to 29	more than 16 to 19	1.10
	more than 29 to 32	more than 19 to 22	1.20
	more than 32 to 35	more than 22 to 25	1.30
	more than 35 to 38	more than 25 to 28	1.40
	more than 38 to 41	more than 28 to 31	1.50
	more than 41 to 44	more than 31 to 34	1.60
	more than 44 to 47	more than 34 to 37	1.90
	more than 47 to 50	more than 37 to 40	2.20

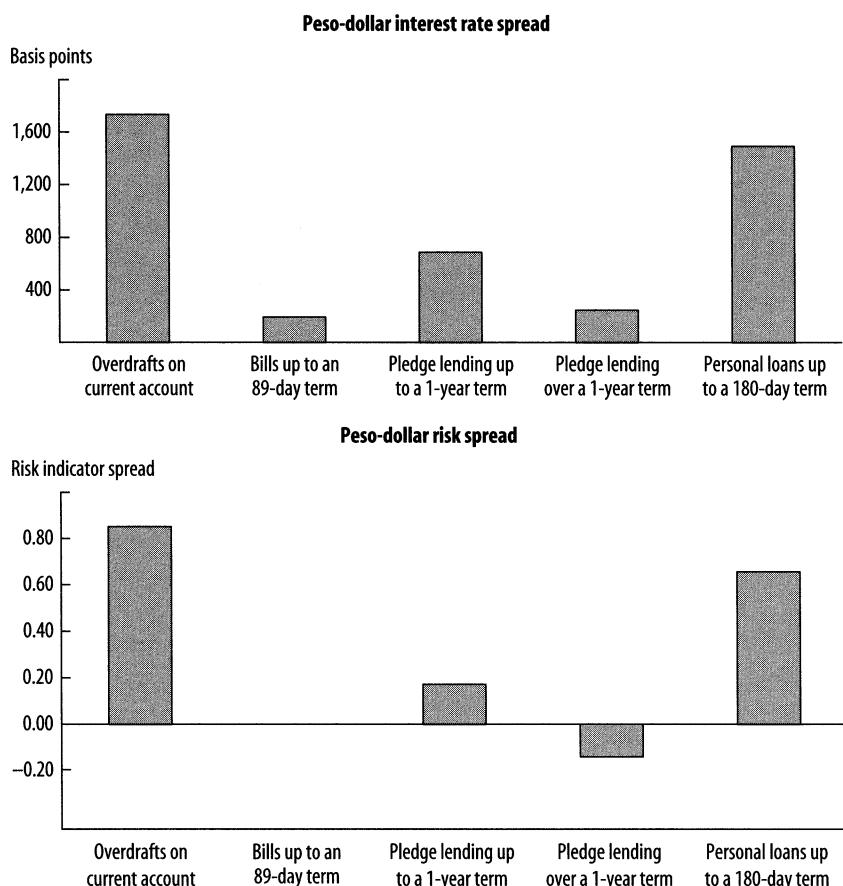
Source: Central Bank of Argentina.

a. Risk indicator is used in the calculation of the risk value of loans and other financing (excluding credit to financial institutions), which is then used to determine the capital requirements for credit risk. For higher interest rates, other risk indicators apply.

b. Includes personal loans, credit card financing, and overdrafts.

specific risk of dollar loans to the nontradables sector (a point discussed further in the next section). Rather, the interest rate factor may have encouraged dollarization because it was higher for peso loans than for dollar loans, given that the peso problem entailed systematically higher peso interest rates (see figure 5). Moreover, when currency risk became a source of policy concern in 1999, the differentiation in the interest rate factor according to the currency of loan denomination was eliminated—yet another example of the contradictions inherent in the convertibility game of continuously raising the stakes.

The increasing level of financial dollarization further affirmed the one-peso-one-dollar rule but at the expense of the peso—that is, by departing from the convertibility framers' admittedly unrealistic vision of a

**FIGURE 5. Interest Rate and Risk Spreads by Type of Loan<sup>a</sup>**

Source: Central Bank of Argentina.

a. The top panel shows the average spread between peso and dollar financing interest rates. The bottom panel shows the average spread between peso and dollar financing risk indicators. The period covered is July 1993 through December 1999, when the risk indicator was different for peso and dollar financing. Mortgage loans are excluded because only a few banks in the system granted mortgage loans in pesos during this period. Note that the peso-dollar risk spread for bills up to an eighty-nine-day term is zero although the interest rate spread is positive. This is due to the fact that when the interest rate spread is small, the same risk indicator is used for peso and dollar loans.

strengthening peso. As financial dollarization persisted and increased, it also became clear that a disorderly breakdown of the one-peso-one-dollar rule would be an unmitigated catastrophe—it would wreck the solvency of debtors in the nontradables sector and, hence, of the banking system. As such, dollarization was not an undesirable side effect but rather a crucial ingredient in the convertibility scheme: by increasing the exit costs, it reinforced the burning-of-the-ships effect.

The high level of financial dollarization appears to have been a key factor behind investors' ambivalence regarding the currency board and the repeated shifts in market sentiment. In tranquil times, dollarization of liabilities reinforced the perception that convertibility would endure, because it raised the stakes and created incentives in favor of policies that would not undermine convertibility. This was reflected in a peso premium that, at its minimum, was remarkably low (figure 2). In times of financial turbulence, however, when the sustainability of the currency board was put to the test, high dollarization exacerbated investor anxiety, and the currency premium spiked sharply. By raising the costs of exit from the currency board to catastrophic levels, dollarization arguably increased the scope for multiple equilibria and self-fulfilling runs, manifested in a highly volatile currency premium.

### *Bad Times: A Currency-Growth-Debt Trap*

Right from the beginning of the De la Rúa administration (which took power in December 1999), the Argentine economy was caught in a currency-growth-debt trap. The currency was overvalued, growth was faltering, and the debt was hard to service. This trap was in no small part due to major external shocks. This section analyzes the elements of the trap and the policy failures in addressing them.

The Argentine peso appreciated sharply relative to most trading partners, in tandem with the revaluation of the U.S. dollar vis-à-vis European and emerging market currencies (particularly the Brazilian real).<sup>17</sup> The real exchange rate overvaluation, in turn, masked the precariousness of Argentina's sovereign debt position. To be sure, the reported debt-to-GDP ratio was not high in comparison with other Latin American coun-

17. Perry and Servén (2002), for example, estimate that the Argentine real exchange rate was overvalued by about 50 percent by 2000. While estimates may diverge, the perception of overvaluation was widespread both at home and abroad.

tries, although it was on the rise (from less than 40 percent in 1997 to over 50 percent by the end of 2000). When measured at the equilibrium real exchange rate, however, the debt-to-GDP ratio was very high and assailed by a potentially explosive dynamic. Perry and Servén estimate that relative to a benchmark analysis of fiscal sustainability, the use of the equilibrium real exchange rate in the sustainability calculation adds 24 percentage points to the public sector debt-to-GDP ratio in 2001, and it leads to an average increase of about two percentage points in the annual primary fiscal surplus required (in 2000–03) to attain intertemporal fiscal solvency.<sup>18</sup>

After 1998, Argentina slipped into an unyielding economic recession and rising unemployment.<sup>19</sup> This was triggered by a sudden stop in capital flows that, while regional in its origins, was particularly acute and persistent in Argentina after the 1999 Brazilian devaluation.<sup>20</sup> This capital flow reversal, together with doubts about fiscal viability, was reflected in sharp increases in the marginal cost of capital for Argentina (as measured by the spread of Argentine bonds over U.S. Treasury bonds), which reinforced pessimistic expectations regarding future growth and fiscal revenues and exacerbated the perception of a potentially explosive debt trajectory. All of this fed doubts about the sustainability of the one-peso-one-dollar commitment.<sup>21</sup>

The government's strategy for breaking free from the CGD trap focused on reviving growth, although the means to achieve this objective changed dramatically after April 2001, when Cavallo took the post of economy minister.<sup>22</sup> In 2000, growth resumption was sought indirectly by

18. Perry and Servén (2002).

19. GDP shrank by nearly 4 percent in 1999 (although it registered a rather strong, albeit fleeting, revival in the last quarter of 1999). GDP continued to contract at about 2 percent per year in 2000–01. Open unemployment rose from about 13 percent in 1998 to over 15 percent in 2000.

20. Perry and Servén (2002) provide evidence that Argentina was not affected as severely as other Latin American countries by the slowdown in capital flows in 1999 and that the sharp reversal of capital flows to Argentina in 2000–01 was mainly endogenous to domestic factors.

21. Some people still argue that the currency was not overvalued, as most observers claimed at the time. Even if this were the case, however, a widespread belief that the currency is overvalued is enough to generate a preventive retrenchment of capital flows that could give rise to a CGD trap, as described in this section. See Razin and Sadka (2001) for an analytical discussion.

22. See appendix B for a chronology of the political and economic events.

trying to regain investor confidence through fiscal adjustment, including the tax increase (*impuestazo*) enacted in January 2000. It was hoped that improved confidence would eventually lead to more capital inflows and growth, making the debt and current account sustainable. The authorities also tried to address the problem of currency overvaluation indirectly, by pushing for greater flexibility in labor markets.<sup>23</sup> As confidence was not restored and growth failed to pick up, the authorities shifted their attention toward calming fears of a possible debt default. The December 2000 International Monetary Fund (IMF) bailout package (advertised as a U.S.\$40 billion package) was negotiated with this latter objective in mind. However, none of these actions achieved the expected results, and hopes of reviving growth faded.

Cavallo banked on his prestige in trying to pull off the rescue. Empowered by Congress with special powers, he focused on rekindling growth, but this time directly, through heterodox measures. These included imposing a tax on imports while subsidizing exports (a fiscal devaluation for trade transactions), lowering reserve requirements, and announcing the eventual peg of the peso to both the dollar and the euro (with equal weights), once these two currencies reached parity. The growth-focused strategy not only did not yield growth, it also escalated the uncertainty about the debt and currency components of the CGD trap.<sup>24</sup>

Doubts about the maintenance of the one-to-one peg of the peso to the dollar soared after April 2001 (figure 2).<sup>25</sup> This correspondence had already been broken through the back door for trade transactions, and it was feared that it could also be broken for financial transactions. In addition, Cavallo had successfully pushed for the resignation of Central Bank president Pedro Pou, who was viewed by investors as a strict guardian of monetary and banking system soundness.<sup>26</sup> Cavallo further used his special powers

23. The approval of the labor market reform was linked to a bribery scandal, in which senators were accused of receiving payments from the government to approve the law. The scandal was unresolved, leading to the resignation of Vice President Carlos Alvarez.

24. Whether this risky bet was justified *ex ante* is difficult to ascertain given the foreseeable costs of attempting an early exit. At any rate, the decision illustrates how a government facing a dilemma between a sure loss and an improbable salvation is tempted to gamble by adopting desperate measures that make the loss even larger in the event those measures fail.

25. For a detailed chronology of the impact of political and economic announcements on the currency premium, see Schmukler and Servén (2002).

26. At the time of writing (January 2003), the Argentine Supreme Court was discussing the constitutionality of Pedro Pou's forced resignation.

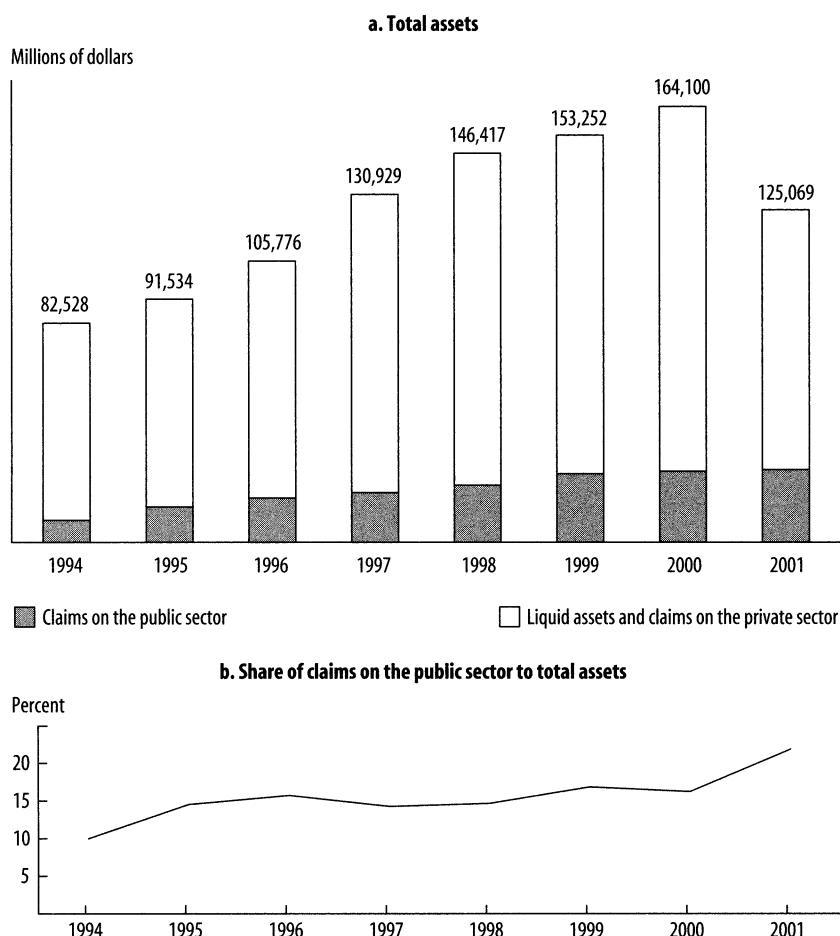
to reform the Central Bank charter, removing limits on the Central Bank's ability to inject liquidity, thereby effectively dismantling the money-issuance rule that underpinned convertibility.<sup>27</sup>

At the same time, uncertainty about the debt component of the CGD trap grew as the government procrastinated in making a decision on the debt. Instead of accepting that an orderly approach to debt reduction was needed after the failed attempts to restore growth, the government averted debt service arrears temporarily by absorbing the liquidity of the financial system—mainly of banks and pension funds. In particular, in April 2001, the government used moral suasion to place U.S.\$2 billion of bonds with banks in Argentina, allowing banks to use those bonds to meet up to 18 percent of the liquidity requirement. The banking system thus became less liquid and more exposed to a government default. Total banking system claims on the government gradually rose from less than 10 percent of total bank assets at the end of 1994 to 15 percent at the end of 2000, and then jumped to over 20 percent by the end of 2001, as shown in figure 6.<sup>28</sup> This, in turn, heightened concerns about a potential abandonment of the currency board. As options for financing the deficit through debt rapidly shrank, the specter of money printing loomed large. In the process, the fate of public finances, the banking system, and the currency became tightly linked.

The elements of the CGD trap reinforced each other in a perverse way. Continued economic contraction, increasing doubts about the sustainability of the public debt, and soaring uncertainty about the permanence of the one-peso-one-dollar rule fell into a vicious circle. This led to capitulation—including a massive run on bank deposits (figure 7). The run precipitated an economic meltdown by the end of 2001, which featured the imposition of

27. As mentioned above, prior to the April 2001 amendments to the Central Bank charter, internationally traded, dollar-denominated Argentine government bonds valued at market prices could be treated as part of the country's disposable international reserves. After the amendments, the claims on the government received by the Central Bank (through repurchase agreements or as collateral) in the context of its liquidity operations with the banking system no longer counted as part of the maximum of 33 percent of disposable international reserves. The April 2001 amendments thus authorized unlimited injection of lender of last liquidity with the backing of government paper, thereby effectively eliminating the money issuance rule of convertibility. In practice, the claims on the government that the Central Bank received as part of its lender-of-last-resort activity in 2001 did not exceed the 33 percent limit. Nevertheless, the amendment contributed to increasing doubts that the currency board would be maintained.

28. Note that this figure may underestimate public sector exposure. Other calculations yield higher levels of public claims over total assets, for example, reaching 29 percent in December 2001.

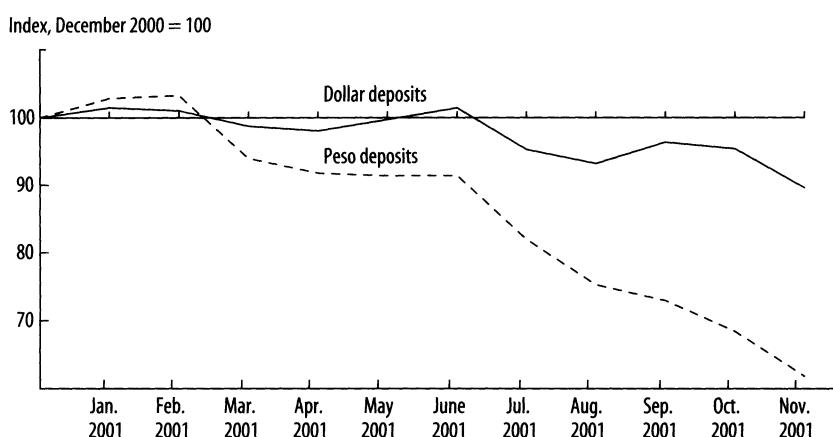
**FIGURE 6.** Financial System Exposure to the Public Sector<sup>a</sup>

Source: Central Bank of Argentina.

a. Financial system is defined to include public banks, private domestic banks, foreign banks, and nonbank financial institutions. Figures correspond to year-end values.

limits on cash withdrawals from bank accounts (*corralito*) and the consequent disruption of the payment system.<sup>29</sup>

29. The name *corralito* (literally, a small fence) was initially adopted because deposits could be used freely inside the financial system but could not leave the system. This measure should not be confused with the forcible reprogramming of time deposits that followed in January 2002, referred to locally as the *corralón* (large fence).

**FIGURE 7. Evolution of Private Deposits**

Source: Central Bank of Argentina.

The *corralito* was immediately followed by angry riots that prompted a change in presidents, a default on the government debt, the abandonment of the currency board for a float (in which an initial 40 percent devaluation immediately proved insufficient), the forcible conversion of dollar-denominated financial contracts into peso-denominated ones with different conversion rates applied to bank loans and deposits (asymmetric stock pesification), and the lengthening of their maturities.<sup>30</sup> This unprecedented destruction of property rights was later compounded by new measures such as the de-indexation of part of the pesified loans, changes in the

30. Dollar loans were forcibly converted to pesos at a one-to-one rate, while bank deposits were converted at 1.4 pesos to the dollar. Pesified loans and deposits were indexed to the consumer price index (CPI), although part of the loans were subsequently de-indexed. Also, pesified deposits (loans) were subject to an administratively imposed minimum (maximum) interest rate. The asymmetric pesification transferred part of the currency mismatch that had previously resided in the balance sheets of debtors in the nontradables sector to the balance sheets of their creditor banks, resulting in lower losses than otherwise to depositors. However, the (already bankrupt) government undertook to compensate banks for the impact of the asymmetric pesification on their net worth, through the so-called compensation bond. On impact, the asymmetric pesification left banks with a capital loss and a major open exposure to foreign exchange risk (because their foreign liabilities cannot be pesified through a domestic decree); the compensating bond would thus have to offset both problems. The amount of the compensating bond is estimated at 14.6 billion pesos. To close the open foreign exchange position, the equivalent of 13.8 billion pesos (U.S.\$9.8 billion) of that total would have to be denominated in dollars.

corporate bankruptcy code, and a series of court rulings on *amparos*, which allowed depositors to undo the deposit freeze.

### *Meltdown: Currency and Deposit Run*

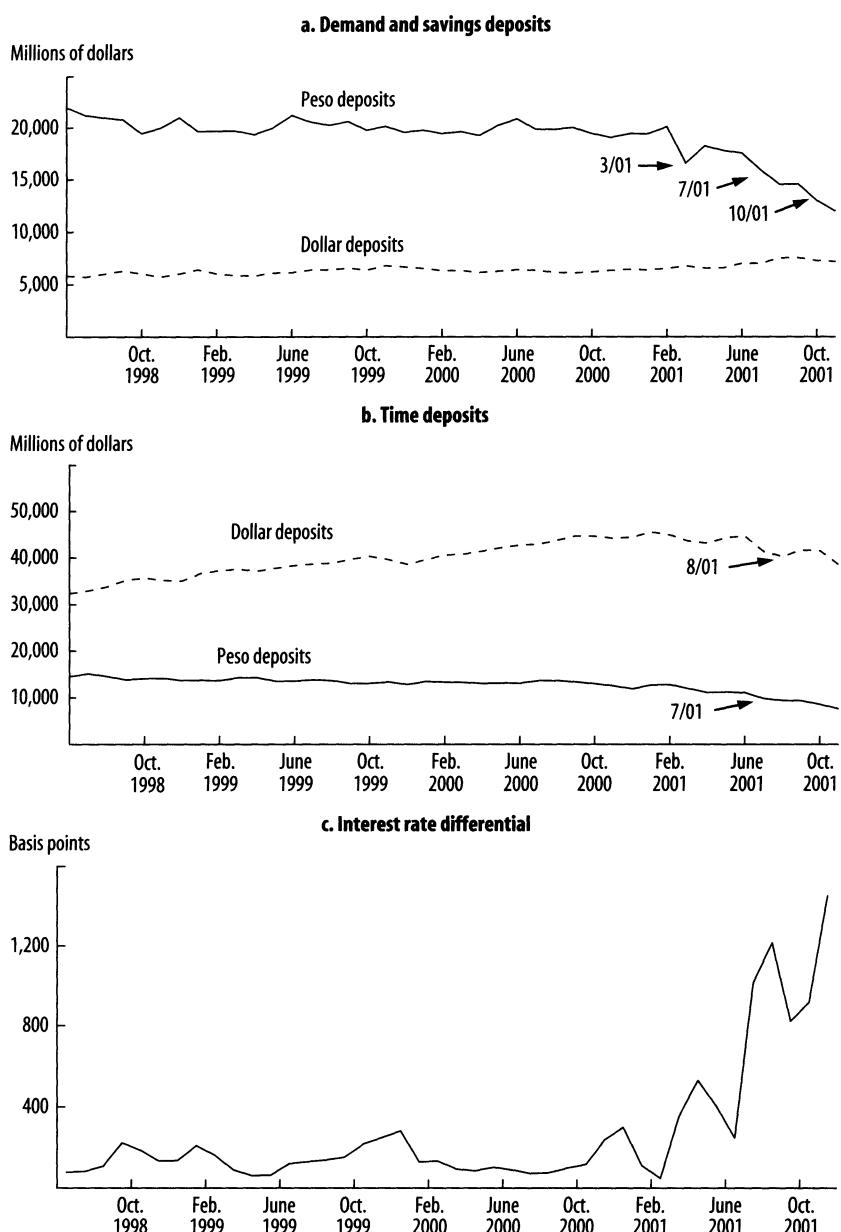
Understanding the nature of the bank run in Argentina is essential for answering key questions regarding alternative paths to exit convertibility. Could a different exit strategy have enabled the authorities to preserve—and capitalize on—the high quality of the banking system and its regulatory framework, including the large presence of foreign banks? Was the *corralito* a coarse measure aimed mainly at saving the few (mostly public) banks with significant fiscal exposures that were suffering large deposit withdrawals? If so, was the *corralito* a vehicle through which the government exported the crisis to otherwise liquid institutions, in the process leading to a currency run that made the abandonment of convertibility inevitable? Or was the *corralito* the consequence of a run on the banking system? What triggered the run—perceived currency risk, perceived country risk, or both? This last is ultimately an empirical question, to which we now turn.

To identify the factors that fueled the run, we compiled a rich bank-level dataset that distinguishes deposits by currency (peso and dollar) and deposit type (demand, savings, and time). We also use banks' balance sheet data to control for bank-specific fundamentals. We analyze the top fifty banks, which accounted for 98 percent of total private deposits in December 2000. Our empirical analysis supports the view that the rising perception of currency risk generated a run on the currency. It began with a shift from peso to dollar deposits between February 2001 and July–August 2001. This then evolved into a run on bank deposits regardless of currency of denomination or bank characteristics, probably as a result of increasing fears that a major devaluation could lead to bank failures and some form of deposit confiscation.<sup>31</sup>

Figures 7 and 8 show the evolution of deposits and the currency premium over time. With regard to demand and savings deposits, dollar deposits remained stable and even increased through the end of 2001, whereas peso deposits started to decline after February 2001. The pattern

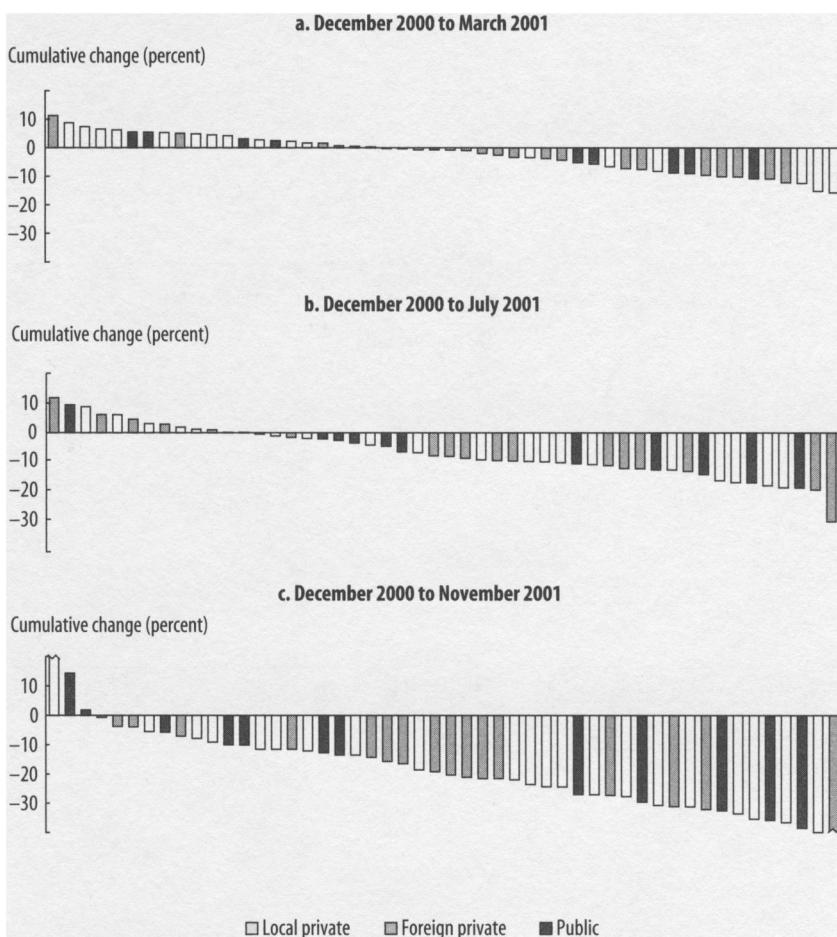
31. In this regard, the 2001 run is strikingly similar to the post-tequila crisis in terms of both the displayed symptoms and the underlying drivers.

**FIGURE 8. Evolution of Deposits and Currency Premium<sup>a</sup>**



Source: Central Bank of Argentina.

a. Deposits include private and public deposits. The interest rate differential is defined as the spread between domestic interest rates for thirty-day time deposits in pesos and U.S. dollars.

**FIGURE 9.** Change in Private Deposits for the Fifty Largest Banks<sup>a</sup>

Source: Central Bank of Argentina.

a. The bars in the graphs represent the cumulative change in private deposits sorted from the largest positive to the largest negative change. A positive (negative) bar means that the bank gains (loses) deposits during the period. The fifty banks in the sample represent 98 percent of private deposits and 96 percent of total deposits in December 2000. See table 4 for a summary of the deposit change by type of bank.

**TABLE 4.** Change in Private Deposits for the Fifty Largest Banks

Percent

Period	Average deposit change among fifty largest banks				Total deposit change in banking system
	Local private	Foreign private	Public	Total	
December 2000 to March 2001	-0.5	-4.0	-1.4	-1.9	-2.8
December 2000 to July 2001	-6.7	-6.1	-6.0	-6.3	-8.9
December 2000 to November 2001	-20.1	-18.6	-16.5	-18.8	-19.1

Source: Central Bank of Argentina.

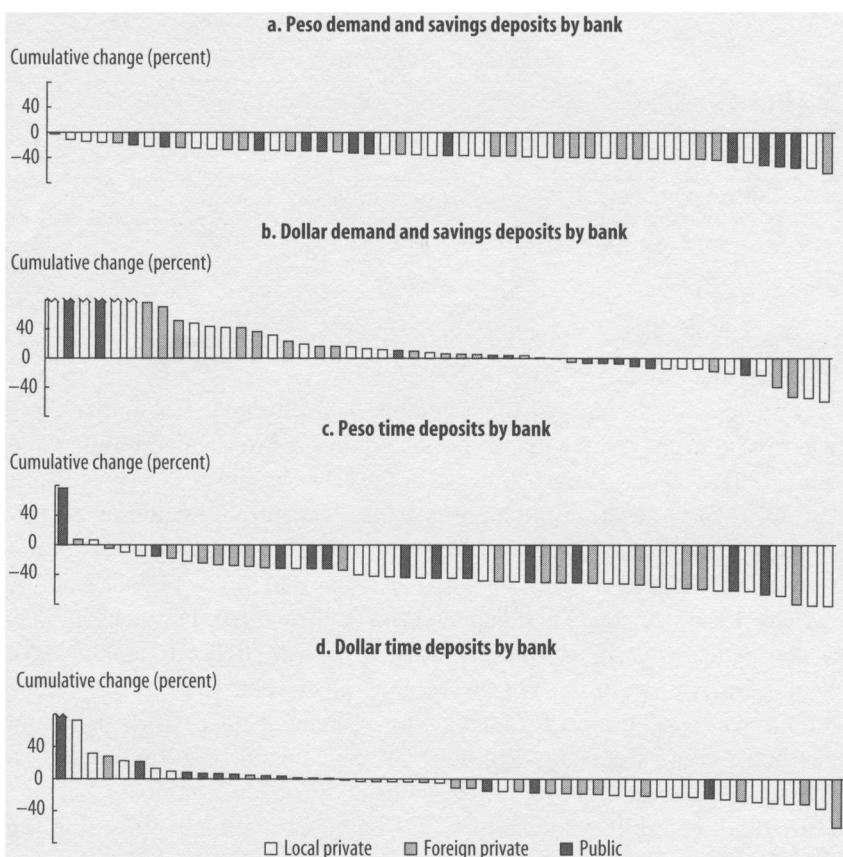
a. The fifty banks in the sample represent 98 percent of private deposits and 96 percent of total deposits in December 2000. In the last column, total deposit change in banking system includes all banks in the system.

is clearer in the case of time deposits, with dollar deposits steadily increasing until the second semester of 2001.

The deposit withdrawal of December 2000 through November 2001 was not focused on a few banks or on certain types of banks (figure 9 and table 4). It spread to almost all banks as the crisis progressed.<sup>32</sup> By November 2001, forty-seven of the top fifty banks had suffered withdrawals relative to December 2000. Local private, foreign private, and public banks were all affected by the run, with no particular ranking by type of bank. A breakdown by currency and deposit type confirms that there was no particular pattern regarding withdrawals by bank type (figure 10 and table 5). Withdrawals of peso deposits were generalized and large. The average withdrawal for the top fifty banks was 34 percent for peso demand and passbook savings deposits and about 40 percent for peso time deposits. The figures are different for dollar deposits, however. More banks gained rather than lost dollar demand and savings deposits: on average, the top fifty banks gained close to 25 percent of dollar demand and savings deposits relative to the December 2000 level. By contrast, more banks lost than gained dollar time deposits—on average, the top fifty banks lost 5 percent of their dollar time deposits, although eighteen of the fifty banks

32. Banks differed, however, in their liquidity level. Toward the end of 2001, as the deposit run intensified, the government put pressure on the most liquid private banks to recirculate their liquidity toward the relatively less liquid (mainly public) banks. This is consistent with the view that the *corralito* was an extreme (and highly inefficient) way of distributing the burden of the run between liquid and illiquid banks. It does not detract, however, from the fact that the run was systemic in nature and was not directed only to those banks with relatively weak fundamentals.

**FIGURE 10.** Change in Private Deposits for the Fifty Largest Banks by Deposit Type, December 2000 to November 2001<sup>a</sup>



Source: Central Bank of Argentina.

a. The bars in the graphs represent the cumulative change in private deposits sorted from the largest positive to the largest negative change. A positive (negative) bar means that the bank gains (loses) deposits during the period. The fifty banks in the sample represent 98 percent of private deposits and 96 percent of total deposits in December 2000. See table 5 for a summary of deposit change by type of bank and deposit.

registered an increase in their dollar time deposits. This suggests that whatever flight to quality may have taken place, it mainly involved dollar time deposits and did not favor foreign-owned over locally owned banks, as expected.

A more formal examination of the deposit run yields the same insights. We follow the methodology used by Martínez Pería and Schmukler, who

**TABLE 5. Change in Private Deposits for the Fifty Largest Banks by Deposit Type, December 2000 to November 2001<sup>a</sup>**

Percent

Deposit type	Average deposit change among fifty largest banks				Total deposit change in banking system
	Local private	Foreign private	Public	Total	
Peso demand and savings deposits	-31.5	-35.7	-36.3	-34.1	-36.0
Dollar demand and savings deposits	35.6	14.4	19.8	24.6	11.3
Peso time deposits	-45.2	-37.3	-32.7	-39.5	-37.7
Dollar time deposits	-6.5	-13.0	7.5	-5.4	-13.9

Source: Central Bank of Argentina.

a. The fifty banks in the sample represent 98 percent of private deposits and 96 percent of total deposits in December 2000. In the last column, total deposit change in banking system includes all banks in the system.

regress the change in monthly deposits on different bank-specific characteristics to gauge the importance of bank fundamentals.<sup>33</sup> If depositors distinguished between banks with different risks, bank fundamentals would appear as statistically significant in the regression. We run the same regressions for different types of deposits and for different periods, namely, a precrisis period (1997–99) and a crisis period (2000–01). Bank fundamentals are chosen based on standard measures of bank risk characteristics. Since this information is published with a delay of three months, variables are lagged accordingly. We also add bank-type dummies to test whether the crisis affected different types of banks differently.

Table 6 reports the results for the monthly change in dollar and peso deposits and for the precrisis and crisis periods. The ratio of capital to total assets and that of nonperforming to total loans are bank-specific risk features that had a statistically significant effect (with the expected sign) during the precrisis period. The other explanatory variables, including the bank-type dummies, are not significant. During the crisis period, however, almost all bank-specific risk variables become insignificant. Only cash over total assets is significant in the regression for peso deposits, while no variable is significant in the regression for dollar deposits. Table 7 shows that the proportion of the *R* squared explained by bank fundamentals decreases from 19 percent during the precrisis period to less than 4 percent during the crisis period in the case of peso deposits. A similar phenomenon affects dollar deposits, with the proportion falling from 10 to 1 percent.

33. Martínez Pería and Schmukler (2001).

TABLE 6. Response of Peso and Dollar Deposits to Bank Risk Characteristics<sup>a</sup>

Indicator	Precrisis period (1997–99)		Crisis period (2000–01)	
	Growth of peso deposits	Growth of dollar deposits	Growth of peso deposits	Growth of dollar deposits
Capital / total assets (t – 3)	0.112*	0.091	0.039	0.051
(0.068)	(0.062)	(0.053)	(0.059)	
Nonperforming loans / total loans (t – 3)	-0.104**	-0.067*	0.009	-0.023
(0.041)	(0.038)	(0.028)	(0.031)	
Mortgage loans / total loans (t – 3)	-0.009	-0.007	-0.024	-0.003
(0.032)	(0.029)	(0.027)	(0.029)	
Personal loans / total loans (t – 3)	-0.010	-0.019	-0.021	0.001
(0.027)	(0.025)	(0.021)	(0.023)	
Cash / total assets (t – 3)	-0.112	-0.136	0.167**	0.081
(0.094)	(0.086)	(0.075)	(0.083)	
Public exposure (t – 3)	-0.036	0.050	0.002	-0.053
(0.048)	(0.044)	(0.036)	(0.040)	
Dummy public bank	0.010	-0.009	-0.004	0.008
(0.014)	(0.013)	(0.011)	(0.012)	
Dummy private local bank	-0.007	-0.011	-0.007	-0.004
(0.010)	(0.009)	(0.009)	(0.010)	
<i>Summary statistic</i>				
Overall R squared	0.05	0.08	0.07	0.15
No. observations	1,469	1,469	1,144	1,144
No. banks	50	50	50	50

<sup>\*</sup> Significant at 10 percent.<sup>\*\*</sup> Significant at 5 percent.<sup>\*\*\*</sup> Significant at 1 percent.

a. The table reports regressions of growth of deposits on bank fundamentals, including time dummies. Public exposure is calculated as public bonds and loans to the public sector over total assets. Robust standard errors are in parentheses.

In other words, the importance of systemic effects (relative to bank fundamentals) rose sharply during the crisis period, suggesting that whatever influence bank-specific fundamentals had on depositors' behavior in the preceding period was dwarfed by systemic factors during the 2001 run. This pattern is displayed in figures 7 through 10 above.<sup>34</sup>

To further probe the factors behind the systemic effects, we run regressions by type of deposit, replacing the time dummies by time-varying variables. The results are reported in table 8 (bank fundamentals are included

34. This pattern is similar to those obtained for the tequila crisis in Argentina and Mexico and the debt crisis in Chile, as studied by Martínez Pería and Schmukler (2001).

**TABLE 7. Percentage of Variance Explained by Bank Risk Characteristics<sup>a</sup>**

Percent

<i>Indicator</i>	<i>Precrisis period</i> (1997–99)	<i>Crisis period</i> (2000–01)
Growth of peso deposits	19.2 (0.05)	3.6 (0.07)
Growth of dollar deposits	10.3 (0.08)	1.2 (0.15)

a. The figures indicate the percentage of the overall  $R^2$  explained by bank fundamentals, as a proportion of all the time-varying variables. They are calculated as the  $R^2$  squared of the regressions of growth of deposits on bank fundamentals over the  $R^2$  squared of the regressions of growth of deposits on both bank fundamentals and time dummies. Overall  $R^2$  squared is in parentheses.

in the regressions but omitted from the table). The top panel of table 8 displays the results for peso deposits, divided by demand and passbook savings deposits, on the one hand, and time deposits, on the other. The bottom panel shows similar estimations for dollar deposits. Regarding peso deposits, the currency risk (measured by the interest rate differential) is statistically significant for demand and savings as well as time deposits. This result is robust—it holds even when including country risk and the interaction between country risk and exposure to the public sector.<sup>35</sup> By contrast, systemic variables are not statistically significant in the regression for dollar demand and passbook savings deposits, which is not too surprising given that these deposits remained flat throughout the crisis. Regarding dollar time deposits, the currency risk is statistically significant when introduced as the only systemic factor, but it becomes nonsignificant when country risk (measured by bond spreads) is introduced. Thus, while currency risk was the dominant factor behind the generalized withdrawal of peso deposits, country risk appears to be a more precise indicator of the evolution of dollar time deposits. Overall, the result seems to support the view that the crisis originated in a currency run that affected banks across the board, regardless of their fiscal exposure or other bank-specific characteristics.

35. The fact that the latter is never significant contradicts the view that depositors run from those banks most exposed to the public sector.

**TABLE 8. Private Deposit Withdrawal by Currency and Type, December 2000 to November 2001<sup>a</sup>**

Indicator	Growth of peso demand and savings deposits		Growth of peso time deposits		Growth of dollar demand and savings deposits		Growth of dollar time deposits	
	(1)		(2)		(1)		(2)	
Currency risk	-0.006*** (0.001)	-0.012*** (0.003)	-0.011*** (0.001)	-0.011*** (0.004)	0.002 (0.003)	-0.006 (0.007)	-0.005*** (0.001)	-0.001 (0.002)
Country risk	0.003 (0.002)	0.003 (0.002)	0.000 (0.002)	0.000 (0.002)	0.004 (0.004)	0.004 (0.004)	-0.003** (0.001)	-0.002 (0.001)
Country risk*Public exposure	0.003 (0.006)	0.000 (0.008)	0.000 (0.008)	0.000 (0.014)	0.000 (0.014)	0.000 (0.014)	0.002 (0.003)	0.002 (0.003)
Summary statistic								
Overall R squared	0.03	0.03	0.05	0.05	0.00	0.01	0.05	0.05
No. observations	1,144	1,144	1,144	1,144	1,140	1,140	1,140	1,140
No. banks	50	50	50	50	50	50	50	50

\* Significant at 10%.

\*\* Significant at 5%.

\*\*\* Significant at 1%.

a. The table reports regressions of growth of deposits on bank fundamentals and country and currency risks. Although included in the regressions, bank fundamentals are not reported in the table. Figures correspond to end-of-period values. Standard errors are in parentheses.

## **Living or Dying with Hard Pegs: Lessons from Argentina**

This section reviews the salient lessons that can be drawn from the Argentine experience for hard pegs and formally dollarized systems. Three sets of lessons are worth emphasizing. The first relates to the practical limitations of a hard peg (including the extreme version of formal dollarization), particularly in the case of countries that do not meet the conditions for an optimal dollar area. The second set addresses the design of appropriate prudential norms given the hard peg (that is, accepting its premise that the exchange rate will not be modified). The third concerns an issue on which the literature on hard pegs has always been speculative: strategies for exiting a hard peg. While the Argentine case certainly does not provide a blueprint for a smooth exit, it does illustrate the costs of suboptimal strategies.

### *Limitations of Hard Pegs as Commitment Mechanisms*

As discussed earlier, one obvious benefit of a hard peg system is that it boosts financial intermediation by providing savers with an unquestionable store of value, albeit at the expense of rising financial dollarization. The drawbacks of hard pegs are discussed extensively in the economic literature, particularly for the case of countries that do not meet the conditions for an optimal currency area, like Argentina. Nonetheless, advocates of hard pegs frequently downplay the practical difficulty of establishing greater nominal flexibility in fiscal spending and wages in light of the limitations imposed by the loss of the nominal exchange rate as an adjustment mechanism, as well as the difficulty of establishing a fiscal discipline consistent with the loss of the inflation tax.<sup>36</sup> Moreover, these advocates tend to overstate the potential disciplining spillovers of hard pegs. They often advertise hard pegs as an irrevocable decision that, inasmuch as it restricts monetary financing of the budget, can help foster fiscal prudence, inducing governments eventually to learn to adjust nominal fiscal spending.<sup>37</sup>

36. Hard peg advocates recognize these needs, but they tend to simply state them as obvious conditions for the success of hard pegs, without highlighting the practical obstacles to their feasibility. For instance, Calvo (2002, p. 7) writes that hard pegs have “to be supplemented by adequate institutions and regulatory conditions. For example, it is essential that government wages and regulated prices show a high degree of flexibility.”

37. See, for example, Balíño and Enoch (1997) for a discussion of the pros and cons of currency boards.

This view is naïve and ultimately wrong, particularly in the case of hard peg economies that are open to capital flows but that do not meet the conditions for an optimal currency area, and that are therefore exposed to significant shifts in the equilibrium real exchange rate. No matter how credible, a currency board (or dollarization) *per se* does not create nominal flexibility and fiscal discipline.<sup>38</sup> The Argentine experience illustrates this well. To start with, nominal flexibility in fiscal spending is seldom verified in practice (in either emerging or industrial economies). The political realities of democratic processes severely constrain the margin for reducing nominal fiscal expenditure, especially in the context of a recession. As noted, this was a decisive factor in the evolution of the Argentine CGD trap. Nominal adjustment of the Argentine budget was achieved only to a limited extent and in the context of a protracted recession. Indeed, the reduction in public expenditure that should have accompanied the curtailment of access to external financing did not go beyond an insufficient and politically costly wage cut that was never meant to be permanent.<sup>39</sup>

The restriction on monetary financing of the deficit was not relevant in practice during the good times of convertibility because Argentina had access to voluntary debt placements in international and local markets. In effect, the procyclical nature of access to international capital markets helped create incentives against appropriate fiscal discipline in good times.<sup>40</sup> When foreign markets closed, the restriction imposed by convertibility was violated through a somewhat compulsory placing of domestic debt. When even compulsory access to local banks and other local sources of financing (like pension funds) was exhausted, the public sector resorted to issuing central government and provincial paper that differed from currency only cosmetically.

38. See, for example, Levy Yeyati (2001); for the case of Panama, see Goldfajn and Olivares (2001).

39. Public sector wages and contracts in the federal government were cut by 13 percent in the second semester of 2001, but the reduction could not be extended to provincial workers. Moreover, although the cuts were meant to adjust endogenously to meet the zero-deficit rule, further reductions were judged to be politically unfeasible and were never implemented.

40. Perry and Servén (2002) analyze cyclically adjusted measures of (federal government) fiscal stance. They show that fiscal policy thus assessed was unduly expansionary in the good years of 1996–98, and that fiscal adjustment was actually insufficient in 1999–2001, except in the few months leading up to the 1999 election.

Figure 11 depicts this process. Growing financing needs were met in the first half of the 1990s by recourse to the sale of state-owned assets and, when this source dried up, by borrowing in international capital markets. After the tequila crisis, the government relied on domestic savings, notably pension funds and local banks, which steadily increased their share until 2001. Once the funding capacity of the domestic markets was exhausted, the government resorted to the issuance of small-denomination federal bonds (*letras de cancelación de obligaciones provinciales*, or *lecop*) redeemable for federal tax payments.<sup>41</sup> Similarly, the financing needs of the province of Buenos Aires exceeded local revenues, and federal transfers were eventually met by the placement of provincial bonds in domestic markets and the launch of the province's own small denomination paper, the *patacón* (table 9).<sup>42</sup> Thus the persistent fiscal imbalance did not adjust to the budget constraint presumably imposed by the monetary regime, but in fact circumvented it, rendering the regime little more than a formal arrangement in this regard.

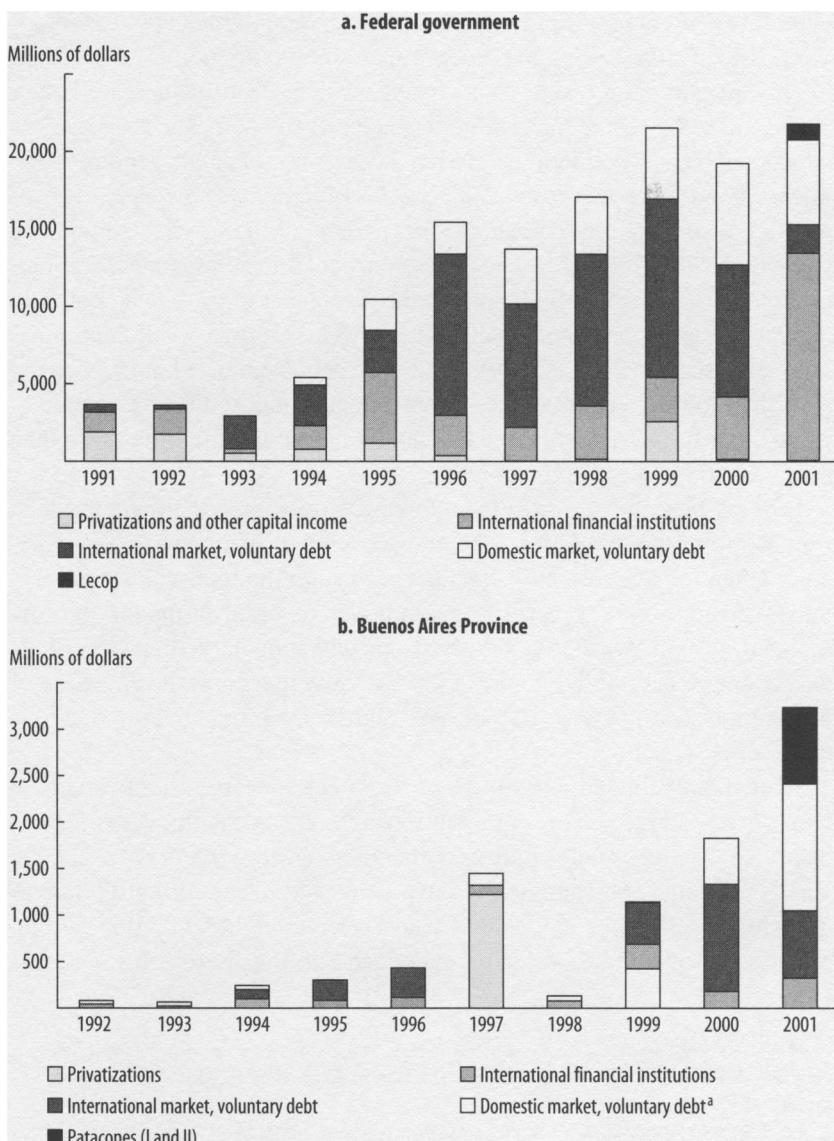
Two lessons can be drawn from this evidence. First, there are perils in trying to impose a hard budget on the government via a hard peg—especially when the government is incapable of squaring its fiscal accounts in the short run. One key peril is the spillover of fiscal problems into the financial system. On its way toward outright monetary financing of its budget, the Argentine government dramatically increased the exposure of the banking sector to fiscal default. We discuss the prudential implications of this process below.

Second, the monetary discipline of hard pegs appears easier to abandon than often believed. The ease with which the Argentine government resorted to printing money under another name (*lecos*, *patacones*, and the like) is striking. The same could have happened under formal dollarization. Dollarization *per se* would not have overcome the CGD trap as long as the fiscal imbalance was a given (at least in the short term), and this

41. The figure underestimates the monetary expansion by excluding indirect deficit financing through Central Bank lending to the Banco de la Nación, which accelerated substantially in 2001.

42. Figure 11 understates the surge of quasi-money printing. As table 9 indicates, a number of other provinces adopted similar mechanisms to finance their deficits and, as a result, the total stock of quasi-monies reached more than 2.6 billion pesos, or about 26 percent of total pesos in circulation, by the end of December 2001; it had doubled by the end of March 2002.

**FIGURE 11. Financing Sources**



Source: Central Bank of Argentina.

a. Includes bank debt and national government financing.

**TABLE 9. Quasi-Monies in Circulation**

Millions of Argentine pesos

<i>Source</i>	<i>Denomination</i>	<i>December 2001</i>	<i>March 2002</i>
a. Federal government	Lecop	1,039	2,543
b. Provincial government		1,627	2,591
Buenos Aires Province	Patacón	822	1,591
Buenos Aires City	Porteno	n.a.	n.a.
Catamarca	Ley 4748	26	31
Chaco	Quebracho	50	100
Córdoba	Lecor	200	300
Corrientes	Cecaror	193	185
Entre Ríos	Bonfe	54	148
Formosa	Bocanfor	33	50
Jujuy	Patacón	n.a.	6
Mendoza	Petróm	n.a.	n.a.
La Rioja	Bono de Cancelación	8	8
Tucumán	Bocade	98	173
Total quasi-monies (a + b)		2,666	5,134
Total quasi-monies (as percentage of pesos in circulation)		26.2	37.5

Source: Economy Ministry of Argentina.

n.a. Not available.

imbalance was not easily reversible by a reduction in nominal public expenditure. Dollarization, too, would have likely been accompanied by a proliferation of local quasi-monies, reflecting the simple fact that a fiscal deficit cannot be eliminated merely by a monetary arrangement. Quasi-monies are more than a problem in themselves; they are a symptom of a deep inconsistency between a strict monetary framework and the nominal rigidities that this framework cannot magically eliminate.

### *Prudential Lessons*

The financial system was not a cause of the Argentine crisis, but rather its victim. The evidence clearly indicates that under convertibility, Argentina was able to build a strong and well-supervised banking system—a model to be emulated by other emerging markets. Moreover, Argentine authorities displayed considerable innovative capacity in developing prudential norms suitable to a hard peg system, particularly in terms of liquidity buffers (see appendix A).

Nonetheless, the Argentine experience reveals some prudential shortcomings and thus suggests directions for tailoring prudential policy to

better deal with risks that are specific not just to hard peg regimes, but also more broadly to financial systems that are *de facto* highly dollarized. Three weaknesses in the otherwise sound Argentine regulatory framework can be identified by taking as given the rules of the convertibility game—that is, by assuming the permanency of the one-peso-one-dollar rule. They have to do with the insufficient realization that general liquidity buffers do not fully protect the payments system from a run; the exposure of the banking system to government default; and the link between debtor capacity to pay and the deflationary adjustment to a more depreciated equilibrium real exchange rate.

High liquidity requirements, such as those in effect in Argentina during the second half of the 1990s, enhance the resiliency of the banking system: they cushion the system vis-à-vis liquidity shocks and deter runs, thereby reducing the scope for multiple equilibria. Thanks to its liquidity requirements, the Argentine banking system withstood a prolonged and severe process of deposit withdrawal during the tequila crisis and also in 2001. At the same time, however, the Argentine experience suggests that once a run is under way, relaxing liquid reserve requirements can have adverse signaling effects that exacerbate the attack on the peso (instead of spurring credit growth as Cavallo hoped) and further weaken confidence.<sup>43</sup> Moreover, as confidence collapses, a general liquidity requirement (available to all deposits on a first-come-first-served basis) fails to protect the payment system, because liquidity is rapidly consumed by the flight of time deposits.

The lesson is sobering. In the absence of an effective and credible lender of last resort, the payment system is vulnerable and can collapse under a run, even when liquidity is high but still a fraction of deposits available to pay any deposit withdrawal.<sup>44</sup> Under a currency board or dollarization, protecting the payment system from bank runs might actually require prudential norms that give some form of priority of claim over

43. During the tequila crisis in the mid-1990s, the Argentine authorities reduced liquidity requirements to help the banking system confront the deposit withdrawals, and this regulatory action did not seem to have exacerbated such withdrawals. The deleterious effect of the relaxation of liquidity requirements during the 2001 run probably arose because it contributed to the already high uncertainty about the authorities' commitment to the currency board. Many analysts cautioned about the potential negative effects of using prudential policy as a countercyclical instrument in 2001. In effect, this issue was a major cause of dispute between the Central Bank and the Ministry of Economy.

44. See Chang and Velasco (2000) for an argument along these lines.

available liquidity to transactional deposits, that is, to deposits that are germane to the functioning of the payment system. This does not necessarily require a narrow bank structure. It could also be achieved, for instance, by an *ex ante* rule that earmarks available liquidity to demand deposits under specified conditions. While implementing this concept would not be easy, the prudential principle on which it is based warrants serious consideration. The objective of such prudential innovation would be to preserve the functioning of the payment system even in the extreme scenario in which banks are unable to honor withdrawals of time deposits.<sup>45</sup>

The second prudential weakness has to do with credit risk. It arises from the Argentine failure to sufficiently isolate the solvency of the banking system from the solvency of the government. As discussed earlier, no matter how credible, a currency board (or dollarization) *per se* does not create fiscal discipline. To the extent that banks hold significant claims on the domestic government, a fiscal and public debt crisis would immediately affect banking system solvency. However, one silver lining of convertibility (or dollarization) is that, in principle, it makes it possible to protect banking intermediation from the vagaries of the fiscal process, including an event of government debt default, as long as banks are not significantly exposed to domestic government risk. The reason is that the store of value that underpins financial intermediation in a currency board (or dollarized) country is ultimately the dollar, whose quality does not depend directly on the solvency of the domestic government.<sup>46</sup> This feature should have been harnessed through prudential norms in Argentina, especially considering the country's recurrent fiscal problems. As described in appendix A, the authorities moved in this direction belatedly, in 2000, when they introduced mark-to-market requirements for government bond holdings and established a positive weight for loans to the government for the purposes of determining regulatory capital requirements. This approach should

45. Developments during the recent crisis in financially dollarized Uruguay are an *ex post* rendition of this concept. In effect, as the run intensified, the Uruguayan authorities decided to concentrate Central Bank reserves (which were bolstered by an IMF-led emergency package) on fully backing demand deposits in troubled banks. Time deposits of troubled banks were, by contrast, restructured by decree. The same could be achieved in a more orderly manner by imposing *ex ante* a stop-loss clause on the use of bank liquid reserves, forcing automatic restructuring of time deposits once the decline reaches a certain threshold.

46. In contrast, this condition cannot be obtained where the store of value is the domestic currency.

have been taken more aggressively and much earlier in the decade, and it should have been complemented by limiting individual banks' exposure to the public sector and restricting the amount of government debt that could count as part of the assets eligible for meeting bank liquidity requirements.

The third weakness has to do, again, with credit risk—the latent non-performing loans in the context of a misalignment of the real exchange rate relative to a more depreciated equilibrium level. Convertibility (or formal dollarization), as Roubini correctly stresses, does not immunize a country from the balance sheet effects of a real exchange rate adjustment.<sup>47</sup> In particular, real exchange rate overvaluation is corrected slowly under convertibility (or dollarization) through painful deflation and unemployment (particularly if rigidities in the labor market are significant), which certainly erodes the capacity to pay of debtors whose earnings come from the nontradables sector.<sup>48</sup> Under a hard peg or a de facto highly dollarized financial system that breeds a systematic and severe fear of floating, the erosion of the capacity to pay of debtors in the nontradables sector occurs regardless of whether the loans in question are denominated in dollars or pesos.

The lesson here has much less to do with the Argentine failure to single out the currency of loan denomination in the design of its prudential norms, than with the failure to explicitly recognize the special credit risk of loans to debtors in the nontradables sector—a credit risk that would materialize in the event of significant adverse shocks that led to a deflationary adjustment of the real exchange rate. This risk arises from the simple fact that debtors in the nontradables sector cannot denominate their debts in terms of nontradables or hedge when contracting debts in terms of tradables. The implication is that the authorities in fixed exchange rate economies would be well advised to establish relatively tougher loan classification criteria, higher loan-loss provisioning rules, and possibly also a

47. Roubini (2001).

48. Deflationary adjustment in a currency-board (or dollarized) country lowers the value of nontradables income in terms of tradables, which implies that the burden of the debt rises (capacity to pay falls) for the nontradables sector. By contrast, in a country with a flexible exchange rate (that is, where a fixed parity is not part of the social contract) and without a substantial problem of dollar debts in the nontradables sector, the adjustment to a more depreciated equilibrium real exchange rate would come through nominal depreciation, which would be associated with an improvement (via debt dilution) in the capacity to pay of debtors in the nontradables sector.

higher weight for the purposes of measuring capital requirements for loans to the nontradables sector in either currency.<sup>49</sup> In addition, the authorities could promote the development of a market for financial contracts indexed to the price of nontradables.

This analysis can be extended once the assumption of a permanent peg is relaxed. While the first two lessons are fairly general to any monetary arrangement, a distinction must be made in the third lesson for the case of financially dollarized economies in which changes in the nominal exchange rate have nonzero probability. While the currency of denomination is irrelevant if the peg is preserved, it is crucial in the event of a nominal depreciation of the local currency. In financially dollarized economies under flexible regimes, the considerations discussed in the previous paragraph apply only to dollar loans to nontradables income producers. The presence of a not fully credible peg in a financially dollarized environment adds an obvious complication. Conditional on the survival of the peg, nontradables debtors are exposed to real exchange rate risk regardless of whether they borrow in pesos or in dollars. Their exposure is more dramatic if the peg is abandoned, however, but only if they borrow in dollars. Some degree of currency discrimination in prudential norms may thus be warranted in countries committed to a hard peg, although these considerations should be weighed against a signaling effect that may weaken the credibility of the peg.

### *Exit Strategies*

This section focuses on counterfactual analysis to examine what would have happened if Argentina had adopted different policies in the months before the crisis erupted. Were superior exit strategies open to Argentina for escaping the CGD trap? By nature, this type of analysis is very difficult

49. Given that information asymmetry problems in buoyant times lead to rising bank exposure to the nontradables sector without adequate internalization of risks, a system of countercyclical loan-loss provisioning requirements, like the one established at the end of 1999 by the Bank of Spain (Circular 9/1999 of 17 December 1999), could help address risks in loans to the nontradables sector. This is because lending booms are mainly to the nontradables sector, and thus the loan decay after the boom affects primarily loans to nontradables producers. The Spanish system requires a buildup of countercyclical provisions in good times (thereby curbing excessive dividend distributions), which are shifted into specific provisions in bad times (without passing through the income statement) as the loan portfolio decays.

to support with real data. Nevertheless, a serious consideration of the different arguments presented here may help to draw relevant policy lessons for the future, particularly for countries with weak national currencies and highly dollarized financial systems.

Four alternative courses of action can be identified in relation to the Argentine case, particularly for the period after the January 1999 devaluation of the Brazilian real. Analysts who emphasize the real exchange rate overvaluation as the source of the sluggish growth recommend floating the currency, despite its adverse balance sheet effects.<sup>50</sup> Those who are concerned about the balance sheet implications of a float but who are also worried about the real exchange rate overvaluation recommend stock-pesification-cum-float, that is, the forcible conversion of dollar-denominated domestic contracts into peso-denominated contracts indexed to the consumer price index (CPI), followed by the abandonment of the peg.<sup>51</sup> Those who disbelieve the existence of a demand for a floating peso recommend *de jure* dollarization.<sup>52</sup> Finally, we submit a fourth alternative: early dollarization of existing financial contracts (stock dollarization) complemented by the introduction of a new national currency (pesification at the margin) to function as a means of payments.

The main lessons from the counterfactual analysis are as follows. Floating could have corrected the overvaluation problem, but it would have destroyed the convertibility contract and would have had a massive and immediate adverse impact on debtor and banking system solvency by fueling the currency run of peso depositors. Formal dollarization at a 1:1 rate would have respected the structure of property rights and would have had a better chance of preventing the run on deposits, but it would have done nothing to attenuate the protracted and contractionary real exchange rate adjustment.<sup>53</sup> Stock-pesification-cum-float was probably the most disorderly exit alternative—and it was the one taken. While in principle it should have limited the immediate impact on balance sheets of the

50. See, for instance, Roubini (2001); Paul Krugman, "Notes on Depreciation, the Yen, and the Argentino," *New York Times*, 28 December 2001 ([www.wws.princeton.edu/~pkrugman/argentino](http://www.wws.princeton.edu/~pkrugman/argentino)).

51. In particular, Ricardo Hausmann, "A Way Out for Argentina: The Currency Board Cannot Survive Much Longer," *Financial Times*, 30 October 2001.

52. For instance, Dornbusch (2001); Calvo (2002).

53. If done at a much more depreciated rate, formal dollarization would have had similar (immediate) adverse effects on debtor and banking system solvency as the previous alternative.

unavoidable real exchange rate adjustment by shifting the losses to depositors, its destructive effect on property rights and institutions will probably have long-lasting costs in terms of financial disintermediation. Moreover, by creating a huge peso overhang in the context of a currency run, it fueled the deposit flight and the unprecedented exchange rate overshooting that followed. For the same reasons, stock dollarization complemented by pesification at the margin could have averted the run. It would not have spared debtors in the nontradables sector from the adverse balance sheet effects of the devaluation, but by providing a margin for nominal flexibility, it could have facilitated the real exchange rate adjustment without unduly disfiguring property rights.

**FLOAT.** Floating the peso would have immediately addressed the currency component of the CGD trap. It has several associated costs, however: a run on the currency, as peso depositors moved to protect the real value of their savings, adding to the exchange rate overshooting; a sharp and immediate deterioration of the payment capacity of private and public sector debtors in the nontradables sector, compounded by the overshooting to be expected from the currency run; and a run on bank deposits, as agents anticipated that banks would become insolvent immediately after the float. Moreover, a disorderly float in the context of widespread dollar debts among nondollar earners would have probably led to a long period of continued real exchange rate depreciation, as Ecuador's experience suggests.<sup>54</sup>

While the second cost was inevitable in the context of a real exchange rate adjustment, and may have prompted government action to compensate bank losses and minimize depositors' misgivings about bank solvency, the currency run induced by the floating of the peso was the main drawback of the "just float" exit strategy. The resulting exchange rate overshooting would have not only accelerated the real exchange rate adjustment, but also exacerbated its balance sheet effects. Even if depositors were allowed to dollarize their savings within the banking system (as Cavallo encouraged by the end of 2001, once the run was under way), existing limits on foreign exchange open positions would have forced

54. Ecuador's 1999 crisis illustrates the dire consequences of floating in the context of a weak fiscal position and widespread currency mismatches (dollar debts of nondollar earners). The crisis deepened dramatically as nominal devaluation and debtor insolvency were caught in a feedback loop, leading to an excruciatingly long period of a collapsing real exchange rate. See de la Torre, García-Saltos, and Mascaró (2002).

banks to drastically reduce dollar deposit rates vis-à-vis peso deposit rates to balance their positions, which could have resulted in a dollar deposit flight. At any rate, it is not obvious whether an early move to a float would have triggered a run to the dollar bill. Once under way, however, such a run would only have ended once deposits became dollarized, an outcome that could have been achieved in a more orderly fashion through a pre-emptive de jure dollarization of all financial contracts, as explained below.

From a political economy perspective, a substantive devaluation would have coordinated the actions of debtors (even those in the tradables sector who preserved their capacity to pay) and would likely have triggered enormous pressure on the government to provide exchange rate insurance or some kind of compensation to private debtors, increasing either the fiscal cost of the bailout or the level of nonperforming loans, or both.<sup>55</sup>

Such likely consequences made the “just float” alternative highly unlikely politically, particularly in 1999 when the imminence and size of the crisis were still unsuspected. From a practical point of view, however, and as the margin for avoiding a full-blown crisis narrowed, many analysts came to believe that in the event of a float, something drastic would have to be done to avoid its deleterious impact on balance sheets.

**STOCK-PESIFICATION-CUM-FLOAT.** Because of widespread balance sheet mismatches (dollar debts among nondollar earners), an increasing number of analysts believed that exiting convertibility by floating required the prior pesification of existing domestic financial contracts by decree. As the argument goes, without prior stock pesification, a significant and discrete devaluation would have immediately wrecked debtors in the non-tradables sector and, hence, the banking system. A way to deal with the adverse real and financial impact of a devaluation would have been a massive public bailout (of banks and firms), but this possibility was out of the question by mid-2001 for a government on the verge of default. By contrast, stock-pesification-cum-float promised a way to address the currency component of the CGD trap that presumably avoided the adverse balance sheet effect on debtors by transferring the burden of the expected bailout directly to private creditors.<sup>56</sup> It was the alternative chosen by the Argentine government under pressure at the beginning of 2002.

55. As nonperforming loans mounted, the perception of a bankrupt financial sector could have reignited the run on bank deposits.

56. Not surprisingly, this option appeared late in the crisis process and was originally presented in the context of the debt restructuring debate, with an emphasis on the compulsory

The forcible pesification of domestic financial contracts only created a mass of previously dollarized depositors who could not wait to redollarize their savings before the expected real exchange rate adjustment drastically reduced their dollar value. Even after abstracting from the social discontent that such a massive confiscation unsurprisingly stirred, one could not ignore the fact that pesification could only exacerbate the ongoing currency run, fueling the overshooting of the nominal exchange rate and turning a potential solvency problem into an immediate liquidity problem.<sup>57</sup> Stock pesification was a desperate attempt to escape what Eichengreen and Hausmann call the original sin, but it gave way to a graver sin—the murder of money as a store of value.<sup>58</sup> Pesified Argentina now awaits a sort of miracle, that is, the resurrection of the peso as a store of value and, with it, the regeneration of peso financial intermediation.

Was stock-pesification-cum-float a feasible alternative in earlier, more tranquil times? We have serious doubts that it would have been any less destructive than it actually was. Since forcible stock-pesification-cum-float necessarily implied a departure from the one-peso-one-dollar rule, no government had an incentive to implement such a departure in tranquil times. Forcible pesification-cum-float was therefore a feasible alternative only in turbulent times.<sup>59</sup> In addition, the massive violation of property rights implied in stock pesification (and the massive transfer of wealth involved) meant that any anticipation of it would have triggered a run. Hence, stock-pesification-cum-float would have required the simultaneous

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conversion of sovereign debt. At the time of this writing, the Supreme Court was considering a ruling stipulating the redollarization of deposits. Since the redollarization of debts appeared politically unlikely, it was widely believed that such an action by the Supreme Court would induce the government to assume the banks' balance sheet losses. Under that scenario, the pesification adventure would go full circle to become a blanket exchange rate guarantee to be financed by taxpayers in years to come—a massive bailout that stock pesification was intended to avoid.

57. The social discontent had nonnegligible political economy consequences, as witnessed by the subsequent reluctance of the judicial system to validate the pesification and the decision of the government to allow the redollarization of reprogrammed deposits through their swap for dollar-denominated government bonds.

58. As defined by Eichengreen and Hausmann (1999), the original sin refers to the condition of a country that is unable to issue peso debt in international markets, which tragically traps the country between currency mismatches (it can only issue long-term debt in dollars) and maturity mismatches (local markets only accept short-duration peso debt).

59. Indeed, it was an alternative that almost by necessity had to be implemented in the context of a change in government.

establishment of a deposit freeze or securitization and widespread capital controls to keep depositors and investors from fleeing.

In sum, stock-pesification-cum-float arguably could not have been feasibly implemented in tranquil times or without a change of government; would have provoked a run in any case, requiring a deposit freeze of some form; and was deleterious for financial intermediation. All these factors lead us to believe that stock pesification was the least desirable alternative.

**FORMAL DOLLARIZATION.** Formal dollarization would have been consistent with the Argentine social contract based on the long-term commitment to the one-peso-one-dollar rule. It would have boosted depositor confidence not just because the perceived risk of deposit confiscation would have been dimmed significantly, but also because the option value of foreign banks' access to their parent's capital and liquidity would have been better protected. Even if a run had occurred, foreign banks would probably have been more willing to stand behind their Argentine affiliates, relative to the current situation marked by confiscatory (and asymmetric) stock pesification.

Dollarization, though clearly not easy politically, would not necessarily have entailed a change of government. It arguably was within the scope of the government in power, inasmuch as it respected the one-peso-one-dollar rule. In this sense, there is an asymmetry in the political economy of dollarization versus stock pesification. It is generally less costly politically for governments in developing countries to maintain an exchange rate parity than to break it. This argument is strong in the case of Argentina, given the crucial relevance of the currency board to the operation of the financial system.

The dollarization alternative would have been more likely to avert a run if adopted early in the game—that is, before 2001. The Argentine government considered this option in 1999–2000, but it lost ground thereafter partly owing to political polarization: it was construed as a symbol of support for former president Carlos Menem. By contrast, the stock-pesification-cum-float proposal gained ground against a background of continued recession and increasing real exchange rate overvaluation.<sup>60</sup>

60. It in fact became somewhat popular in academic and policy circles after Hausmann publicly recommended it to Argentina in the October 2001 Latin American and the Caribbean Economic Association Meetings in Montevideo (see Ricardo Hausmann, “A

The feasibility and potentially salutary effects on depositor confidence of dollarization clearly narrowed in 2001, but they did not disappear. A run became more likely once the government raided the liquidity of the financial system and was clearly headed toward default in the context of no access to capital markets.<sup>61</sup>

Could formal dollarization still have averted the run if adopted belatedly in 2001? Any answer to this question is, of course, highly speculative, but we are inclined to answer with a cautious yes. While deposit withdrawals in 2001 were probably motivated by heterogeneous expectations, much of the depositor activity appears to have reflected fears of a nominal devaluation, as discussed above. The possibility of no run under dollarization, even in the face of a default on government debt, appears reasonable in light of Ecuador's experience (see figure 12). In Ecuador, formal dollarization was implemented in March 2000, but the sole announcement of dollarization in January 2000 had an immediate positive impact on deposits, even though the Ecuadorian government was in open default (the debt restructuring agreement was signed several months after the dollarization announcement), most banks were highly exposed to the government, and it was no secret that many of the large banks were completely insolvent. There is no obvious reason to believe that developments would have been different in Argentina, particularly considering that the Argentine banking system was unquestionably in much better shape than Ecuador's. Moreover, Argentina could have reinforced the stabilizing effects of dollarization on depositor behavior by relaxing the link between banking system solvency and fiscal solvency.<sup>62</sup>

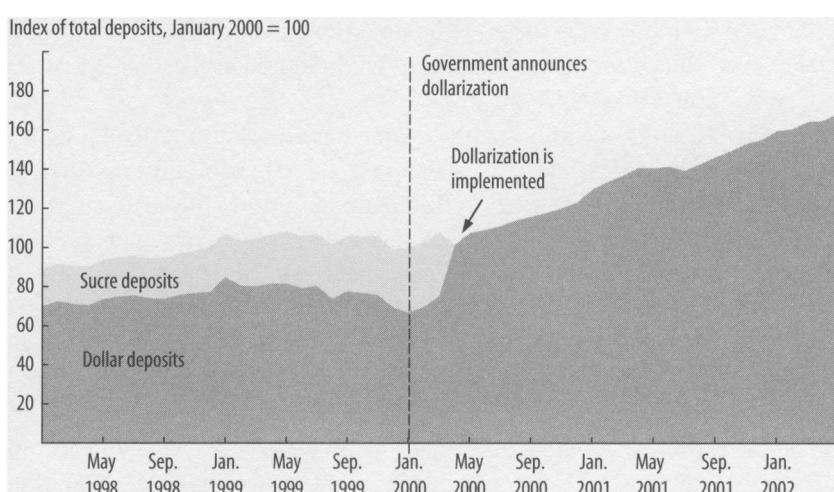
With regard to increasing the chances for averting a run, preserving healthy links between money and banking, and preventing a disorderly real exchange rate adjustment, the dollarization of financial contracts would have been less traumatic than the strategy pursued. Though painful, it would have allowed the banking system to gradually absorb the losses

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Way Out for Argentina: The Currency Board Cannot Survive Much Longer," *Financial Times*, 30 October 2001). This proposal failed to anticipate that it would inevitably lead to a deposit freeze. The proposal also seriously underestimated the difficulty of establishing the peso as a store of value in order to regenerate financial intermediation going forward.

61. The failure to secure debt rollover in July 2001 was probably the threshold.

62. The decree passed in 2001 (Presidential Decree 1005), to allow the use of the amount of the government debt falling due to pay taxes, would have helped in this regard.

**FIGURE 12.** Ecuador: Bank Deposits and Dollarization<sup>a</sup>

Source: Central Bank of Ecuador.

a. Dollarization was announced by President Mahuad in January 2000, but it legally entered into effect only in March 2000, after President Mahuad had been replaced by President Gustavo Noboa. Sucre deposits are scaled by the conversion rate at which dollarization took place (25,000 sucre per dollar).

associated with rising nonperforming loans as the real exchange rate adjusted toward equilibrium through deflation.<sup>63</sup>

A formal move to full dollarization (of financial contracts and money in circulation), however, would clearly have been inadequate for mitigating the fundamental inconsistency between the peg to the dollar and Argentina's trade and productive structure. Moreover, it would not have addressed the problem posed by severe practical limits to nominal flexibility in fiscal spending in a recessionary context. The main function of dollarization would initially have been to stabilize the financial system and perhaps stem the run, but the premium of introducing some nominal flexibility would have risen over time. As a result, dollarization would have appeared as merely a step toward building a viable paradigm that com-

63. As the recent Uruguayan experience illustrates, a securitization of liabilities can be designed selectively (distinguishing across banks and, within them, between deposit and nondeposit claims), without changing the original currency of denomination of bank assets and liabilities.

bines the dollar as the store of value with substantive nominal flexibility (particularly in wages and fiscal spending).<sup>64</sup>

**STOCK DOLLARIZATION WITH PESIFICATION AT THE MARGIN.** The above discussion suggests that dollarization would have been a better exit strategy only if it were followed by greater nominal flexibility. Indeed, full dollarization would have eliminated two sources of flexibility available at the time: the peso-denomination of most prices and nonfinancial contracts, and the transactional demand for the local currency. In this section, we argue that the stabilizing benefits of stock dollarization could have been reaped while preserving these two sources of flexibility through pesification at the margin—that is, the introduction of a new domestic currency, initially circumscribed (either by design or spontaneously) to transaction purposes. This was already occurring in Argentina, albeit in a disorderly manner, through the issuance of quasi-monies.

The simplest version of this alternative strategy would have been to dollarize the stock of existing financial contracts by decree (without redeeming the pesos in circulation with dollars), in order to stem the run and stabilize financial conditions, and then to consolidate the peso and quasi-monies (such as the *lecop*s and *patacones*) in circulation into a single (new) national currency. That national currency would have floated against the dollar and would have been voluntarily used for future flows (payments, wages and prices, and new financial contracts). It would have had legal tender privileges under the control of the Central Bank. This process would have provided a much less disruptive way out of the rigid constraint imposed by the one-to-one rule, without unduly violating existing contracts. By offering the government a way to escape nominal fiscal rigidities in the face of a drying up in financing, the consolidation of the peso and quasi-monies in circulation into a single currency would have turned the disorderly situation of quasi-monies into an opportunity for recomposing a degree of sustainable flexibility (to adjust the budget as well as real wages) in a financially dollarized economy.

In Argentina, not only did the recourse to printing quasi-monies relax the cash flow constraints faced by the public sector, but it also worked as an adjustment mechanism for the private sector, which rapidly embraced

64. This paradigm corresponds to what we elsewhere call the dollar trinity. A key element of this trinity is sound institutions, which we believe are a key precondition irrespective of the exchange rate arrangement in place. See de la Torre, Levy Yeyati, and Schmukler (2002).

the new “bills” as an instrument for reducing labor costs and thus for circumventing labor market rigidities. However, most of these quasi-monies were accepted for tax payments at face value. This, coupled with the convertibility of the peso in which they were denominated, limited the nominal flexibility that could be achieved through its use to a secondary market discount that never exceeded 10 percent.<sup>65</sup>

The introduction of a new currency may find political support only once a crisis is well under way. Even at that stage, the process of pesification at the margin in a currency board or dollarized country is likely to start with the spontaneous printing of quasi-monies. Once a quasi-money has emerged spontaneously, however, the authorities could nurture it as part of their crisis management and resolution strategy and eventually formalize it as a new currency. At any rate, while the precise manner in which pesification at the margin could have been instrumented is a legitimate issue for debate, the basic process is somewhat of a moot point, given that the emergence of local currencies somehow has to be resolved eventually.<sup>66</sup>

The logic of pesification at the margin, grounded theoretically and empirically in the distinction between currency and asset substitution, is reinforced by the post-devaluation experience in Argentina. The legal and political obstacles that hampered the government’s strategy of stock pesification exemplify the difficulty of establishing the peso as a store of value. By contrast, the transactional demand for the domestic currency (both for the old peso and the quasi-monies) remained relatively stable even through the depths of the crisis, as the worst devaluation expectations materialized (figure 13).<sup>67</sup> This evidence suggests that stock dollarization with pesification at the margin was a feasible option for Argentina.

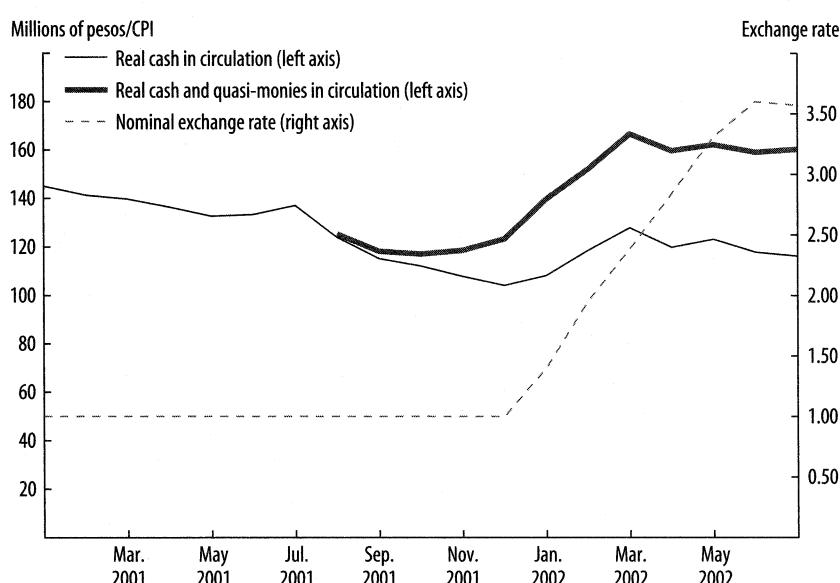
Arguably, reluctant acceptance of the new local currency could have fueled a sharp depreciation that would have defeated the objective of achieving a gradual and less traumatic real exchange rate adjustment,

65. The discount was due more to a liquidity premium than to perceived credit risk.

66. We deliberately abstract from the problem of an unfair wealth transfer between different issuers once currencies are monetized by a central bank. Conceivably, such transfers could be undone either within the monetization scheme or directly through countervailing budgetary transfers.

67. As noted above, the degree of dollarization of deposits in Argentina has historically been inversely related to their transactional nature (figure 4). The flip side of this is the low level of dollarization of bank overdrafts (figure 3).

**FIGURE 13.** Real Cash and Quasi-Monies in Circulation<sup>a</sup>



Source: Central Bank of Argentina; IMF, *International Financial Statistics*.

a. Quasi-monies include only patacones and lecops. Cash and quasi-monies in circulation are scaled by the CPI. Figures are monthly averages.

prompting foreign exchange intervention by the Central Bank and undesired nominal uncertainty. Whether dollarization should have been extended preemptively to the purchase of pesos in circulation or be limited to financial contracts only is ultimately a matter for debate, with the answer depending on the estimated demand for the new local currency.

In any event, the new currency would have initially been part of a bi-monetary system in which the peso would have been used, as before, for transactions and as the unit of denomination for most wages and prices, while the dollar would have retained its role as a store of value for financial savings. The new currency would have realistically been externally nonconvertible, fluctuating against the dollar. Moreover, in addition to its legal tender status, it could have been granted exclusivity for tax payment purposes, so as to consolidate its transactional demand.

Pesification at the margin is certainly not a panacea, but it would have allowed a marginal degree of nominal flexibility for a dollarized financial

system—flexibility to adjust fiscal spending to income and, to the extent that the indexation of wages and prices to the dollar was incomplete, to help correct misalignments in the real exchange rate. While the adverse balance sheet effects of real exchange rate adjustment on debtors in the nontradables sector were inevitable, pesification at the margin would have mitigated the need for a long recessionary and deflationary adjustment of the real exchange rate, could have prevented the collapse of the banking sector, and would have avoided the long-lasting effects of the massive violation of the rule of law as a consequence of a forcible stock pesification. Ultimately, the sustainability of pesification at the margin would have crucially depended on the recombination of strong, viable fiscal institutions, financial reforms designed to address the risks of dollar loans to the nontradables sector, and the strengthening of the local currency through an independent monetary policy credibly focused on price stability.

### **Final Remarks**

Although the economy is now devastated by the crisis, the main challenge for Argentina currently is no different in nature from that faced at the beginning of convertibility: to build a strong and sustainable link between money and financial intermediation, given the initial condition of a weak currency.<sup>68</sup> Formulating the basic challenge in this way shifts the debate on floating versus hard peg exchange rate systems to the terrain of financial intermediation and financial globalization. Once in this terrain, it is easy to see that a one-dimensional focus on the fix-float dilemma is insufficient. In effect, it is not enough to have a national currency that floats (freely or dirtily, it does not matter) and thus helps the real exchange rate adjust to shocks if, at the same time, financial intermediation in that currency is nonexistent or shallow and dominated by contracts of extremely short duration. Similarly, a hard peg (including formal dollarization) combined with dollarized financial markets that are correspondingly deeper and characterized by longer-term contracts could be extremely hazardous in the absence of adequate nominal flexibility.

68. De la Torre, Levy Yeyati, and Schmukler (2002) define a weak currency as one not accepted as a reliable store of value by either residents or nonresidents, a concept that relates to Eichengreen and Hausmann's (1999) original sin, as well as to the widespread financial dollarization observed in numerous developing countries.

In the heyday of the currency board, Argentina was able to develop a relatively deep and, by most standard measures, sound banking system. However, its inability to generate a minimum degree of nominal flexibility to deal with shocks that result in a major depreciation of the equilibrium real exchange rate proved devastating. After the collapse of the currency board, Argentina regained a currency that floats and thus facilitates rapid adjustment in the real exchange rate, but financial intermediation has been all but wiped out. Argentina, which previously had financial intermediation without a flexible currency, now has flexibility without financial intermediation. The central challenge for Argentina, therefore, is how to reconstruct sustainable links between money and financial intermediation. This same challenge haunts many countries with a weak currency, regardless of their ostensible exchange rate arrangements.

What is specific to Argentina is the daunting difficulty it will face in tackling that challenge. During the fifty years that preceded convertibility, Argentine citizens were subject to a history of intermittent debasement of the national currency. Convertibility soothed those nightmares with a heavy legal armor designed to make people believe that the ultimate store of value for their savings was the dollar—a hard currency that national mischief could not debase. When the currency board imploded via the forcible pesification of financial contracts, it debased something even more fundamental than a national currency, namely, the contractual environment itself.

If major price instability is avoided, pesified Argentina should be able to maintain and enhance the function of the peso as a means of payment. That is the relatively easy part. As long as inflation is not out of control, the transactions demand for pesos is likely to be resiliently stable. The difficulty lies in the establishment of the peso as a reliable store of value that can underpin sound financial intermediation. In effect, the reestablishment of the peso as a means of payment, even if sustained through a viable fiscal process, does not in itself guarantee that the peso will become a trusted receptacle for saving, particularly considering that the bad memory of the forcible pesification of their savings is likely to torment the Argentines for a long time.

If the goal in Argentina is to promote the peso as the currency for financial intermediation through limits or outright prohibition of dollar deposits and credit, then one might expect many years of a relatively narrow banking system (focused mainly on payments) while credible institutions are

built and proven. Alternatively, a bi-monetary scheme (peso transactions and dollar savings) may be considered to restore a degree of financial intermediation earlier in the game. The prospects for the restoration of dollar-based financial intermediation also appear bleak, however, given the severe damage to the contractual environment inflicted by stock pesification.<sup>69</sup> In either case, there is no substitute for the hard work of institution building to underpin sustainable linkages between money and banking.

## **Appendix A: Post-1994 Banking System Strengthening**

Effective and ambitious financial sector reforms vigorously adopted in the second half of the 1990s were translated in a major consolidation and internationalization of the banking system (see table 1 in the text). The number of banks shrunk from 166 in 1994 to eighty-nine in 2000. Banks exited not just through mergers and acquisitions, but also through bank closures. The number of public banks decreased from thirty-two in 1994 to fifteen in 2000, reflecting an aggressive privatization of provincial banks. The number of branches of foreign-owned banks increased from 391 in 1994 to 1,863 in 2000, while the share of these banks in the system's assets rose from 15 to 73 percent.

This process was accompanied and underpinned by an acceleration in the pace of legal, regulatory, and supervisory innovations. The main improvements in the regulatory and contractual environment for the banking system are briefly described below.

### *A Market-Friendly Approach to Prudential Oversight*

Much of the progress in this area was organized around the innovative BASIC program. BASIC was an Argentine-bred approach, superimposed on internationally recognized CAMELS-based supervisory methodology, to enhance the complementarity between official and market monitoring. The five prongs of the BASIC program are the requirement that banks issue subordinated debt so as to generate better price signals of bank risk; a program to improve internal and external audits; the implementation of

69. The prudential lessons drawn from the Argentine case should be useful for better internalizing and managing the attendant risks if financial redollarization is the option of choice.

consolidated supervision of financial conglomerates; a major program to enhance the quality, depth, coverage, and dissemination of information—through higher reporting standards for financial statements, broader and more easily accessible information on debtors, and more stringent information requirements on financial group structure and ownership; and the requirement for larger banks to be rated annually by international rating firms.<sup>70</sup> Partly as a result of the implementation of the BASIC program, it was broadly believed that Argentina in the late 1990s was near full compliance with the Basel Core Principles for Effective Banking Supervision.

Particularly noteworthy in the Argentine regulatory reform was the introduction of a rigorous system of capital requirements, defined to absorb both credit and market risks. The system was significantly more stringent than the Basel minimum standard. One of the system's several components was a minimum capital requirement for credit risk of 11.5 percent of risk-weighted loan exposures to the private sector, with variable weights within each loan class depending on the risk of individual loans, as measured by the interest rate charged on the loan. This ratio was augmented by a factor for banks receiving lower CAMEL ratings. Moreover, in 2000 positive risk weights were introduced for loans to the government, and mark-to-market requirements were introduced for holdings of government bonds. Finally, capital requirements were set separately to absorb unexpected fluctuations in interest rates and in the prices of private sector securities.

The regulatory system also featured stringent liquidity requirements, which were high by international standards. They were intended to work countercyclically—that is, to be tightened during buoyant times and relaxed during systemic liquidity squeezes. By 1998, most deposits (those with maturities of less than ninety days) required a 20 percent (remunerated) reserve.

### *A Best Practice Scheme for Troubled Bank Resolution*

After the tequila crisis, Argentina introduced key institutional innovations to enhance the bank exit framework, including Article 35bis of the banking law—which created an efficient system for bank closure and

70. The acronym stands for *bondos* (bonds), *auditoria* (auditing), *supervisión consolidada* (consolidated supervision), *información* (information), and *calificadoras de riesgo* (risk rating).

resolution—and a privately managed limited deposit insurance scheme (SEDESA). This framework greatly contributed to the consolidation of the banking system through the exit of unviable banks. The Argentine regulatory authorities closed about twenty unviable banks (and not just small ones) between 1995 and 2000, using the powers of Article 35bis.<sup>71</sup>

### *Privatization of Provincial Banks*

Between 1994 and 1998, sixteen provincial banks were privatized within a process that, though not perfect, was among the most aggressive and successful in the region.<sup>72</sup>

### *Contingent Repo Facility*

The repurchase agreement (repo) facility was over-collateralized, structured to partially compensate for the virtual lack of a domestic lender of last resort and to strengthen the banking system's capacity to weather a liquidity crisis. The facility gave the Central Bank the option of selling dollar-denominated Argentine government bonds to a consortium of reputable international banks, subject to a buy-back clause with an embedded implicit interest rate. In 1999, the World Bank reinforced this facility by committing contingent funds to help meet margin calls in the event it was activated. By the end of the 1990s, the contingent repo line ensured the liquidity of about 10 percent of the system's deposits, in addition to the equivalent of nearly 20 percent of deposits already held in the form of liquid and safe FX assets (dollar cash and near-cash in the Central Bank and commercial banks).

### *Creditor Rights and Corporate Insolvency*

In 1995, Argentina enacted a modern insolvency law that substantially improved the system of corporate liquidation and rehabilitation. Similarly important reforms were implemented to improve the enforcement of secured and unsecured creditor rights. The World Bank assessment of Argentina's degree of compliance with international standards on insol-

71. For further details, see de la Torre (2000).

72. A thorough assessment of the process and results of provincial bank privatization in Argentina can be found in World Bank (1999).

vency and creditor rights found that the permanent framework for corporate insolvency and creditors rights is “largely consistent with the Principles.”<sup>73</sup>

## Appendix B: Argentina’s Via Crucis

We offer the following timeline to help clarify the complex unfolding of the Argentine crisis.

—December 1999: President Fernando De la Rúa takes power with the country already in recession and the public debt at high levels. The government tries to gain confidence and restore growth through fiscal adjustment.

—January 2000: The new tax scheme, or *impuestazo*, is implemented, including an increase in the taxation on consumer goods, an extension of the value added tax to health insurance and transportation, and an extension of the income tax base. As the year progresses, the fiscal adjustment does not bring growth. Rather, the recession deepens and doubts about debt sustainability increase dramatically.

—October 2000: The political weakness of the De la Rúa administration becomes evident when Vice President Carlos Alvarez resigns.

—December 2000: Economy Minister José Luis Machinea negotiates a U.S.\$40 billion package with international and domestic financial institutions to extend the public debt maturity and try to ease fears of default. The deal implied a much lower amount of fresh funds, around U.S.\$12 billion.

—March 2001: Growth did not pick up following the injection of funds in December, and Machinea resigns. The newly appointed economy minister Ricardo López Murphy resigns after two weeks in office, owing to the strong opposition to the new fiscal austerity package he sent to Congress on 16 March.

—April 2001: Domingo Cavallo becomes economy minister for the second time. He is granted special powers by Congress and tries different, more direct measures to revive growth. On 16 April 2001, he proposes an amendment to the convertibility law, according to which the peso would be pegged to a basket consisting of U.S. dollars and euros with equal weights, when the dollar-euro rate reaches 1:1. This proposal aims to

73. World Bank (2002).

better align the peso with Argentina's trading partners. Congress approves the amendment in mid-June 2001.

—25 April 2001: The president of the Central Bank, Pedro Pou, resigns amid disagreements with Cavallo and other members of the government. Roque Maccarone replaces Pou.

—10 July 2001: The government announces a “zero deficit” rule after being forced to pay 1,410 basis points over U.S. Treasury bonds to place a short-term bond. It thus becomes obvious that the government cannot tap capital markets without the debt exploding. To implement the zero deficit rule, the government pushes hard for an IMF-supported program, but to obtain it, the government must reach an agreement with the provinces on tax revenue sharing. U.S. Treasury Under Secretary John Taylor later declares that there will not be any external help for Argentina until it can comply with its objective of a zero deficit.

—17 August 2001: U.S. Treasury Secretary Paul O'Neill tells CNN: “We’re working to find a way to create a sustainable Argentina, not just one that continues to consume the money of the plumbers and carpenters in the United States who make U.S.\$50,000 a year and wonder what in the world we’re doing with their money.”

—26 October 2001: Negotiations with the provinces on the distribution of tax revenues fail (again).

—28 October 2001: Cavallo starts negotiations to obtain resources from the IMF and the U.S. Treasury to purchase collateral for new bonds to be issued in exchange for the nearly U.S.\$100 billion of local and external debt.

—29 October 2001: Cavallo defines the debt exchange operation as voluntary. The old debt would be exchanged for bonds paying 7 percent per year and guaranteed by taxes revenues. However, the IMF and U.S. Treasury ask for compliance with the zero deficit and an agreement with the provinces on the tax revenue sharing before any kind of financial support is given. The negotiations last for more than a month.

—19 November 2001: The IMF announces that it will not make any new disbursements to Argentina without being satisfied that the country has secured the goals previously defined.

—2 December 2001: The government announces measures restricting deposit withdrawals (the *corralito*). Withdrawals are limited to 250 pesos (dollars) per week per account.

—19 December 2001: Cavallo and all other ministers resign.

—20 December 2001: President De la Rúa resigns; Ramón Puerta becomes interim president.

—23 December 2001: Rodriguez Saa, governor of one of the provinces, becomes the new interim president. His period is supposed to last sixty days, until elections are called on 3 March 2002. He declares the suspension of external debt payments for at least sixty days.

—24 December 2001: The government announces that a new fiat currency (that is, without foreign-currency backing) will be created, the “argentino.”

—30 December 2001: Rodriguez Saa resigns, and the legislative assembly chooses Eduardo Duhalde as the new president. After assuming power on 2 January 2002, he officially ends the currency board and announces the floating of the peso.

## Comments

**Alberto Ades:** This paper critically examines the rise and fall of Argentina's currency board. The authors argue that while convertibility provided nominal stability and boosted financial intermediation, it failed to foster fiscal or monetary discipline. In particular, they emphasize that the failure to adequately address the currency-growth-debt (CGD) trap that Argentina experienced in the late 1990s precipitated a run on the currency and the banks, followed by the abandonment of the currency board and a sovereign debt default. De la Torre, Levy Yeyati, and Schmukler therefore see the crisis as a bad outcome of a high-stakes strategy to overcome a weak currency problem. They conclude by examining alternative exit strategies that would have been less destructive than the one adopted.

The authors provide a comprehensive and often quantitative analysis of the challenges faced by the currency board in 1998–2001. The effort is commendable, and it will likely be followed by additional work in this exciting and important area of research. My comments center on three specific areas that call for further refinement.

First, the authors characterize the situation that the authorities faced during the period as a CGD trap caused primarily by the economy's inability to adjust to external shocks. However, this CGD theory is hard to distinguish empirically from an alternative collective-suicide (CS) hypothesis. According to this theory, the Alianza government made an endless succession of policy and political mistakes that made the collapse of convertibility inevitable. Critical statements about convertibility by key Alianza leaders, the resignation of Vice President Carlos Alvarez, the forced resignation of Central Bank president Pedro Pou, attacks by the Finance Ministry on Central Bank independence, the modification of convertibility to peg the peso to a basket, statements by key Alianza politicians in favor of a debt restructuring and against globalization—these are just some of the political shocks that gradually eroded confidence in Argentina's economic institutions, fueled capital flight, and ultimately led to the collapse of the banking system and the peso. While the situation

faced by the authorities in 1999 was far from ideal, it is hard not to speculate how much of the 2000–01 malaise was engineered by a government that never truly believed in the policies that circumstances forced it to defend. A more balanced discussion of these issues would benefit the paper.

Second, the authors argue, as do many economists, that flexibility (of labor markets and of primary public spending) is critical for fixed exchange rate regimes to work in the medium term. The same argument is applicable to a country considering dollarization. The authors note that given the difficulty in developing flexible labor and fiscal institutions, such regimes are generally not advisable. However, the cost of developing such institutions needs to be balanced against the cost of living with an underdeveloped financial system (if the banking system is forcefully pesified) or balance-sheet volatility (if the currency floats but most of the saving and lending continue to be done in foreign currency). It is not obvious that developing flexible labor market and fiscal institutions is more costly than developing the institutions necessary for a pesified financial system to become acceptable in a country like Argentina.

Finally, the authors argue that the demand for pesos following the break of convertibility was surprisingly strong. They mention that many analysts had indeed expected peso demand to collapse and the economy to become fully dollarized. The fact that this did not happen is seen as evidence that Argentines do, in fact, want to hold pesos, and it therefore provides hope for the pesification alternative. However, judging the demand for pesos in a context of stringent currency controls and a substantial increase in the share of the underground economy is, at best, heroic.

**Graciela Kaminsky:** Argentina's default and the demise of its currency board in January 2002 triggered a colossal interest in understanding what went wrong. This interest is not surprising. Until very recently, Argentina was the darling of Wall Street and the poster child of the International Monetary Fund. Argentina had stabilized the economy after a bout with hyperinflation, successfully privatized a large and inefficient public sector, managed to have a stable banking sector well prepared to deal with liquidity problems, and boosted financial intermediation to levels not seen for more than thirty years. Notwithstanding these reforms, in January 2002, Argentina staged the largest sovereign debt default in history, abandoned the one-to-one parity with the U.S. dollar, causing the peso to quickly

depreciate to 3.5 pesos per U.S. dollar, and confiscated almost all bank deposits, leaving the banks all but defunct. Mussa's title, "From Triumph to Tragedy," perhaps best captures this paradox.<sup>1</sup>

Within a couple of months, a variety of articles had been written on Argentina. Mussa argues that fiscal unsustainability was at the core of this crisis; Feldstein blames the real exchange overvaluation. Calvo, Izquierdo, and Talvi claim that a sudden stop in capital flows following the Russian crisis created a major real exchange rate misalignment and fiscal problems in Argentina that were difficult to address given the country's widespread currency mismatches, high indebtedness, and relatively closed economy. Hausmann and Velasco focus on the interaction between the real exchange rate and the country's capacity to borrow. Finally, Perry and Servén find the origins of the crisis in multiple vulnerabilities, such as deflationary adjustment under the peg, high public debt, and fiscal and banking fragility.<sup>2</sup>

Augusto de la Torre, Eduardo Levy Yeyati, and Sergio Schmukler contribute to this line of research with a new twist. They do not deal with the variety of macroeconomic vulnerabilities—domestic or external—that triggered the crisis, but rather reexamine the fixed versus flexible exchange rate debate from a new angle. In particular, they argue that hard pegs sow the seeds of their own destruction. They also provide new empirical evidence on the characteristics of the bank run that preceded the crisis. Finally, they also discuss alternative strategies for exiting the currency board.

With respect to the pros and cons of hard pegs, the authors highlight that the Argentine monetary authorities tried to raise the credibility of the currency board by increasing the exit costs—that is, by fostering dollarization—but this, in turn, made the peg more vulnerable and triggered its collapse. In particular, the authors show that the monetary authorities did not adopt prudential norms (such as loan classification and provisioning rules) that would have explicitly discouraged the use of the dollar in financial contracts.<sup>3</sup> The authors also claim that the government did not issue

1. Mussa (2002).

2. Mussa (2002); Feldstein (2002); Calvo, Izquierdo, and Talvi (2002); Hausmann and Velasco (2003); Perry and Servén (2002).

3. As discussed by de la Torre, Levy Yeyati, and Schmukler, Argentina's regulatory capital requirements for credit risk not only were determined by the typical Basel-type procedure of applying higher weights to riskier loan classes, but also took into account the risk

peso debt in domestic markets, not just because dollar debt was less costly, but probably also because it feared that issuing peso debt would create concerns that the government would liquefy the debt in the future through a nominal devaluation of the peso. I have two comments on those claims. While it is true that prudential regulations failed to account for the risk of dollar loans to the nontradables sector, proper risk accounting would not necessarily have had a significant impact on the degree of dollarization of the economy. One possibility would have been to price risk using interest rates on peso loans to the various industries. As shown in figure 2, however, interest rate differentials were very low most of the time, increasing to at most 200 basis points only sporadically until April 2001. The authors would need to provide empirical evidence on the effect of capital requirements on the volume of loans to evaluate whether the degree of dollarization would have changed substantially with other provisioning rules. My second comment refers to the effect of hard pegs on the choice of the currency denomination of government debt. While the issuance of debt denominated in foreign currency might certainly be used as a commitment mechanism, it is unclear what the contribution of the peg is to the degree of dollarization. In fact, some would argue that causality goes in the other direction. This is the so-called original sin phenomenon. According to this hypothesis, emerging countries cannot borrow in domestic currency, perhaps because of lack of credibility. This pushes governments to adopt a peg to avoid balance sheet mismatches. It would have been important to provide some evidence of the two-way causality.

The second major theme of the paper is the banking sector and the characteristics of the bank run. Here, the authors provide a very interesting dataset on the characteristics of the banking sector, including information on the currency of denomination of loans to traded and nontraded goods industries, as well as that of demand, savings, and time deposits. There is also information on the varying exposure of banks to the public sector. Certainly, this dataset can be used to examine in detail the changing vulnerability of the banking sector. I find most interesting the information and estimation of the characteristics of the bank run. The authors estimate a

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of individual loans within each loan class. In particular, the Central Bank imposed higher weights on individual loans with high interest rates, which presumably reflected the higher risk of the loan. However, this system failed to capture credit risk of dollar loans to the nontradables sector.

regression of the change of bank deposits on the characteristics of the banks during crisis and noncrisis periods. While banks' fundamentals affected the injection/withdrawal of deposits in the precrisis period, this was not the case during the crisis. Depositors did not pay attention to the characteristics of the banks at the onset of the crisis; it did not matter whether banks were public or private, domestic or foreign owned. During times of crisis, systemic events were at the core of the run. Country risk appears to have been the main driver behind the run on dollar deposits, while currency risk was the dominant factor behind the generalized withdrawal of peso deposits. These results suggest that foreign banks may not provide, as has been expected, complete insurance against fragilities of the banking sector following a variety of adverse shocks.

The third major theme of the paper is the exit strategies from currency boards. The authors examine the pros and cons of dollarization, floating, pesification of deposits and floating, and their own proposal of pesification at the margin.<sup>4</sup> They argue that floating the peso would have addressed the real exchange rate misalignment, but it would have bankrupted the banks and would not have prevented the run on deposits. The authors also suggest that stock-pesification-cum-float was the worst alternative because it involved the arbitrary and massive violation of property rights. Not only did it trigger the run, but it also contributed to the disruption of the payments system and destroyed financial intermediation. They argue that formal dollarization would have been consistent with the Argentine social contract based on the long-term commitment to the one-peso-one-dollar rule, enhancing depositors' confidence and likely preventing a bank run. Still, it is argued, dollarization would not have helped to unwind the real exchange rate appreciation and would have generated a long and protracted deflation. The authors suggest that pesification at the margin could have prevented a run and, by providing a margin for nominal flexibility, could have facilitated the unavoidable real exchange rate adjustment, without unduly disfiguring property rights.

This comparison across exit strategies lacks a common benchmark. The common benchmark should reflect the fact that under all possible exit strategies, the size of the adjustment had to be large enough to offset the

4. On dollarization, see Dornbusch (2001); on floating, see Roubini (2001); on pesification of deposits and floating, see Ricardo Hausmann, "A Way Out for Argentina: The Currency Board Cannot Survive Much Longer," *Financial Times*, 30 October 2001.

severe and prolonged stop of capital flows to emerging markets.<sup>5</sup> Under all exit strategies, current account deficits had to be transformed into current account surpluses. This, in turn, required a major wealth adjustment, via deflation or devaluation. The required adjustment was under all circumstances going to generate a tug of war: what group would have to suffer the burden of the adjustment? Pesification at the margin would not have been a panacea, either, on account of the size of the adjustment. Nontraded goods industries would have had to suffer the brunt of the adjustment. Bankruptcies would have followed, and this would have triggered major vulnerabilities in the banking sector. A run might not have been prevented either. Arguably, whichever of the four alternatives the monetary authorities chose, from complete pesification to full dollarization, after the adoption, they would have wished they had chosen something else.

To summarize, this paper provides a new angle on the Argentine crisis, as well as a new dataset for examining banking vulnerability and information on banking regulations. It also provides an interesting discussion on exit strategies from hard pegs. In short, the paper belongs in the required reference list of those interested in learning about the 2001 Argentine crisis.

5. See Calvo, Izquierdo, and Talvi (2002).

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