



---

**NORTH-HOLLAND**

North American Journal of  
Economics and Finance 13 (2002) 237–252

---

THE NORTH AMERICAN  
JOURNAL OF  
**ECONOMICS  
AND FINANCE**

---

# The great exchange rate debate after Argentina

Sebastian Edwards\*

*The Anderson Graduate School of Management, National Bureau of Economic Research, University of California, 110 Westwood Plaza, Room C 5-08, Los Angeles, CA 90095-1481, USA*

Received 14 April 2002; received in revised form 4 August 2002; accepted 12 August 2002

---

## Abstract

In this paper I discuss in what way, if any, the collapse of Argentina's experience with a currency board has affected the policy debate on the appropriate exchange rate regime in emerging and transition countries. More specifically, I deal with three issues: (1) I discuss some important aspects of the Argentine experience; (2) I provide a comparative evaluation of economic performance under strict dollarization; and (3) I analyze emerging countries' experiences with flexible exchange rates, including the issue of "fear of floating."

© 2002 Elsevier Science Inc. All rights reserved.

*JEL classification:* F31; F32

*Keywords:* Exchange rate regime; Inflation; Debt; Dollarization; Currency union

---

## 1. Introduction

Not very long ago, hybrid exchange rate regimes—including crawling pegs, crawling bands, and pegged-but-adjustable systems—were very popular among policy makers and economists in the emerging countries. All of this changed in the late 1990s, when as a result of successive currency crises a number of authors began to argue that in a world of high capital mobility, middle-of-the-road exchange rate regimes were highly unstable. As a result, during the last few years the so-called "two corners" option on exchange rate regimes has become increasingly dominant. According to this view, countries should either have a floating exchange rate, or they should opt for a super-fixed exchange rate regime, that is, a currency board or full official dollarization (Fischer, 2001).

---

\* Tel.: +1-310-206-6797; fax: +1-310-206-5825.

*E-mail address:* sedwards@agsm.ucla.edu (S. Edwards).

During most of the 1990s, Argentina's currency board was the poster child of super-fixed regimes. Not only had Argentina done quite well during 1991–1997, but more importantly, it was the only large country with a functioning super-fixed exchange rate system. [Mussa \(2002\)](#) explains how, and in spite of initial IMF skepticism, the Argentine experience became increasingly popular in Washington policy circles. The official sector's support for the experience is perhaps best captured by the views of Ricardo Hausmann, the influential former Chief Economist of the Interamerican Development Bank, who in April 2001 went as far as to argue that other Latin American countries—including Brazil and Mexico—would soon follow Argentina and adopt currency boards.<sup>1</sup> Nothing of that sort happened, and in early 2002 Argentina's adventure with a currency board came to an end, when deposits were frozen, the peso was devalued, and the government defaulted on its debt.

The purpose of this paper is to discuss in what way, if any, the collapse of Argentina's experience with a currency board has affected the policy debate on the appropriate exchange rate regime in emerging and transition countries. The rest of the paper is organized in four parts. In [Section 2](#), I discuss some important aspects of the Argentine experience. In particular, I deal with the run on deposits and some of the consequences of abandoning convertibility in early 2002. In [Section 3](#), I discuss how the collapse of Argentina's currency board has affected the arguments in favor of hard pegs. I point out that most supporters of super-fixed exchange rate regimes have not changed their minds, and continue to believe that hard pegs are an appropriate solution for many of the problems of the emerging countries. In this section, I also provide a summary of the existing evidence on performance under dollarization. [Section 4](#) is devoted to emerging countries' experiences with flexible exchange rates, including the issue of "fear of floating." I argue that incorporating exchange rate considerations into a Taylor rule does not constitute "fear of floating." Under most circumstances it is optimal flotation. I also point out that additional research is needed to understand whether "sterilized" intervention in foreign exchange markets is destabilizing. Finally, [Section 5](#) presents some concluding thoughts, including some remarks on the practical relevance of the "two corners" approach to exchange rate policy.

## 2. Argentina's crisis, de-dollarization and money overhang

Throughout its currency board experience, Argentina had a highly dollarized economy. The public was repeatedly told that "*a peso is a dollar, and a dollar is a peso*," and was encouraged to hold dollar-denominated deposits. A high percentage of banks' portfolios was dollar-denominated, and by late 2001 more than 80% of the public debt was denominated in foreign currency. Because of this high degree of dollarization, even authors who had questioned the wisdom of the hard peg and had argued that the peso was overvalued, were skeptical about the benefits of a devaluation of the peso. In the presence of significant balance sheet dollarization, they argued, a (real) devaluation would result in a large increase in debt burdens and unleash a string of bankruptcies.

Towards mid-2001, and in the midst of a 4-year recession, the Minister of the Economy Domingo Cavallo was desperately trying to deal with perverse debt dynamics. With the country risk premium exceeding 2,000 basis points, and with an increasingly contentious disagreement

with the provinces regarding revenue transfers, Cavallo was rapidly running out of time. As economic conditions deteriorated, a growing number of analysts began to debate alternative ways out of the convertibility law. In one camp were those who favored partial default, while maintaining the basic features of convertibility and the currency board; in another camp were those who argued that the only way out was to officially dollarize the economy, possibly at a rate higher than the prevailing one peso per dollar. Still another group called for devaluation-cum-pesification, followed by adoption of a generalized indexation scheme.<sup>2</sup>

Minister Cavallo dismissed all of these plans and insisted on his own program based on restructuring the public debt, providing an array of incentives to the industrial sector, and negotiating with the provinces. In early December 2001, and as a way to quell a rapidly growing run on the banking system, the government implemented a deposit freeze and *de facto* exchange controls. The public, which had repeatedly been assured that their savings were untouchable, was stunned. People took to the streets and staged violent demonstrations that were severely repressed by police forces. By December 19, and after more than 20 people were killed during violent protests, the government appeared to have lost control over events. A day later, President de la Rúa resigned, bringing an era to an end. In rapid succession, Argentina went through three chief executives, until in mid-January 2002 Eduardo Duhalde—a Senator and former governor of the province of Buenos Aires—was appointed President by congress, with the mandate of finishing Mr. De la Rúa's term.<sup>3</sup>

The new authorities were quick to denounce the “old” economic policy—including the convertibility law—as inefficient, recessionary and corrupt. In designing a new policy, however, they did not follow any of the blueprints that had been thoroughly discussed in preceding months. Instead, they implemented a series of measures that included the worst elements of each of the existing proposals. The peso was devalued, public debt—or most of it—was repudiated, and dollar-denominated private debts were “pesified” at different and arbitrary rates. Moreover, Cavallo's deposit freeze was generalized and strengthened, and the public was forbidden to transfer deposits across banks. The peso, which for more than a decade had stood at parity with the U.S. dollar, lost value rapidly, and in a few weeks the exchange rate broke the 3 pesos per dollar mark. Politicians and many local analysts were astounded. Not in their worst nightmares, did they expect the nominal devaluation to exceed 60%.<sup>4</sup> Growth forecasts for 2002 predict GDP to contract by 15% or more; for 2003 most analysts expect an additional drop in GDP of 5%.

These tragic events showed that in a *de facto* dollarized economy, a devaluation can be very messy indeed. Bank and corporate balance sheets were wrecked, and depositors clamored to get their money back. Populist promises by the government did not help, and months after the currency was devalued the country was still paralyzed. Political instability grew by the day, as the population staged demonstrations against politicians, judges and bankers. It became rapidly evident that reestablishing the payments system was a fundamental requirement for getting the economy moving again. This, however, required finding a solution for the deposit freeze problem; as long as deposits were frozen, it was difficult for banks to function in quasi-normal ways.

The events of December 2001–January 2002 generated a massive collapse in the demand for money in Argentina. People who for over a decade had been told that a peso was as good as a dollar, suddenly realized that this was not the case. Not only was a peso not a dollar, but after the freeze a “peso” was not even a “peso.” People did not want to hold the Argentine

currency. Yet, because deposits were frozen, they were unable to dispose of unwanted pesos. By early 2002 Argentina faced a large *monetary overhang*, similar to the problem of the Eastern European countries during the late 1980s and early 1990s.<sup>5</sup>

The economic theory of monetary overhangs is well known and simple and goes back at least to David Hume. Under fixed exchange rates, undesired domestic money leaves the economy through a reduction in international reserves. This is the main insight of the *monetary approach to the balance of payments*. This option, of course, was not available to Argentina, as the country had virtually run out of foreign exchange reserves. Under flexible exchange rates, a monetary overhang is resolved through jumps in the nominal exchange rate and in the price level. These nominal adjustments have to be large enough to eliminate the difference between desired and actual stocks of (real) money.<sup>6</sup> In theory, these reactions are often modeled as once-and-for-all jumps, but in reality this type of adjustment tends to be slow and painful and usually unleashes an inflationary process that is difficult to control. It is for this reason that throughout the first half of 2002 the IMF argued that lifting the deposit freeze would generate chaos and proposed the alternative of substituting long-term bonds for frozen deposits. The characteristics of these bonds, and in particular whether the conversion was to be voluntary or mandatory, became a source of heated debate. Expropriation of deposits has a recurrent history in Argentina; the most recent episode took place in 1989, when the so-called *Bonex Plan* was put into place.

An important question concerns the *initial* magnitude of the monetary disequilibrium created by the deposit freeze, the devaluation of the peso and default on the public sector debt.<sup>7</sup> The extent of the disequilibrium—and the associated pressures on prices and the nominal exchange rate—depends on four key factors: (i) The decline in the demand for money; (ii) the exchange rate at which dollar-denominated deposits are “pesified”; (iii) whether “pesified” deposits are subsequently indexed, and if so, in what manner; and (iv) whether all frozen deposits are freed up. It is easy to show, that the post-crisis (and pesification) equilibrium price level ( $P_1$ ) and exchange rate ( $E_1$ ) needed to fully clear the *money overhang in the absence of a freeze* are equal to:

$$P_1 = \frac{C_0 + D_0 + F_0 E_P}{m_1 y_1}, \quad (1)$$

$$E_1 = 1 + \frac{P_1 - 1}{ba + (1 - b)}, \quad (2)$$

where it is assumed that prior to the crisis  $P_0 = E_0 = 1$ ,  $C_0$  is the stock of currency (in pesos) in circulation before the crisis,  $D_0$  the stock of peso-denominated deposits—both checking account and time deposits—before the crisis,  $F_0$  the pre-crisis stock of dollar-denominated deposits in the banking system,  $E_P$  the exchange rate at which these deposits are transformed into pesos after the crisis, and  $m_1$  is the new (post-crisis) ratio of desired money balances to nominal GDP, that is,  $m_1 = M_1/(P_1 y_1)$ , where  $M$  denotes the stock of broadly-defined nominal money and  $y$  is real GDP. In Eq. (2),  $b$  is the share of non-tradable goods in the price level, and  $a$  is the “pass-through” coefficient.<sup>8</sup>

From these equations it is clear that the new equilibrium price level will depend on the new demand for money  $m_1$ , and on the rate at which dollar-denominated deposits are “pesified” ( $E_P$ ). The higher is the “pesification” rate, the higher will be the required jump in  $P$ . The lower is the new money demand, the higher will be the required jump in the nominal price level. The

new equilibrium nominal exchange rate will also depend on those variables, on the weight of tradables in the price level and on the “pass-through” coefficient. A higher pass-through coefficient dampens the effect of price increases on the nominal exchange rate and results in smaller real exchange rate adjustment.

Using data from late 2001, it is possible to estimate the “notional” or equilibrium nominal exchange rate ( $E_1$ ), and price level ( $P_1$ ) in the post-crisis period. Just prior to the crisis, currency in circulation was approximately 11 billion pesos; peso-denominated deposits stood at 15 billion pesos; and dollar-denominated deposits amounted to approximately \$45 billion. These deposits were originally pesified at 1.4 pesos per dollar. Assuming a decline in real GDP of 10% for 2002—a change that according to most analysts is on the optimistic side, we can use a figure of 250 billion pesos for  $y_1$ . Drawing on a number of studies, I assume that the share of tradable goods in the price level is 0.5 and that the pass-through coefficient is 0.6.

The final piece of information required for estimating Eqs. (1) and (2) is the post-crisis demand for money. Consider, as an illustration, the case where the new demand for (broad) money is equal to 7% of GDP.<sup>9</sup> In this case,  $P_1$  would climb from 1 before the crisis to 5 after the crisis, implying a cumulative rate of inflation of 400%. Under these assumptions, the new equilibrium nominal exchange rate would be 5.1 pesos per dollar. If, however, the new demand for money is as low as 5% of GDP, then the equilibrium “notional” exchange rate climbs to 8.7 pesos per dollar! Even an optimistic assumption of a post-crisis  $M$  to GDP ratio of 10% still implies a very high new equilibrium nominal exchange rate of 4.2 pesos per dollar. Notice that this analysis has ignored indexation. If, however, “pesified” deposits are indexed to inflation, the pressure on the nominal exchange rate would be even greater, and under some constellation of parameters may even be explosive.

Although the economics profession is still digesting the implications of Argentina’s crisis, it is already possible to extract some important lessons, most of which are neither new nor surprising. In fact, as the crisis unfolded, many observers warned the authorities that past experience suggested that Argentina was in a very vulnerable position. Unfortunately, the authorities rejected these warnings, arguing instead that Argentina was really very different from other countries.

It is worthwhile to repeat these lessons, as in policy circles there is a frightening tendency to forget history. A list of lessons, both old and new, would include the following:

- The Argentine crisis shows that, contrary to the claims of some of its most ardent supporters, a super-fixed exchange rate regime is not *on its own* a solution to a country’s macroeconomic problems. A currency board is not “a panacea.”
- A currency board cannot “force” politicians to run prudent fiscal policies, nor can it ensure a lasting low-inflation equilibrium.<sup>10</sup>
- Perverse fiscal dynamics, when the country fails to generate a primary surplus large enough to stabilize the debt to GDP ratio, usually generate a vicious circle, where failure to stabilize the debt ratio results in higher cost of funds, lower growth, and in an even larger required primary surplus.
- Fiscal federalism issues are of paramount importance. In Argentina, the inability to bring the provinces’ finances into check was a key ingredient in the unfolding crisis. Institutional arrangements are needed to bring provincial spending into line with overall fiscal

objectives, but an important question is how to design such institutions. Some have argued that the EMU's "Growth and Stability Pact" is the type of institution that would help deal with fiscal federalism issues.<sup>11</sup> Whether the pact will actually live up to its promises is still to be seen, however.

- Situations of real exchange rate overvaluation are very costly, and lead to low growth and in some cases even stagnation. Moreover, in super-fixed nominal exchange rate regimes, overvaluation is very difficult to resolve. This notion is far from new—in fact, Keynes wrote extensively about it when discussing inter-war international financial problems, but it is one that policy makers seem to forget over and over again.<sup>12</sup>
- Economies with low degrees of openness to international trade have difficulties adjusting to external shocks. More specifically, the costs of adjustment are proportional to the inverse of the marginal degree of openness of the economy.
- In the presence of *de facto* dollarization, large devaluations wreck balance sheets and generate very costly bankruptcies. This, in fact, was also a major lesson of the Chilean currency crisis of 1982. Surprisingly, not enough attention has been given to that particular episode of a modern currency crisis.<sup>13</sup>
- Defaulting on the public debt may be very costly. Indeed, contrary to the claims of a number of foreign and Argentine analysts, the experience of Argentina during 2002 indicates that there isn't such a thing as a "painless" default. Some may argue that it was not the default *per se* that caused so much havoc, but rather the awful policies that accompanied it. But that is exactly the point. Defaults don't come in a clean, surgical way. They are messy and costly.
- Perhaps the most important lesson stemming from Argentina is that, contrary to the claims of a number of authors, a banking system dominated by major foreign banks may still be subject to a run on deposits. This happened in Argentina throughout 2001 and induced Minister Cavallo to impose the ill-fated deposit freeze and exchange controls in early December of that year.<sup>14</sup>
- Related to the previous point, there are a number of serious risks associated with a highly dollarized banking system. In particular, in the absence of a lender of last resort—as is almost always the case when the banking system is highly dollarized, a run-of-the-mill crisis may be transformed into a major catastrophe. An important question is whether emerging markets should allow any foreign-currency-denominated deposits in their banking system.

### 3. The Argentine debacle, the quest for hard pegs, and dollarization

Many supporters of super-fixed exchange rate regimes have not changed their views as a result of the Argentine debacle. Some argue that Argentina's regime was not a genuine currency board. *The Wall Street Journal's* editorial page, for example, which for a number of years commended Argentina, now claims that Argentina didn't really have a "true" currency board or sound monetary policy. Although it is true that some analysts referred to the Argentine arrangement as "mimicking" a currency board, it is also true that before the crisis many super-fixers praised the Argentine regime.<sup>15</sup>

Other “super-fixers” argue that dollarization is the preferred super-fixed regime. According to this argument, countries who dollarize truly eliminate currency risk, and will thus outperform nations with a currency of their own. Still other super-fixers argue that emerging markets have no alternative but to adopt a (true) hard peg (i.e., dollarization). According to this view, emerging countries cannot adopt flexible exchange rates, because their “fear of floating” leads them to systematically intervene in the foreign exchange market in destabilizing ways.

In this section I will deal with dollarization and its record; in [Section 4](#) I focus on the feasibility of flexible exchange rates in emerging countries.

### 3.1. Dollarized countries are very small

There is a great myth about dollarization. It turns out, that until recently we knew very little about how countries have performed under this regime, and most of what we know is based on the experience of Panama, a country that has been dollarized since 1904. Igal Magendzo and I have been able to find 20 independent countries that have strict dollarization and enough data to permit serious evaluation. The median population of those 20 independent countries is 145,000 people. Moreover, these small countries don’t collect a lot of data, so that it is not possible to know much about their economic record.

There are certain things, however, that we do know about dollarized economies. According to [Engel and Rose \(2002\)](#) and [Frankel and Rose \(2002\)](#), they have higher bilateral trade than countries with currencies of their own. [Persson \(2001\)](#), however, has persuasively argued that this effect is not nearly as strong as originally thought. We also have (limited) evidence indicating that although currency risk tends to disappear, dollarized countries do not necessarily enjoy lower cost of capital than countries with currencies of their own.

Consider the case of Panama, the dollarized nation par excellence. Between 1997 and 1998, for example, the average daily spread on Panamanian dollar-denominated Brady par bonds was 464 basis points. Although this was lower than the spread on equivalent Argentine bonds (710 basis points), it was not the lowest spread in Latin America. In fact, during this period the spread on Panamanian bonds was systematically and significantly higher than that on Chile’s sovereign bonds of similar maturity ([Edwards, 2001](#)).<sup>16</sup> Interestingly, Chile is a country that during the period under discussion experienced an overall *increase* in its degree of exchange rate flexibility. Comparison between Chile and Panama underscores the very simple but important point that dollarization does not by itself reduce country risk. In fact, during the last few years, and in spite of its improved fiscal performance, Panama has experienced a sizable country risk premium and has been subject to “contagion.”<sup>17</sup>

### 3.2. Dollarization and economic performance: some formal tests

In a series of papers Igal Magendzo and I have used a cross-country panel data set to investigate performance—GDP per capita growth, inflation and growth volatility—in dollarized countries. The data set is an unbalanced panel that covers 1970–1998, and includes 199 countries and territories, both dollarized countries and countries with a currency of their own. The number of observations varies, depending on the performance variable considered. There are 3,174 observations on inflation and 4,888 observations on growth per capita. In investigating

the behavior of volatility we used a cross section for 1990–1997 that includes 194 countries.<sup>18</sup> The data set covers 20 strictly dollarized countries.

We compared performance in dollarized and non-dollarized countries, using a “treatment effect” methodology, a non-parametric analysis based on “matching estimators” (see [Blundell & Costa Dias, 2000](#)). An advantage of this method is that no particular specification of the underlying model is required.<sup>19</sup> Matching estimators pair each dollarized country with countries from the non-dollarized group. With sufficiently large samples we can, in principle, find at least one untreated observation with exactly the same characteristics as the treated (dollarized) observation. Each of these properly selected untreated observations provides the required counterfactual for our comparative analysis.<sup>20</sup> The problem is that under most general conditions it is not possible to find an *exact* match between a treated and untreated observation. The matching estimator method focuses on estimating an average version of the parameter of interest,<sup>21</sup> that is, the matching estimator consists of the difference in outcomes as an average of the differences with respect to “similar”—rather than identical—untreated outcomes.

[Rosenbaum and Rubin \(1983\)](#) have shown that an efficient and simple way to perform this comparison is to rely on a *propensity score*, defined as the probability of participation or treatment:  $P(x) = \text{Prob}(D = 1/x)$ . In our case, this is the probability of a country being a dollarized country. This reduces a multi-dimensional problem to a one-dimensional problem, provided that we can estimate  $P(x)$ . Instead of matching countries directly on all of their characteristics, we can compare countries with similar probability of being dollarized.

We used two alternative methods for computing matching estimators. First, we used a *simple-average nearest neighbor* estimator. According to this method, for each treated observation, we select a pre-determined number of untreated nearest neighbor(s). The nearest neighbors of a particular treated observation  $i$  are defined as those untreated observations that have the smallest difference in propensity score with respect to  $i$ . If we choose to use  $nn$  nearest neighbors, we set  $W_{ij} = 1/nn$  for the observations that have been selected; for other observations, we set  $W_{ij} = 0$ . We applied this method to both one nearest neighbor and five nearest neighbors. The second method consists of using *local linear regressions* to identify each matching observation ([Fan, 1992](#)).

The results from the matching estimators in [Edwards and Magendzo \(2002\)](#) are presented in [Table 1](#). For each variable of interest—inflation, growth, and volatility—the table reports data on: (a) the number of countries and number of observations in the control group; (b) the “*mean difference*,” calculated as the mean of the differences for each variable, between the dollarized economies and the corresponding non-dollarized control group; and (c) the “*median difference*,” calculated as the median of the differences between the dollarized economies and the corresponding non-dollarized control group. For both the mean and the median difference, the table includes, in parentheses, a  $t$ -statistic. The test for the mean difference is a standard  $t$ -statistic, while that for the difference in median was calculated using a bootstrapping procedure. Finally, and for comparison purposes, the table reports the means and medians differences obtained when the unadjusted control group of all dollarized countries is used (“unadjusted comparisons”).

The results may be summarized as follows. First, for every one of the matching indicators both the mean and median differences in inflation are negative and significant. This



Table 1

Matching estimators: inflation, GDP per capita growth and volatility<sup>a</sup>

	Number of control countries	Number of control observations	Mean difference	Median difference
Inflation				
M1R	22	197	−3.53 (−5.68)	−3.15 (−4.00)
M1N	28	197	−3.39 (−5.01)	−1.92 (−2.82)
M5R	31	985	−3.89 (−9.03)	−4.45 (−9.89)
M5N	53	985	−5.68 (−5.98)	−4.42 (−8.41)
GDP per capita growth				
M1R	29	386	−0.28 (−0.47)	−1.05 (−3.03)
M1N	35	386	−1.56 (−2.78)	−1.53 (−3.88)
M5R	40	1,930	−1.12 (−2.48)	−1.01 (−3.34)
M5N	79	1,930	−1.19 (−2.78)	−1.30 (−2.71)
Volatility of growth				
M1R	12	386	0.86 (0.63)	0.42 (0.24)
M1N	16	386	0.62 (0.40)	1.29 (0.51)
M5R	71	1,930	0.72 (0.74)	1.59 (0.86)
M5N <sup>b</sup>	–	–	–	–

Source: Edwards and Magendzo (2002).

<sup>a</sup> M1R: one nearest neighbor, with replacement; M1N: one nearest neighbor, without replacement; M5R: five nearest neighbors, with replacement; M5N: five nearest neighbors, without replacement. Numbers in parentheses are *t*-statistics.

<sup>b</sup> Not computed because the number of observations was too small.

indicates that dollarized economies have had significantly lower yearly rates of inflation than non-dollarized countries. However, as may be seen from the results reported in Table 1, the mean difference in inflation is much *smaller* than what simple, uncorrected comparisons would suggest.

Second, for every one of the matching indicators, the GDP per capita growth differences—both for means and medians—are negative and significant in seven out of the eight cases reported in Table 1. The only exception is the mean difference using one nearest neighbor.

Overall, I interpret these results as providing fairly strong evidence that, once appropriate control groups are defined, dollarized economies have tended to experience lower GDP per capita growth than non-dollarized ones. This conclusion is supported by local linear regression results reported in Edwards and Magendzo (2002).

In terms of magnitudes, the results from the matching analysis indicate that dollarized countries' underperformed non-dollarized countries by a wider margin than is suggested by simple comparisons. The (statistically significant) mean differences in GDP per capita growth in Table 1 range from −1.56% per year to −1.12% per year; the unadjusted mean difference is only −0.69%. The median differences in GDP per capita growth in Table 1 range from −1.53% per year to −1.01% per year; the unadjusted mean difference is −1.41%. Statistically speaking, the matching results reported in Table 1 indicate that there are no differences (either in the means or medians) in volatility between dollarized and non-dollarized economies.

#### 4. On the feasibility of exchange rate flexibility in emerging countries: fear of floating or optimal floatation?

For many years it has been argued that emerging countries cannot successfully adopt freely floating exchange rates. This view has recently become particularly popular among supporters of super-fixed exchange rate systems. Two reasons have traditionally been given for this position: first, it has been argued that since emerging countries tend to export commodities and/or light manufactures, a floating exchange rate would be “excessively” volatile. Second, it has been argued that emerging countries don’t have the institutions for conducting effective monetary policy under purely floating exchange rates (Summers, 2000). According to this perspective, emerging markets that float would be unable to implement the (rather complex) feedback rules required by effective inflation-targeting systems. In particular, it has been argued that emerging countries that shift to floating after a currency crisis will be unable to stabilize the value of their currency. This view is expressed in Eichengreen, Masson, Savastano, and Sharma (1999, pp. 18–19) who, after discussing the merits of floating rates and inflation targeting, state:

[I]t is questionable whether a freely floating exchange rate and an inflation target objective for monetary policy are feasible, advisable or fully credible for many developing and transition economies . . . [T]hese economies are subject to substantial larger internal and external shocks . . . and the transmission mechanisms through which monetary policy affects the economy and the price level tend to be less certain and reliable . . .

More recently, a new objection to floating in emerging markets has been raised. Some authors, most notably Calvo (1999), Calvo and Reinhart (2002) and their associates, have argued that in a world with high capital mobility, incomplete information, fads, rumors and dollar-denominated liabilities, the monetary authorities will be subject to a “fear to float” (Reinhart, 2000). This is because significant exchange rate movements—particularly, large depreciations—will tend to have adverse effects on inflation and on foreign-currency-denominated debt. According to this view, such regimes in emerging markets will be “floating” only in name. In reality, countries that claim to float will be “closet peggers,” making every effort, through direct intervention and interest rate manipulation, to avoid large exchange rate fluctuations. These countries will be in the worst of worlds: they will have *de facto* rigid exchange rates and high interest rates. Reinhart (2000) has aptly summarized the “fear to float” view:

Countries that say that they allow their exchange rate to float mostly do not; there seems to be an epidemic case of “fear of floating.” Relative to more committed floaters . . . exchange rate volatility is quite low . . . [T]his low relative-exchange rate volatility is the deliberate result of policy actions to stabilize the exchange rate . . . .” (p. 65)

After analyzing the behavior of exchange rates, international reserves and nominal interest rate volatility, Reinhart (2000) concludes that emerging markets usually considered to be floaters—Bolivia, India and Mexico—are subject to the fear-of-floating syndrome. She goes on to argue that, under these circumstances, “lack of credibility remains a serious problem,” and that the only way to avoid it may be “full dollarization.” (p. 69).<sup>22</sup>

In a recent paper, [Levy Yeyati and Sturzenegger \(2000\)](#) follow an approach similar to that proposed by [Reinhart \(2000\)](#) in analyzing exchange rate policy in emerging economies. They use data on the volatility of international reserves, of exchange rates, and of exchange rate changes for 99 countries during the period 1990–1998 to ascertain the “true” exchange rate regime. Their analysis begins with the well-known fact that the system used by the IMF tends to misclassify countries. The authors conduct a series of cluster analysis exercises to classify countries into five categories: (1) fixed; (2) dirty float/crawling peg; (3) dirty float; (4) float; and (5) inconclusive. The results tend to contradict the “fear of floating” hypothesis. Indeed, Levy Yeyati and Sturzenegger find that 273 out of a total of 955 cases are floaters. This means that a number of countries are wrongly classified by the IMF. In 1998, for example, 12 countries classified by the Fund as floaters did not really float. There were also some fixers who did not fix.<sup>23</sup>

The emerging countries who, according to Levy Yeyati and Sturzenegger, had floating regimes during 1997–1998 (the last 2 years of their sample) include Chile, Colombia, Ghana, India, and South Africa. A particularly important case is Mexico, a country whose authorities have claimed to have a floating rate since the collapse of 1994. The Levy Yeyati and Sturzenegger analysis concurs that, after a transitional period following the crisis, Mexico’s currency has floated freely since 1997. During 1995, Mexico had a dirty float/crawling peg regime, which evolved into a dirty float in 1996, and then to the free float. This means that Mexico’s experience can be used as an illustration of one way in which a floating regime might work in an emerging country.

#### 4.1. Volatility and external disturbances

Detailed studies of (nominal) exchange rate volatility in emerging countries provide no support for the claim that these have been excessively volatile or “abnormally” stable. For example, [Edwards and Savastano \(1999\)](#) find for Mexico that the peso-dollar rate was as volatile as other currencies during 1997. In 1998, its degree of volatility increased significantly, but was lower than the yen/dollar rate. In 1999, volatility declined, and the peso was once again in the middle of the pack. The overall conclusion is that Mexico does not appear to be different, in terms of volatility, from other floaters.

In a recent paper, [Edwards and Levy Yeyati \(2002\)](#) use the new regime classification to investigate whether floating exchange rates act as effective shock absorbers and, thus, help countries deal with external disturbances. They use panel data to analyze the way in which terms of trade shocks impact real GDP growth. Their results indicate that countries with (genuine) flexible exchange rates are less affected by terms of trade disturbances, and tend to grow faster than countries with rigid or semi-rigid exchange rate regimes.

#### 4.2. Monetary policy, feedback rules, intervention and “fear of floating”

The “fear of floating” critique implicitly assumes that the optimal policy for emerging countries is a clean float, without any type of government intervention. By intervening in the foreign exchange market, authorities are seen as pursuing a sub-optimal course of action and as introducing destabilizing forces. This, however, need not be the case. Indeed, it is perfectly

possible that the optimal policy, that is, the policy that minimizes a well-defined loss function is one where the central bank intervenes from time to time.

From a technical point of view, this discussion may be framed in terms of the Taylor rule for small open economies. Taylor himself has posed the problem as follows (2001, p. 263): “How should the instruments of monetary policy (the interest rate or a monetary aggregate) react to the exchange rate?” In order to address this question more formally, consider the following equation (Taylor, 2001):

$$r_t = f\pi_t + gy_t + h_0e_t + h_1e_{t-1}, \quad (3)$$

where  $r_t$  is the short-term interest rate used by the central bank as a policy tool,  $\pi_t$  the deviation of the rate of inflation from its target level—possibly 0,  $y_t$  the deviation of real GDP from potential real GDP, and  $e_t$  is the log of the real exchange rate in year  $t$ .<sup>24</sup>

Traditional analyses have assumed that the central bank should ignore open economy considerations in the conduct of monetary policy; that is,  $h_0 = h_1 = 0$ . It is conceivable, however, that in a small open economy the optimal monetary policy rule, that is, the policy that maximizes the authorities’ objective function, is one where both  $h_0$  and  $h_1$  are different from 0.<sup>25</sup> If this were the case, exchange rate developments would play a direct role in the formulation of monetary policy under inflation targeting.

If the optimal policy calls for intervention, that is, for  $h_0$  and  $h_1$  to differ from 0, a casual observer may conclude that authorities are subject to “fear of floating.” This, however, would be an incorrect inference, as the country would be practicing “optimal floatation.”

At this point, the profession seems to be somewhat divided on whether  $h_0$  and  $h_1$  should be different from 0. For example, Taylor (2001) has expressed some skepticism on the merits of adding the exchange rate into the interest-rate equation; he argues that the exchange rate already plays an *indirect* role through its effect on  $\pi_t$  and  $y_t$ . Ball (1999), Obstfeld and Rogoff (1995) and Svensson (2000), on the other hand, have argued that adding the exchange rate as an additional variable will result in more stable macroeconomic outcomes. According to a simulation exercise undertaken by Svensson (2000), the optimal values of the exchange rate coefficients are  $h_0 = -0.45$  and  $h_1 = 0.45$ . Ball (1999) suggests that macroeconomic instability will be reduced if  $h_0 = -0.37$  and  $h_1 = 0.17$ . In a recent study, Ades (2002) has estimated a number of Taylor rules for emerging countries, and has concluded that the majority of them appear to pay some attention to the exchange rate when conducting monetary policy. Although these issues are still under investigation, it is clear that not all policy reactions to exchange rate movements are sub-optimal, or deserve to be labeled as “fear of floating.”

The preceding discussion has focused on “nonsterilized” intervention, where the authorities alter the course of monetary policy in response to exchange rate movements. A somewhat different question—and possibly a more important one from a policy perspective—is whether it is optimal for the authorities to engage in “sterilized intervention.” Goldfajn and Silveira (2002) have recently addressed this issue. The point of departure is the simple proposition that in the absence of externalities it is difficult to justify government interventions. They then build a general equilibrium model in which debtors and creditors have different views of the world. Specifically, debtors are more pessimistic than creditors. Heterogeneous beliefs generate “congestion” effects which lead the private sector to under-hedge its foreign currency exposure. In this case—and under the assumption of an overly pessimistic foreign

sector—government intervention to smooth exchange rate risk may be Pareto-improving. Whether these results can be generalized will require additional research.

## 5. Concluding remarks

The recurrence of currency crises during the last few years has prompted analysts and academics to reconsider the traditional wisdom regarding exchange rate policy. An important development has been the so-called “two-corners” solution, according to which emerging nations should avoid intermediate exchange rate regimes. They should either opt for a floating exchange rate or for a hard peg such as a currency boards or strict dollarization.

For many years, Argentina was considered to exemplify the merits of super-fixed exchange rate regimes. The abandonment of the currency board in early 2002, and the massive collapse of the Argentine economy, have opened a host of questions about exchange rate regimes in developing countries. While some observers conclude that super-fixed regimes are highly inflexible and inhibit adjustment, others argue that “true” super-fixity—that is, dollarization—is the only viable regime for emerging economies. Recent discussions have also considered the feasibility of genuine floating rates in countries with underdeveloped capital markets.

In this paper, I have analyzed some of the most important issues that have been at the center of the exchange rate debate. I have reviewed the experience with strict dollarization, and I have discussed problems related with “fear of floating.” I argue that economic performance under dollarization has been mixed: while inflation has been lower in dollarized countries than in countries with a currency of their own, growth has been significantly lower. Proponents of the “fear of floating” argue that emerging countries cannot have a genuinely floating regime, because the authorities systematically intervene in the foreign exchange market and thereby create highly unstable economic environments. I argue that in many cases it is optimal for these countries to react to exchange rate developments. Rather than “fear of floating,” it is “optimal floatation.”

## Notes

1. See *La Nación*, April 6, 2001.
2. Default, or partial default, was supported by a number of U.S. economists, including Charles Calomiris, Allan Meltzer, and Adam Lerrick. This view was also supported by a number of Argentine politicians both from the opposition and the main government party. Dollarization was supported by a group of American academics, by the financial page of *The Wall Street Journal*, by former president Carlos Menem and by a group of Peronist economists. Pesification followed by indexation and a floating exchange rate was supported by the editorial page of the *Financial Times* and by former IDB Chief Economist Hausmann.
3. At the time of this writing, however, elections had been moved forward to March 2002.
4. Most computations of the extent of overvaluation were in the range of 30–45%.
5. See [Lipton and Sachs \(1990\)](#) and [Edwards \(1992\)](#).
6. In theory, increasing the demand for money is an alternative way of solving the disequilibrium. This, however, is not likely to happen in Argentina anytime soon.

7. In what follows, I concentrate on the initial—that is early 2002—monetary pressures. The changing rules on de-dollarization result in some changes in the magnitudes involved. The final effect, however, is similar to what I report in this section.
8. In deriving Eqs. (1) and (2), I used the following expression for inflation:  $\pi = b\pi_N + (1 - b)\delta$ , where  $\pi_N$  is nontradables inflation, and  $\delta$  is the rate of nominal devaluation. I also used the following “pass-through” equation:  $\pi_N = a\delta$ .
9. In mid-2001 the ratio of broad money to GDP stood at approximately 40%.
10. Hanke and Schuler (1994, p. 28), arguably two of the most ardent supporters of currency boards, wrote: “Because a CB [currency board] cannot finance budget deficits . . . , the CB establishes an implicit low-inflation fiscal constitution . . .”
11. See Hochreiter, Schmidt-Hebbel, and Winckler (2002), for a discussion along these lines.
12. Of course, the overvaluation lesson is an important one from previous Latin American crises, including Chile’s crisis in the 1970s and the Mexican crisis of 1994.
13. See Edwards and Edwards (1991).
14. A standard criticism of hard pegs—currency boards and dollarization—is that the country is left without a lender of last resort. Supporters of super-fixed regimes respond that to the extent that the banking system is dominated by top-of-the-line foreign banks, a run on deposits would be unthinkable. Argentina proved that this is certainly not the case.
15. Kurt Schuler, the author of some of the most serious work on currency boards, included Argentina in his “team of currency boards,” in a public wager that he posted on the Internet.
16. Bogetic (2000, p. 193) has claimed that “Panama’s sovereign spreads have been consistently lower than in other Latin American countries.” As Edwards (2001) shows this is not so.
17. El Salvador, a country that dollarized recently, will eventually provide an interesting case study that will allow us to learn more about the effects of dollarization on interest rate behavior, the cost of capital and other key macroeconomic variables.
18. When alternative 5-year averages were used, there were no significant changes in the results.
19. If we estimate the equation above using all non-treated observations, the selection bias is given by:

$$B(x) = E\left(\frac{u_0}{x}, D = 1\right) - E\left(\frac{u_0}{x}, D = 0\right).$$

20. In order to guarantee that all treated agents have such a counterpart in the population (not necessarily in the sample), we also need to assume that  $0 < \text{Prob}(D = 1/x) < 1$ .
21. This averaged version is given by:

$$M(S) = \frac{\int_S E((y_1 - y_0)/x, D = 1) dF(x/D = 1)}{\int_S dF(x/D = 1)},$$

where  $S$  is a subset of the support of  $x$  given  $D = 1$ .

22. See also Calvo and Reinhart (2002).
23. See also the recent paper by Reinhart and Rogoff (2002).
24. In this formulation, an increase in  $e$  denotes a real exchange rate appreciation.
25. Note, if  $h_0 < 0$  and  $h_1 = -h_0$ , then the rule implies that monetary policy should react to changes in the (real) exchange rate. The formulation in Eq. (3) does not imply, even when  $h_0$  and  $h_1$  are different from 0, that the monetary authorities should defend a certain level of the exchange rate.

## Acknowledgments

This is a revised version of the Keynote Speech I delivered at the conference “Monetary Union: Theory, EMU Experience and Prospects for Latin America” organized by the University of Vienna, the Central Bank of Austria and the Central Bank of Chile, held in Vienna, May 2002. Some of the ideas presented here draw from my previous work on exchange rates and financial crises. I thank Edi Hochreiter and Klaus Schmidt-Hebbel for encouragement, and my co-author Igal Magendzo for stimulating discussions. I also thank the editor of the journal Sven Arndt for his comments and suggestions. As always I am grateful to Ed Leamer for his willingness to listen and for his comments.

## References

- Ades, A. (2002, July). Taylor rules in emerging markets. *Goldman Sachs Emerging Market Strategy*, 2, 12.
- Ball, L. (1999). Policy rules for open economies. In J. B. Taylor (Ed.), *Monetary policy rules*. Chicago: University of Chicago Press.
- Blundell, R. A., & Costa Dias, M. (2000). Evaluation methods for non-experimental data. *Fiscal Studies*, 21, 427–468.
- Bogetic, Z. (2000). Official dollarization: Current experiences and issues. *Cato Journal*, 20(2), 179–213.
- Calvo, G. A. (1999). *Fixed versus flexible exchange rates. Preliminaries of a turn-of-millennium rematch*. Mimeo, University of Maryland.
- Calvo, G. A., & Reinhart, C. (2002). Fear of floating. *Quarterly Journal of Economics*, 117(2), 379–408.
- Edwards, S. (1992). Stabilization and liberalization policies for economies in transition. In C. Clague & G. Rauser (Eds.), *The emergence of market economies in Eastern Europe*. Oxford: Blackwell Publishers.
- Edwards, S. (2001). Dollarization: Myths and realities. *Journal of Policy Modeling*, 23(3), 249–265.
- Edwards, S., & Edwards, A. C. (1991). *Monetarism and liberalization: The Chilean experiment*. Chicago: University of Chicago Press.
- Edwards, S., & Levy Yeyati, E. (2002). *Flexible exchange rates as shock absorbers: An empirical investigation*. UCLA Working Paper.
- Edwards, S., & Magendzo, I. I. (2002). *Dollarization, inflation and growth*. NBER Working Paper, No. 8671.
- Edwards, S., & Savastano, M. A. (1999). *Exchange rates in emerging economies: What do we know? What do we need to know?* NBER Working Paper, No. W7228.
- Eichengreen, B., Masson, P., Savastano, M., & Sharma, S. (1999). *Transition strategies and nominal anchors on the road to greater exchange-rate flexibility*. Essays in International Finance, No. 213, Princeton University Press.
- Engel, C., & Rose, A. K. (2002). Currency unions and international integration. *Journal of Money Credit and Banking*, 34(2), 518–541.
- Fan, J. (1992). Design-adaptive nonparametric regression (in theory and methods) *Journal of the American Statistical Association*, 87(420), 998–1004.

- Fischer, S. (2001). Exchange rate regimes: Is the bipolar view correct? *Journal of Economic Perspectives*, 15(2), 3–24.
- Frankel, J., & Rose, A. K. (2002). An estimate of the effect of common currencies on trade and income. *Quarterly Journal of Economics*, 117(2), 437–466.
- Goldfajn, I., & Silveira, M. A. (2002). Should government smooth exchange rate risk? *Journal of Development Economics* (forthcoming).
- Hanke, S. H., & Schuler, K. (1994). *Currency boards for developing countries*. Sector Study No. 9, ICEG (San Francisco).
- Hochreiter, E., Schmidt-Hebbel, K., & Winckler, G. (2002, April). *Monetary Unions: European lessons, Latin American prospects*. Presented at the Vienna Conference on Currency Unions.
- Levy Yeyati, E., & Sturzenegger, F. (2000). *Classifying exchange rate regimes: Deeds versus words*. Working Paper 2, Universidad Torcuato Di Tella.
- Lipton, D., & Sachs, J. (1990). Creating a market economy in Eastern Europe. *Brookings Papers on Economic Activity*, 1, 75–147.
- Mussa, M. (2002). *Argentina: From triumph to tragedy*. Washington, DC: IIE.
- Obstfeld, M., & Rogoff, K. (1995, Fall). The mirage of fixed exchange rates. *Journal of Economic Perspectives*, 14(1), 121–144.
- Persson, T. (2001, April). *Currency unions and trade: How large is the treatment effect?* Washington, DC: IIE.
- Reinhart, C. (2000, May). The mirage of floating exchange rates. *American Economic Review*, 90(2), 65–70.
- Reinhart, C., & Rogoff, K. (2002). *The modern history of exchange rate arrangements: A reinterpretation*. NBER Working Paper, No. 8963.
- Rosenbaum, P. R., & Rubin, D. B. (1983). The central role of the propensity score in observational studies for causal effects. *Biometrika*, 70, 41–55.
- Summers, L. H. (2000, May). International financial crises: Causes, prevention and cures. *American Economic Association*, 90(2), 1–16.
- Svensson, L. (2000, February). Open-economy inflation targeting. *Journal of International Economics*, 50, 117–153.
- Taylor, J. (2001, May). The rules of exchange rates in monetary policy rules. *American Economic Review*, 91(2), 263–267.