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## Is adopting full dollarization the solution? Looking at the evidence

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DEPARTAMENTO DE ECONOMIA  
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TEXTO PARA DISCUSSÃO  
Nº. 416

**Is adopting Full Dollarization the solution?  
Looking at the evidence**

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# **Is adopting Full Dollarization the solution? Looking at the evidence<sup>\*</sup>**

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## **Abstract**

The paper discusses the advantages and disadvantages of the full dollarization option and offers a few stylized facts and conclusions regarding the effects of full dollarization. On one hand, a full-dollarized economy delivers an impressive inflation performance and may even reduce the impact of external confidence shocks, although not external real shocks. On the other hand, full dollarization does not guarantee fiscal discipline neither the elimination of currency risk precludes default risk or the high volatility of sovereign spreads. In addition, it is not clear whether the reduction in domestic interest rates is the consequence of full dollarization or the competitive internationalized banking system.

Keywords: Dollarization, Exchange Rate Regime

JEL Classification Numbers: F30, F41.

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## **I. INTRODUCTION**

Why should a country adopt a foreign currency as its legal tender? Leaving the trauma of losing its national symbol aside, what are the disadvantages and advantages of using other country's money? These questions are becoming more relevant as countries increasingly seek to renounce their own currency and adopt an international currency as its own. Recent examples include the European union countries adopting the Euro and several countries in Latin America either considering (as in Argentina) or outright adopting (Ecuador) the U.S. dollar as the legal tender.

The main issues are whether full dollarization generates sufficient gains in credibility to reduce domestic interest rates and spreads on sovereign external bonds; whether the gains in inflation offset the cost of losing seignorage and the ability to use monetary policy to offset external and internal shocks; whether full dollarization guarantees or at least promote fiscal discipline; and whether full dollarization improves the efficiency of financial markets allocating resources better than in other exchange regimes.

The paper analyzes these issues comparing different exchange regimes. First, the paper examines the data and provides a few stylized facts. Then the paper performs a VAR analysis on three Latin American countries – Argentina (currency board), Costa Rica (floating regime) and Panama (fully dollarized) – and evaluates the effect of both real and confidence external shocks on the domestic economies. The paper concludes that on one hand, a full-dollarized economy delivers an impressive inflation performance and may even reduce the impact of external confidence shocks, although not external real shocks. On the other hand, full dollarization does not guarantee fiscal discipline neither the elimination of currency risk precludes default risk or the high volatility of sovereign spreads. In addition, it is not clear whether the reduction in domestic interest rates is the consequence of full dollarization or the competitive internationalized banking system.

The paper is organized as follows. In the next section we discuss the main theoretical arguments about the advantages and disadvantages of the full dollarization option. In section III we take a brief look at the Latin American experience. In section IV we show the econometric evidence about the effects of external shocks on countries under different exchange rate regimes. Section V contains the conclusions of the paper.

## **II. FULL DOLLARIZATION IN THEORY**

One can divide the theoretical debate on the benefits and costs of full dollarization in three sequential blocks. The first block debates whether having a fixed parity to an international currency is relatively more advantageous than a more flexible regime. There is a vast literature on this issue, in particular in the context of the optimal currency area. Once the relative benefits and costs of a fixed exchange regime are laid down one can analyze which type of fixed regime is more appropriate, whether a simple parity or a more rigid regime, as for example a currency board. Finally, the third block analyzes the marginal benefits and costs that apply exclusively when a country decides to abandon currency and to adopt a hard currency. Here issues like renouncing completely the seignorage revenues are relevant.

## **A. Fixed versus Flexible**

The first decision level on evaluating full dollarization is whether a country should adopt a flexible or a fixed regime. The literature on this issue is vast. For example, the Optimal Currency Arrangement (OCA) literature has identified the pre-conditions for a country to join a monetary union.<sup>3</sup> In short, the OCA literature has argued that the more asymmetric the shocks are between the economies and the harder it is to an individual country to smooth the shock by other means than the exchange rate, the more costly it is to adopt a fixed exchange rate. This general rule entails investigating the size, openness, and correlation of the shocks to evaluate the impact of a given external shock and examining the labor mobility, price flexibility, the fiscal cyclical stabilizers and the degree of financial opening to evaluate the ability of a country to smooth the shock in a pegged regime.

Adopting a fixed exchange regime without the necessary pre-conditions may entail large costs. For example, if fiscal policy is not very counter-cyclical, financial openness is such that monetary policy is not independent, and the labor market is not very flexible, a pegged regime must adjust to external shocks through large fluctuations in output. The costs therefore could be measured by the volatility of GDP and employment. The benefits of the pegged regime would be to reduce transactions' costs and risks associated with a floating regime that discourage trade and investment and to provide a nominal anchor for monetary policy. The latter benefit has been more relevant for developing countries since many pegs have been used to help stabilize high and medium inflation economies.

More modern arguments in the flexible versus fixed debate include on the cost side the large costs of the recent exchange rate and financial crises. These costs include not only the large GDP drops that were termed the “sudden stops” (Dornbusch et. al. (1995), Calvo (1998)) as well as the costs associated with the bailout of the banking and corporate sectors. The modern debate adds to the benefit side supposedly larger fiscal discipline by the reduction to the resort to inflationary finance. Recent experiences (e.g. Brazil) show that this is not necessarily the case. Some argue that what is needed is a more credible peg, which is a debate regarding the optimal pegged regime (fixed versus currency board or full dollarization), a theme we explore in the next subsection. In any case, it is accepted that a pegged regime is a step in the direction of increasing the credibility of the stabilization efforts and that one can summarize the existing trade-off in the debate as a choice between flexibility and credibility.

## **B. Which Type of Fixed Regime is Preferable?**

The long list of speculative attacks and exchange rate crises in the last decade has led to the argument that simple fixed exchange rate regimes are no longer desirable, or even sustainable. The alternative to countries that would like to insist on fixed exchange parities would be to make more “credible” commitments, for example making the parity a constitutional amendment and defining the proportion of the domestic currency that would be covered by foreign exchange reserves, as in the currency board regime. Defenders of more “rigid” exchange regimes argue the origin of all the problems is the low credibility of simple fixed regimes because it is difficult to

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<sup>3</sup> See the volume edited by Blejer, Frenkel, Leiderman, Razin, and Cheney (1997).

believe that a country will maintain its currency fixed relative to another country's currency for an undetermined period of time.

The reason for this lack of credibility is sometimes associated with the appreciation of the real exchange rate (RER) that often occurs in fixed exchange regimes. Several studies show that the probability of large nominal corrections is correlated with a more appreciated RER.<sup>4</sup> A typical example occurs in exchange rate-based stabilizations where the RER tends to appreciate beyond justifiable movements in the fundamentals leading to a loss of competitiveness and a negative effect in the external accounts, leaving these countries extremely vulnerable to external shocks. In addition, growth falters after an initial boom and unemployment follows. It is at this point that the policy makers' credibility problems arise. What is the maximum unemployment rate that the society and the government are willing to tolerate to attain the objective of price stability? The answer depends on the cost of abandoning the regime.

It is the balance of costs and benefits of abandoning the peg in moments of distress that determines the credibility of the regime. The higher the cost the more credible the regime would seem. Therefore, the conclusion is that more rigid regimes, defined as the ones with higher exit costs, would tend to be more credible.<sup>5</sup> The irony is that for a given cost of abandoning the regime, sticking to the parity may not increase the credibility of the policy. In the words of Drazen and Masson (1994), "if there is persistence in unemployment, observing a tough policy in a given period may lower rather than raise the credibility of a no-devaluation pledge in subsequent periods".<sup>6</sup>

Governments would therefore try to "tie their hands" increasing ex-ante their exit cost by adopting a more rigid exchange regime. Of course, the cost of abandoning the regime is also partially determined by market forces and given by the history of the economy. An important example is the existence of an unofficial dollarized economy encouraged by the uncertainty caused by a history of high inflation rates. In this case the costs of abandoning the regime could be the return of the inflationary past. Another example is the currency mismatch in the balance sheets of banks and corporations encouraged by the implicit guarantee that a fixed exchange rate would last indefinitely. In these conditions, modifying the parity could generate a serious banking and corporate crisis.

One could think of actual fixed exchange regimes as having implicit escape clauses. Obstfeld (1997) argues that the existence of escape clauses of fixed regimes is destabilizing in the sense that it increases the uncertainty regarding the continuation of the fixed regime. One could generalize the argument to include several types of fixed exchange regime, each with a different

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<sup>4</sup> Klein and Marion (1997), using logit analysis and a sample consisting of Latin American and Caribbean experiences with pegs during the period from the late 1950s through the early 1990s, found evidence that more appreciated real exchange rates are associated with a higher likelihood of devaluation. Goldfajn and Valdés (1999) using a broader sample show that overvaluation leads to a higher probability of sharp nominal corrections.

<sup>5</sup> In fact, if policy makers do not want to make such a binding commitment, the flexible regime could be revealed more appropriate. Edwards and Savastano (1999) argue that this is an important reason explaining the developing countries' shift toward more flexible regimes.

<sup>6</sup> In a nice analogy Drazen and Masson (1994) argue that the credibility of a fasting diet diminishes as time goes by.

degree of escape clauses. Even currency boards and dollarized economies are in principle subject to regime changes and, therefore, have implicitly escape clauses. During the gold standard several countries had to reverse their currency boards and Liberia is at least one example where dollarization was reversed. The solution to the destabilizing feature of fixed regimes would be to reduce the escape clauses by adopting of a more “rigid” peg regime that reduces the exit options. Therefore, reducing the escape clauses is equivalent to increasing credibility, i.e., reducing the uncertainty that the regime would not be changed. Of course, the disadvantage of more credibility is losing the escape clauses or the ability to easily change regime if the costs are very high.

The disadvantage created by reducing the escape clauses could be very costly too. Krugman (1999a) argues that when one country adopts a currency board (and his argument is also valid in the case of full dollarization) it prevents itself from printing money to finance populist schemes, for example, but at the same time it is preventing itself from printing money when the costs of unemployment are very high.

The discussion above is not more than a new version of an old one: Credibility versus flexibility. Cooper (1999) provides an excellent review of the debate on the choice of the exchange rate regime. He concludes that, unfortunately, “after a quarter century of floating between the major currencies, exchange rate policy is still source of vexation, and the appropriate choice is by no means clear”. Maybe, the best thing to do is to claim, as Jeffrey Frankel (1999), that “no single currency regime is right for all countries or at all times”.

A consequence of implementing more rigid regimes like currency board or full dollarization is the end of the central bank's role as the lender of last resort of the economy. This fact would induce banks to seek for alternative contingent credits, particularly foreign funds, to replace partially the lender of last resort role. The necessity to seek for foreign funds gives a competitive edge to international banks over domestic banks, inducing a more international banking system. In this sense, liberalize the financial sector would be a necessary condition to a successful implementation of regimes as currency board or full dollarization.

One of the favorite arguments in favor of the adoption of a more rigid regime as currency board or full dollarization is the fiscal discipline that it may induce. Under this line of argument, the elimination of the possibility of printing money would limit the possibilities of financing fiscal deficits and would prompt more fiscal discipline. However, the resort to debt financing is available and governments may substitute fully money financing for higher public debts.

### **C. The Limit of a Fixed Exchange Regime: Full dollarization**

Once a very rigid peg regime was chosen based on the credibility versus flexibility trade-off, what determines whether one should choose a currency board or a full dollarization regime?

First, one could think of full dollarization as a regime with even more credibility at the costs of even less flexibility. Then, the argument in favor of a more credible fixed exchange rate regimes could be taken to the extreme in favor of full dollarization. The idea would be that pegs that are less than absolute are perhaps not viable in modern, globalized financial markets, with high mobility of capital and, for this reason, for some countries the only defense would be to abandon their own money and to adopt the U.S. dollar as legal tender.

One of the costs of choosing a full dollarization regime over a currency board is the loss of the seignorage revenues. Although the currency board regime cannot resort to money printing to finance deficits, the existing inflation and the growth of GDP induce a natural growth in money demand that still generates revenues for the government.

One of the main arguments in favor of full dollarization is that the elimination of currency risk will reduce both domestic interest rates and spreads on external bonds. Although it is plausible that the elimination of currency risk will somewhat reduce interest rates it is by no means certain. In principle, interest rates could be reflecting mostly default risks and the elimination of currency risk has little effect on the level of spreads and interest rates. Or it could be the case that, in the absence of exchange rate flexibility, the elimination of currency risk could actually increase the default risk (e.g. in a full-dollarized economy without price flexibility, a severe negative terms of trade shock could require such a large recession that policy makers may prefer to default on external obligations).

The identification of the effect of the elimination of currency risk is not trivial. Currency risk could be correlated with default risk. If the correlation is negative, the elimination of currency risk increases default risk. If the effect on the default risk is strong enough we could actually observe an overall increase in risk and an increase in interest rates, as we argued above. However, if the correlation is positive then the elimination of currency risk would have a beneficial indirect effect reducing also default risk (e.g. currency crises sometimes induce corporate and sovereign default).

The effect on the domestic interest rates can depend more on a higher degree of the liberalization of the financial system than on the full dollarization regime itself. However, it is difficult to separate the two effects. According to Berg and Borensztein (1999): “Another powerful but somewhat hypothetical argument for legal dollarization is that the change in monetary regime may contribute to raise the level of investor confidence and establish a firm basis for a sound financial sector, which would provide the basis for strong and steady economic growth”.

#### **D. Main Implications of the Theoretical Section:**

1. The absence of monetary and exchange policy in a dollarized economy may induce more volatility of GDP, provided fiscal policy is not very counter-cyclical, relative to more flexible exchange regime but not relative to other fixed exchange regimes.
2. The credibility gains associated with full dollarization induce lower average and variability of inflation.
3. Absence of currency risk should imply lower domestic interest rates but not necessarily lower spreads on foreign currency debt.
4. The absence of seignorage not necessarily induces more fiscal discipline.
5. The absence of a lender of last resort induces banks to seek for alternative contingent funds. This gives a competitive edge to international banks over domestic banks inducing a more international banking system.
6. The use of a hard currency may increase the efficiency of financial markets creating long run markets and allocating resources better than in other exchange regimes.



7. There is no presumption on the relative effect of external shocks on a full-dollarized economy. On one hand the flexibility to use exchange and monetary policy is limited. On the other hand, confidence shocks may have a smaller effect on full-dollarized economies.

### III. FULL DOLLARIZATION: THE EVIDENCE

The objective in this section is to analyze if the prescriptions of the theory are consistent with the facts. We will analyze and comment the evidence about the advantages and disadvantages of the different exchange rate regimes and, simultaneously, we will look at the Panamanian case to see if it is true that a regime of full dollarization performs better than any other exchange regime, as its defenders argue.

#### A. Do the facts correspond with the theory?

There is not a large set of cross section empirical evidence comparing the different exchange rate regimes. The reason is the absence of a good data set on exchange regimes. The available data set comes from the IMF's Exchange Arrangements and Restrictions publication which is known to report exchange regimes as defined by the reporting country, procedure that not always leads to a fair characterization of the regime.<sup>7</sup> Notwithstanding this shortcoming, using this available dataset, Ghosh, Gulde, Ostry, and Wolf (1997) finds results that provide reasonable confirmation of the predictions of the theory. First, the paper finds that countries with fixed exchange rate regimes enjoy lower average and volatility of inflation rates, which it associates with a higher degree of credibility of the authorities. Second, the paper finds that GDP volatility is higher under pegged regimes than under floating ones.

Table 1, borrowed from Berg and Borensztein (1999), shows the pattern of various exchange rate regimes regarding inflation and GDP volatility. Observe that, as expected, inflation is lower and GDP volatility is higher under fixed regimes than under more flexible regimes. In addition, GDP growth is lower in fixed regimes than in other pegged regimes. This conclusion is not consistent with the evidence in Ghosh, Gulde and Wolf (1998), where more rigid pegs (currency boards) have higher average growth rates (see Table 2). In the case of Panama--the unique full-dollarized Latin American economy--, Table 3 shows that its average growth since 1970 is not atypical compared with other Latin American countries.

Ghosh et al. (1998) found evidence of an inverse relationship between the degree of rigidity of the exchange rate regime and inflation rates. In addition, Ghosh et al. found that currency board countries have fiscal deficits that are lower than deficits under any other exchange rate regime. This result would support the argument, frequently used by defenders of "more fixed" exchange rates regimes, that a higher degree of rigidity imposes more discipline in the fiscal authorities. We will return to this point below.

Since Latin American countries have experienced almost all types of exchange rate regimes, it is interesting to look at their macroeconomic performance (see Table 3). We observe

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<sup>7</sup> As an example of the problems with the IMF's Exchange Arrangements and Restrictions classification, Calvo and Reinhart (2000) shows that countries that say they allow their exchange rate to float mostly do not. Levy-Yeyati and Sturzenegger (1999) offers an alternative *de facto* classification of exchange rate regimes based in cluster analysis.

that, on one hand, the performance of Panama in terms of inflation is clearly an exception in Latin America, either measuring by the average or volatility of inflation, and in terms of GDP growth average is not much lower than any other Latin American country and would have compared even better if we had restricted the sample to the last 18 years. On the other hand, GDP volatility is among the worst in Latin America, partly because of the large drop in GDP during the conflict with the U.S. in 1988-89. Fiscal performance is not overwhelming, only better than the worst Latin American performers as Mexico and Brazil.

This initial comparison already sheds light on important issues regarding full dollarization. We can summarize Panama's relative performance in four points. First, Panama's experience confirms that an exchange peg, with full dollarization being the extreme example, generates low and stable inflation. In this regard, confirming the result on currency boards, it seems that the extreme pegs deliver even better inflation performance. Second, this gain in inflation performance is done without compromising average GDP growth. However, Panama's experience does not show any gain in average growth either (contrary to evidence on currency boards). Third, Panama has a bit higher volatility in GDP growth that could be attributed to the lack of flexibility in monetary and exchange policy. Fourth, the absence of monetary financing did not preclude Panama from having large and persistent fiscal deficits, not better than the typical Latin American country (again this is at odds with the evidence on currency boards).

**Table 1: Developing Countries' Macroeconomic Performance, 1960-1995**  
(Deviations from average for all countries, in percent)

	Average for various exchange rate regimes		
	Pegged	Intermediate	Floating
Inflation			
Rate	-2.90	-0.10	3.80
Volatility	-1.74	0.53	1.67
Output			
GDP growth	0.00	0.70	0.50
GDP volatility	0.08	-0.80	-0.52
Employment volatility	0.05	0.01	-0.32

Sources: Berg and Borenstein (1999). For methodology and results for developing countries, see Ghosh et. al (1997).

Notes: Database is all developing countries with data from 1960 to 1995, classified by exchange rate regime.

**Table 2: Macroeconomic Performance Across Fixed Exchange Rate Regimes**

In percent, except Nobs	Nobs	Average $\pi$	Std. Dev. $\pi$	Average $\pi/(1 + \pi)$	Average Money Growth	Average Gov. Bal./GDP	Average GDP Growth
Currency Boards	115	5.6	2.6	5.0	11.9	-2.8	3.2
Pegged. Excl. Currency Boards	1576	19.0	10.1	8.5	23.0	-4.2	1.3

Source: Ghosh, Gulde, and Wolf (1998).

**Table 3: Macroeconomic Performance of Selected Latin American Countries  
1970 - 1998  
(in percent)**

Countries	Inflation		GDP Growth		Fiscal Deficit (% of GDP)
	Average	Volatility (s.d.)	Average	Volatility (s.d.)	
Argentina	46.79	31.50	2.3	5.1	3.7
Brazil	62.43	30.67	4.6	4.4	4.7
Chile	26.42	22.92	4.2	6.3	0.5
Costa Rica	14.20	9.06	4.2	3.5	3.0
Mexico	22.57	14.93	4.0	3.8	4.4
Panama	3.25	3.46	4.1	5.7	3.8
Peru	36.49	27.65	2.6	5.8	3.4

Source: IFS.

Notes: To avoid outliers, we calculated the average and volatility of the inflation using  $\pi' = \pi / 1 + \pi$ .

Fiscal Deficit is the public sector borrowing requirement of the Central Government.

## **B. Currency risk or credit risk?**

As mentioned in the theoretical section above, one of the main arguments of full dollarization' advocates is that a higher degree of exchange regime rigidity would imply a higher degree of credibility in the regime and it would allow a better access to the international capital markets. If it is correct to associate a "higher degree of rigidity" with "more credibility", and the latter with "lower risk", then we should observe that countries with more rigid exchange rate regimes should enjoy more credibility and, as a consequence of this, they should have access to international funds in better conditions (meaning lower interest rates) than countries with less rigid exchange regimes. Thus, countries with more credible exchange regimes should have, for example, better credit ratings than countries with flexible exchange regimes.

Table 4 shows the long term debt rating of some Latin American countries. We observe, for example, that Panama displays a much better rating compared for example to Brazil or Peru, but it is difficult to associate this exclusively to benefits of its completely rigid regime. Observe also that Costa Rica and Panama have similar ratings, despite the fact that the former has a floating exchange regime. This fact could be indicating that the exchange regime is not the unique determinant of the "reputation" of a country.

If currency risk were an important component of default risk, one would expect Panama to pay lower spreads on external bonds than other comparable Latin American countries. However, during most of 1998 Panama paid a higher spread on dollar denominated external bonds relative to Costa Rica. This difference increased as the Russian crisis spilled over into a Brazilian crisis. In October 1998, Panama was paying around 700 basis points more than the equivalent U.S. Treasury bond and 340 basis points more than Costa Rica. Therefore one would not necessarily conclude that overall dollarization in Latin America would necessarily reduce spreads across the board. (See Table 5)

Another way to analyze this issue is to look at the evolution of the spreads the countries paid during the recent crises. One would expect, first, that a country with a more rigid regime (implying more credibility) should pay lower spread and, second, that the evolution of this spread

should not be affected by the crises, since the exchange regime would isolate the country from these external problems. Figure 1 shows the J. P. Morgan' Emerging Markets Bond Index Plus (EMBI<sup>+</sup>) for Argentina and Panama. Here we compare spreads paid by Argentina, a dollarized economy under a currency board and Panama under a fully dollarized regime. Observe that both are strongly influenced by the crises (Asian, Russian and Brazilian). The Russian crisis seems to be the most harmful, followed by the Asian crisis. The Russian crisis and its effect on Brazil seem to affect Argentina more than Panama. In general one cannot identify substantial difference in the behavior of spreads of both Panama and Argentina. This would indicate that most of the movement in spreads can be identified as movements in the perception of risk across Latin America, with the different currency regimes having little influence on its behavior (other countries as Brazil and Mexico follow the same pattern).<sup>8</sup> In other words, the exchange regime could not be a signal strong enough to make a country to appear different to the eyes of international investors.

Adopting a full dollarization regime does not necessarily reduce spreads on foreign debt bonds neither it guarantees automatic access to international markets. At the beginning of March 1999, the government of Panama tried to obtain funds through a bond issue in international markets but the operation was suspended because of the poor market conditions existing at that time (nonetheless, later on Panama obtained success with a US\$500 millions 30-year bond issue at a premium of “only” 405 basis points).

**Table 4: Long Term Debt Ratings**

	Foreign Currency		Local Currency	
	Moody's	S&P	Moody's	S&P
Argentina	Ba3	BB	Ba3	BBB-
Brazil	B2	B+	Caa1	BB-
Chile	Baa1	A-	NR	AA
Costa Rica	Ba1	BB	Ba1	BB+
Panama	Ba1	BB+	NR	BB+
Peru	Ba3	BB	Baa3	BBB-

Source: Bloomberg.

Notes:

Moody's: Baa1 > Baa3 > Ba1 > Ba3 > B2 > Caa1.

S&P: AA > A- > BBB- > BB+ > BB > BB- > B+.

NR: No rating.

**Table 5: External Bond Spread  
(Basis points)**

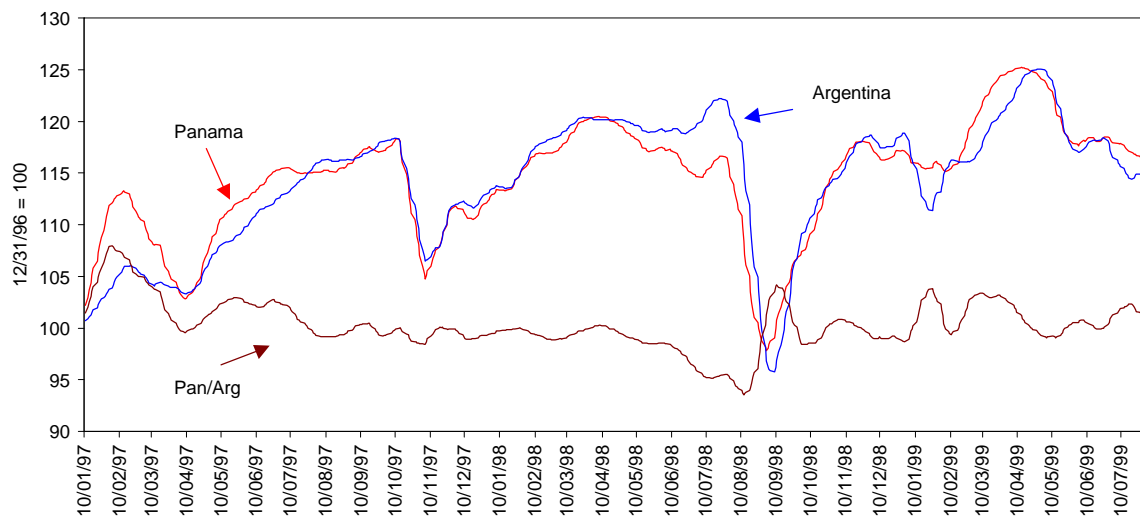
Countries	05/22/98	07/02/98	08/13/98	10/08/98
Panama	236.4	296.3	341.9	699.8
Costa Rica	212.5	228,5	260.1	422.6

Source: Bloomberg.

Notes: For both countries we used a foreign bond issued in US dollars. The Panamanian bond maturity is 2002 and the Costarican bond maturity is 2003.

<sup>8</sup> Berg and Borensztein (1999) compares Argentine and Panamanian Brady Bonds spreads and concludes that much of the Argentina's spread cannot be attributed to currency risk. The evolution of the J.P. Morgan EMBI<sup>+</sup> series seems to reinforce this argument.

**Figure 1: Panama and Argentina J.P. Morgan EMBI+ 1997-99  
(15-days centered moving average)**



Source: JPMorgan

### C. Fiscal Discipline?

One of the favorite arguments in favor of the adoption of full dollarization is the fiscal discipline that it may induce. Under this line of argument, the elimination of the possibility of printing money and the absence of seignorage revenues would limit the possibilities of financing fiscal deficits and would prompt more fiscal discipline.

However, Tornell and Velasco (1995) shows that fixed exchange rates do not necessarily provide more fiscal discipline than do flexible rates. The main result of this paper is that "fixed rates induce more fiscal discipline than flexible rates only when fiscal authorities are sufficiently patient, so that future costs have enough deterrent power".<sup>9</sup> This does not seem to be the case of Panama. Deficits are the rule more than the exception in Panama. Between 1970 and 1998 the fiscal deficit averaged 3,8 percent of GDP (See Table 3 above). Without the possibility to print money, a full-dollarized country as Panama should finance its deficits with debt, mainly foreign debt, as actually occurred. As the problems of Panama were not resolved, the solution was to resort to the IMF' support. Finally, when the situation became unsustainable, Panama restructured its foreign debt.<sup>10</sup> In short, the full dollarization regime was not able to generate fiscal discipline in Panama. Again, we could think fiscal discipline more as a necessary condition than as a natural consequence of a successful full dollarization regime, but it is also true for all the other types of pegged regimes.

<sup>9</sup> Tornell and Velasco (1995), pp. 761. In Tornell and Velasco's framework, "patient" can be interpreted as "worried with the future". In other words, fixed regimes could fail to provide more fiscal discipline because they could allow the fiscal authorities to hide or postpone the costs generated by their lack of discipline. Sun (1999) develops a dynamic general equilibrium version of the Tornell and Velasco's model with similar results.

<sup>10</sup> Edwards (1999) argues that Panama did not have incentive to improve his fiscal performance because its authorities knew that the IMF was there, ready to help them.

#### **D. Domestic Interest Rates, the Banking Sector, and the Absence of a Lender of Last Resort**

Full dollarization is also assumed to reduce domestic interest rates by eliminating currency risks. One more time the paper looks at the case of Panama. Interest rates in Panama are probably the lowest in Latin America. But is it due to the elimination of currency risk? Is full dollarization the explanation for these facts?

The low interest rates are at least partially determined by Panama's financial openness. Panama liberalized its banking system and freed interest rates in 1970 allowing the modernization of this sector and its integration with world financial markets. The reform implemented in Panama allowed banks to operate in offshore and local markets simultaneously and removed restrictions on the allocation of funds by the banks between domestic and foreign market. In addition, the government opened the banking industry to foreign participants with the desire to improve the efficiency in the allocation of resources and foster economic growth. The result was a substantial reduction in interest rates.

Defenders of the full dollarization option argue frequently that the low interest rates and the development of the financial system observed at Panama are consequences of its exchange rate regime. But, as mentioned by Hausmann and Eichengreen (1999, pp. 31-32), it may not be correct to attribute these two facts to the Panamanian exchange rate regime. In the words of these authors: "A problem with this attribution is that the growth of Panama's financial sector (...) did not coincide with dollarization but post-dated it by 60 years. The growth of the Panamanian banking sector only began following the adoption of Law No. 18 of 1959, which enhanced secrecy and opened the way for numbered bank accounts. [...] This made Panama attractive as an offshore banking center. The irony then, is that the financial depth and stability of the Panamanian financial system is not associated with the transparency and good practices that dollarization is supposed to bring, but precisely with the country's lack of transparency".

Finally, the absence of a central bank in a fully dollarized economy implies that there is no lender of last resort in the economy. In the case of Panama, as well as in Argentina, the absence of a lender of last resort induced banks to seek for alternative contingent credits, particularly foreign funds, to replace partially the lender of last resort role. The necessity to seek for foreign funds gives a competitive edge to international banks over domestic banks, inducing a more international banking system. In December 1998 the foreign participation in the Panamanian banking system was approximately 90 percent, measured in terms of assets and net worth. The overall participation of foreign banks amounts to approximately 55 percent.

#### **IV. ECONOMETRIC EXERCISE: THE EFFECTS OF EXTERNAL SHOCKS**

In this section we analyze the effects of external shocks on growth, interest rates and the RER in Panama, Costa Rica and Argentina. It is interesting to carry on the analysis on a comparative basis, in order to gauge the effects of an external shock on a dollarized economy relative to economies with other exchange rate regimes. We have chosen Costa Rica and Argentina as the control countries because the former is a small Latin American economy with a floating exchange regime and the later has a currency board regime, the closest to a full dollarization regime.

Formally, the paper estimates a Vector Autoregression (VAR) model for each country and analyzes the effect of an external shock on domestic variables and the resulting dynamics. The domestic variables include the real exchange rate, domestic interest rate, and the level of activity. To represent the external factors we have used alternatively the J. P. Morgan' Latin Emerging Market Bond Index Plus (EMBI<sup>+</sup>), representing the confidence in Latin American countries and the costs of external funds,<sup>11</sup> and an index of industrial production of the industrial countries, representing the world's level of activity. Because of data limitations the exercise covers the period 1994 to 1999 in a monthly frequency.

The ordering of the variables include always the external variable (the J. P. Morgan' Latin Emerging Market Bond Index Plus-EMBI<sup>+</sup>- or the industrial countries' industrial production index) as preceding both the RER and the activity level. The RER was assumed preceding the activity level variable but the results were robust to changes in the ordering (the figures and tables shown below use the following order: external variable, RER and then activity level).

The real exchange rate series used here are the Real Effective Exchange rates (REER) from the International Monetary Fund (Information Notice System database). The industrial countries' industrial production index was taken from the IMF's International Financial Statistics. The level of activity series are the monthly series of industrial production for Argentina, the Monthly Economic Activity Index published by the *Dirección de Estadística y Censo* of Panama, and a monthly series based in quarterly GDP series for Costa Rica.<sup>12</sup> All variables are expressed in logs except interest rates.

## **A. The Effect of a Negative External Confidence Shock**

The figures below show the response of the level of activity and the real exchange rate to a negative shock in the Latin EMBI+ index, representing a negative confidence shock on Latin American countries.

### **Panama**

A negative confidence shock has a negative and significant effect on the real exchange rate (real depreciation). The effect on the level of activity is initially positive and insignificant, but five months after the shock we observe a negative and significant effect. In other words, a negative confidence shock generates a recession in Panama (see Figure 2)

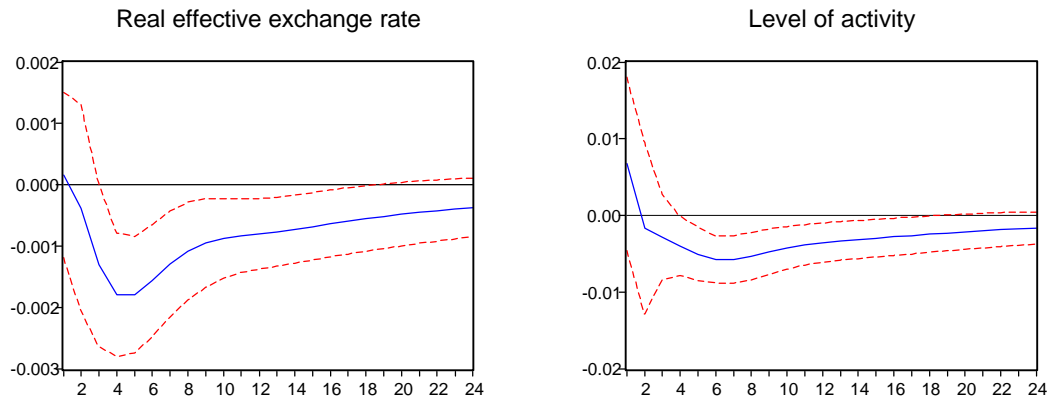
The variance decomposition of the forecast errors of the estimated VAR shows that after 24 months thirty-four percent of the variance of the real exchange rate is explained by the external confidence variable. In the case of the level of activity, the external confidence variable explains only 17 percent of the variance (Table 6).

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<sup>11</sup> The exercise was replicated using the federal funds rate as the external variable. It is available from the authors on request.

<sup>12</sup> The series for Panama starts in January 1995. For Costa Rica we used the *distrib.src* procedure of RATS to obtain the monthly series from quarterly data.

**Figure 2: Response of Panama to a negative Latin EMBI+ shock**



**Table 6: Variance Decomposition, Panama**

Real Exchange Rate:				
Period	Standard Error	EMBI <sup>+</sup>	Real Exchange Rate	Economic Activity
1	0.043721	0.121416	99.87858	0.000000
6	0.095298	22.34655	73.20348	4.449969
12	0.112384	29.85842	63.88347	6.258112
18	0.119382	32.80853	60.62932	6.562143
24	0.122386	34.01723	59.27944	6.703323

Economic Activity				
Period	Standard Error	EMBI <sup>+</sup>	Real Exchange Rate	Economic Activity
1	0.004563	3.072169	0.148170	96.77966
6	0.006930	7.652978	5.226561	87.12046
12	0.007450	13.96428	4.965100	81.07062
18	0.007648	16.17047	4.821566	79.00796
24	0.007735	17.13086	4.760561	78.10858

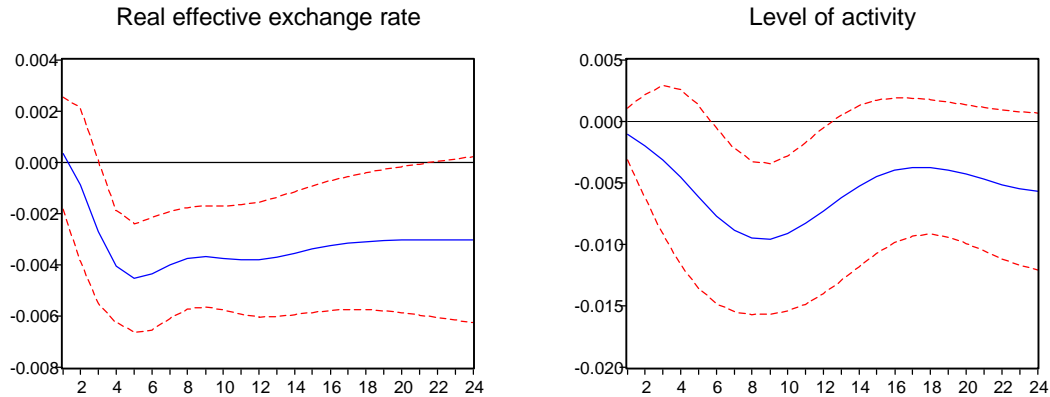
### Costa Rica:

In this case we have used data from the period 1994:01-1999:06. The results for Costa Rica show that a negative confidence shock has a strong effect on the real exchange rate. Figure 3 shows that the shock generates a strong real depreciation. The effect of the shock on the level of activity is negative and becomes statistically significant after six months, attaining its lower value nine months after the shock. One year later the effect becomes insignificant.

The variance decomposition of the forecast errors of the real effective exchange rate and the estimated monthly GDP series show that, in the first case, the Latin EMBI+ series explains more than fifty-eight percent of the variance in a 24-months horizon. In the case of the level of activity, the series Latin EMBI+ series explains more than 30 percent of the variance in a 24-months horizon (Table 7). These variances are larger than in Panama.



**Figure 3: Response of Costa Rica to a negative Latin EMBI+ shock**



**Table 7: Variance Decomposition, Costa Rica**

Real Exchange Rate:				
Period	Standard Error	EMBI <sup>+</sup>	Real Exchange Rate	Economic Activity
1	0.047318	0.160730	99.83927	0.000000
6	0.122291	26.36421	71.06209	2.573701
12	0.160113	44.47961	52.58600	2.934384
18	0.187989	53.39919	43.67360	2.927217
24	0.209052	58.58272	38.70104	2.716238

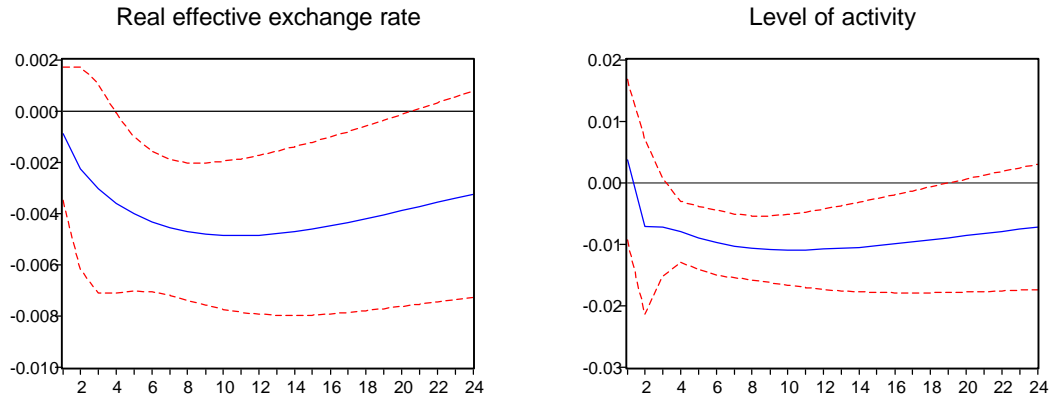
Economic Activity				
Period	Standard Error	EMBI <sup>+</sup>	Real Exchange Rate	Economic Activity
1	0.008662	1.506547	0.040876	98.45258
6	0.015621	8.447155	8.229046	83.32380
12	0.018425	25.81713	6.976569	67.20630
18	0.020255	27.86489	6.458307	65.67680
24	0.021634	30.45789	6.648489	62.89363

## Argentina:

Figure 4 shows the impulse-response graphs for Argentina estimated with a VAR including the Latin EMBI+, the real exchange rate and an index of industrial production in the period 1994:01-1999:06. Observe that a negative confidence shock has a significant impact on both real exchange rate and level of activity series. In other words, the negative confidence shocks generates a real depreciation and a recession. Both results were as expected.

The variance decomposition of the forecast error of the real exchange rate series shows that, after 24 months, thirty-eight percent of the variance is explained by the Latin EMBI+ series. In the case of the level of activity series the Latin EMBI+ series explains thirty-two percent and the real exchange rate series explains twenty-five percent of the variance (Table 8).

**Figure 4: Response of Argentina to a negative Latin EMBI+ shock**



**Table 8: Variance Decomposition, Argentina**

Real Exchange Rate:				
Period	Standard Error	EMBI <sup>+</sup>	Real Exchange Rate	Economic Activity
1	0.045105	0.792458	99.20754	0.000000
6	0.130612	13.22874	86.27524	0.496012
12	0.190385	31.45689	67.71139	0.831719
18	0.223148	37.50190	61.77723	0.720874
24	0.240270	38.04168	61.34600	0.612316

Economic Activity:				
Period	Standard Error	EMBI <sup>+</sup>	Real Exchange Rate	Economic Activity
1	0.009940	0.560508	5.307466	94.13203
6	0.021770	10.05138	11.39081	78.55781
12	0.025185	24.03217	11.88120	64.08663
18	0.029304	30.10064	18.95965	50.93971
24	0.032526	31.59138	25.19599	43.21263

## B. The Effect of a Negative External Real Shock

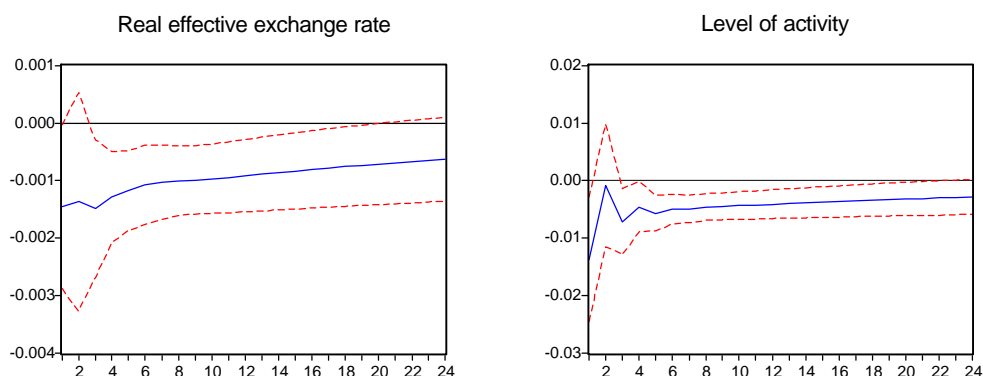
This section estimates the VAR models replacing the EMBI+ series for the industrial countries' industrial production index. The idea is to analyze the effect of a negative real shock (instead of a financial shock) on Panama, Costa Rica and Argentina. Figures 5-7 below show the responses of both the real exchange rate and the level of activity for each country.

### Panama:

A negative real shock on industrial countries generates, as expected, a real depreciation and a recession in Panama. The depreciation becomes statistically significant after the third month and remains significant for seventeen months. The recession also becomes significant after three months and lasts nineteen months (See Figure 5)

The variance decomposition shows that after 24 months thirty-one percent of the variance of the real exchange rate and twenty-nine percent of the variance of the level of activity are explained by the external variable (Table 9)

**Figure 5: Response of Panama to a negative real shock in Industrial Countries**



**Table 9: Variance Decomposition, Panama**

Real Exchange Rate				
Period	Standard Error	Industrial Countries	Real Exchange Rate	Economic Activity
1	0.005577	8.706003	91.29400	0.000000
6	0.010401	17.61085	76.94175	5.447402
12	0.013228	24.56638	69.58477	5.848851
18	0.014875	28.73996	65.06955	6.190491
24	0.015916	31.32330	62.27634	6.400361

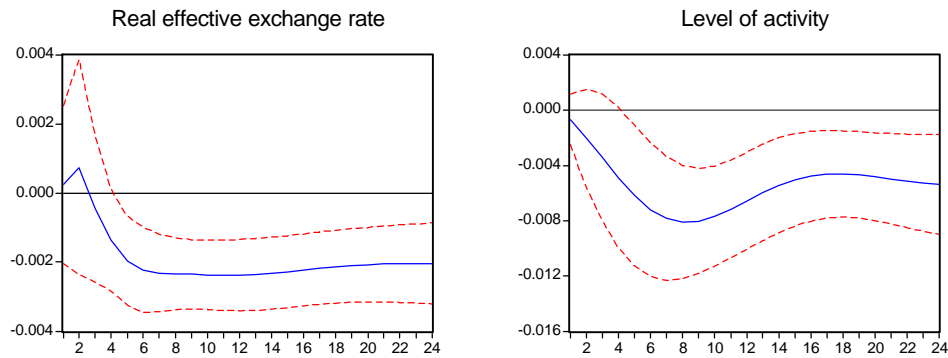
Economic Activity				
Period	Standard Error	Industrial Countries	Real Exchange Rate	Economic Activity
1	0.004932	13.03384	0.171464	86.79469
6	0.007690	19.05990	3.295870	77.64423
12	0.008113	24.26642	3.190026	72.54355
18	0.008393	27.43776	3.056819	69.50542
24	0.008580	29.45332	2.974488	67.57220

### Costa Rica:

A negative real shock in the industrial countries also provokes both a real depreciation and a recession in Costa Rica. The effects on Costa Rica seem to last longer than on Panama. Both real depreciation and recession remain significant after 24 months.

The variance decomposition shows that after 24 months the external variable explains twenty-nine percent of the variance of the real exchange rate and thirty-four percent of the level of activity variance. For the real exchange rate the proportion that is explained by the external variable is smaller in the case of Costa Rica than in the case of Panama. For the level of activity the proportion of the variance that is explained by the external variable is larger in Costa Rica than in Panama.

**Figure 6: Response of Costa Rica to a negative real shock in Industrial Countries**



**Table 10: Variance Decomposition, Costa Rica**

Real Exchange Rate				
Period	Standard Error	Industrial Countries	Real Exchange Rate	Economic Activity
1	0.006766	0.055044	99.94496	0.000000
6	0.013908	4.230179	94.86453	0.905293
12	0.019594	14.24593	82.42421	3.329864
18	0.023615	21.76496	75.17314	3.061902
24	0.026775	27.06418	69.94662	2.989199

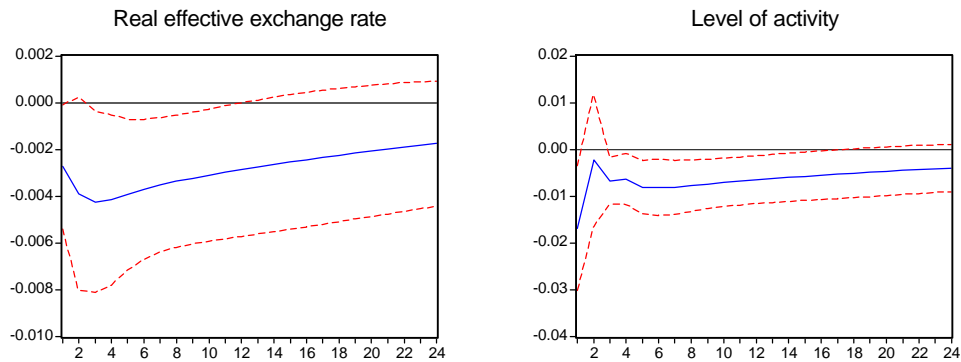
Economic Activity				
Period	Standard Error	Industrial Countries	Real Exchange Rate	Economic Activity
1	0.010693	0.617590	0.053107	99.32930
6	0.016514	9.125956	0.847742	90.02630
12	0.017753	24.72531	1.333429	73.94126
18	0.018611	29.51954	1.499522	68.98094
24	0.019306	33.73024	1.402571	64.86719

### Argentina:

In the case of Argentina the negative real shock in the industrial countries has also negatives effects on both Argentine real exchange rate and level of activity, but these effects seem to be shorter than in the cases of Panama and Costa Rica. The real depreciation becomes significant after three months and remains in this way during nine months. The recession begins to be statistically significant three months after the shock and lasts fourteen months.

The variance decomposition shows that after 24 months the external variable explains twenty-one percent of the variance of the real exchange rate and twenty percent of the variance of the level of activity. For both variables (real exchange rate and level of activity) the proportion of the variance explained by the real external variable is lower in Argentina than in Costa Rica and Panama.

**Figure 7: Response of Argentina to a negative real shock in Industrial Countries**



**Table 11: Variance Decomposition, Argentina**

Real Exchange Rate				
Period	Standard Error	Industrial Countries	Real Exchange Rate	Economic Activity
1	0.005826	6.999612	93.00039	0.000000
6	0.010098	12.74856	84.91073	2.340703
12	0.012457	16.83459	79.59655	3.568865
18	0.013699	19.47201	76.65064	3.877346
24	0.014403	21.11278	74.89653	3.990697

Economic Activity				
Period	Standard Error	Industrial Countries	Real Exchange Rate	Economic Activity
1	0.010299	10.38105	5.006202	84.61275
6	0.026085	11.86123	17.59437	70.54440
12	0.029570	15.92782	24.81283	59.25936
18	0.030775	18.40577	25.55210	56.04213
24	0.031316	19.91565	25.46791	54.61643

### C. Summary of Econometric Results and Comparative Analysis

Under the hypothesis that a negative shock in the J.P. Morgan Latin EMBI+ in fact represents an external negative confidence shock, the paper has analyzed the effects of a confidence shock on the real exchange rate, the domestic interest rates and the level of activity for Panama, Costa Rica and Argentina. There are two main results. First, as expected, a negative external confidence shock affects significantly the level of activity generating recessions in all the three countries. Since these countries maintain different exchange rates regimes, one may conclude that an "external confidence shock" has significant effects on Latin American countries' level of activity **independently** of the exchange rate regime.

There are, however, differences in the extent of the shocks. The variance decomposition analysis provides evidence that the external shocks in Panama explain a much smaller proportion of the overall variance in the activity level, about half of the proportion explained in Argentina and Costa Rica. This result occurs despite the fact that Panama is a very open economy and foreign interest rates translate fast into domestic interest rates. One explanation is, of course, that

the credibility gained in a dollarized economy may contribute to insulate the economy from adverse shocks. The problem is that we have seen that domestic interest rates react strongly to the external environment. Another explanation is the fact that Panama's activities are concentrated in services, which may fluctuate less with external factors or may have more automatic stabilizers.

Second, negative external confidence shocks provoke real depreciations in all the countries and, therefore, it seems that the direction and significance of the effect is independent of the exchange rate regime. However, as expected, the intensity of the shock differs across the countries. Costa Rica has a larger effect on the RER than both Argentina and Panama basically due to the floating exchange regime. Fixed exchange regimes minimize the effect the variability of the RER's. This does not mean that the price effects are negligible in Panama but that they are smaller than the exchange variations in Costa Rica. In fact, quite to the contrary, price movements could be substantial in Panama, as was Panama's deflation during the Asian crisis.

In our second exercise we have analyzed the effects of a negative real shock affecting the industrial countries on the real exchange rate and the level of activity in Panama, Costa Rica and Argentina. In contrast to the previous exercise, the external shocks seem to affect more the activity level in Panama and Costa Rica than in Argentina. This result contradicts the hypothesis that Panama's service economy is generally less affected by external shocks than the other economies and suggests that it is particularly financial shocks that have mild effects. Indeed, real shocks have strong effects on both real exchange rate and the level of activity in Panama.

Our two exercises seem to be parallel with the old literature about the choice between fixed and floating regimes. Remember that the usual macroeconomics textbook prescription is: if the source of shocks is nominal then the best choice is a pegged regime; but if the source of shocks is real then the best choice is a floating regime. In this case we could claim: If the source of shocks is nominal then the best choice is full dollarization, but if the source of shocks is real then the best choice could be a less-than-extreme pegged. Of course it is an over-simplification since the recent crises, with shocks through the capital account, contain both real and nominal components, making more difficult the choice of the exchange rate regime on that basis (Calvo and Reinhart (1999)). The evidence of the VAR impulses-responses and variance decomposition show that Panama performs better than Argentina and Costa Rica if the shock is nominal (a external confidence shock), but it does not repeat this performance if the shock is a real one (a real shock in industrial economies).

Of course, the econometric evidence showed above provides just a first approximation to the effects of external shocks on Latin American countries. The next step--and an objective of future research--is to analyze these effects estimating jointly the countries' responses. However, we think our results help to clarify the ideas about the properties of the different exchange rate regimes.

## V. CONCLUSIONS

The paper discusses the advantages and disadvantages of the full dollarization option. The paper offers a few stylized facts and conclusions regarding the effect of full dollarization. First, inflation performance in fully dollarized economies is impressive both in terms of its average and

volatility. Second, one should partly attribute the decline in domestic interest rates in these countries to other factors as the reform of the financial system that, at least in the case of Panama, both freed and opened the markets to foreign participation.

Third, full dollarization does not necessarily reduce spreads on foreign debt bonds neither it guarantees automatic access to international markets. Although Panama's spreads are relatively low compared to the average in Latin America, they are not lower than in Costa Rica. Moreover, Panama's external debt spreads are extremely correlated to other spreads, as for example, the Argentine. In essence full dollarization reduces currency risk but not necessarily default risk.

Fourth, the absence of inflationary finance does not necessarily induce more fiscal discipline. The fiscal performance of Panama has been poor and had led to very high public debt and even default on external obligations. Moreover, in the last 25 years Panama has had 13 IMF programs, more than any Latin American country since 1963.

Finally, in the empirical exercises, the external confidence shock in Panama explains a much smaller proportion of the overall variance of the activity level than in Argentina or Costa Rica. This could be interpreted as evidence that overall confidence shocks may have a smaller effect on more credible currency regimes. This interpretation is further supported by the fact that once confidence variables are replaced by real shocks, the level of activity of Panama reacts as strongly as in Costa Rica and stronger than in Argentina. These two results would suggest that adopting a more rigid regime could be useful to minimize the effects of confidence shocks, but not necessarily to reduce the effect of real shocks.

## REFERENCES

- BERG, ANDREW, AND EDUARDO BORENSZTEIN (1999). "Full dollarization". IMF Policy Discussion Paper (in preparation). Washington D.C.
- BLEJER, MARIO, FRENKEL, JACOB, LEIDERMAN, LEONARDO, ASSAF RAZIN, AND D.M. CHENEY (EDS.) (1997). *Optimum Currency Areas: New Analytical and Policy Developments*. International Monetary Fund. Washington D.C.
- CALVO, GUILLERMO (1998). "Capital Flows and Capital-Market Crises: The Simple Economics of Sudden Stops". *Journal of Applied Economics*, 1, pages 35-54.
- (1999a). "Argentina's Dollarization Project: A Primer". Available from <http://www.bsos.umd.edu/econ/ciecalvo>.
- (1999b). "On Dollarization". Available from <http://www.bsos.umd.edu/econ/ciecalvo>.
- (1999c). "Testimony on Full dollarization". Available from <http://www.bsos.umd.edu/econ/ciecalvo>.
- (1999d). "Fixed versus Flexible Exchange rates: Preliminaries of a Turn-of-Millennium Rematch". Available from <http://www.bsos.umd.edu/econ/ciecalvo>.
- , AND CARMEN REINHART (1999). "Capital Flows Reversals, the Exchange Rate Debate, and Dollarization". *Finance and Development*, September, pages 13-15.
- (2000). "Fear of Floating". Paper presented at the Universidad del Pacífico's Winter Camp in International Economics and Finance. Paracas, Peru, 12-15 January.
- COOPER, RICHARD N. (1999). "Exchange Rate Choices". Mimeo. Department of Economics, Harvard University.
- DORNBUSCH, RUDIGER, ILAN GOLDFAJN, AND RODRIGO VALDÉS (1995). "Currency Crises and Collapses". *Brookings Papers on Economic Activity*, 2, pages 219-270.
- DRAZEN, ALLAN, AND PAUL MASSON (1994). "Credibility of Policies versus Credibility of Policymakers". *Quarterly Journal of Economics*, 109, pages 735-754.
- EDWARDS, SEBASTIAN (1999). "Latin America at the End of the Century: More of the Same?". Mimeo. University of California at Los Angeles.
- , AND MIGUEL SAVASTANO (1999). "Exchange rates in emerging economies: What do we know? What do we need to know?". NBER Working Paper No. 7228.
- FRANKEL, JEFFREY (1999). "No Single Currency Regime is Right for All Countries or at All Times". NBER Working Paper No. 7338.
- GHOSH, ATISH, ANNE-MARIE GULDE, JONATHAN OSTRY AND HOLGER WOLF (1997). "Does nominal exchange rates regime matters?". NBER Working Paper No. 5874.
- GHOSH, ATISH, ANNE-MARIE GULDE, AND WOLGER WOLF (1998). "Currency boards: The ultimate fix?". IMF Working Paper No. 98/8.
- GOLDFAJN, ILAN, AND RODRIGO VALDÉS (1999). "The Aftermath of Appreciations". *Quarterly Journal of Economics*, 114, pages 229-262..
- HANKE, STEVE H., AND KURT SCHULER (1999). "A Dollarization Blueprint for Argentina". Foreign Policy Briefing No. 52. The Cato Institute. Washington D.C.
- HAUSMANN, RICARDO, AND BARRY EICHENGREEN (1999). "Exchange Rates and Financial Fragility". NBER Working Paper No. 7418.



- INTERNATIONAL MONETARY FUND (1999). "Panama: Recent Economic Developments". Staff Country Report No. 99/7. Washington D.C.
- KRUGMAN, PAUL (1999a). "Monomoney mania". Available from <http://www.slate.com>.
- (1999b). "Don't Laugh at Me, Argentina". Available at the site [www.slate.com](http://www.slate.com).
- LEVY YEYATI, EDUARDO, AND FEDERICO STURZENEGGER (1999). "Classifying Exchange Rate Regimes: Deeds vs. Words". Mimeo. Universidad Torcuato di Tella. Buenos Aires.
- MINISTERIO DE ECONOMÍA Y FINANZAS DE PANAMÁ (1999). "Informe Económico 1998". Panama.
- MISHKIN, FREDERIC (1999). "International experiences with different monetary policy regimes". *Journal of Monetary Economics*, 43, pages 579-605.
- MORENO-VILLALAZ, JUAN LUIS (1999). "Lessons from the Monetary Experience of Panama: A Dollar Economy with Financial Integration". *Cato Journal*, 18, pages 421-439.
- OBSTFELD, MAURICE (1994). "The logic of currency crises". NBER Working Paper No. 4640.
- (1997). "Destabilizing effects of exchange rate escape clauses". *Journal of International Economics*, 43, pages 61-77.
- SUN, YAN (1999). "Do Fixed Rates induce More Fiscal Discipline or Indiscipline?". Mimeo. Department of Economics, New York University.
- TORNELL, AARON, AND ANDRÉS VELASCO (1995). "Fiscal Discipline and the Choice of Exchange rate Regime". *European Economic Review*, 39, pages 759-770.