

Dollarization: A Primer

Eduardo Levy Yeyati and Federico Sturzenegger

Business School, Universidad Torcuato Di Tella

July 2001

1. INTRODUCTION

Recent turmoil in financial markets has revealed the inherent vulnerability of intermediate exchange rate regimes and conventional pegs to sudden aggregate shocks in a context of rapidly growing global financial integration. As a result, an increasing number of economists and policymakers has endorsed the idea that financially open economies are best served by more flexible regimes. Alternatively, many analysts have recently argued in favor of the relative merits of extreme exchange rate regimes or “hard pegs” that exhibit a stronger commitment to a fixed parity (as in the case of currency boards) or directly relinquish control over their own currency (as in the case of currency unions and dollarized economies), as opposed to intermediate arrangements and conventional (“soft”) pegs. At any rate, there seems to be a growing consensus that arrangements anywhere between floating regimes and hard pegs are not sustainable in the long run.

To some extent, this so-called bipolar view appears to be supported by the evidence, as witnessed the collapse of “soft” pegs in South East Asia and Latin America, on the one hand, and the swift move to monetary integration in Europe in the aftermath of the EMS crisis of 1992 and the recent adoption of the U.S. dollar as legal tender in Ecuador and El Salvador, on the other.¹ In addition, assuming a broader perspective, the fact reported by the IMF (1997) that the number of flexible exchange rate arrangements increased from 11 to 52 over the period 1976-1996, should be contrasted with the list of Eastern European economies waiting to join EMU, and some Latin American and African countries seriously considering a unilateral dollarization strategy.

While strong fixes, such as currency boards, are typically cited as examples of a fixed exchange rate regime with sufficient credibility to weather the storms of current international financial markets, the runs on the Argentinean peso in 1995 and 2001, and on the Hong Kong dollar in 1997 showed that even a currency board may be insufficient to ensure credibility. As a result, a discussion has gained momentum on the potential beneficial effects of moving forward towards full (de jure) dollarization, understood here as the adoption of a (presumably stronger) foreign currency as sole legal tender.² The recent adoption of the US dollar in Ecuador is a significant example in which the credibility factor was crucial, and where renouncing to the national currency was seen as the only way to commit to more reasonable macroeconomic policies. On the other hand, the case of El Salvador illustrates that the regime switch may arise as a consequence of a long debate on its benefits and pitfalls (including trade gains unrelated with credibility concerns), as opposed to a last resort option due to a terminal crisis.

While the present debate has been triggered by “credibility” issues, dollarization has received support from other quarters as well. On the one hand, there is increasing evidence that the use of a common currency may induce a substantive increase in trade, which in

¹ Other Latin American countries, including Guatemala and Nicaragua, are seriously considering following the Salvadorean example.

² In what follows, the terms full dollarization and de jure dollarization are used interchangeably. Similarly, as is customary in the literature, the term “dollarization” is applied here to the use of any foreign currency, noting that in many cases the US dollar is not the foreign currency of choice.

turn may fuel economic growth; on the other, the role of foreign currency-denominated liabilities in the financial sector and the associated currency imbalance have also hinted at the potentially big gains from the full elimination of currency risk. Yet the debate is far from settled. For example, the successful move to full floating regimes in Mexico, Chile and (more debatably) Brazil, has added arguments to those in favor of a more flexible arrangement that may eventually work as a shock absorber in the event of external shocks.

The purpose of this piece (as well as that of the volume in general) is not to settle this complex debate that, as many of the papers in this volume note, hinges on country specific characteristics and, as such, can only be resolved, if ever, once sufficient dollarization experiences are in place to conduct a thorough comparison. Rather, here we intend to provide an impartial survey of the main issues associated with dollarization, and their most relevant empirical and analytical underpinnings, to contribute a framework that feeds into the more specific and detailed discussions undertaken in the following chapters. In doing so, we will try to distill a cohesive view whenever possible, emphasizing the historical determinants of the debate and the importance of the initial macroeconomic conditions in each particular country when judging the benefits and disadvantages of a full dollarization strategy.

The plan of the paper is the following. In section 2, we try to provide an historical perspective of the current dollarization debate, tracing back its origins to recent developments in domestic and international financial markets that have influenced the traditional fix vs. flex debate. In section 3, we introduce the main arguments for and against dollarized economies, drawing from Chapters 2 to 6 in this volume, as well as from of the existing literature. In section 4, we discuss the main issues involved in the transition towards full dollarization and its political economy aspects, addressed in Chapters 7 and 8. Finally, section 5 lays down a preliminary balance of the debate.

2. HISTORY: WHERE ARE WE COMING FROM?

The idea of full dollarization as a regime choice is relatively recent. Whereas there are a few cases of dollarized economies in the world, until 1999 all of these experiments had been the result of specific political and historical factors, and in most cases had been put in place even before a local currency was created. Simple inspection of the upper panel of Table 1 reveals that, in a way, Panama, the most salient dollarization example until very recently, has been something of an outlier, with a size, both measured in terms of population and GDP, that largely exceeded those of other members in the group.³ The fact that all of these long standing cases of dollarization have been adopted owing more to historical and political reasons than to an evaluation of the pros and cons of alternative arrangements or the short run cost involved in the transition to the new regime (aspects that are at the center of the current debate), detract from their value as comparator cases.

³ Indeed, Panama differs also in the fact that many of these included cases can hardly be compared with a standard independent economy. However, Panama shared with most of them its large degree of openness and its concentration in the production of services.

The two more recent full dollarization processes may prove to be more influential and more illustrative of what a transition to full dollarization may involve. It was only in 2000 and 2001, respectively, that two new countries, Ecuador and El Salvador, joined the group of fully dollarized economies. Their experiences, and particularly the way in which they arrived to the decision, differed significantly. Ecuador, on the one hand, resorted to dollarization as a way to cope with a widespread political and financial crisis rooted in massive loss of credibility in its political and monetary institutions. El Salvador, on the other, decided to adopt the US dollar as legal tender, after years of an unofficial peg, as a result of an internal debate, and in a context of stable macroeconomic fundamentals. Unfortunately, although there is preliminary evidence that both arrangements have delivered partial results, the cases are too recent to be useful for any meaningful empirical analysis. However, they can be used to illuminate some of the institutional and political aspects involved in the transition.

The caveats mentioned in the previous paragraphs apply also to the Euro area launched in 1999, which might be considered as a variety of a full commitment regime (a currency) similar to full dollarization inasmuch as we are willing to regard it as a (disguised) adoption of the deutsche mark by the participant countries. Several additional differences distinguish the Euro experiment from other dollarization projects, though. First, the Euro area groups developed countries that differ in its very nature from developing small open economies to which the dollarization debate is usually associated. In this regard, the convergence process of developing Eastern European countries currently in the Euro waiting list offers richer case studies.

Second, and perhaps more to the point, is the fact that all countries within EMU preserve their influence (albeit limited) over monetary policy as they are proportionally represented at the Board of the European Central Bank. While this is true also for other existing currency unions,⁴ the Euro is allowed to float against other major reference currencies, so that in the end, the rigidity of the new arrangement is only restricted to the loss of flexibility in cross exchange rates within the group.⁵

In sum, at least at this point, the debate on full dollarization suffers from a lack of relevant experiments to test most of its economic implications empirically. In line with this, the origins and nature of the current debate has been barely influenced by existing examples of dollarized economies that are either barely representative or too recent to be appraised. One can gain a better historical perspective of the issues at stake by tracing the evolution from the traditional fix vs. float debate to the current dollarization debate in light of some important factors that have informed the view that economists have of the economic connotations of different regimes. To this we turn next.

⁴ Existing currency unions include the Eastern Caribbean Monetary Union, and the two unions that comprise the African franc zone.

⁵ For example, the degree of exchange rate flexibility of currency unions in the Caribbean or the franc zone is further restricted by pegging the common currency against the US dollar and the French franc, respectively, which in practice implies the subordination of the union's monetary policy.

2.a The traditional fix vs. flex debate

If we think of the regime choice set as a ladder that climbs from full flexibility towards increasing exchange rate rigidity, we can regard the particular case of full dollarization as a step further upwards from a conventional fixed exchange rate regime. It is not surprising, then, that most analyses of the dollarization option rely, at least partially, on considerations that have permeated the traditional (and longer standing) fix vs. flex debate, which can be traced back to the pioneering work of Mundell and Fleming in the 60s, refined by Dornbusch in the 70s.⁶

One of the main implications of the Mundell-Fleming-Dornbusch model is that, in a context of flexible exchange rates, unanticipated permanent shifts in money demand may have an impact on the real economy due to the presence of (temporarily) sticky prices.⁷ In particular, according to the model, an increase in the demand for money should result, given money supply, in a temporary contraction with a period of higher interest rates, lower output and higher unemployment as prices take their time to fall and adjust to the now higher demand for real balances. Indeed, higher nominal interest rates are expected to induce an exchange rate appreciation, both because the interest rate differential make domestic currency-denominated assets more attractive and because the expected deflation imply a lower exchange rate in the long run, depressing the current exchange rate even further.⁸

By contrast, a fixed exchange rate regime fully eliminates any real effect as the monetary authorities accommodate any increase in the demand for money through nonsterilized interventions. On the other hand, any money supply shock is reflected automatically in a change in international reserves, placing a limit on the capacity of monetary authorities to conduct countercyclical monetary policy.

A different conclusion is obtained from the model for the case of real shocks.⁹ Here, while a flexible regime can accommodate the shock through a change in the nominal exchange rate that restores the long-run full employment equilibrium, a fix requires an adjustment in domestic nominal prices that, in the presence of sticky prices, would entail a period of depressed domestic demand and high unemployment.

Hence, the familiar argument that, in order to minimize output fluctuations, fixed (flexible) exchange rates are to be preferred if nominal (real) shocks are the main source of

⁶ See Fleming (1962), Mundell (1963, 1964) and Dornbusch (1976). See also De Grauwe (1994) for a recent survey.

⁷ Changes in money demand may be due, for example, to financial innovation affecting money velocity or the money multiplier.

⁸ The result that current exchange rates react more than proportionally to monetary shocks is Dornbusch's well-known overshooting effect. The impact of an unanticipated increase in money supply has exactly the opposite effect.

⁹ Real shocks could also include changes in external demand for the domestic product (e.g., as a result of a devaluation of trading partners' exchange rate) or exogenously induced changes in the cost of capital (e.g., due to an increase in the country's risk premium).

disturbance in the economy.¹⁰ As a result, one should expect that the choice of exchange rate regime should depend, to certain extent, on the importance of real relative to monetary shocks. Indeed, lack of insulation against real shocks is still the main argument against fixed (and, in particular, fully dollarized) regimes. Moreover, as real shocks become increasingly important due to growing trade flows and capital market integration (alternatively, as monetary shocks or inflation concerns become less of a priority) one should expect to see a trend towards more flexible regimes around the globe.

Optimal currency areas

The role of the nominal exchange rate as an instrument to isolate the economy against real shocks is at the center of the optimal currency area approach to monetary integration. The traditional Optimal Currency Area (OCA) theory, developed in the 60s by Mundell (1961), McKinnon (1963) and Kenen (1969), identifies a number of factors that determine the benefits and costs of a currency union. The benefits are generally associated with the reduction in transaction costs between member countries as a result of the use of a common currency, a reduction that is proportional to the degree of economic integration (that is, trade flows) within the union (McKinnon). On the other, the costs are the result of the loss of the nominal exchange rate as an adjustment mechanism against real macroeconomic shocks that alter the equilibrium real exchange rate *vis à vis* the rest of the union. In turn, these costs will be relatively less important the higher the degree of factor (labor and capital) mobility within the region (Mundell), and the higher symmetry of shocks between member countries (Kenen).

Although one would expect that a currency union that eliminates any restriction to labor mobility should stimulate labor integration, other barriers such as culture or language may prove to be surprisingly resilient, as witness the case of the Euro zone. Moreover, in the particular case of unilateral dollarization, the regime switch does not imply any relaxation of the legal impediments to labor migration already in place. Naturally, the fact that most possible dollarization marriages entail adopting the currency of a country with a much higher per capita income makes labor integration even less likely.

Regarding the symmetry of shocks argument, the union can float against other currencies, so that shocks elsewhere in the world will entail some sort of disequilibrium only to the extent that its effect differs across member countries.¹¹ Then, we could add that the costs would be related not only to the correlation of real shocks among participating countries but also to the symmetry of the response to external shocks within the region. At any rate, the argument appears to suggest that similar countries are more likely to constitute an optimal currency area.

¹⁰ In both cases, given that prices tend to be more rigid to downward adjustment, the adjustment period is likely to be particularly long and taxing in the event of an adverse shock, the more the less flexible domestic prices are.

¹¹ Note that different countries in principle require different adjustments in the nominal exchange rate in the event of an external shock

However, a counterargument can easily be made if either labor or capital is mobile: countries with asymmetric shocks (or asymmetric shock responses) enjoy a larger scope for diversification, inasmuch as the proper instruments are in place. More precisely, if shocks are asymmetric, adverse shocks in one region would generally be accompanied by positive shocks in another, so that they compensate each other as factors move to the temporarily more productive region. Even in the absence of factor mobility, a scheme of fiscal transfers between member countries can yield the same result. Accordingly, the role that the symmetry argument should play while testing the OCA condition should be qualified.

How important are OCA considerations in today's discussion of dollarization? A casual inspection of the recent literature on the subject will reveal that the "modern approach" to dollarization have given priority to credibility issues over the trade gains-shock insulation tradeoff implicit in the traditional OCA approach. Two main reasons appear to have induced this change in focus. First, most OCA tests of existing currency unions have yielded mixed results as to the ex-ante convenience of the union, suggesting the presence of other (both political and historical) factors behind them.¹² For example, some analysts tend to see the convergence process towards EMU as a scheme by which European countries borrowed monetary policy credibility by implicitly pegging their currencies to the deutsche mark, and ultimately by modeling the European Central Bank after the Bundesbank.¹³ On the other hand, the African franc zone may have owed more to a common colonial past than to previous extended trade links among the members.

Second, many countries that are currently considering adopting a major foreign currency as legal tender are moved primarily by the need to reduce their vulnerability to financial shocks, rather than by the promise of a boost in trade. On the other hand, the experience of various free trade areas (FTA) like ECM or NAFTA have shown that substantial trade gains can be achieved without a common currency or even a peg against the regional reference currency. Thus, in the context of highly sophisticated financial markets the incremental gains to be derived from unifying the currency may not to be that important after all.¹⁴

If this is so, then the evaluation of whether to relinquish the domestic currency in favor of a foreign common currency involves weighting the costs of losing the exchange rate instrument against whatever credibility can be derived from the new (presumably stronger) currency. However, once the decision to dollarize is taken, OCA considerations still play an important role at the time of choosing the right reference currencies, underscoring the

¹² The political dimension of EMU is discussed in Chapter 8.

¹³ In addition, the Maastricht Treaty has been seen as a commitment mechanism that helped participant governments curb fiscal deficits and reduce inflation.

¹⁴ On this, the work done by Frankel and Rose (2000) and Rose (2000) on the trade effects of a currency union deserve a special mention. In their work, they find that countries sharing the same currency trade among each other significantly more than countries that do not, even after controlling for the existence of a FTA. It should be mentioned, however, that their sample includes dependencies, territories, colonies and overseas departments, leaving open the question of whether the common currency effect is not reflecting very specific historical, political and cultural ties that might not be captured by the control variables used in their test (language, common colonial past, etc.). Moreover, a recent paper by Persson (2001) find that the result virtually disappears once he corrects for "treatment effects."

conventional view of the Euro as the natural choice for Eastern European economies, and the US dollar as the obvious candidate for most Latin American economies.

Capital account liberalization

The relative size of real shocks is not the only way in which the trend towards global integration has informed the fix vs. flex debate. A key ingredient of the textbook Mundell-Fleming-Dornbusch framework is the assumption of perfect capital mobility that implies international interest rate arbitrage across countries that takes the form of the uncovered interest parity. In particular, this implies that deviations of the domestic currency interest rate from the exogenous given international interest rate should only reflect expected changes in the domestic price of foreign currency (the exchange rate). From this, it follows that monetary policies cannot be aimed both at maintaining stable exchange rates and smoothing cyclical output fluctuations due to real shocks, in what is usually referred to as the “impossible trinity.”¹⁵

This key assumption, however, has not been always binding in the past (and, in many cases, it is still not in the present). Financial innovation and the dramatic decline in transaction costs induced by it fueled a gradual trend towards more open capital accounts that start only in the early 70s in industrial countries, and spread in the next decades to what are typically denoted as emerging markets economies. This, in turn, made the restrictions implicit in the impossible trinity argument more stringent, pushing the choice between independent monetary policy and exchange rate stability back to the forefront.

In particular, the reluctance of many developing countries to undergo the fiscal necessary adjustment during contractionary periods combined with the widespread use of exchange rate anchors to fight price instability became increasingly vulnerable to speculative attacks on the currency, which resulted in higher output volatility and only temporary success in reducing inflation. Moreover, the development of secondary markets for debt of emerging economies led many of these countries to rely on foreign (usually short-run) capital to ignite their economies and postpone the necessary fiscal adjustment, making exchange rate-based stabilizations (and conventional pegs in general) even more vulnerable to sudden shifts in market sentiment and self-fulfilling crises. In a twist to the previous argument, it has been argued in countries that have suffered a significant loss in competitiveness and higher unemployment rates due to the presence of inertial inflation or the strength of the peg currency, high political costs makes an exchange rate defense less likely, and the regime more vulnerable to a successful attack.¹⁶

Whatever the (mix of) model(s) that one judges more representative of recent currency crises, it is apparent that the surge in the dollarization debate in recent years have been

¹⁵ The third pillar of the trinity being capital mobility.

¹⁶ These three arguments has been associated, respectively, with the so-called first, second, and third generation models of currency crises. Note that the third argument implies that the credibility of a peg may actually decline over time, as opposed to the view of a gradual credibility build-up. The case of Argentina’s protracted recession since 1998 is a good example.

largely induced by considerations related to the increased vulnerability (and, in turn, falling credibility) exhibited by conventional fixed exchange rate regimes. In turn, vulnerability aspects are intimately related to the degree of *de facto* dollarization that pervades most developing economies. To this we turn next.

De facto dollarization

Globally grouped as *de facto* dollarization, high degrees of currency substitution and financial dollarization represent an important (and often understated) factor underscoring the recent debate on dollarization for various reasons.¹⁷ First, they already impose some of the constraints usually associated with *de jure* dollarization. Second, because of their implications on inflation and banking sector fragility, they limit the scope of exchange rate fluctuations that monetary authorities can afford to tolerate. In other words, it could be argued that *de facto* dollarized economies reduce both the costs of a transition to *de jure* dollarization and the exchange rate flexibility that is lost in the process.

Most of the earlier literature on *de facto* dollarization is concerned with currency substitution, reflected in the emphasis on the expected returns of holding different currencies (as opposed to the expected returns of interest-bearing assets denominated in those currencies). As a result, it typically centers around the dynamics of money demand (and, in particular, the link between dollarization and the inflation *level*) and the implications for monetary policy. The focus on currency substitution also seems to underlie the presumption, usually subscribed by this literature, that dollarization should recede with price stability.¹⁸

This presumption has been repeatedly at odds with the empirical evidence. While *de facto* dollarization appears to have been fueled by recurrent high inflation episodes, it remained a common feature of developing economies around the globe after inflation levels were brought down during the 90s, even in countries such as Argentina, Bolivia, and Peru, where several years of stable macroeconomic policies should have gradually improved confidence.¹⁹

As noted by many observers, however, much of the empirical literature on which the argument is based is plagued by a definitional problem, as interest bearing deposits, which generally account for the bulk of measured dollarization, are used to estimate money demand equations. Moreover, the papers that specifically address the issue of dollarization

¹⁷ Here, currency substitution refers to the use of a foreign currency as a means of payment or unit of account, while financial dollarization, following Ize and Levy-Yeyati (2000), denote the holding by residents of foreign currency-denominated assets and liabilities.

¹⁸ The dollarization literature is too extensive to be summarized here. Recent surveys can be found in Calvo and Vegh (1992 and 1997), Giovannini and Turtleboom (1994), and Savastano (1996).

¹⁹ Explanations of dollarization persistence (referred to in the literature as “hysteresis”) typically hinder on lack of credibility (e.g., the presence of large inflationary memory, as in Savastano, 1996) or network externalities (e.g., the costs of switching the currency of denomination of everyday transactions, as in Guidotti and Rodriguez, 1992). Both arguments, again, are consistent with a view of dollarization as a currency substitution phenomenon.

as a portfolio choice problem generally do not fully recognize the nature of financial dollarization, namely the fact that deposit dollarization generally has loan dollarization as its mirror image, which is crucial to determine both the extent and the implications of dollarization.²⁰

An exception is Ize and Levy Yeyati (2000), where, using a portfolio choice model and considering both sides of the banks' balance sheets (deposits and loans), they find that financial dollarization depends on the volatility of *real* returns on assets denominated in each currency, in turn a function of the volatility of real exchange rates changes relative to that of inflation. This approach leads to four important implications. Firstly, countries that allow foreign currency deposits in the domestic banking sector will naturally generate some degree of financial dollarization.²¹ Secondly, policies that target (at least partially) a stable real exchange rate to preserve competitiveness, should not be expected to reduce financial dollarization. Thirdly, economies with high pass-through coefficients (either due to widespread dollar pricing as a result of previous high inflation spells, or because of their very open nature) will exhibit higher dollarization ratios irrespective of their current inflation levels.²² Finally, from a more general standpoint, there is no reason why changes in inflation (and in *nominal* interest rates) should affect the choice of portfolio denomination, inasmuch as these changes are incorporated in nominal interest rates to leave *real* interest rates unchanged.²³ This implication, derived in Thomas (1985), and reinstated in Calvo and Vegh (1997), is key to distinguish financial dollarization from a currency substitution phenomenon. The fact that most of the recent debate regarding dollarization has revolved around financial dollarization issues just shows how relevant this distinction is.

As mentioned above, there are many reasons why the degree of de facto dollarization should be considered as an important determinant of the choice of regime and, in particular, of the decision to proceed to de jure dollarization. De facto dollarized economies with an inflation target cannot afford to allow wide exchange rate fluctuations because of their detrimental impact on inflation performance. As Chang and Velasco (2000) point out, "any scheme to control the rate of inflation at a short horizon must control, to some extent, the nominal exchange rate." In view of the previous discussion, we could complement this statement by noting that *the extent to which inflation targeting countries can let the nominal exchange rate fluctuate depends negatively on the degree of exchange rate pass-through, itself a function of de facto dollarization.*²⁴

²⁰ See, e.g. Thomas (1985) and Sahay and Vegh (1997).

²¹ Reasons that have prompted monetary authorities to introduce (and even facilitate) foreign currency deposits in the domestic banking sector include the need to limit capital flight and to protect banks from runs induced by changes in the currency composition of local portfolios during inflationary episodes.

²² This statement follows from the fact that, for given inflation and nominal exchange rate volatilities, the higher the pass-through, the lower the real exchange rate volatility in the economy. As noted by the authors, the argument implies that currency substitution (e.g., in the form of exchange rate indexation) may induce financial dollarization, although the converse is not necessarily true.

²³ In particular, successful exchange rate-based stabilizations should not be expected to reduce financial dollarization as long as they do not alter the relation between inflation and real exchange rate volatility.

²⁴ Trivially, currency substitution in the form of dollar pricing (i.e., the use of the dollar as a unit of account) increases the exchange rate pass-through, impairing the ability of the monetary authority to limit price variations in the presence of exchange rate fluctuations.

But the inflation response is not the only concern that prevents de facto dollarized economies from adopting fully floating exchange rates. The inherent currency mismatch introduced by widespread financial dollarization makes the financial sector (and the economy as a whole) highly vulnerable to exchange rate fluctuations. In particular, the fact that banks are usually precluded by regulations to hold open foreign currency positions does not eliminate the problem, inasmuch as dollar loans simply transfer the currency risk to non-dollar earning borrowers, at the cost of greater (exchange rate-related) credit risk to the bank. Thus, the degree of loan dollarization determines the financial system's exposure to systemic credit risk in the event of large devaluations and, more in general, the willingness of the monetary authorities to use the exchange rate to accommodate real or external shocks.²⁵

Interestingly, the authorities' reluctance to let the exchange rate fluctuate may in itself induce more financial dollarization, as foreign currency borrowers anticipate a stable exchange rate and lower currency risk. One may argue that frequent currency crises proved this anticipation to be incorrect, but the same logic by which the government may find it optimal to avoid a sudden appreciation indicates that, in the case of a currency collapse, dollar borrowers are likely to be (at least partially) bailed out.²⁶

An additional factor underlying the authorities' preference for a stable exchange rate is the fact that the vast majority of countries hold a substantial stock of foreign-denominated sovereign external debt. This pattern is typically attributed to the country's inability to borrow in its own currency presumably due to the currency's weakness,²⁷ although one could alternatively argue that the outcome is the result of a deliberate decision not to incur the cost of a currency risk premium that is judged to be excessive by most governments.

Calvo and Guidotti (1990) argue that the government faces a time inconsistency problem at the time of choosing the denomination of its debt, since once the home currency debt is issued, it is optimal for the government's to partially repudiate its obligations by devaluing. Investors anticipate this and require a higher interest rate so that expected returns are comparable to international levels. Devaluation (and a higher than optimal inflation rate) occur in equilibrium.

The case of fixed exchange rate regimes is an interesting illustration of this problem. Since the sole purpose of borrowing in the domestic currency is to hedge against the possibility of a depreciation, the issue of home currency debt can only be interpreted as signalling the government's belief in the possibility of a future change in the parity, which in itself defeats the goal of gaining confidence in the regime. Alternatively, a government committed to a fixed parity should have no reason to pay the currency premium if it is convinced of its

²⁵ This argument is proposed by Calvo (1999, 2000) and others to account for the common practice among many emerging economies of avoiding substantial exchange rate volatility by intervening actively in foreign exchange markets, a phenomenon that Calvo and Reinhart (2000) label "fear of floating."

²⁶ Indeed, this implicit guarantee has been validated in many recent crises (Mexico 1994 and Brazil 1998 are two examples). See Burnside et al. (1999) for an analytical model of this implicit guarantee.

²⁷ See Haussman (1999).

capacity to maintain the peg. Thus, the dollarization of external liabilities could be interpreted as a consequence rather than as a cause, of a fixed exchange rate regime.²⁸

Finally, as is argued in more detail in Chapter 5, the existence of a large proportion of dollar assets in the banking sector as a result of financial dollarization naturally reduces the central bank's capacity to provide lender of last resort assistance in the event of systemic liquidity crunches without substantially increasing its stock of liquid international reserves.²⁹

In sum, while *de jure* dollarization entails very specific costs (the loss of the exchange rate as an adjustment mechanism, the loss of the lender of last resort function of the central bank), the magnitude of these costs may be relatively minor in *de facto* dollarized economies. It is not surprising, then, that the dollarization debate has taken greater momentum in these economies, as the persistence of the dollarization phenomenon and the extent of its implications became increasingly apparent. Indeed, in extreme cases, *de jure* dollarization can be viewed as reaping important credibility benefits (e.g., from the outright elimination of currency risk) without the imposition of sizeable additional costs.

2.b The bipolar view

Advocates of the bipolar view argue that conventional fixes may fall short from achieving the desired credibility gains, and that, if exchange rate stability is the first priority, the stronger commitment that characterizes hard pegs may be in order.³⁰ Accordingly, they tend to group regimes into three broad categories, namely "hard pegs", fully floating regimes, and a number of intermediate managed floats and conventional fixes that they generically label "soft pegs." Underlying this criterion is the view that countries, particularly those with open capital markets, have been moving, either voluntarily or forced by market pressures, towards the extremes, a view that is partially supported by the data.

Thus, while most recent currency crises in Asia and Latin America resulted in the floating of the exchange rate, an increasing number of countries have moved (or are in the process to do so) towards *de jure* dollarization or currency unions.³¹

It should be noted that the apparent movement away from intermediate regimes is far from conclusive. For reasons mentioned in the previous section, many of the new floaters exhibit

²⁸ The time inconsistency argument, however, does not explain why some countries borrow in their own currency and some do not, a difference that is often attributed to credibility associated with the country's track record (as, e.g., in the "original sin" argument in Haussman, 1999).

²⁹ Alternative sources of liquidity are discussed in more detail below. Let us just note for the moment that all these alternatives are costly and that, at any rate, the problem is not specific to fully dollarized economies.

³⁰ See, e.g., Eichengreen (1994) and, more recently, Fischer (2001) and Summers (2000). Needless to say, this view is consistent with a preference for floating regimes when monetary policy objectives take the lead.

³¹ "Hard peg" candidates include countries like Guatemala and Nicaragua that are currently considering following the steps of El Salvador, European countries in the wait list to EMU, and six African countries (Cape Verde, Gambia, Ghana, Guinea, Liberia, Nigeria and Sierra Leone) that plan to launch a monetary union by 2003 as a first step to join WAEMU and form a broader common currency area.

flexible exchange rates merely formally, allowing short-run exchange rate fluctuations only within certain limits.³² Similarly, many conventional pegs that ended in currency crises simply reflected past monetary policies that were rendered inconsistent by a growing integration of domestic and international capital markets.

However, this mismatch between claims and actual practices notwithstanding, it remains true that, as capital markets are liberalized, the choice of the *de jure* regime has increasingly favored the extremes, thereby avoiding a commitment to a fixed parity that may make the economy vulnerable to speculative attacks and financial contagion. Figure 1 offers some support to this hypothesis. The figure replicates the analysis of the distribution of regimes over time in Fischer (2001), with some minor modifications. First, within the “intermediate” group, we distinguish conventional (soft) pegs from other intermediate arrangements. Secondly, we use a standard IMF-based *de jure* regime classification, as well as Levy-Yeyati and Sturzenegger’s (2000) *de facto* classification.³³ As can be seen, results in both cases are broadly comparable and go in the same direction: Emerging economies that in the 90s have gradually opened to international capital markets have exhibited a growing preference for either floating regimes or hard pegs, whereas less financially integrated developing countries have displayed no clear trend in any direction.

Advocates of hard pegs claim that they have the advantage of reaping the low inflation benefits that historically motivated conventional pegs, while avoiding their usual pitfalls, namely greater output volatility and slower growth, typically associated to frequent and costly speculative attacks.³⁴ In addition, recent work on currency unions find that a common currency area significantly increases trade among members, which, if we are willing to accept international trade as one of the drivers of output growth, points at an additional benefit.³⁵

However, in a recent piece, Levy-Yeyati and Sturzenegger (2001) partially contradict these claims by showing that, while hard pegs do contribute to a substantial reduction in inflation, their growth performance lags that of more flexible regimes. Thus, it appears that hard pegs, while delivering better results than conventional pegs in general, and exhibiting an outstanding inflation record, do not eliminate the inflation-growth tradeoff that underscores the fix vs. float dilemma.

But the relevant question remains: Do hard pegs actually deliver the credibility gains that they are expected to provide? Naturally, the chances that a government holds the line against an attack (and the probability that the attack is actually launched in the first place) depends positively on the cost (both political and economic) of abandoning a peg. In this

³² In this sense, the IMF’s *de jure* classification does not capture the actual behavior of the regimes and may lead to a misrepresentation of current trends. For an analysis on the recent evolution of exchange regimes based on a *de facto* regime classification, see Levy-Yeyati and Sturzenegger (2000).

³³ Fischer (2001) uses a specification of exchange rate categories from the IMF’s *Annual Report 2000* (pp 141-143), based on the IMF staff’s assessment of *de facto* regimes. Interestingly, however, the bipolar pattern appears to more visible when the *de jure* criterion is used.

³⁴ See the piece on currency boards by Ghosh et al. (1998) for empirical results in this direction and Fischer (2000) for an argument concerning hard pegs in general.

³⁵ See footnote 14.

regard, the implementation of a hard peg raises the stakes involved in a currency collapse, by placing legal, and in many cases, economic barriers to a reversal to a float. Thus, the stronger commitment to a peg is naturally interpreted by the markets as an implicit insurance against exchange rate risk, fueling financial dollarization and foreign currency-denominated cross-border flows.³⁶ This, in turn, increases the overall currency imbalance of the economy, adding to their vulnerability in the event a large devaluation eventually materializes and, by increasing the exit costs, to the credibility of the commitment to the fixed parity.

However, this (partially self-inflicted) extreme sensitivity to devaluations may cut both ways since, by substantially worsening the post-collapse scenario, it makes the economy more vulnerable to sudden changes in market sentiment. Hence, the strong correlation between currency risk and country risk exhibited by many highly dollarized countries. The example of the Argentinean currency board is a case in point. After successfully forestalling an attack in 1995 as a spillover of the Tequila crisis, and exhibiting a remarkable monetary discipline during the Asian crisis period, the Argentinean peg could not gather the needed credibility to insulate the economy against the Brazilian devaluation. This lack of credibility certainly played a role in the protracted recession that followed since, which in turn put into question the long-run sustainability of the external debt, inducing a rise in borrowing costs that fed back into more output contraction.³⁷

It is interesting to note in passing that even currency boards, a hard peg variety that enjoyed a short-lived period of fame in the aftermath of the Mexican crisis, has lately been regarded with increasing disbelief, following speculative attacks on the Hong Kong dollar and in view of the protracted recession affecting Argentina, the two most salient examples of this type of arrangement.³⁸ Then, it is not obvious that a hard peg that falls short of full dollarization is sufficient to dispel doubts about the sustainability of the regime, as opposed to being simply another “intermediate” peg bound to be tested recurrently by the market. Under this even more radical version of the bipolar view, the exchange rate regime menu would narrow down to only two sustainable alternatives: floating arrangements or full dollarization (in any of the varieties discussed below).

3. IMPLICATIONS: WHAT DO WE TALK ABOUT WHEN WE TALK ABOUT DOLLARIZATION?

³⁶ This increased de facto dollarization may be actively fostered by the local authorities in an attempt to signal their commitment. For example, the choice of a one-to-one parity in the case of Argentina was quite possibly aimed at putting dollar and peso intermediation on equal grounds. Chapter 4 discusses an additional channel through which financial dollarization can be endogenously deepened in the context of a bi-monetary economy.

³⁷ It could be argued, however, that the current predicament of Argentina has been (at least partially) triggered by concerns about the country's ability to serve an increasing external debt rooted in persistent fiscal deficits. To what extent full dollarization, as opposed to a currency board, would have been an attenuating factor in this particular instance is difficult to assess.

³⁸ See Figure 1 in Chapter 6.

Having briefly surveyed the main driving forces behind the current dollarization debate, we turn in this section to the main subject of this volume, namely the advantages and disadvantages of dollarization in its different varieties, and their relevant determinants.

As Chang and Velasco state at the introduction of Chapter 2, the importance of an analytical framework within which to weight the costs and benefits of dollarization cannot be overemphasized. If not for anything else, the already mentioned scarcity of relevant empirical experiments on the subject forces us to use a fair amount of speculation to assess the practical importance of the different aspects involved in the debate.

To help in this process, they introduce each of these main aspects in the context of an analytical model of a small open economy in which a government faces the decision of whether or not to dollarize. From a theoretical point of view, they show the tradeoff between a suboptimal response to external shocks due to the exchange rate rigidity (an issue that relates to the OCA theory), and the gain from the mitigation of the inflation bias that results from the time inconsistency problem associated with monetary policy and that determines the credibility gains typically attributed to credible fixed exchange rates (and, in particular, dollarization). As expected, they conclude that the net social welfare effect of dollarization is an empirical matter, that will depend, among other things, negatively on the variability of the exogenous shocks buffeting the economy, on the one hand, and the credibility problems faced by the authorities at the time the decision is made.

Theory is again useful to cast a different look on one of the negative aspects of dollarization, namely the loss of seignorage revenue. As stressed in Chapter 2, for seignorage losses to be counted as social (as opposed to fiscal) losses one should assume away policy credibility problems that result in an inflation bias, since otherwise we would be regarding as an economic gain the proceeds of an excessive (and welfare reducing) inflation tax. Finally, turning to the lender of last resort function of the central bank, the authors emphasize that its loss may increase the probability of financial crises, much in the same way as the lack of deposit insurance is viewed as increasing the probability of bank runs.³⁹

While the analytical preamble helps us elucidate the main tradeoffs involved from a general perspective, the lack of unambiguous answers highlights the importance of specific characteristics of the countries facing the decision and the precise way in which dollarization would be put in place. To clearly distinguish the initial conditions that may increase the convenience of dollarizing for particular countries is perhaps the main challenge of this volume, the outcome that will contribute to qualify arguments that are typically framed in too general terms. In this section, we try to present the findings of the volume on these issues in a succinct way. However, before getting into the cost-benefit analysis of dollarization, it will help us to define up front the different monetary arrangements that we will broadly group as “dollarized” regimes, and to point out the main distinction between them.

³⁹ The final part of the Chapter 2 introduces the discussion on the impact of dollarization on country risk, resumed in more detail in Chapters 3 and 6.

3.a Varieties

Going back to our “ladder” analogy of exchange rate regimes, one can conceive the varieties of full dollarization as different steps that reach increasing levels of monetary policy integration (alt. decreasing levels of policy independence). Thus, unilateral dollarization, the scheme that first comes to mind when talking about dollarization, entails the decision by an individual country to adopt a foreign currency as sole legal tender, a priori without any requirement to coordinate policies with the issuer of the foreign currency.

A further degree of integration is implicit in a monetary treaty that negotiates the provision by the foreign country’s central bank of some of the services formerly offered by the domestic central bank, most notably, seignorage income and liquidity insurance (lender of last resort function). In this regard, both recently dollarized countries like Ecuador and El Salvador, and former dollarization candidates like Argentina, tested, so far unsuccessfully, the possibility of reaching an agreement by which the US would reimburse part of the seignorage revenue to these countries, or use it as collateral for future liquidity assistance to domestic financial institutions. Thus, such treaty would modify to some extent the US monetary policy, which no longer is indifferent to the countries’ decision to dollarize.⁴⁰

A third, deeper degree of policy coordination is involved in a monetary union. Whatever the common currency of choice, the main difference between a currency union and standard dollarization lies in the existence of a common central bank in which all members are represented. Despite the fact that in practice large countries tend to influence the central bank policy more strongly, the broad membership representation smoothes out the potential misalignments that may arise if the anchor country were to run monetary policy based only on domestic considerations, in the event of asymmetric shocks within the region. Moreover, a currency union implicitly introduces a common lender of last resort through which weaker countries benefit from the larger clout of stronger economies.

Note also that the case of a small country with little influence on the union’s decision, while quite closer to the case of unilateral dollarization in terms of policy coordination, still benefits from the presence of the common central bank as guarantor, a factor that may induce a rapid convergence to the cost of capital of the region, something that is not likely to be seen in unilateral dollarized countries. The same is true even if the central bank of the anchor country remains as the central bank of the union, the likely situation in the event that a Latin American monetary union ever comes in place.

While we typically tend to think of dollarization as an arrangement of the first type, most of the advantages and disadvantages of a standard unilateral dollarization extend to the other

⁴⁰ Even at this degree of disaggregation we can find cases not fully represented by any of these categories. Take for example the countries within the Rand zone (Botswana, Lesotho, Namibia, and Swaziland) that use the South African Rand as legal tender and even perceive seignorage revenues from the South African Central Bank, while at the same time preserve their own central bank and their own currency, albeit with a 100% reserves back up requirement much as in the case of a currency board.

two varieties. This allows us to analyze the pros and cons of dollarization abstracting from specific varieties, and qualifying the discussion whenever a distinction between each of them is warranted. Chapters 2 to 5 are largely devoted to this analysis. In the remaining part of this section, we present a brief summary of their main conclusions.

3.b The pros

The economic literature identifies three main advantages of dollarization, understood as the adoption of a *strong* foreign currency as sole legal tender. First, it reduces transaction costs with countries using the same currency, along the lines stressed by the OCA theory. Second, it enhances (both monetary and fiscal) policy credibility, resulting in lower inflation rates, lower real exchange rate volatility, and, possibly, a deepening of the financial system. Third, it reduces sovereign risk by eliminating currency risk and the occurrence of costly speculative attacks. Chapter 5 reviews each of them in light of the experience of Central American countries, a group that benefits from the presence of the most interesting long-lived example of a dollarized economy and the fact that most of its members are relatively homogenous. Chapter 6, on the other hand, concentrates in detail in the third expected effect by examining the impact of exogenous changes in currency risk on country risk and looking into its potential determinants. Finally, some important aspects of the measurement of currency risk are highlighted in Chapter 3. Here, we draw on these works to summarize the main findings.

Reduced transaction costs

As mentioned in the previous section, the traditional OCA theory implicitly assumes that there are gains to be obtained from currency unification beyond and above those achievable through a free trade agreement with no commitment to a fixed parity. In the literature we find at least two ways in which the impact of currency unification can be inferred from the data. First, there is a large body of research on the effect of exchange rate volatility on trade that in most cases finds the effect to be significantly negative. In Chapter 5, Panizza et al. estimate that the effect of exchange rate volatility on trade for a large sample of developing countries and for Central American countries, and find in both cases a significant and negative effect. They conclude that the trade gains from dollarization are potentially large.

In addition, there are transaction costs associated with the need to operate with multiple currencies, which the EC Commission estimates for the European Union to be between one fourth and one half percent of GDP per year. We should expect these costs to increase with the higher bid-ask spreads prevalent in less developed economies.

Rose (2000) estimates the combined gains from reduced exchange rate volatility and transaction costs by comparing the bilateral trade flows between countries that share the same currency with those that are obtained from a standard gravity model, finding substantive incremental effects.⁴¹ Along the same lines, Panizza et al. conclude that, given

⁴¹ These results have to be treated with caution, however. On this, see footnote 16.

that these gains are larger the stronger the trade links within the common currency area, for the case of Central American countries analyzed in Chapter 5, a common currency may induce important trade gains.

Enhanced credibility

Fixed exchange regimes advocates traditionally highlighted two important dimensions (monetary and fiscal) in which a commitment to a fixed parity can provide important credibility benefits to a country. First, by forcing a passive monetary policy, it eliminates the inflation bias à la Barro-Gordon by which a government may be tempted to inflate the economy through unanticipated money injections. Moreover, by eradicating inflationary financing of the deficit, it imposes stronger financial constraint to the government, that in turn has no option but to keep its budget in check. This tie-up-one's-hands approach, however, is not without risks, since if the self-imposed limitation does not necessarily lead to further discipline, the regime could become rapidly unsustainable. The argument can be partially extended to the case of dollarization, which in this context can be seen as pegs without any control over monetary policy.

In principle, dollarization would imply that monetary policy in general, and inflation rates in particular, would tend to converge to the currency issuer's inflation rate, adjusted by differentials in productivity changes. Unsurprisingly, if hard pegs fare unambiguously better than their more flexible counterparts in any dimension, it is in their inflation record. Casual evidence and several econometric studies have found that, on average, dollarized regimes have systematically displayed lower inflation levels. Unfortunately, with the exception of Ecuador, the latest additions to the dollarized troupe (El Salvador and, arguably, EMU countries) entered the new regime after achieving a substantial degree of price stability, so that the impact effect of the regime switch is difficult to ascertain.⁴² However, the preliminary performance of Ecuador, and the fact that the implementation of sustainable conventional pegs has been accompanied by a substantial decline in inflation supports the view of dollarization as providing important benefits on the inflation front.⁴³

The record on fiscal discipline is more ambiguous. Fatás and Rose (2000) find, in a recent study, that currency unions are associated with a smaller government size (measured, alternatively, as the ratio of expenditures and tax revenues over GDP), while both currency unions and unilaterally dollarized economies exhibit narrower fiscal deficits. However, as in Rose (2000), most observations of unilaterally dollarized economies in the sample correspond to subnational entities that may not be representative of a standard small open economy. An alternative, more casual look, at the issue is provided by Table 2. There, we use observations included in Levy-Yeyati and Sturzenegger (2001) to compare countries that belong to a currency union, both against the rest of the sample, and against de facto

⁴² One could argue that price stability is a precondition to dollarize, as opposed to a consequence of the regime.

⁴³ See, e.g., Ghosh et al. (1997, 1998) and Levy-Yeyati and Sturzenegger (2001), for a large set of industrial and non-industrial countries, and Domac et al. (2001) for transition economies.

fixes.⁴⁴ As a reference, we also include the figures for Panama, the only unilaterally dollarized IMF-reporting country as of end-1999. As can be seen, while the first group exhibits smaller governments (measured either as government expenditure, tax revenues, or fiscal deficit), Panama does not differ significantly from either currency unions or other conventional pegs.⁴⁵ We interpret the results, which are broadly in line with Fatás and Rose's, as providing (weak) support to the claim that dollarization may elicit fiscal discipline.

Reduced country risk

A crucial aspect related with credibility gains is the extent to which, by dollarizing, a country can improve its international creditworthiness. A high cost of capital, both external and internal, is possibly one of the most important factors hampering the development of non-industrial countries. This is particularly so for the case of emerging economies that have undergone important institutional reforms and have achieved a level of political stability in many cases comparable to those of more advanced countries.

In Chapter 6, Powell and Sturzenegger stress the fact that, while the gains from trade would depend on the degree of openness and may in principle be achieved by other means, the impact of a sizeable decline in the cost of capital may have substantial direct consequences in the country's wealth.

The arguments in favor of a fall in country risk is to some extent at odds with the experience of Panama, where sovereign risk has not only been systematically above that in the US, but also has responded to external negative shocks much in the same way as other non-dollarized economies. This contrasts with the evidence of a rapid country risk convergence of industrial European economies in their way to EMU. In both cases, however, other more fundamental factors may be in play, including the fiscal record (mixed in the Panamanian case and substantially improved in Europe under the Maastricht period), and the distinction between unilateral dollarization and a currency union with the presence of common lender of last resort.⁴⁶ Thus, while a decline in sovereign risk is likely to benefit Eastern European countries in the event they join EMU, the same is not so obvious for Latin American countries adopting the US dollar.

At any rate, the question of whether borrowing costs will increase or decrease is key to evaluate the convenience of dollarization. Powell and Sturzenegger list a number of reasons why we should expect these costs to move up or down with dollarization. Among the former, they include the loss of the inflationary tax as a financing mechanism, the impact of

⁴⁴ The sample includes: Antigua and Barbuda, Benin, Burkina Faso, Cameroon, Central African Republic, Congo, Côte d'Ivoire, Chad, Dominica, Equatorial Guinea, Gabon, Grenada, Guinea-Bissau, Mali, Niger, Saint Kitts and Nevis, Saint Lucia, Saint Vincent and the Grenadines, Senegal and Togo.

⁴⁵ One should note that the results concerning unilaterally dollarized economies suffer from a small sample problem. While in our sample these economies are represented by Panama (arguably not a good example of fiscal restraint), Fatás and Rose only find data for 32 observations.

⁴⁶ Although in theory the ECB is not assigned LLR functions, the lack of a clear LLR arrangement in EMU certainly contribute to this perception.

the loss of seignorage on the government budget constraints, the loss of the diversification margin in a context of imperfect substitutability,⁴⁷ and the impact of the greater output volatility associated with dollarization on country risk. Among the latter, they mention the impact of the elimination of devaluation risk on default risk through balance sheet effects in currency imbalanced economies,⁴⁸ the cost of interest rate defenses against speculative attacks,⁴⁹ the increased efficiency in financial intermediation arising from the use of a common reference currency, enhanced monetary and fiscal policy credibility, and the perceived seniority of external (foreign currency-denominated) over internal (home currency-denominated) debt.⁵⁰

Whatever the relative size of other intervening factors, their main results confirm the importance of balance sheet effects, as country risk in financially dollarized countries (where these effects are bound to be more substantial) tend to fall significantly on news that increase the probability of dollarization. The opposite effect is detected in Chile and Colombia, where the virtual absence of domestic financial dollarization combines with very low levels of external, foreign currency-denominated debt.⁵¹

Their findings highlight the importance of the fact that most emerging economies do not borrow internationally in their own currency, presumably because of the domestic currency's weakness.⁵² As the argument goes, the financial fragility that results from this unavoidable currency imbalance can only be eliminated by adopting as sole legal tender the foreign currency in which the external debt is denominated. The argument, as always, should be qualified, since external debt is often denominated in more than one reference currency so that the indexation to the foreign currency that full dollarization implies eliminate currency risk only partially.

On the other, if foreign currency borrowing is an important source of country risk, why not develop the domestic currency debt market. Indeed, there is not systematic evidence that the lack of domestic currency denominated debt is due to the inability to borrow in the home currency, as opposed to a deliberate decision not to incur the cost of a currency risk premium that is judged to be excessive by most governments.

This puzzle, as expected, brings back credibility issues. The case of fixed exchange rate regimes serves to illustrate this point. Since the sole purpose of borrowing in the domestic currency is to hedge against the possibility of a depreciation, the issue of home currency

⁴⁷ Under this argument, agents willing to diversify its currency exposure would be willing to pay a premium on local currency-denominated debt.

⁴⁸ Indeed, as they note, even in a currency balanced economy imbalance are to be expected at the micro level.

⁴⁹ Note that even unsuccessful attacks impose a considerable (albeit temporary) real cost to the economy.

⁵⁰ This last point relates to the option to depreciate the domestic currency, reducing the burden of home currency debt and thus the probability of a generalized default. Chapter 3 discusses the conditions under which this option is likely to be exercised. While there is no systematic evidence of a differential treatment of external and internal debt, one could speculate that the sensitivity of country risk to financial shocks is smaller the larger the share of domestic currency debt that can be partially diluted through devaluation. Here, again, the initial financial dollarization ratio plays a crucial role.

⁵¹ Interestingly, for the case of Brazil, they find a positive, albeit much weaker, effect, possibly reflecting the dollarization of external debt.

⁵² See Haussman (1999).

debt can only be interpreted as a signal of the possibility of a future change in the parity, which in itself defeats the goal of gaining confidence in the regime. Alternatively, a government committed to a fixed parity should have no reason to pay the currency premium if it is convinced of its capacity to maintain the peg. Thus, the dollarization of external liabilities could be interpreted as a consequence rather than as a cause, of a fixed exchange rate regime.

In the same vein, fully floating regimes, by dollarizing their debt, change their incentive structure to make an opportunistic devaluation less likely. As Neumeyer and Nicolini stress in Chapter 3, the chances that a government repudiates its debt by a surprise devaluation is negatively related with the degree of financial dollarization. Interestingly, by dollarizing their debt, governments gain a credibility that they cannot later exploit by issuing debt in their own currency. Thus, the discipline obtained by this self-imposed restrictions bring with it an increase in vulnerability to events beyond the control of local governments.

3.c The cons

Three main disadvantages are often attributed to a dollarized economy. First, the standard fix-flex argument concerning the loss of the exchange rate instrument to buffer the economy against real or external shocks (alternatively, the loss of monetary independence) applies identically in this case. In addition, the elimination of the local currency entails a fiscal cost arising from the loss of seignorage revenues. Finally, the use of a foreign currency for financial intermediation eliminates the capacity of the domestic central bank to finance its lender of last resort (LLR) activities by printing the domestic currency. Here, we summarize the discussion of the first point included in Chapter 5 and the analysis of the issue of the LLR and different alternatives to the standard central bank liquidity assistance presented in Chapter 4. In the final part of the section, we briefly address the issue of seignorage, its measurement and its potential magnitude.

The loss of the exchange rate instrument

One of the standard arguments against fixed exchange rate regimes in general, and full dollarization in particular, stresses that a flexible exchange rate is better equipped to isolate the real economy from external and real shocks. Indeed, there is evidence that fixed regimes are associated with higher output volatility.⁵³ Moreover, since the price rigidity that underscores the lack of adjustment in fixed regimes tends to be higher when it comes to reduce prices, the succession of quantity adjustments during recessions and price adjustment during expansions may results in a smaller growth rate in the long run.⁵⁴

However, some analysts have argued that the shocks faced by individual countries are not totally exogenous to the exchange regime. Thus, Calvo (1999) argues in favor of full

⁵³ See, among others, Ghosh et al. (1997), Broda (2000), and Levy-Yeyati and Sturzenegger, (2001).

⁵⁴ Levy-Yeyati and Sturzenegger (2001b) suggests this explanation as one possible reason behind the slower growth rate they find for conventional and, to a lesser extent, “hard” pegs.

dollarization by stressing that the poor performance of conventional pegs is not independent of the fact that they are inherently more vulnerable to speculative attacks based on rumors or financial contagion, an outcome that the elimination of the national currency automatically rules out.

The analysis in Chapter V fails to find a significantly different response to real (terms of trade) shocks under different regimes, partially contradicting the results in Broda (2000). However, one should note that the latter also finds that, for highly dollarized economies (as is the Central American countries used in the Chapter 5), the difference in output response ceases to depend on the exchange rate arrangement.

An issue related to the loss of exchange rate flexibility is the fact that, in the context of a small open economy, full dollarization eliminates the scope for (countercyclical) monetary policy. Standard arguments against adopting a fixed exchange rate emphasizes that a floating regime has the ability to protect the country from external interest rate fluctuations and to use monetary policy as an aggregate demand management tool, under the presumption that domestic interest rates are (more) independent in this case. This provides an alternative way to test the isolation properties of flexible rates and the costs of fixing them.

The existing evidence on this point is rather mixed. Previous analysis of the effect of external interest rate fluctuations (measured either as foreign borrowing costs or as changes in US interest rates) on domestic rates under different exchange regimes suggest no evidence that flexible regimes are successful in isolating domestic monetary variables from external ones.⁵⁵ These conclusions are confirmed by the tests provided in Chapter 5. In particular, the authors find that domestic interest rates in Latin American countries seem to be more sensitive to external financing costs (dollar rates on sovereign bonds) and to worldwide shocks affecting emerging markets as a whole (measured as change in the EMBI+ index) under more flexible regimes. Indeed, interest rates in Panama appear not to be significantly influenced by external rates, suggesting an important credibility aspect underlying the link between external and domestic interest rates.

In addition, they look at the evolution of interest rates over the cycle and find no systematic countercyclicality in flexible regimes.⁵⁶ It is interesting at this point to emphasize that, for many reasons, monetary policy procyclicality seems to be the norm rather than the exception among developing countries, contrary to what we observe in industrial economies. This pattern is, undoubtedly, partially explained by credibility factors that result in the closure of international markets at the time these countries face domestic financial constraints. The failure of international capital markets to “insure” developing economies against cyclical fluctuations detracts from the usefulness of monetary policy as a short-term adjustment mechanism, rendering it less valuable.

In short, while the loss of the exchange rate regime flexibility appears to be associated, in general, with higher output volatility, the benefits of flexible exchange rate seem to be

⁵⁵ Frankel (1999), Hausmann et al. (1999) and Borensztein and Zettelmeyer (2000)

⁵⁶ This confirms previous findings in Hausman et al. (1999).

limited in the context of de facto dollarized economies. Moreover, the dependence of monetary policy on external events under flexible regimes is, at best, similar to that prevalent under pegs. Indeed, the resilience of domestic rates in Panama indicates that full dollarization, by tying domestic rates to US rates, may have provided a better isolation device against temporary changes in market sentiment towards emerging economies, a benefit that appears to more than offset the loss of independent monetary policy.

The Loss of the Lender of last Resort

Among the main costs attributed to full dollarization is the loss of the capacity of the domestic central bank to play its lender of last resort function, namely its ability to provide additional liquidity to the banking sector in the event of a transitory shortage. Trivially, while central banks can issue the domestic currency at no cost, an excess demand of the foreign currency in the market can only be met by the existence of a (costly) stock of liquid foreign currency denominated reserves.

Many observers have pointed out the existence of alternative mechanisms to provide liquidity insurance. In fact, there are at least two ways in which the LLR can be preserved in a context of full dollarization. First, it is easy to conceive (although more difficult to implement) a scheme by which the international financial community (e.g., a consortium of international banks) charges an insurance fee in exchange for a commitment to provide a credit line to a domestic agency (e.g., the domestic central bank) in charge of liquidity management in the banking sector, or to individual banks separately, much in the same way as a standard insurance contract works.

Second, it is still possible that the domestic agency collects the contributions directly from the domestic banking sector and insures them up to the certain amount that in the aggregate will be limited by the total accumulated insurance fund. This arrangement, that resembles the usual deposit insurance scheme, can be alternatively implemented through direct funding by the domestic Treasury. In both cases, the option is no different to what highly dollarized economies tend to do in practice: avail themselves of a large inventory of international reserves.

As argued in detail in Chapter 4, feasible as both alternatives may be, they still imply important incremental costs, particularly if they are engineered to isolate the banking sector from systemic shocks.⁵⁷ The external insurance strategy involves, on the one hand, the payment of an insurance fee that is likely to increase more than proportionally with the coverage of the policy, as the insurer's diversification margin narrows. The Argentinean contingent credit line represents the closer example of such scheme.⁵⁸ While the fee appears to be relatively minor as compared with the inventory cost of holding reserves, the

⁵⁷ Idiosyncratic shocks to individual banks can usually be handled by the interbank market or directly by the central bank through the use of a limited amount of reserves. Systemic shocks, on the other hand, requires that individual banks or the central bank be able to borrow from abroad, at a time in which access to international markets is severely limited.

⁵⁸ On this, see chapters 2 and 4.

insurer benefits from the fact that the policy is activated only after the large existing liquid assets reserves are exhausted, and even then the coverage (and the associated risk for the insurer banks) is relatively limited.⁵⁹ One can only speculate as to the feasibility and cost of a scheme solely based on this type of private insurance. In addition, the private insurance strategy leaves open an additional (and so far unanswered) question related with moral hazard issues: what would prevent that, as the probability of a crisis increases, participating banks hedge their exposure in the market, contributing to the crisis?

But this is not the only practical limitation of the strategy to outsource the LLR. As any insurance contract, this one suffers from two moral hazard problems. The first one stems from the fact that the occurrence of a crisis is not independent of the government's actions. It follows that the privatization of the LLR could substantially reduce the government's incentives to monitor and reduce risk, arising both from its own imbalances and from leniency in the enforcement of a prudential framework. That is the main reason why the insurance contract is bound to require some kind of collateral (as it does, for example, in the Argentinean case). However, as noted in Chapter 4, it is not at all clear to what extent the issuer of the contract will be willing or able to comply with the policy in case of a widespread crisis, particularly if this type of arrangement generalizes across countries that historically have exhibited a high correlation of external shocks. Thus, the chapter concludes, the private alternative should be considered only as part of a larger insurance package.⁶⁰ Finally, if insuring banks place a limit on the exposure they face to a particular country, one should expect that, as an upcoming crisis increases the expected exposure, banks will partially liquidate their positions in the country, accelerating the collapse in asset values.

Most of these previous shortcomings may be attenuated if the LLR function is assigned to an international agency like the International Monetary Fund. Indeed, the IMF have already been performing this role, albeit reluctantly, during much of the 90s. The benefits of this strategy are obvious. By encompassing countries around the world, such an agency could exploit the scope for diversification and reduce the liquidity stock needed to fulfill its role. Moreover, as a supranational agency, it can include conditionalities on the extension of the insurance, something that would be unthinkable for a private consortium of banks. However, its very supranational nature would make it vulnerable to political pressures that may worsen the moral hazard problems and create the perception of an implicit insurance that is independent of the country's compliance with the conditionality.⁶¹ At any rate, it is to be expected that dollarized countries with reduced access to last resort liquidity will rely heavily on IMF assistance.⁶²

⁵⁹ Additional provisos of the scheme make any actual disbursement even less likely. This includes a 20% margin call requirement that, in the event the value of the sovereign bonds used as collateral declines by more than 20%, it has to be met in cash.

⁶⁰ The fact that most countries compensate for the limitations to the LLR by increasing their stock of reserves seems to suggest that the private insurance may not be a readily available alternative in practice.

⁶¹ One could argue, however, that this implicit insurance is already present and will ultimately be unavoidable, and that an explicit commitment to insure countries under certain conditions may improve rather than worsen the moral hazard problem.

⁶² Panama, with its sequence of 17 IMF Programs since 1973, is a case in point. On this, see Edwards (2001).

The alternative of holding a large stock of liquid assets as a precautionary liquidity fund involves the usual inventory cost of maintaining a sizeable stock of reserves in a context high borrowing costs. More precisely, as the domestic cost of capital is typically higher than the return on liquid assets that constitute the major part of reserves, reserve holdings entail a cost that is proportional to the spread between short-term safe foreign assets and longer and riskier domestic government paper that largely reflects two types of premiums: a liquidity premium associated with the shorter maturity of reserves needed for liquidity management in the domestic financial sector, and a risk premium associated with a higher probability of default.⁶³

The cost of holding reserves for liquidity insurance purposes is proportional to the probability distribution of shocks (which in turn determines the needed stock of reserves for a given confidence level) and to the external debt spread (which determines the optimal confidence level) that the government has to pay when it borrows to invest on low yield safe reserve assets. The optimal level of reserves is not straightforward, though, as the volatility of liquidity shocks is itself endogenous to the amount of reserves: the higher the amount, the less likely a confidence crisis or a bank run will actually occur.

At any rate, the previous arguments highlight one important (and often underemphasized) aspect of the debate: Central banks in countries with extensive de facto financial dollarization suffer, albeit to a lesser degree, from the same shortcoming, as liquidity shortages in the banking sector forcefully takes the form of an excess demand for the foreign currency.⁶⁴ Thus, as before, the actual lender of last resort cost specifically attributable to full dollarization is smaller the higher the initial financial dollarization ratio.

One can in principle estimate the cost of losing the LLR function of the central bank directly as the cost of holding the stock of excess reserves that substitutes it. If we are willing to accept that reserves are primarily used as an insurance against systemic shocks, then a reasonable approximation to the optimal stock may be obtained as a stress test of the aggregate portfolio of the domestic central bank, taking into account all contingent liabilities arising from the expected assistance of the financial sector in the event of a systemic crisis.

In this regard, the nature of the reserves decision is no different to a standard inventory problem involving a tradeoff between the cost of holding reserves and the cost of facing immediate liquidity needs that, if anything, can be met in international markets at a very large premium. In order to solve this problem, we need to answer three questions: i) how

⁶³ Note that, even though, in an efficient market, increases in the risk premium should be perfectly offset by an ex-ante lower expected cost of debt servicing, ex-post a country that honors its debt is “punished” by a higher debt spread that rises the opportunity cost of capital and the cost of holding low-yield reserves assets. In addition, the higher default risk and higher volatility of returns that characterizes developing country debt are penalized by risk-averse international investors.

⁶⁴ Arguably, unlike in fully dollarized countries, central banks in financially dollarized economies still can print the domestic currency to assist the banking system, but at the cost of a sharp increase in the exchange rate and high inflation that will be proportional to the ex-ante degree of financial dollarization. In turn, the associated devaluation may worsen the fragility of the banking sector due to balance sheet effects, adding to the cost of the bailout and detracting from the effectiveness of the LLR.

much liquidity will be mopped out of the system during a crisis (for example, due to a run on deposits), ii) what is the probability that such a crisis actually occurs for a given reserve coverage,⁶⁵ and iii) what is the cost of carrying the reserves.

Interestingly, as full dollarization trivially increases the degree of dollarization of financial assets, it raises the optimal stock of precautionary reserves.⁶⁶ On the other hand, as noted above, dollarization eliminates an important source of economic disturbance, namely the possibility of a currency crisis that negatively affects the banking sector through the balance sheet channel, it reduces the probability of systemic liquidity shortages (for example, due to self-fulfilling prophecies) and the optimal stock of reserves for any given dollarization ratio. Thus, a highly dollarized country such as Argentina may indeed benefit from the latter effect, while a relatively non-dollarized country like Brazil may be forced to increase its liquidity requirements.

In short, while there are several alternatives available to substitute for the LLR function of the central bank, none of them is costless or even complete. However, the incremental cost of the limitations imposed by dollarization is relatively minor for countries that already exhibit a substantial degree of de facto dollarization.

The loss of seignorage

How large is the loss of seignorage associated with dollarization? A correct estimation of seignorage losses needs to take into account two components: the need to purchase the initial stock of foreign currency to be used as currency, as well as from the costs of purchasing later increases in the stock of currency. Alternatively, one can think of these costs as the lost income from international reserves used to exchange the monetary base for the foreign currency, and from future increases in the stock of reserves as a result of increases in the demand for money.

A quick calculation can be made based on two simplifying assumptions: i) output and prices grow at constant rates g and π , where the latter is assumed to follow the inflation rate in the foreign country from which the new currency is borrowed; ii) the currency-to-(nominal) GDP ratio remains constant at the initial level, denoted θ .⁶⁷ Under these assumptions, it follows that the total flow of seignorage is exactly equivalent to a perpetuity that pays an interest i on a stock of international reserves that grows at a rate $\pi = (1 + \pi)(1 + g) - 1$, the rate of growth of the demand for currency on which seignorage is collected. In turn, the present value of the perpetuity is given by:

$$S = \sum_{t=0}^{\infty} \theta i (\theta \text{ GDP}_0) [(1 + \pi)(1 + g)]^t / (1 + i)^{t+1} = i (\theta \text{ GDP}_0) / (i - \pi)$$

⁶⁵ Note that, although the crisis can be completely exogenous, it can also result from a self-fulfilling confidence crisis, which will be negatively related to the insurance coverage.

⁶⁶ In the limit, a country with no foreign currency liabilities would only need reserves for exchange market interventions.

⁶⁷ This is equivalent to assuming a unit income elasticity of the demand for real balances, so that they grow at the same pace as the real domestic GDP.

where i is the government's opportunity cost. Since the real interest rate can be computed directly as $r = (1 + i)/(1 + \pi) - 1$, the equation immediately gives us the seignorage cost in terms of GDP for any expected real interest, inflation and growth rates, and any expected monetization ratio. To illustrate the point, Table 3 presents the estimated numbers under the assumption of a constant currency-to-GDP ratio of 4%, and a real interest rate r of 4%, for different growth and inflation assumptions. As an example, for a growth rate of 3% and an inflation rate of 2% we obtain a sizeable value of the seignorage costs of close to 23.8% of GDP.⁶⁸

From this exercise we can conclude that seignorage cost are by no means trivial when correctly computed.⁶⁹ Indeed, the value of future increases in the demand for money represents the larger part of total seignorage costs.⁷⁰ Thus, the final number heavily depends on the expected rates of growth and inflation, as well as on the evolution of the currency-to-GDP ratio, so far assumed constant for simplicity.

The degree of monetization is higher in developed than in developing countries, which suggests that, for the latter, the rate of growth of the demand for money may be higher in the short run than in the steady state if levels eventually converge to those of more developed economies. This entails an additional seignorage cost, in the form of higher flow costs in the transition period. However, one can present an argument in the opposite direction, by pointing at the presence of a declining trend in the demand for real balances in developed economies (due primarily to financial innovation) that would require a downward adjustment in our estimation of seignorage costs.

4. APPLICATIONS: HOW DO WE GET THERE?

Besides the cost-benefit analysis underlined above, the dollarization decision entails a number of important questions related with the institutional arrangements to be implemented and, in particular, with the smoothness of the transition process to the new environment. This, in turn, involves not only technical questions regarding, for example, the "correct" entering exchange rate or the treatment of contracts during the path to dollarization, but also the political economy of the process that underscores the search for political support, a necessary condition for a successful dollarization plan. In this section

⁶⁸ Note that this figure already includes the costs of purchasing the current monetary base, which appears as the present discounted flow of income on the initial money supply. Fischer (1982) alternatively compute seignorage costs as an annual cash flow in terms of current nominal GDP which, under the assumption of a constant currency-to-GDP ratio, would be equal to π in the current period and $\pi/(1+g)$ in all subsequent periods. For the values of the example this will represent a cost of 4% today and around 0.2% in all future years. See Levy-Yeyati and Sturzenegger (2000) for a more recent application of this approach to Latin American countries.

⁶⁹ It should be noted, however, that, while the loss involves a clear and non-negligible fiscal cost, its welfare effect has to be qualified in most cases to the extent that (a potentially large) part of it may be originated in a suboptimal inflation tax, as Chang and Velasco stress in Chapter 2.

⁷⁰ They account for more than 80 % of the total cost in the previous example. The number is obtained subtracting the value of the current stock of 4% of GDP from the total of 23.8%.

we discuss the most salient points in these two groups of issues, which are tackled in full detail in the last two chapters of the volume.

Institutional arrangements

Chapter 7 presents a thorough analysis of the main institutional aspects of the transition to full dollarization, broadly dividing the discussion according to whether the goal is a unilateral dollarization or a monetary union.⁷¹

A number of important technical points are posed by the analysis. First and foremost, there is the question of the exchange rate at which the economy should enter the new arrangement, that is, the rate at which the domestic currency should be changed by the foreign currency at the beginning of the process. Here, there are at least two alternatives. The easier way to answer this point is simply by computing the exchange rate that make current international reserves equal to the sum of money base and the outstanding stock of domestic currency interest rate securities issued by the central bank. However, while there will always be a rate that will make foreign currency assets equal to domestic currency liabilities of the central bank equal, the exchange rate may be excessively high if international reserves are relatively scarce, and a substantial devaluation may be in order.⁷² Alternatively, the exchange rate may be allowed to float during a short period of time in order for the market to achieve its equilibrium in anticipation of the dollarization exchange rate. In either case, one would expect domestic prices to adjust upward in time. A potential problem could arise in the case in which a large stock of international reserves call for an appreciation of the currency, which in the context of downward price inflexibility could have adverse effects on the real economy. However, it is easy to conceive a scheme in which the central bank (or the Treasury) keeps part of existing reserves, for example, as a fund to substitute for the loss of the lender of last resort or to buy back sovereign debt.

As in the case of trade and capital account liberalization, the debate on dollarization have also delved on the issue of sequencing. The proponents of a gradual process towards dollarization argue that a number of complementary institutional and economic reforms are in order to guarantee the sustainability of the new arrangement, including fiscal adjustment to offset the loss of seignorage and inflation tax revenues, labor market reform to allow for a more flexible adjustment to external shocks, and financial reform and a strengthening of the banking sector to cope with the loss of LLR.⁷³ In contrast, the proponents of a rapid move towards dollarization have emphasized the fact that all necessary preconditions are likely to be put in place once the limitations imposed by the new regime become apparent. In any case, they argue, waiting for the reforms to happen is the best way to postpone forever.⁷⁴

⁷¹ The intermediate case of a monetary treaty is addressed in conjunction with the first type of arrangement.

⁷² This appears to have been the case in the recent dollarization process in Ecuador.

⁷³ Note that the first two conditions are present, albeit to a lesser extent, in the decision to fix the exchange rate.

⁷⁴ As Zarazaga argues, much in the way in which the discussion evolved in the liberalization debate, the issue of sequencing may prove to be of secondary importance, since the final fate of dollarization plan will

An interesting issue related with the transition to dollarization is the rate at which existing domestic currency contracts are converted to the new regime. The problem is easily illustrated by the example of a domestic currency bank deposit. Should the deposit be converted at the exchange rate attendant at the time of its issuance, or at the rate at which the money base was purchased? In the former case, the holder of the deposit will be granted a benefit from the change in regime that will be equal to the local-foreign currency interest rate spread. In the former, however, the bank will be benefited inasmuch as the spread already incorporated expectations of a regime change, based on information available at the time that the deposit was made. Zarazaga concludes that, under the rational expectations hypothesis, the second of the two cases applies, from what it follows that contracts should be converted at the rate established under the dollarization plan. However, if we accept that expectations are formed in an adaptive way, this alternative would imply a transfer of wealth from domestic currency creditors to domestic currency debtors. Moreover, as he mentions in footnote 20, this may in turn induce a negative balance sheet effect if firms indebted in the local currency find it difficult to meet the (now higher) debt service burden.⁷⁵ The concomitant adverse effect on the financial sector should not be underestimated. To attenuate these types of disturbance, the authorities should allow of a long enough transition period in which existing contracts expire or are voluntarily renegotiated.⁷⁶

A fourth technical aspect in the implementation of dollarization is the possibility of a seignorage-sharing scheme. The recent proposal of the Joint Economic Committee of the US Senate hinted at the possibility of sharing an unspecified fraction of the seignorage accruing to the US from the unilateral dollarization of foreign countries, based on the money base at the time the dollarization process is started. Alternatively, Barro (1999) proposed replacing the flow of seignorage payments by an up front disbursement that may help prevent the sharp devaluation needed when the stock of international reserves is small relative to the money base. The moral hazard associated with an advance of seignorage revenues (a crucial shortcoming of the Barro proposal) may in principle be mitigated by issuing a long-term foreign currency-denominated bond to collateralize the advance that, for all practical purposes, would be equivalent to a loan from the issuer of the foreign currency. However, the increase in sovereign debt implied by the last alternative may detract from the beneficial effect of dollarization on country risk. At any rate, none of these alternatives have received any serious political support in the US.

Many of the issues discussed above are still present in a monetary union, although in a different fashion. Thus, while seignorage is not lost in this case, members have to come up

ultimately depend on the quality and credibility of the policies in place rather than on the order in which this policies are implemented.

⁷⁵ Note the symmetry of this argument with that of the impact of a devaluation in a currency imbalance economy. In this case, the financial fragility is triggered by an appreciation of the *future* value of the domestic currency, hitting firms more strongly the larger their long position in the foreign currency.

⁷⁶ Voluntary renegotiation is certainly still an option once dollarization is in place, but a massive and simultaneous renegotiations of contracts is not easy to achieve and may entail non-trivial economic costs.

with a sharing scheme.⁷⁷ Similarly, while there is a scope for a domestic lender of last resort, it is not obvious whether this function should lie within the common central bank or with the national reserves banks or some other decentralized agency. The same moral hazard concerns that justify the reluctance of the US Fed to provide LLR services to unilaterally dollarized countries determine the decision of EMU to separate the LLR function from the ECB (however, this has not dispelled concerns about the perception of an implicit insurance by the ECB, concerns that are additionally fueled by the lack of a transparent LLR procedure), and apply to the location of the supervisory function.

But perhaps the most salient distinction between the two varieties of dollarization is the greater bearing on monetary policy decisions that member countries have in a monetary union, which, in turn, requires a longer and more restrictive convergence process prior to the launch of the union. This is only logical if we think of a union as a long-term partnership by which members assume joint responsibility over a range of issues. More precisely, while the US has no bearing on the policies undertaken in Ecuador or on their impact on its population, monetary authorities within a union should aim at the welfare of the whole constituency of member countries. Accordingly, to prevent some particular country from free riding on other members' good behavior, the union needs prospective members to be in a comparably good stance.⁷⁸ Examples of this free riding problem are not difficult to find. Countries may be tempted to incur excessive fiscal expenses financed by debt that is (at least implicitly) backed by the rest of the union. Similarly, national supervisory bodies may relax banks' prudential supervision in the belief that the national banking sector is implicitly insured by the common central bank.

Thus, a monetary union, while it may limit some of the adverse consequences of unilateral dollarization (mainly, the loss of the LLR and seignorage revenues), introduces moral hazard issues that can only be (at least partially) resolved through a much longer transition period and, in particular, through more stringent qualifying requirements, particularly from the countries from which monetary policy credibility is to be gained.⁷⁹ Alternatively, it presumes the willingness of such a country to open its decision process to newcomers, something that may still be a long shot for many developing economies.

Political Economy

The success of a dollarization plan will depend to a large extent on the popular support it can gather. Chapter 7 suggests the need to hold a referendum on the plan to make sure the backing of a broad majority. However, as important is the political support from different

⁷⁷ In EMU, for example, seignorage is distributed among members according to a ratio that comes as the simple average of their population and GDP shares.

⁷⁸ This convergence process involves, among other things, the harmonization of statistics, prudential norms and tax practices. In addition, the launch of a common money market requires the linkage of national payments systems.

⁷⁹ Underscoring this problem lies that fact that, if the union is to deliver credibility gains, it requires a high degree of credibility of participating countries. Thus, currency unions between countries that suffer long-standing credibility problems are unlikely to reap the credibility benefits. See Levy-Yeyati and Sturzenegger (1999) for a discussion of this argument in the context of a common currency within Mercosur.

interest groups in the economy, itself probably a condition for a referendum to be held in the first place. This is the subject of Chapter 8, where Frieden addresses the impact of dollarization on different influential sectors in the economy, as well as the relevance of the country's economic structure, macro conditions, and electoral institutions on the likelihood that the needed consensus around the dollarization plan is actually created.

The chapter asks what are the sectors more likely to benefit or suffer from a move to full dollarization, and stresses the importance of the relative political influence of "winners" and "losers" in the creation of political consensus. Among the former, we can identify sectors involved in cross-border operations (multinationals, financial institutions, and international trade intermediaries) where the use of a common currency and the elimination of exchange risk are bound to have a large positive effect. We could add to this group exporters that benefit from the deepening of trade links within the common currency area. Among the latter, we find import-competing producers, for which the lack of exchange rate adjustments would entail a greater volatility of demand.

Thus, the identikit of a prospective dollarizer should show a fairly open economy with an internationally-oriented private sector, as opposed to a closed economy with a powerful domestic market-based, import-competing sector.

Several additional factors are singled out in the chapter: the presence of a strong government capable of leading the regime shift, macro conditions that increase the dollarization benefits (for example, persistently high inflation as in Ecuador), institutional stability that guarantees the credibility of the commitment embedded in the dollarization process (as in El Salvador), and even political ties with the issuer of the candidate foreign currency.

Indeed, it could be argued that EMU involved not only economic considerations such as those discussed in the previous section, but rather (and perhaps mainly) a "prerequisite to seat at the table for other important European decisions," as Frieden puts it. Similarly, a plan for a Pan American free trade area may deepen political links among the intervening countries, increase the cost of competitive devaluations (and the value of a floating exchange rate) and fuel the interest in a common currency and (particularly in the US) in arrangements that goes beyond unilateral dollarization.⁸⁰

In the end, a serious evaluation of the viability of dollarization should not be blind to many of its consequences that escape the economic sphere. The political and strategical dimensions discussed in Chapter 8 complement the cost-benefit analysis of section III. Ultimately, what makes dollarization a feasible alternative is not only is welfare

⁸⁰ While the credibility benefits from monetary integration should be clear for countries that need to build their credibility, the gains for the "anchor" country that provides the guarantee is less obvious. Many of the potential gains for Germany arising from EMU (exchange rate and capital flows stability, the building of institutions that could provide explicit bailout mechanisms) may be minor for the US and its much smaller potential partners. A more realistic alternative is advanced by Frieden (1998), suggesting the role of "linkage" politics by which EMU may have helped Germany to gain European support for its foreign policy initiatives in Eastern Europe. At any rate, we should not underestimate the political aspects attached to a monetary unification process.

implications but also the way in which this implications affects in particular those in charge of making the decisions.

5. PRELIMINARY BALANCE: THE IMPORTANCE OF INITIAL CONDITIONS

An outside observer will be immediately stricken by the sharply contrasting views offered in the current dollarization debate, which can only be explained by a combination of fragmentary and rather unrepresentative real experiments and an important ideological component. However, the previous survey of the issues involved goes a long way to motivate the apparent lack of consensus, as it flags the complexity of issues at stake and the relevance of individual countries' initial conditions at the time of choosing whether or not to dollarize.

Taking the side of hard peg advocates, one could argue that de facto dollarized economies under a flexible regime do not actually float, due to concerns that extreme fluctuations would lead to financial fragility (balance sheets effects) or high inflation (pass-through effects). In addition, conventional pegs are subject to frequent confidence crises, many of them triggered without any significant change in fundamentals, which, through the two effects mentioned above, may affect the financing costs and, ultimately, the solvency of the country. Similarly, as we have stressed, central banks in financially dollarized economies are likely to face serious limitations on their capacity to perform as LLR without resorting to a large and costly stock of international reserves, and even in the scope to conduct independent monetary policy. However, while there is some evidence on the presence of "fear of floating" in many developing countries,⁸¹ and on the practice of holding a sizeable stock of international reserves in financially dollarized economies, the data is by no means so conclusive as to suggest that flexible regimes completely sacrifice the benefits of exchange rate adjustments.⁸²

On the other hand, while existing hard pegs have proved to be highly successful in increasing monetary discipline and lowering inflation, the evidence on their impact on government size and fiscal performance is rather weak. Finally, extreme fixes appear to have exhibited slower growth and higher output volatility, confirming the existence of real effects of giving up the exchange rate as an adjustment mechanism. Moreover, while even hard peg advocates recognize the need of wage and price flexibility in order to minimize the burden of real shock adjustments, there is no systematic evidence that existing hard pegs have been successful on these fronts.

In the end, the main conclusions that can be drawn from this debate point at the importance of very specific initial conditions. Benefits from de jure dollarization are likely to outweigh costs in countries with high financial dollarization, with important trade links with other users of the foreign currency to be adopted, and with pervasive credibility problems that result in high country risk, and persistent high inflation or frequent currency collapses

⁸¹ See Calvo and Reinhart (2000) and Levy-Yeyati and Sturzenegger (2000).

⁸² See, e.g., Broda (2001), where he finds that the nominal exchange rate response to terms of trade shocks between countries with low and high financial dollarization do not differ.

whenever they attempt to use an exchange rate anchor. On the other hand, countries with limited financial dollarization, diversified trade links, or with stable flexible monetary regimes and high creditworthiness, are likely to profit the least from the adoption of a dollarized regime. The evolution of ongoing experiences will ultimately be the final test of these preliminary conclusions.

REFERENCES

- Barro, Robert (1999) Let the Dollar Reign from Seattle to Santiago, Wall Street Journal, March 8, 1999.
- Borensztein, Eduardo and Jeronim Zettelmeyer (2000) Does the Exchange Rate Regime Make a Difference? *mimeo* IMF.
- Broda, Christian (2000) Terms of Trade and Exchange Rate Regimes in Developing Countries, *mimeo* Massachusetts Institute of Technology.
- Burnside, Craig, Martin Eichenbaum and Sergio Rebelo (1999) Hedging and Financial Fragility in Fixed Exchange Rate Regimes NBER Working Paper No. 7143.
- Calvo, Guillermo (1999a) On dollarization, University of Maryland, College Park, Maryland, United States. Mimeograph
- Calvo, Guillermo (1999b) Fixed versus Flexible Exchange Rates: Preliminaries of a Turn-of-Millennium Rematch, *mimeo* University of Maryland.
- Calvo Guillermo (2000a) Testimony on Dollarization, *mimeo* University of Maryland.
- Calvo Guillermo (2000b) The Case for Hard Pegs in the Brave New World of Global Finance, *mimeo* University of Maryland.
- Calvo, Guillermo and Carmen Reinhart (2000) Fear of Floating, NBER Working Paper No. 7993.
- Calvo, Guillermo and Carlos Vegh (1997) From Currency Substitution to Dollarization and Beyond: Analytical and Policy Issues, in Guillermo Calvo, Essays on Money, Inflation and Output, Cambridge, MA: MIT Press.
- Calvo, Guillermo and Carlos Vegh (1992) Currency Substitution in Developing Countries: An Introduction, *Revista de Análisis Económico*, Vol. 7, pp.3-28.
- Calvo, Guillermo and Pablo Guidotti (1990) Credibility and nominal debt: exploring the role of maturity in managing inflation. IMF Working paper: WP/89/73.
- De Grauwe, P. (1994) *The Economics of Monetary Integration*. Oxford, United Kingdom: Oxford University Press.
- Domac, Ilker and M.S. Martinez Peria (2000) Banking Crises and Exchange Rate Regimes: Is There a Link?, *World Bank Policy Research Working Paper*, No. 2489.
- Dornbusch, Rudiger (1976) Expectations and Exchange Rate Dynamics, *Journal of Political Economy* 84, pp. 1161-76.

Edwards, Sebastián (2001) Dollarization myths and realities, *mimeo* University of California.

Eichengreen, Barry (1994) International Monetary Arrangements for the 21st Century, The Brookings Institution, Washington DC.

Fatás, Antonio and Andrew Rose (2001) Do Monetary Handcuffs restrain Leviathan? Fiscal Policy in Extreme Exchange Rate Regimes, *mimeo*.

Fischer, Stanley (1982) Seigniorage and the Case for a National Money. *Journal of Political Economy* 90 (April), 295-313.

Fischer, Stanley (2001), "Exchange Rate Regimes: Is the Bipolar View Correct?," Distinguished Lecture on Economics in Government, delivered at the AEA meetings in New Orleans on January 6, 2001

Fleming, Marcus (1962) Domestic Financial Policies under Fixed and under Floating Exchange Rates, *IMF Staff Papers* 9, pp. 369-79.

Frankel (1999) No Single Currency Regime is Right for all Countries or at all Times, *NBER Working Paper* No. 7338.

Frankel, Jeffrey and Andrew Rose (2000) Estimating the Effect of Currency Unions on Trade and Output, *NBER Working Paper* No. 7857.

Ghosh, A, A.M. Gulde, J.Ostry and H. Wolf (1997) Does the Nominal Exchange Rate Regime Matter?, *NBER Working Paper* No. 5874.

Ghosh A, Anne-Marie Gulde and Holger C Wolf (1998) : Currency Boards: The Ultimate Fix? International Monetary Fund, Working Paper No. 98/8.

Giovannini, Alberto and Bart Turtleboom (1994) Currency Substitution, in Frederick van der Ploeg, ed. *Handbook of International Macroeconomics*, Blackwell Publishers, Cambridge, MA, pp. 39-436.

Guidotti, Pablo and Carlos Rodriguez (1992) Dollarization in Latin America: Gresham's Law in Reverse? *IMF Staff Papers*, Washington: International Monetary Fund, Vol. 39, pp.518-544.

Hausmann, Ricardo, Carmen Pagés-Serra, Michael Gavin, Michael Stein and H. Ernesto (1999) Financial Turmoil and Choice of Exchange Rate Regime, Research Department, Inter-American Development Bank, Working Paper No.400, January 1999.

Hausman, Ricardo (1999) Should There Be Five Currencies or One Hundred and Five? Foreign Policy.

Ize, Alain and Eduardo Levy-Yeyati (2000) Financial Dollarization, mimeo, available at www.utdt.edu/~ely.

Levy-Yeyati and Sturzenegger (2000) Is EMU a Blueprint for Mercosur?, Cuadernos de Economía, 37, Vol. 110, pp.63-99.

Levy-Yeyati, Eduardo and Federico Sturzenegger (2001a) To Float or to Trail: Evidence on the Impact of Exchange Rate Regimes, CIF Working Paper No. 01/2001, Universidad Torcuato Di Tella, available at www.utdt.edu/~ely.

Levy-Yeyati and Sturzenegger (2001b) Exchange Rate Regimes and Economic Performance, CIF Working Paper No. 01/2001, Universidad Torcuato Di Tella, available at www.utdt.edu/~ely.

Mundell, Robert (1964) A reply: Capital Mobility and Size, Canadian Journal of Economics and Political Science 30, pp. 421-31.

Mundell, Robert (1963) Capital Mobility and Stabilization Policy Under Fixed and Flexible Exchange Rates, Canadian Journal of Economics and Political Science 29, pp. 475-85.

Rose, Andrew (2000) One Money, One Market? The Effects of Common Currencies on International Trade. Economic Policy 15, No. 30.

Sahay, Ratna and Carlos Vegh (1997) Dollarization in Transition Economies: Evidence and Policy Implications, The Macroeconomics of International Currencies, Theory, Policy and Evidence, edited by Paul Mizen and Eric J.Pentecost, Brookfield, Vt:Edward Elgar, 1996.

Savastano, M.A. (1996) Dollarization in Latin America: Recent Evidence and Some Policy Issues, IMF Working Paper, 96/4, Washington: International Monetary Fund, January 1996.

Summers, Lawrence (2000) International Financial Crises: Causes, Prevention and Cures, *American Economic Review, Papers and Proceedings*, Vol 90, No.2.

Thomas, L.R. (1985) Portfolio Theory and Currency Substitution, Journal of Money, Credit, and Banking, Vol. 17, pp.347-357.

Table 1. List of Dollarized Economies

Country	Population	Political Status	Currency used	Since
Andorra	63,000	Independent	French franc and Spanish peseta	1278
Channel Islands	140,000	British dependencies	pound sterling	1797
Cocos Islands	600	Australian external territory	Australian dollar	1955
Cyprus, Northern	180,000	de facto independent	Turkish lira	1974
Greenland	56,000	Danish self-governing region	Danish krone	Before 1800
Guam	150,000	U.S. territory	U.S. dollar	1898
Kiribati	80,000	Independent	Australian dollar	1943
Liechtenstein	31,000	Independent	Swiss franc	1921
Marshall Islands	60,000	Independent	U.S. dollar	1944
Micronesia	120,000	Independent	U.S. dollar	1944
Monaco	30,000	Independent	Euro (French franc since 1865)	1999
Nauru	8,000	Independent	Australian dollar	1914
Niue	2,000	New Zealand self-governing Territory	New Zealand dollar	1901
Norfolk Island	2,000	Australian external territory	Australian dollar	Before 1900
Northern Mariana Islands	48,000	U.S. commonwealth	U.S. dollar	1944
Palau	18,000	Independent	U.S. dollar	1944
Panama	2.5 m.	Independent	1 balboa = US\$ 1; uses dollar notes	1904
Pitcairn Island	56	British dependency	New Zealand and U.S. dollars	1800s
Puerto Rico	3.5 m.	U.S. commonwealth	U.S. dollar	1899
Saint Helena	6,000	British colony	pound sterling	1834
Samoa, American	60,000	U.S. territory	U.S. dollar	1899
San Marino	24,000	Independent	Euro (Italian lira since 1897)	1999
Tokelau	1,600	New Zealand territory	New Zealand dollar	1926
Turks and Caicos Islands	14,000	British colony	U.S. dollar	1973
Tuvalu	10,000	Independent	Australian dollar	1892
Vatican City	1,000	Independent	Euro (Italian lira since 1929)	1999
Virgin Islands, British	17,000	British dependency	U.S. dollar	1973
Virgin Islands, U.S.	100,000	U.S. territory	U.S. dollar	1917
Ecuador	12.9 m.	Independent	U.S. dollar	2000
El Salvador	6.1 m.	Independent	U.S. dollar	2001
Austria	8.1 m.	Independent	Euro	1999
Belgium	10.2 m.	Independent	Euro	1999
Finland	5.2 m.	Independent	Euro	1999
France	58.8 m.	Independent	Euro	1999
Germany	82.0 m.	Independent	Euro	1999
Ireland	3.7 m.	Independent	Euro	1999
Italy	57.6 m.	Independent	Euro	1999
Luxembourg	0.43 m.	Independent	Euro	1999
Netherlands	15.7 m.	Independent	Euro	1999
Portugal	10.0 m.	Independent	Euro	1999
Spain	39.4 m.	Independent	Euro	1999

Table 2. Hard Pegs and Fiscal Policy

	Currency Unions			Non-CU			Fix de facto (w/o CU)			Test (CU=NCU) P-value		Test (CU=Fix) P-value	
	Obs.	Mean	Median	Obs.	Mean	Median	Obs.	Mean	Median	Means	Medians ¹	Means	Medians ¹
Total Expenditure	168	26.2	26.9	1639	28.1	25.7	460	31.7	30.7	0.08	0.37	0.00	0.00
Current Revenue	171	21.9	23.1	1642	23.5	21.6	462	26.8	26.3	0.06	0.30	0.00	0.00
Overall Budget Surplus	166	-2.5	-1.6	1630	-4.2	-3.3	449	-4.5	-3.4	0.00	0.00	0.00	0.00
Tax Revenue	171	18.0	20.3	1650	19.4	17.3	463	21.6	18.3	0.07	0.65	0.00	0.00
Gov Consumption	406	16.4	15.6	2023	15.6	14.3	608	17.7	16.3	0.05	0.00	0.00	0.03

	Panama			Panama = CU P-value		Panama = Fix P-value	
	Obs.	Mean	Median	Mean	Medians ¹	Mean	Medians ¹
Total Expenditure	25	28.6	28.9	0.22	0.25	0.37	0.61
Current Revenue	25	25.1	25.4	0.09	0.27	0.64	0.95
Overall Budget Surplus	25	-3.5	-4.0	0.24	0.08	0.55	0.95
Tax Revenue	25	18.6	18.4	0.98	0.36	0.23	0.84
Gov Consumption	19	17.9	17.6	0.45	0.04	0.84	0.22

¹ Wilcoxon / Mann-Whitney test

Table 2. Hard Pegs and Fiscal Policy (continued)

Currency Unions

<i>Antigua and Barbuda</i>
<i>Benin</i>
<i>Burkina Faso</i>
<i>Cameroon</i>
<i>Central African Republic</i>
<i>Congo</i>
<i>Côte d'Ivoire</i>
<i>Chad</i>
<i>Dominica</i>
<i>Equatorial Guinea</i>
<i>Gabon</i>
<i>Grenada</i>
<i>Guinea-Bissau</i>
<i>Mali</i>
<i>Niger</i>
<i>Saint Kitts and Nevis</i>
<i>Saint Lucia</i>
<i>Saint Vincent and the Grenadines</i>
<i>Senegal</i>
<i>Togo</i>

Definition of Variables

Total Expenditure: Current and capital (development) expenditures and excludes lending minus repayments.

Current Revenue: Includes all revenue from taxes and current nontax revenues (other than grants) such as fines, fees, recoveries, and income from property or sales. Data for central government only.

Overall Budget Deficit: Current and capital revenue, and official grants received, less total expenditure and lending minus repayments.

Tax Revenue: Comprises compulsory, unrequited, nonrepayable receipts for public purposes collected by central governments. It includes interest collected on tax arrears and penalties collected on nonpayment or late payments of taxes and is shown net of refunds and other corrective transactions.

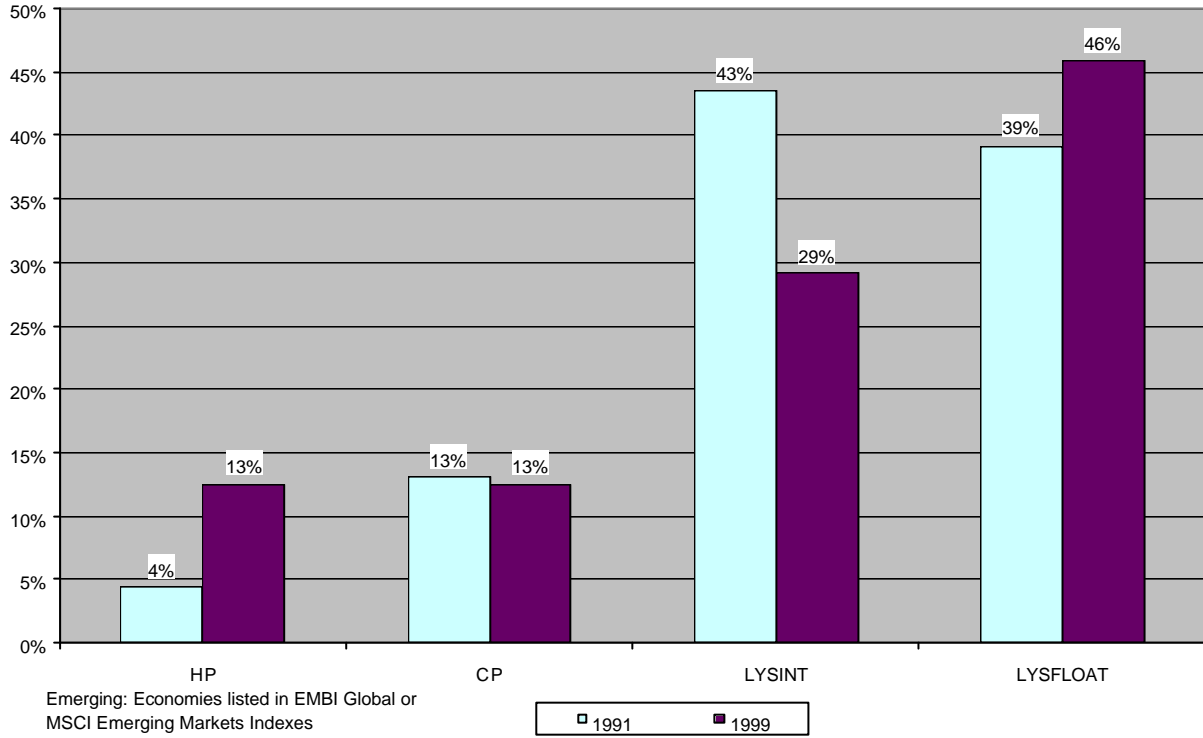
Government Consumption: Current spending for purchases of goods and services (including wages and salaries). It also includes most expenditures on national defense and security, but excludes government military expenditures that are part of government capital formation.

All variables as percentage of GDP and for central government only.

Source: The World Bank's World Development Indicators.

Figure 1

**Emerging Markets
(LYS Classification)**



**All Other Countries
(LYS Classification)**

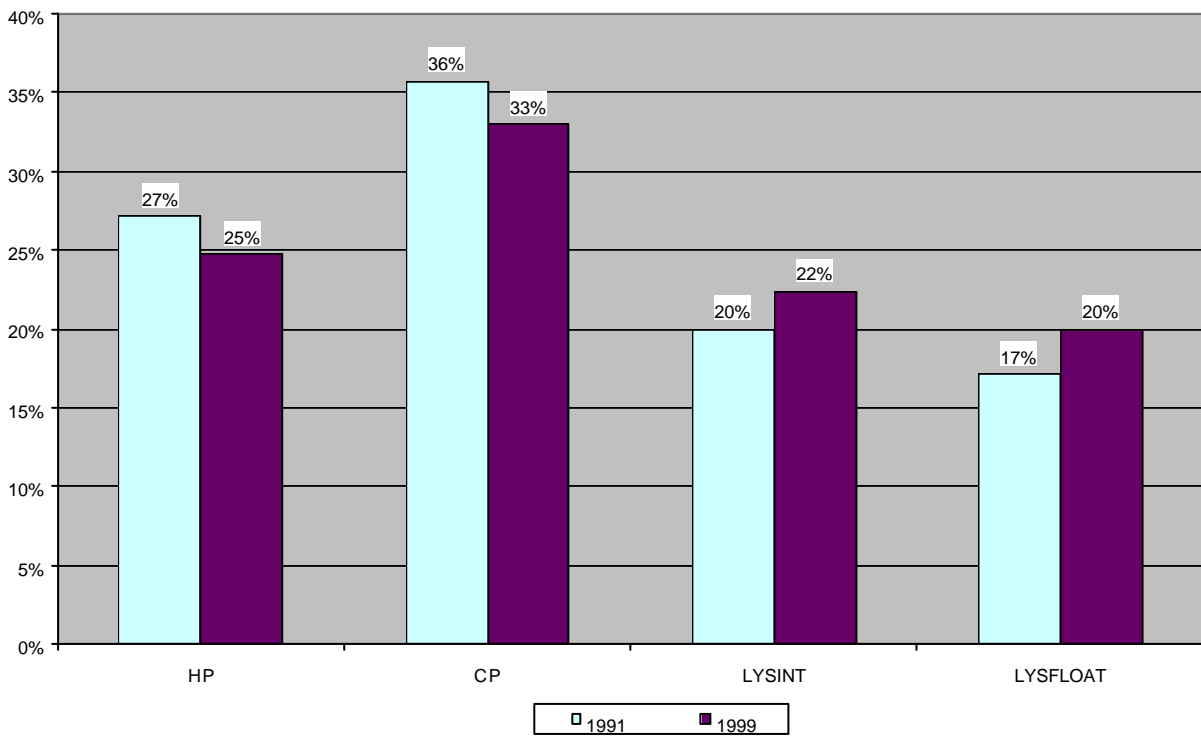
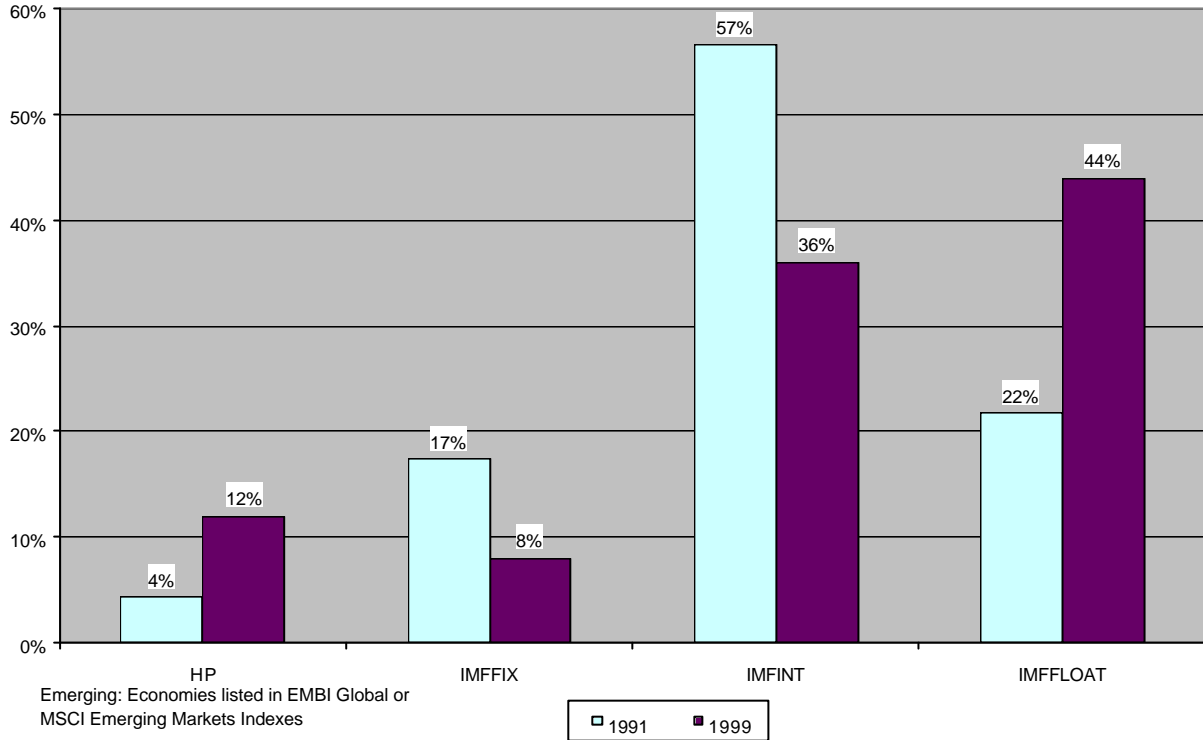


Figure 1 (continued)

**Emerging Countries
(IMF Classification)**



**All Other Countries
(IMF Classification)**

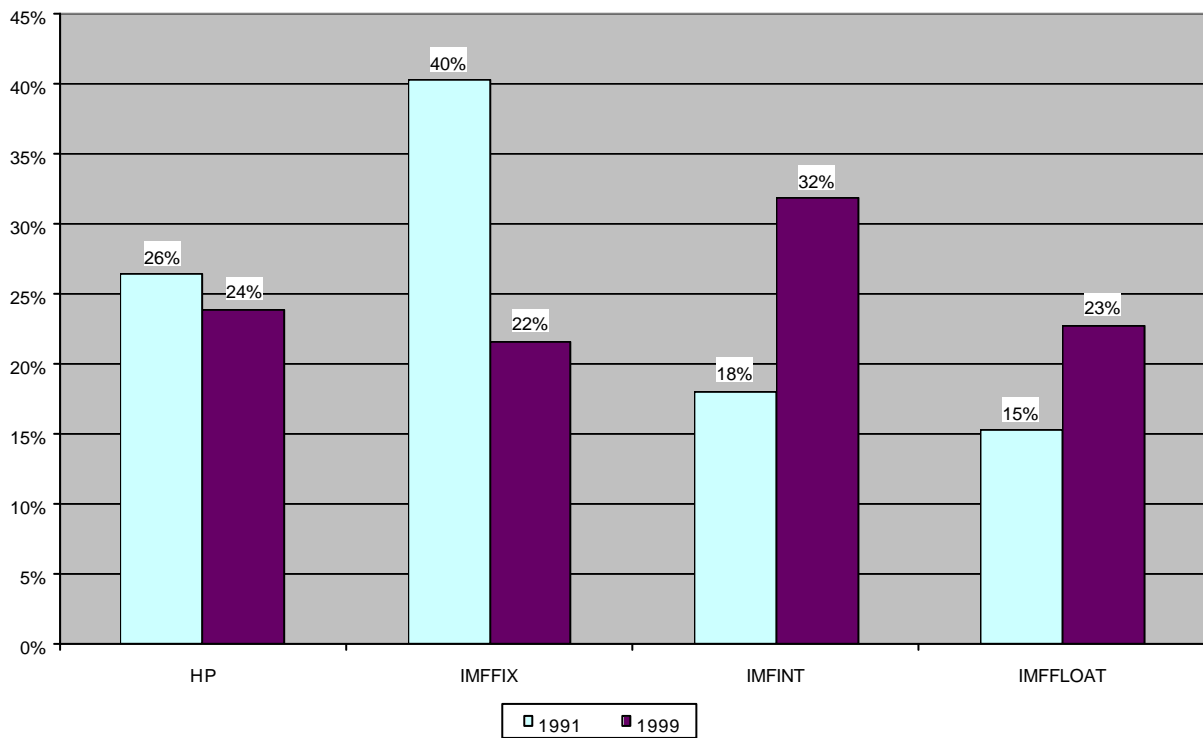


Figure 2. Ecuador: Evolution of the Exchange Rate in the Road to Dollarization

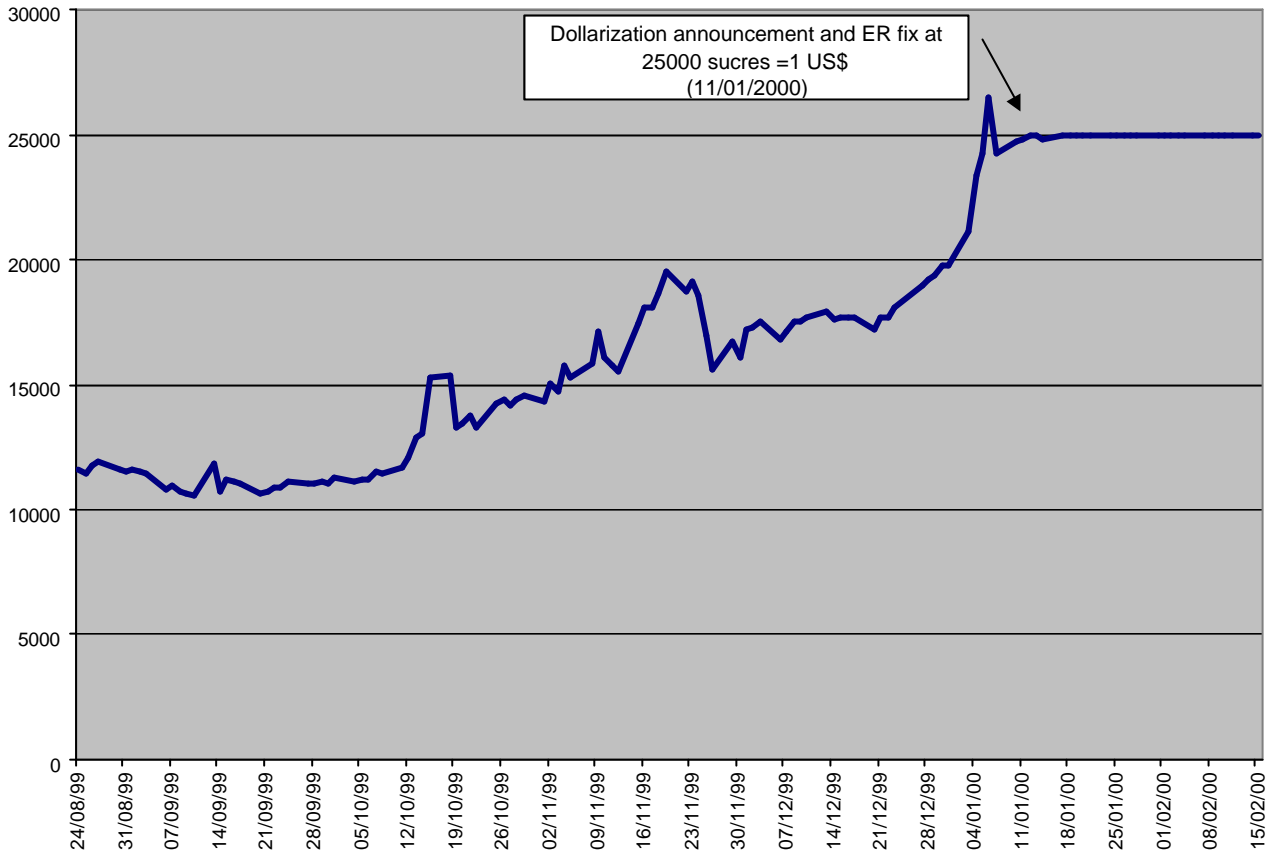


Table 3. The loss of Seigniorage Revenues
(in percent of GDP)

r = 4%				
g = 4%				
g	1%	2%	3%	4%
0%	5.0%	6.0%	6.9%	7.8%
1%	6.7%	7.9%	9.2%	10.5%
2%	10.0%	11.9%	13.8%	15.7%
3%	20.0%	23.8%	27.7%	31.4%