

The Dollarization Debate in Argentina and Latin America

Pablo E. Guidotti and Andrew Powell¹

March 2000
Revised, November 2001
Revised, April 2002

¹ Pablo E. Guidotti is Director of the School of Government at the Universidad Torcuato Di Tella, and Andrew Powell is Professor of Economics at the Universidad Torcuato Di Tella. The views expressed are exclusively those of the authors. We wish to thank in particular Verónica Cohen Sabban and Elena Grubisic for excellent research assistance. Any mistakes naturally remain our own.

1. Introduction

For emerging markets, and for Latin America in particular, the 1990's represented the decade of globalization. For Latin America, globalization meant the return to international capital markets in significant scale after a long period of inward-orientation, especially marked by the protracted resolution of the debt crisis of the 1980's.

Globalization translated rapidly into higher economic growth, increased trade flows, and strong and increasing foreign direct investment to emerging market economies. The largely rosy picture that characterized the world economy during the first half of the decade was a re-enforcing combination of a relatively benign policy environment in industrial countries coupled with the implementation of significant structural reforms in developing countries.

Nevertheless, the decade's second half showed suddenly a face of globalization that had not been fully anticipated: that of volatility and contagion. This new environment prompted a wide and multilateral discussion on what became known as "the international financial architecture". This discussion was motivated by the perception that crises in international capital markets might become recurring events. The Russian debt moratorium showed that crises in emerging markets could affect the functioning of liquid markets in industrial countries and that emerging market economies were becoming very sensitive to events occurring in places with which there was no significant apparent real or financial connection. Consequently, there was a focus on measures to strengthen domestic policies and to reduce contagion through increased transparency and redefining the role of multilateral organizations, in particular, the IMF.

Furthermore, the discussions on the international financial architecture also renewed the debate regarding exchange rate policy. On the one hand, many in the official community appeared to be quickly seduced by a simple solution: that emerging market economies would be more easily shielded from capital market volatility by adopting flexible exchange rates. On the other hand, based on the apparent resilience of Argentina's Convertibility System and Hong Kong's currency board in the recent crises, some praised

countries that adopted “very strong” commitments to exchange rate stability. Thus, the “bi-polar” theory on exchange rate regimes was born.

The experience of the financial crises of the 1990s, however, did not provide hard evidence to settle the debate on the optimal choice of exchange rate regime. Through the 1990s, it is interesting to note that although virtuously all ‘crises’ involved the abandonment of a weak currency peg, in some cases countries with professed monetary independence have appeared to suffer more (through higher interest rates and/or reserve losses) than countries with less monetary independence (e.g.: Hong Kong and, in the 1990s Argentina²). Moreover, emerging market countries with stated independence tended not to use that independence to significantly counter-act the negative shocks but have rather had to maintain higher interest rates in pro rather than counter-cyclical fashion.³ It seems that stated independence does not necessarily correlate with counter-cyclical policy probably due to the twin problems of highly dollarized liabilities and of maintaining credibility in the policy regime itself.

In this context, some have argued that a preferable option to reduce global volatility is in fact to reduce the number of currencies in world circulation.⁴ In this way, one would reduce the risk implicit in countries adopting unsustainable pegs whose abandonment would lead to contagion, and at the same time would capture the benefits that come with greater credibility in monetary institutions.

A clear example of this line of thought is provided by the debate that originated in Argentina in response to the sequel of capital market crises that characterized the second half of the 1990’s. During that decade, the Convertibility Plan (designed to open and deregulate the economy while implementing a currency board to attain price stability) was a significant economic success. Growth averaged 4.7% (1991-1999 inclusive) and the economy proved itself able to surpass a series of sharp shocks. Financial shocks (including Tequila and the Russian debt moratorium) had a greater

² In this paper we do not discuss in detail the origins of Argentina’s current (2001) economic crisis but suffice to say that in our view it is not a simple case of exchange rate misalignment.

³ Hausmann et. al. (1999) have argued convincingly this point.

⁴ See, for instance, Guidotti (1999), Pou (1999), and Calvo (1999).

negative impact on the economy, but did not blunt the view that the currency board mechanism had served Argentina well. Indeed, at that time, a result of these shocks was to promote a debate on how to deepen the currency board mechanism to dispel any perception of devaluation risk and hence reduce the country-risk spread. As a result, in 1999, the then Argentine government argued publicly in favor of the adoption of the US Dollar as a regional currency, stating that if such a move would receive congressional approval from the concerned countries, then risk in then region could be greatly diminished. Interest in this proposal sparked a debate on dollarization across the American region.⁵

This debate was influenced strongly by the ongoing process of European monetary union. . European convergence brought about significant benefits to the peripheral countries in terms of lower inflation and lower nominal and real interest rates. Although European monetary union may have been motivated largely by political reasons, the economic gain - especially in peripheral countries - is a striking case study for emerging market economies.

This paper discusses the origins and nature of the dollarization debate in Argentina, reviewing the arguments concerning deepening Convertibility and discussing how, through a Monetary Agreement with the US, such a deepening might be effected. In this paper we review the main costs and benefits of dollarization understood as a substantive institutional step which requires a decision of both government and Congress and, hence, involves political as well as economic trade-offs. In this respect, recent events in Argentina have cast a shadow of doubt over the future of Convertibility and over whether dollarization might be considered a desirable policy option. In the present context, the dollarization debate has evolved from a discussion regarding deepening institutions into a discussion more concerned with emergency measures to contain an unraveling crisis., .⁶ This paper focuses on the 1998/1999 institutional dollarization debate that, in our view, remains central when thinking about monetary institutions in Latin America.

⁵ Interest in dollarization can be found from Argentina to Canada, see Levy Yeyati and Sturzenegger (forthcoming) and Alesina and Barro (forthcoming) for two interesting collections of papers and Harris and Courchene (1999) specifically on Canada.

⁶ In this respect there are now more parallels with the dollarization debate in Ecuador, although we note that Argentina in 2001 remains a very different case. See De La Torre (2001) for an excellent review of the Ecuadorian case.

This Chapter is organized as follows. The next section focuses on the origins of the debate and on how the experience of the Argentine economy with the Convertibility system in the 1990's led to the dollarization proposal. We examine the main benefits achieved by the system as well as the economy's response to the sequence of external shocks it faced during the second half of the 1990's. This analysis explains the genesis of the dollarization proposal. The section also examines the lessons that can be drawn from the European Monetary Union for the dollarization debate. In particular, we examine the issue of convergence of inflation, nominal and real interest rates.

Section three reviews the main arguments of the ongoing debate on the choice of the exchange rate regime in the emerging market economies' context. Such debate, as well as the experience of emerging market economies with various exchange rate regimes, constituted the background for the dollarization proposal.

Section four examines in detail a specific proposal put forward by the Argentine government in 1999.⁷ In particular we analyze the consequences of full dollarization of the Argentine economy subject to a Monetary Agreement with the US, and its potential benefits and costs. We also compare the proposal with an easier-to-implement but in our view a less desirable alternative: that of unilateral dollarization. Although we analyze conceptually the 1999 proposal, in doing so we take into account recent events in Argentina when obtaining updated estimates of seigniorage revenues and when considering other relevant aspects of its potential implementation.

The Monetary Agreement examined in this paper assumes that Argentine seigniorage revenues are preserved. It also proposes the construction of a liquidity facility, using these potential seigniorage flows as collateral. The latter would at least substitute for the current liquidity lender of last resort capabilities of the Argentine central bank. It leaves open the possibility

⁷ Previous versions of this paper served as the basis for informal discussions of the Argentine government with the US Treasury and the Federal Reserve while Pablo Guidotti was the Argentine Treasury Secretary and Deputy Minister of Finance, and Andrew Powell was Chief Economist of the Argentine Central Bank.

whether this facility is set up with the US authorities or with commercial banks.

The principal benefit envisaged is the reduction in country risk that would ensue dollarization. Other benefits include the reduction in the volatility of country risk, the improvement in the terms of public and private financing, and the more stable resulting economic environment. Indeed, it is argued that the Monetary Agreement would result in a consolidation of Argentina's position regarding trade and capital account openness, hence fostering greater trade with and investment to and from the US.

Finally, the fifth section contains the concluding remarks.

2. The Origins of the Dollarization Debate

2.1. The Argentine Context

The economic turbulence of the 1980's, which finally culminated in hyperinflation, represented a watershed in Argentine economic history. Inflation had become so endemic that normal economic transactions broke down and the use of domestic currency was reduced so significantly that M3/GDP dropped to about 5% with a significant part of the Argentine financial system moving offshore. At the same time the use of the US dollar in Argentina as a store of value and as a mean of payment rose significantly. The costs associated with high inflation remain firmly etched in the hearts and minds of the Argentine public, politicians and policy makers of all persuasions.

The Presidential elections in 1989 resulted in a new economic program that commenced with a policy that lead to the opening of both the capital and the current account, and a strong fiscal reform which rapidly transferred a large number of public sector companies to the private sector. During 1989-1991 exchange rate instability remained. Hence in April 1991 the Convertibility Law was passed by which a currency-board mechanism was introduced to bring stability and to provide a nominal anchor to abate inflation. This Law fixed the exchange rate to the US dollar (initially at 10,000 australes per dollar and then at 1 peso per dollar), compelled the Central Bank to hold international reserves to fully back the monetary base,

and explicitly prohibited all forms of indexation.⁸ In contrast to a “pure” currency board, Convertibility allows for a significant spectrum of central banking functions. However, in the spirit of currency boards these activities are subject to specified legal limitations.

Convertibility allows the use of the US dollar and other currencies for both transactions and contracts. The Convertibility Law stipulates that the only legal tender in Argentina is the Argentine peso meaning that payments in dollar bills or other currency can be refused. Yet it also stipulates that contracts written in dollars or any other foreign currency are legal, and payment on such contracts in the contracted currency can be enforced under the Law.

In 1992 Congress approved a new Charter for the Central Bank, an essential complement to the Convertibility Law. The new legislation made the Central Bank independent, recreated the Banking Superintendence as a semi-autonomous unit within the Central Bank, and provided the Central Bank with specific powers, including a limited lender of last resort function.⁹ In particular the Central Bank is allowed to conduct repurchase agreements and rediscount operations with banks subject to suitable collateral and subject to restrictions on the solvency of the institutions concerned. The Charter also provided a list of prohibited activities including issuing debt, and lending to government (at any level: federal, provincial or municipal) or to non-financial private or public sector companies. The Convertibility system stipulates that the Central Bank can back up to 1/3 of the monetary base with government bonds purchased and valued at market prices. In addition, the Charter of the Central Bank introduced the restriction that the institution’s bond holdings can only increase up to 10% in any fiscal year (in nominal terms).

Since 1992 there have been considerable efforts to strengthen the financial system. International capital standards were brought in and

⁸ The Convertibility Law was later modified in 2001 such that the Peso will be fixed to a basket composed of the US dollar (50%) and the Euro (50%) starting from the moment the Euro/US\$ exchange rate reaches one to one.

⁹ However the legal independence of the Central Bank did not prevent the removal of the Central Bank President by a Presidential decree. This is a vivid example of the difference between legal independence and actual independence as frequently noted in the literature on the topic. .

increased gradually over the 1992-1994 period to reach a basic minimum of 11.5% of assets at risk at the end of 1994. However, the credit risk capital requirements are significantly increased by the inclusion of bank specific multiplicative factors related to CAMELS ratings and loan-specific multiplicative factors related to loan interest rates. Additionally, market risk and interest rate risk capital requirements have also been introduced bringing minimum capital requirements to some 14% of assets at risk and with actual capital at 21% of assets at risk). At the same time, liquidity was also strengthened through high and remunerated reserve requirements.

Economic performance under Convertibility improved markedly relative to the previous decade. Inflation fell rapidly during 1992, and investment and growth rose significantly (see Table 1).

[Insert Table 1]

In addition, the Argentine currency board surpassed various exogenous shocks during the second half of the 1990's. Real shocks included a period of boom and contraction in Brazil, a period of exceptionally high and then exceptionally low commodity prices and periods of high and low valuations of the US dollar versus other major currencies. These real shocks have naturally all had their effects on Argentina and in particular they have affected growth and employment.

At the same time the currency board also surpassed a number of financial shocks. These include the Tequila period, the Asian devaluations, a speculative attack on Hong Kong, the Russian debt moratorium and the Brazilian devaluation. (We classify the Brazilian devaluation as a financial shock rather than a real shock as we contend that the increase in the sovereign risk premium due to the devaluation had a greater effect on Argentina than the trade effect.) In contrast to the real shocks financial shocks have had a much more serious effect on Argentine growth. We discuss each in turn.

The deepest financial shock of the 1990's for Argentina was the Tequila crisis following immediately after the Mexican devaluation at the end of 1994. The Tequila crisis had a tremendous impact on the financial system as some 18% of bank deposits left Argentina. It also provoked a sharp credit crunch in the economy that ultimately induced a 2.8% recession for that year.

¹⁰ The lender-of-last-resort powers of the Central Bank were used at that time virtually to their legal maximum. ¹¹ This was done to offset the effect on credit, and it is estimated that of the \$8bn that left the system, the Central Bank offset some \$3bn with the reduction in reserve requirements and \$2bn through repurchase agreement and rediscount operations. Hence it significantly dampened the negative impact on credit and economic activity (a further \$2bn was financed by the increase in foreign credit lines to the banking system and the residual \$1bn was the reduction in credit).

The Tequila shock was then controlled in part by the Argentine authorities' actions. These measures, along with the fiscal and other reforms that were introduced in the context of a significant financial assistance IMF package in March 1995 considerably dampened the Tequila shock. Deposits and other financial sector variables turned around very quickly after the May 1995 Presidential election. As noted, the economy suffered a recession, but the recovery was also rapid with just 3 quarters of negative, seasonally adjusted, quarter on quarter growth (that cumulated to -5.8%) and a recovery of 1% in quarter on quarter s.a. GDP growth in IV-95. Moreover, many were surprised by the shift in the current account deficit, which had reached 4.3% of GDP in 1994 and declined to 1.9% of GDP in 1995. Helped by the effects of the Real Plan in Brazil, merchandise exports grew by an incredible 32.4% between 1994 and 1995 whilst merchandise imports fell by 6.8%. These figures are not just important because they implied a rapid about-turn in the current account, but also because they were a reflection of the competitiveness and flexibility of the Argentine economy.

The other financial shocks that the currency board has withstood include the international shocks stemming from the Asian devaluations, the speculative attack on Hong Kong in October 1997, the Russian debt moratorium and finally the Brazilian devaluation of January 1999. The Asian devaluations had little impact on Argentina, with the "Asian flu" arriving only with the speculative attack on Hong Kong. As can be seen in Figure 1, this caused a significant spike in prices such as Argentine peso-dollar yield

¹⁰ A second financial crisis characterized by a sharp deposit outflow and credit contraction occurred in 2001.

¹¹ The Central Bank was at that time more constrained than at present because 80% of the monetary bases had to be backed by international reserves excluding Argentine US\$ government bond holdings.

differentials, country risk spreads and a short-lived spike in domestic interest rates. However, financial aggregates such as reserves and bank deposits showed little reaction. Domestic peso interest rates quickly fell along with peso-dollar spreads, and sovereign spreads declined more slowly and to higher than pre-October levels.

[Insert Figure 1]

A significantly more serious financial shock in terms of world financial markets was the Russian debt moratorium in August 1998. Argentine peso-dollar spreads and country risk spreads together with those of other emerging markets, spiked very high (broadly to the same level as Tequila) and again there was a sharp spike in domestic interest rates. Although these spikes were shorter-lived than those following the October Hong Kong attack, sovereign risk spreads once again fell back to higher than previous levels. Despite the fact that there was no capital outflow from Argentina, August 1998 is a point of inflection in the rate of the growth of reserves and deposits in the financial system with the rate of growth slowing markedly in the second half of that year. In turn, investment started to fall off in the second quarter in 1998 in seasonally adjusted terms anticipating the ensuing contraction of the economy. At first the Russian financial shock appeared to have provoked a very sharp and indiscriminate sell-off in Argentine assets. Then as discrimination prevailed, sovereign spreads receded, but a lasting effect remained which translated into lower investment and growth.

[Insert Figure 2]

Finally, the Brazilian devaluation in January 1999 caused a further spike in sovereign yields. However, in common with the previous trend this spike was shorter-lived than either the Hong Kong or Russian shocks and indeed the Government returned to the international bond market faster than after either of the previous events.¹² After accounting for falls in international reserves due to seasonal changes in money demand, there is no evidence whatsoever of outflows from Argentina during the Brazilian event, although

¹² In the Tequila crisis the Argentine Treasury had to wait for 150 days before being able to return to the market. In the Asian crisis it had to stay out of the capital market during 55 days, while after the Russian moratorium and after the Brazilian devaluation it suspended borrowing during 70 and 19 days, respectively.

the deposits' and reserves' growth rates fell (see Figure 2). These multiple financial shocks produced negative growth in Argentina for 1998's 4th quarter and the first three quarters of 1999. The end of 1999 saw a fall in reserves and in December a fall in deposits. However, this was largely a seasonal effect compounded possibly by political uncertainty (presidential elections were held in October 1999 and the new Government took office in December) and Y2K fears. Since then deposits and reserves have rebounded. Moreover, although the 1999 recession was deeper than first anticipated, the 4th quarter of 1999 showed a strong economic recovery.¹³

This experience suggests that it is difficult to reconcile the effects of financial shocks on the Argentine economy especially at times when other fundamentals are sound. Moreover, the spikes in the peso-dollar yield spreads which accompany each international shock suggest that the currency board system, while giving economic and price stability to Argentina, was not able to gain 100% credibility in the eyes of international investors. Thus, the question arose in 1998 in the mind of policymakers whether Argentina would not benefit by the adoption of the US dollar as its national currency, given the high degree of dollarization of financial contracts prevalent *de-facto* in the economy.¹⁴

2.2. Lessons from the European Monetary Union

The recent history of European exchange rate management reflects well the debate between floating, fixed but adjustable, and truly fixed exchange rates. The fact that eleven European nations finally decided after trying many other different systems, to form a monetary union constitutes an important case study and provides useful insights to countries wishing to permanently fix exchange rates or adopt another country's currency as its own. In this section we attempt to draw out some of the most relevant aspects.

¹³ Later, in 2000, with a new government in place that introduced a significant hike in taxes, the Argentine economy entered a new recession, which deepened in 2001.

¹⁴ Initial internal discussions on dollarization within the Argentine government, and with the US Treasury and Federal Reserve started in 1998. The first public official proposal by the Argentine government was however put forward in 1999 after the Brazilian devaluation.

Although many argue that the 'soft' ERM period of say 1979 to 1986 when realignments were frequent, was a success in terms of economic performance, the system gradually changed into a harder exchange rate system. This happened between 1986 and 1990 with fewer realignments and greater calls for discipline amongst its members. This process of a gradual hardening of the ERM gives some ammunition to those that argue that soft regimes of fixed but adjustable rates are inherently unstable.

The 1990 devaluation of the lira and the sterling and lira crisis of 1992, showed that not even the hard version of the ERM could survive. And for some countries the political incentives generated by a harder fixed exchange rate - towards greater discipline in terms of domestic inflation and fiscal probity - could not keep opposing forces in check. The 1992 crisis resulted in a significant widening of the ERM bands, although for many currencies implicit narrower bands remained.

This is not the place for a detailed discussion of the origins of EMU, which clearly reflect political as well as economic aims. But the decision to press ahead with monetary union after the somewhat inauspicious ERM period clearly reflects a view that while the hard exchange rate mechanism was proved to be unstable, a full monetary union would force the discipline necessary to maintain the stability of the pact for those countries that qualified.

The Maastricht Treaty consisted of a set of convergence criteria, essentially fiscal, for countries to qualify for EMU. It might be argued that the role of these convergence criteria was then to ensure that monetary union, unlike hard EMU, was dynamically stable. In other words to ensure that only those countries, which had demonstrated that the discipline necessary to maintain the pact would enter - in particular in terms of inflation and fiscal results-.

At the time the conditions were set, it was not clear how many countries would qualify. Indeed many commentators suggested that if the criteria were interpreted strictly then there would be several countries that might not qualify. Attention was mostly focused on the 3% budget deficit. It was well known that the 60% debt to GDP ratio would be breached and indeed the Maastricht Treaty allowed for countries to be above this limit if

their figures were moving in the right direction. However, our main point is that the convergence criteria provided a focus for market expectations and the critical question in bond and currency markets became which countries would qualify (which for many observers meant simply convergence to German interest rates and an exchange rate close to the central parity in the post 1992 ERM) and which would not. The implication of non-qualification was higher interest rates and potentially weaker currencies with levels subject to significant uncertainty. This market focus then provided further impetus for policy makers, as qualification became the yardstick by which their political success would be judged. It might be argued that this process led to a virtuous circle with countries eager to qualify, and markets anticipating qualification by lowering borrowing costs thus adding further momentum to policy makers' decisions.¹⁵

[Insert Figure 3]

Success in terms of European convergence can be readily appreciated from Figure 3, which plots the movement in fiscal deficits, inflation, and nominal and real interest rates in selected European countries. Fiscal deficits and inflation improved rapidly in many of the countries considered and, in large part as a result, nominal interest rates fell sharply. As can be seen by comparing the graphs of nominal and real interest rate declines, and as detailed in Table 2, most of the decline in nominal interest rates can be accounted for by the fall in inflation. However, in some countries real rates also fell significantly, representing an additional benefit through reputation effects.

[Insert Table 2]

Various authors have estimated the benefits of the single currency. The European Community has estimated that the benefit of eliminating intra-European currency transactions ranges from 1/4-1/2% of EC GDP whereas the elimination of currency risk has been estimated – perhaps somewhat generously - as 2% of GDP. Moreover, the estimates of the reduction in the nominal financing cost of public debt ranges from an average 1% of GDP across the EMU 11 countries and as large as 2% of GDP for Italy.

¹⁵ Indeed, some have even suggested that without the markets' response, qualification would not have been possible for several countries as the lower cost of borrowing made the difference in some cases to obtain a fiscal deficit of less than 3% of GDP.

The fundamental benefits of EMU are surely the higher investment stemming from lower interest rates and the adjustment to a higher capital stock, which then implies further multiplier effects to give permanent gains to growth. These effects will be particularly evident in the peripheral countries where interest rate reductions have been concentrated. A slightly different view is expressed in Currie (1992), who considers explicitly the difference between Germany, which is characterized as a high reputation country, as opposed to other EMU members. The gain in reputation for the other EMU members allows them to achieve, in a Barro-inspired framework, a permanently lower inflation rate at little cost in terms of output (see also Giavazzi and Giavannini, 1989). Depending on the assumed social welfare function, this calculation may yield further significant benefits.

To conclude, it might be argued that EMU arose out of the somewhat inauspicious background of the ERM experience that proved to be dynamically unstable. Europe then opted for monetary union and significantly greater institutional development. The setting of the convergence criteria had an important effect on markets and it can be conjectured that market behavior then fed back to tightened policy objectives thus creating a virtuous circle. Convergence was extremely impressive with respect to inflation rates, fiscal deficits and nominal interest rates falling substantially in peripheral countries. Moreover in some countries real interest rates also fell significantly reflecting gains in reputation due to the institutional changes.

3. Exploring the Options: Floating vs. Fixed, Currency Boards & Currency Unions

In this section we review briefly a more academic debate regarding floating versus fixed exchange rates versus currency boards versus currency unions, drawing out selected salient points. This debate provided the background for the dollarization proposal. We will use the term “currency union”, as this is the term generally applied in the academic literature. However, our focus is on a small country considering monetary union with a larger partner(s) such that it would have no significant say in subsequent monetary policy decisions.

3.1. On Fixed versus Floating

The traditional literature on the choice between fixed and floating exchange rates focuses on the effects of different types of shocks. Broadly speaking, fixed rates are preferred when shocks are mostly monetary whereas floating rates are superior when shocks are mostly exogenous and real in nature.

In practice, however, many countries have adopted intermediate solutions rather than adopting pure floats or truly fixed exchange rates. These include dirty floats, or floats subject to bands that might crawl, or crawling rates subject to some 'managed' flexibility. On the one hand, proponents of intermediate regimes argue that these systems combine the advantages of a flexible exchange rate (in terms of responding to exogenous real shocks) while limiting the costs (by avoiding an 'excessive' reaction to monetary shocks). On the other hand, the literature on speculative attacks has highlighted problems that may arise in these intermediate solutions or indeed any fixed exchange rate, when not supported by appropriate monetary or other policies. In particular, it is well established that under certain conditions the market may provoke a fully rational attack on the system forcing the authorities to change the regime. The 1992 ERM crisis and more recent failures of fixed but adjustable pegs have led many to conclude that given the levels of global capital flows, these intermediate solutions are increasingly difficult to maintain over time and, hence, to prevent currency crises, countries may need to choose between fairly pure floats (where perhaps some intervention can be used for short term objectives) and a truly fixed exchange rate backed by a firm commitment (e.g.: either a currency board mechanism or a fully fledged currency union). In this respect the debate has come full circle and is once again more clearly a debate between two extremes; to fix or to float.

However, the terms of the debate have also changed, based on the realization that neither a pure float, nor a pure fix, will follow the perfect textbook model. On the one hand, Calvo and Reinhart (1999) have documented that many emerging market countries with flexible exchange rate regimes have displayed a "fear of floating", characterized by relatively stable exchange rates (at last in comparison to their G7 counterparts), with proactive interest rate policies and higher levels reserve volatility implying foreign

exchange intervention. Hence, it appears that, despite exchange rate flexibility, policymakers have often preferred to maintain relatively stable rates but at the cost of substantially higher interest rates, as also described by Hausmann et al. (1999). On the other hand as we document in this paper, Argentina's pure fix backed by a currency board has also suffered from a lack of full credibility and hence from perceived devaluation risk.

Thus, although the choice facing countries today may appear to be cast in terms of the extremes of floating versus fixed as depicted in the traditional literature, in our view, the real choice is a different one. The real choice facing policymakers in emerging markets is often between an imperfect floating regime in which monetary policy may not be employed to react optimally to real shocks, and an imperfect fixed exchange rate regime where devaluation risk remains present.

The issue of credibility is critical to understanding these imperfections, and credibility itself is a dynamic concept. In a floating rate regime, it might be argued that as credibility is gained it becomes more possible to use counter-cyclical monetary policy. But it might also be argued that, in the context of a fixed exchange rate regime, perceived devaluation risk may fall over time as the system becomes more credible.

A fear of floating, as advanced by Calvo and Reinhart is often tied to the presence of dollarized liabilities. In a highly dollarized economy, exchange rate fluctuations may be very costly and hence optimal monetary policy decisions may be significantly constrained by balance-sheet considerations (see Baliño et al 1999). In turn, de facto dollarization may itself be a result of a lack of credibility as the option of issuing debt in local currency may be much more expensive than that of issuing in dollars if the monetary regime itself is not credible¹⁶. Indeed, as argued by Calvo and Guidotti (1990), dollarization of liabilities may itself be a powerful instrument to strengthen the credibility of the exchange rate/monetary policy. In turn, as an independent monetary policy becomes more credible, or as a fixed exchange rate becomes more credible, it is to be expected that the economy may de-dollarize over time.

¹⁶ Pedro Pou, the ex President of the Central Bank of Argentina has referred to the choice between issuing long term in dollars or short term in local currencies to reduce the costs of debt as the 'devil's choice'.

3.2. Floating Exchange Rates versus a Currency Union or Currency Board

The literature on Optimal Currency Areas (OCA) follows closely the traditional literature on fixed versus floating exchange rates. Thus, advocates of flexible rates tend to use the arguments from the OCA literature to stress that currency unions are costly when real shocks affect countries asymmetrically. On the other hand, a currency union may seem desirable to the advocates of truly fixed rates as a mechanism to solve the credibility problem mentioned above. If a truly fixed rate is preferred, then a currency board mechanism or a currency union may be required first to ensure that monetary policy is consistent with the fixed rate (a political economy argument may suggest that this is necessary or desirable) and secondly to ensure that the market considers the rate fully credible reducing the possibility of a speculative attack. Alesina and Barro (2001) model the tradeoff between, on the one hand, the benefit of a currency union as the solution of a Barro-Gordon type credibility problem and, on the other hand, the associated cost of losing an instrument to respond to asymmetric shocks. Hence they develop alternative rules for deciding under which conditions it is optimal for a small country to adopt the currency of another country as its own.

A relevant consideration relates to the endogeneity of the OCA conditions. It was suggested above that the Maastricht conditions for EMU set in place a virtuous circle that influenced policy-makers. Hence it might be argued that the conditions for EMU were to a significant extent endogenous to the decision to join the union. In similar vein, many argue that a pre-requisite for a fixed exchange rate or monetary union is price flexibility. However, it might be contested that price flexibility is also, to a significant extent, endogenous to the monetary regime in place. Moreover, a common criticism of currency boards or currency unions is that countries may have different economic cycles. A counter argument is that 'economic cycles' are also endogenous to the regime and that through a currency board/currency union, trade will increase and economic cycles will become much more symmetric¹⁷.

¹⁷ Frankel and Rose (2000) find very substantial trade effects for monetary unions.

Traditional OCA theory stresses the role of asymmetric real shocks and many have in mind shocks to the price of oil, other basic commodities or indeed productivity shocks. This analysis was especially relevant for a world of low capital mobility, but in a world of high capital mobility certain shocks to financial variables may also constitute shocks that affect aggregate wealth and are then equally valid ‘real’ shocks. The correlations of financial indicators (e.g.: bond and stock prices) are high for a wide range of emerging markets and especially within the Americas. Moreover, taking into account regime changes, they are also high between emerging countries and the US. This evidence suggests that although traditional ‘real shocks’ may be asymmetric, ‘real shocks’ stemming from financial variables may be more highly correlated. Thus, rethinking what we mean by ‘real shocks’ in a world of high capital mobility may also have implications for traditional OCA theory¹⁸

At times, financial shocks may be highly asymmetric, as when an increase in risk aversion makes capital flow out of emerging market economies and into “safe havens”. The traditional argument for flexible exchange rates would hold in a case such as this in exactly the same way as when there are widespread asymmetric, say, terms of trade, demand, or productivity shocks. However, the counter-argument related to the benefits of gaining credibility also applies. Especially in the case of countries with a history of high inflation, gaining credibility through a very fixed exchange rate or a monetary union may significantly outweigh the potential cost arising from asymmetric real or financial shocks between the countries involved.

This suggests that although according to traditional theory, emerging countries and the US may not form an OCA because of the existence of asymmetric real and financial shocks, if the gain in credibility is considered then this result may be overturned. Indeed, a monetary union may contribute to eliminate or reduce significantly (asymmetric) financial shocks.

3.3. Currency Boards versus Currency Unions

In terms of the traditional economic theory the only significant difference between a pure currency board and a currency union is the issue of

¹⁸ Eichengreen (1997) argues that highly correlated stock prices in 22 industrialized countries represents evidence of highly correlated expectations of the effect of real shocks.

seigniorage revenue. Under the assumption that a sharing rule could be found that would leave Argentina with no net loss in terms of seigniorage, we do not discuss this matter further here¹⁹. However, there is a set of issues that traditional theory does not take into account

A pure currency board is a construct of economic theory and in practice currency boards tend to have some flexibility built within them. In the Argentine case, the Central Bank has the flexibility of reducing international reserves to 2/3 of the 'monetary base'. This is subject to the additional restriction that total reserves (i.e. including Argentine government dollar denominated bond holdings), must cover 100% of the monetary base. However, to the extent that a liquidity facility is agreed upon within the context of the Monetary Agreement, that effectively replaces this flexibility of the Argentine Central Bank, then once again there may be little difference between a currency board and currency union²⁰.

The credibility of the institutional arrangement is an important issue. A currency board might be thought of as the hardest form of fixed exchange rate that maintains the real existence of a domestic currency²¹. Given that the domestic currency remains in circulation, an advantage of the currency board is then that it leaves open the possibility that at some future date the currency might float. However, leaving open that option gives rise precisely to the cost of imperfect credibility of the fixed peg. It might be argued that a currency union removes virtually any possibility of re-introducing a domestic currency hence increasing the credibility of the monetary arrangement. In our view, to the extent that the currency union is enshrined in a bilateral treaty or agreement with seigniorage sharing and other features, this credibility will be heightened²². It is then the option value (and its cost in terms of residual imperfect credibility) of the currency board that makes it different to

¹⁹ We do discuss below how such a sharing rule might be implemented.

²⁰ Again, we discuss the implementation of such a liquidity facility below.

²¹ We use the phrase real existence as even in dollarized countries such as Panama, Ecuador and El Salvador the national currency remains as an accounting unit and also in the form of coins.

²² Indeed, apart from the financial and political consequences of losing seigniorage revenue, it is the argument of heightening the credibility of the arrangements that is, in our view, the main attraction of dollarization with a monetary agreement versus simply unilateral dollarization.

dollarization²³. Naturally, there may be other dimensions to this difference. As mentioned earlier Frankel and Rose (2000) find a significant effect of a currency union (or use of another's currency) to trade that is not present when considering currency board countries.

²³ In an interesting paper, Craine (2001) models a currency board's option value precisely in this way and the decision to either float or to dollarize (forever) as two ways of 'stopping' in the context of an optimal stopping problem with stochastic disturbances. In this model, the imperfect credibility of the currency board is also modeled in that as there is an endogenous probability that the optimal policy would be to float and that then affects interest rates in the currency board regime. He finds that as the size of real shocks rises, the option value of the currency board increases as does the potential benefit of floating and hence the region where the optimal policy of stopping via a dollarization shrinks. 'Stopping' via dollarization is optimal when the expected volatility of future real shocks is relatively small.

3.4. Conclusions

This section suggests that, in today's world of global capital, the traditional debates between floating and fixed rates, currency boards and monetary unions may need significant revision. First, the feasibility and benefits of an independent monetary policy may be lower than previously thought. Second, a fixed but adjustable exchange rate may be subject to destabilizing speculative attacks. A currency board is a mechanism to subjugate monetary policy more directly for the defense of the currency peg and hence buys credibility, arguably, at the cost of monetary flexibility. However as credibility becomes more and more important, the desirability of a currency union over a currency board increases. But if real shocks are very large or very costly, then the option value of the currency board increases, as does the potential gain from floating. In the next section, we consider what form of currency union might be applicable to the Argentine case. We discuss, in particular, the structure that an US-Argentine Monetary Agreement might eventually take.

4. A US-Argentine Monetary Agreement

4.1. Introduction

As described in previous sections, the dollarization debate emerged from a combination of factors. First, Convertibility had set the basis for wide-range of reforms and, as a consequence, in the period 1991-1998 macroeconomic performance had improved significantly. Thus, Convertibility enjoyed widespread popular and political support. Second, especially after January 1999 when Brazil devalued, there was a perception that although Convertibility had gained credibility over time, it was certainly less than 100% credible, implying a perceived and significant devaluation risk – as evidenced for example in the peso forward rates against the dollar. Furthermore, it appeared that Argentina was subject to significant contagion effects through world financial markets. These effects were very costly in terms of the adverse effect that higher interest rates had on investment, growth and employment.

In this section we examine how the implementation of an US-Argentine Monetary Agreement could constitute an effective strategy to reduce such

perceived risk, to reduce contagion, and to promote economic stability within Argentina and, hence, to reduce sovereign spreads and interest rates, and to increase investment and growth. As we argued above, if successful such a strategy might also jump-start a regional trend towards monetary unification. As mentioned earlier, the discussion that follows is about implementation of dollarization in an institutional context such as that prevailing at the time of the 1998/1999 debate, and not as a response to a crisis scenario.

4.2 What would a Monetary Agreement consist of?

A Monetary Agreement between Argentina and the US might be considered as the framework under which Argentina would adopt the US dollar as legal tender, phasing out the use of the peso.²⁴ It could consist of a set of bilateral agreements. The agreements that we consider here are: (1) an agreement on the sharing of seigniorage revenues and (2) an agreement by which Argentina would establish or gain access to a liquidity facility.

As we discuss further below, our assessment is that an institutional arrangement containing agreements on these issues is necessary in order for Argentina to reap the full benefits of dollarization. In particular, our view is that a unilateral dollarization would not provide the maximum benefits in terms of the elimination of devaluation risk, as a greater incentive to reintroduce a domestic currency would remain than under a monetary agreement. Also, unilateral dollarization could potentially increase risk because of the resulting reduction in the lender of last resort powers of the Central Bank without a corresponding liquidity facility taking its place. Moreover, a full loss of the seigniorage revenue with no corresponding compensation would pose a significant obstacle in the required process of reaching a broad social and political consensus needed to ensure the success of dollarization²⁵.

²⁴ As in other dollarized countries, it might be efficient to keep the Peso circulating for fractional units, in the form of coins.

²⁵ In Hausmann and Powell (1999), ‘initial conditions’ for dollarization are divided into (i) feasibility conditions, (ii) conditions that ensure that dollarization is a ‘best option’ and (iii) conditions to ensure success. The authors argue that it is the third most stringent set of conditions that are the relevant ones and that a broad social and political consensus is required for this condition to be met.

A critical issue is whether a Monetary Agreement with the US would imply any additional contingent liabilities for the US authorities other than those included in the specific agreements. Certainly, the agreements examined here contain no explicit wider responsibility in terms of banking supervision or access to the Federal Reserve discount window. However, a concern might be raised in the sense that given the ‘official’ use of the dollar in Argentina, the US might feel committed to assist Argentina in the wake of any arising problems. There are several responses to this. First, our view is that the ‘initial conditions’ should be such as to make very slim the probability of any future financial problem in Argentina. We are not thinking here of dollarization as a response to the current crisis but rather as a reform to be implemented during ‘better times’. Second, our view is that with the elimination of devaluation risk and hence the impossibility of any future "currency crisis" plus the lowering of country risk and the resulting economic stability would significantly reduce the probability of needing to access extraordinary IMF, other IFI, or bilateral support in the future. Third, even if a crisis occurred after dollarizing it is not at all obvious that the US would be expected to provide more assistance to Argentina simply because of the existence of a Monetary Agreement. Indeed, the most recent rescue packages, including that of Argentina, have revealed the US to be a major contributor anyway through its significant support to the IMF and other IFIs – and in some cases even directly. Hence, an institutional arrangement that induces a significant reduction in the probability of Argentina needing such funding in the future could be thought of as reducing any possible US contingent liability rather than increasing it.

4.2.1 Seigniorage

Seigniorage is the revenue earned by issuing notes and coins that the public holds willingly without receiving interest. The Central Bank, which typically has the monopoly of issuing the national currency, can exchange currency for interest bearing securities. In Argentina, there are currently \$10.4 billion pesos in circulation (including those held by the public and by banks). As discussed above, these are fully backed by hard currency reserves at the Central Bank along with some \$2.9 billion held by banks in the form of liquidity requirements.²⁶ A very simple estimate of the current flow of

²⁶Also, there is a significant quantity of dollar notes in Argentina. There are no Central Bank estimates of the dollar notes in circulation. The Economy Ministry does employ an

seigniorage revenue is obtained by multiplying this \$10.4 billion stock by a relevant interest rate (e.g.: 30 day Libor which on 31/10/2001 stood at 2.3 %), a calculation providing a flow of about \$240 million per annum. However, this estimate may under-estimate the potential long-run seigniorage revenue because currently Libor is at a very low rate. For instance, if we took the level of Libor one year before, which stood at 6.6%, then the estimate rises to \$680 million per annum. Moreover, one might consider the monetary base might grow over time, given the currently low level of monetization of the economy. Currently notes and coins in pesos stand at about 3.6% of GDP.

From the yearly flow estimate, and making some assumption about the future behavior of GDP and monetization, one can obtain a useful stock concept expressing the present discounted value of future seigniorage revenues. Assuming a rate of growth of 4% per annum, and that the monetary base declines over time (using a simple hyperbolic function) but then stabilizes at 2.5% of GDP forever if Libor remains at 2.3% then the present discounted value of future seigniorage considering the next 50 years (discounted changes in stocks and interest earnings) is about \$57 billion. If Libor were to rise back to 6.6%, the figure would be lower: \$20 billion in present value terms (this because of the higher discount rate). These figures may appear large but represent only about 0.25% of the discounted Argentine GDP flows over the same 50 years in each case²⁷. In the discussion that follows, we will consider the issue of seigniorage sharing in general terms but bearing these estimates in mind.

estimate in the balance of payments and the estimate is over \$20billion. The US authorities also have estimates based on dollar notes exported to Argentina. However, there is no hard information on dollar bills re-exported. We consider these estimates to be very high. If we take the ratio of dollar notes to peso notes held by banks this is about 40.5%. This reflects roughly the ratio of sight deposits (checking and savings) in pesos to dollars (about 41%). The 41 % figure implies an additional \$5.8 billion dollar notes currently in circulation plus \$892 million dollar notes held by banks. This is likely to be an underestimate but adding in estimates of the informal economy operating with dollar bills, it is difficult to obtain the estimates suggested above. This lower calculation would yield total notes (peso and dollar) in circulation or held by banks then sums to just over \$19 billion (about 7% of GDP).

²⁷ Levy Yeyati (2001) makes the assumption that the monetary base will grow at the same rate as long-term growth (4% in his base case scenario). We view this as unrealistic in view of the dramatic decline in notes and coins in circulation in the last couple of years. We also consider his emphasis on a large nominal stock figure inappropriate. With the optimistic assumption of 4% GDP growth forever it is surely more appropriate to compare the benefit of seigniorage in comparison to cumulative GDP.

One way of considering how the Monetary Agreement might deal with this issue is to think that Argentina is selling the Federal Reserve System the right to be the monopoly note issuer in Argentina. At current levels of monetization, the present value of this "license" is \$10.4 billion (or \$280 million per annum forever at an interest rate of 2.3%)²⁸.

The Argentine Central Bank would then cancel its peso liabilities with Argentine residents by drawing down its international reserves, mostly in US financial assets. The public and the banks in Argentina would complete their currency substitution with this new stock of US dollars, which would be legal tender and would be used to meet all functions of currency: unit of account, means of payment and reserve of value.²⁹ Other monetary and financial assets and liabilities in pesos would be automatically converted to dollars at par.

In the US the financial institutions that manage the international reserves of the Argentine Central Bank would have to sell assets (say, US Treasury bonds) in order to cancel their debt to the Argentine Central Bank. On the other hand, the US Federal Reserve would issue \$10.4 billion new dollars by purchasing the same amount in US Treasury bonds. Since this supply of new dollars would satisfy a new and equivalent demand (by Argentines) it would not have any inflationary effect.

However, by withdrawing from the market \$10.4 billion in US Treasury bonds, the US government would be saving the interest on this stock of securities. In principle, this net seigniorage gain could then be passed on to the Argentine government on an annual basis. Thus, neither government nor the country as a whole would lose or gain from the change. While the Argentine Central Bank would basically be selling the dollars it receives by drawing down on its foreign investments (as in any exchange market

²⁸ This view of the seigniorage-sharing rule makes clear that there would have to be restrictions on Argentina issuing a new currency (or if it did then that would be grounds to reduce or eliminate seigniorage payments from the US). It is interesting to note that in the current context several Argentine provinces, most notably the province of Buenos Aires, has issued a type of bond and to the extent that this becomes a close money substitute surely reduces the demand for pesos. The Monetary Agreement may have to restrict such actions on the part of Argentine provinces or adjust seigniorage sharing appropriately.

²⁹ Banks' liquidity requirements in the Central Bank, the other part of the monetary base, were already dollarized shortly after the Tequila crisis.

intervention), the US Federal Reserve would basically be purchasing US government securities. An agreement of this sort would then represent a zero cost transaction for both the US and the Argentine authorities.

Alternatively, seigniorage revenues could be shared between the US Treasury and the Argentine government. In this alternative only a portion of the net seigniorage gain would be passed on to the Argentine government. In 1999, Senator Connie Mack attempted to introduce legislation to the US Congress proposing a rebate of a specified percentage of the seigniorage gain to dollarizing countries³⁰.

Another issue is the treatment of the additional seigniorage income from a potential increase in the demand for dollars in Argentina as discussed in our estimate of seigniorage in Argentina above. There are several possibilities in this case.

A first alternative is to establish a monitoring system such that dollar bills exported from the US to Argentina and re-exported from Argentina to other countries can be estimated. The US authorities do have a controlling system of dollar bills exported to Argentina, but currently there is no attempt to directly measure those exported from Argentina to other countries. Such a monitoring system has its problems. These problems are both practical in that it may be difficult to obtain a complete picture and secondly there is a danger that the establishment of such a procedure might increase perceived Convertibility risk (and one objective of full dollarization may be precisely to reduce such risks). An alternative monitoring system would be for the Federal Reserve to print new dollar bills with the thirteenth letter “M” – the first 12 letters currently correspond to the 12 Federal Reserve Districts - and then to export these dollars to Argentina and subsequently monitor their flows³¹.

³⁰ The bill was defeated in committee by a narrow majority. The then Democrat executive voted largely against. However, amendments to the bill changed its nature severely and for example included a clause that seigniorage would not be shared for the first 10 years after official dollarization. There was also a great deal of discretionary powers for the US Treasury Secretary built into the proposed legislation. It is not clear whether the bill was defeated because dissenters decided against the principle of seigniorage sharing or (more likely in our view) because it was felt that this approach was not the right one or and that the timing was inappropriate.

³¹ We are indebted to George McCandles for this suggestion.

A second alternative is to establish a simple sharing rule for future seigniorage flows in a somewhat similar vein to the currently proposed rules for sharing seigniorage within the 11 EMU countries. A simple formula employing population and GDP estimates has been agreed upon, to share seigniorage from Euro note issuance in the different EMU countries. A similar rule could be established for the future flow of dollar bills to Argentina depending on Argentine population and GDP growth.

A third alternative is that proposed by the Paper circulated by the Joint Economic Committee Staff Report (Office of the Chairman, Senator Connie Mack) of the US Congress³². According to this proposal Argentina would receive a yearly proportion of the total demand for dollars in the world. This proportion would be determined by the amount of peso notes converted into dollars at the time of dollarization divided by the total demand for dollars at that time. Thus Argentina would gain from any future increase in total dollar demand, and lose from any future decline in total dollar demand. In fact under this scheme, Argentina would become a shareholder in the "dollar".

A fourth alternative is simply to ignore the flow income. This could probably represent a significant net gain to the US authorities but would depend on the future use of cash in Argentina. The bill submitted to the US Congress by Senator Mack, essentially takes took line.

We remain somewhat agnostic with respect to these alternatives. However, an issue that is highly relevant both politically as well as for building a reliable liquidity facility, is that the rebate of seigniorage should take the form of a non-discretionary multi-year commitment.

4.2.2 Access to a Liquidity Facility

Adopting the full use of the dollar in Argentina implies that Argentina would lose the hard currency reserves that currently back the peso notes and coins in circulation. This would effectively leave the backing of the liquidity

³²See "Encouraging Official Dollarization in Emerging Markets, April 1999, Joint Economic Committee Staff Report (Office of the Chairman, Senator Connie Mack), US Congress.

³³ See Pou (2001) who makes the case for dollarization as a solution to the current crisis.

requirements that the Central Bank currently imposes on banks as the first line of defense against liquidity problems. Thus, compared to the present situation it could be argued that dollarization would significantly reduce the Central Bank's limited capacity as a lender of last resort. To compensate for this loss, the Monetary Agreement might include specified access to a Liquidity Facility.

To a large extent, the Contingent Repo Facility set-up in 1996 by the Central Bank of Argentina with 14 private banks may provide a model for how this could be arranged. This innovative contract gave the Central Bank of Argentina the right to sell Argentine assets to international banks subject to a repurchase clause. The 'repo' is subject to standard haircut and margining rules, and if used attracts an implicit cost of funds by which the arrangement is currently significantly 'out of the money'. The 'collateral' under the contract comprises essentially Argentine Government paper. There is no 'trigger' for the Facility and it is activated solely on the decision of the Central Bank. Each bank has a separate contract and all of these are similar except for the economic conditions. These conditions were determined through a bidding process at the commencement of the contract in December 1996. At that time, the minimum contract length was 2 years, and the idea was to roll this forward every 3 months (subject to an evergreen clause), and the average cost of funds if the facility were used is Libor + 200 basis points. In 2001, the Facility was drawn down for some \$1.2 billion.

One possibility would be to establish an agreement between the Central Bank of Argentina and the US government that would allow the Central Bank of Argentina to draw down a specified amount subject to a set of economic conditions (an agreed maximum, an interest rate, a minimum payback period etc.). An obvious maximum is the present value of the seigniorage revenue that would be shared with Argentina. Then, the future seigniorage flows could provide the collateral behind any advance made under this arrangement, assuming that seigniorage would be payable annually. This arrangement would imply very low risks for the US authorities.

Alternatively, the seigniorage flow income from the US authorities might be used as collateral for a private facility to be set up by the Central Bank of Argentina. This might closely follow the current private Contingent

Repo Facility but using the dedicated flow income from the US authorities rather than principally Argentine government bonds as collateral.

4.3 Potential costs and Benefits

It is typically argued that a cost to currency union is the loss of an independent monetary policy. However, the Convertibility Law of April 1991 implies that Argentina has already given up any independent monetary policy. Hence, comparing the Monetary Agreement to today's situation, there is in principle no further cost in this regard, other than as discussed above the loss of the option value of floating in the future. The value of this option depends crucially on assumptions regarding the potential benefit of floating, the rate of time preference and the estimated time it would take to gain the relevant credibility.

At the time of writing, one view is that the crisis in 2001 is a direct consequence of the combination of fixed exchange rate and a set of very strong exogenous shocks such as the fall in commodity prices, the increase in risk aversion in capital markets, and the Brazilian devaluation. Those believing that these are the fundamental factors behind the current crisis may think that while it was relevant to consider dollarizing when the volatility of shocks were lower, it may not be relevant today as the option value of the currency board and the potential value of floating has increased.

However, another view is that given the imperfect credibility of the current arrangement, the effect especially of higher risk aversion in capital markets on devaluation risk and country risk spreads has been much larger than otherwise has been the case, developing a vicious cycle between high interest rates, growth and the fiscal balance. For those believing that this latter explanation is the fundamental explanation of the current crisis the dollarization alternative is still an attractive policy³³. The cost benefit equation is then critically related to the importance (and feasibility) of a floating exchange rate to adjust to real shocks versus the effect of nominal shocks in a world of imperfect credibility. In this section we discuss various themes that relate to this fundamental trade-off.

4.3.1 Real shocks and OCA conditions

It is often argued that Argentina and the United States do not conform an Optimal Currency Area (OCA). The more recent literature on this topic asserts that countries are ideal partners for a monetary union when they satisfy a number of conditions: 1) they have very substantial trade relations so that they show a high degree of positive correlation along the trade cycle, 2) their economic structures are quite similar so that shocks will affect them in a relatively homogeneous way (not requiring large bilateral exchange rate corrections), 3) there is a high degree of labor and capital mobility between them, and 4) they have integrated fiscal systems. It is clear that Argentina and the US do not satisfy these conditions. However, as reviewed above Argentina has already adopted US monetary policy since 1991. These costs then really apply to the currency board as well as to a full currency union. The only difference in terms of these two systems relates to the value of losing the option to float in the future.

As argued in previous sections, the traditional OCA literature needs enhancement in an emerging country context. In the case of Argentina, the effect of financial shocks has been very significant and indeed the current recession can be traced back to the decline in investment that began after the Russian default in 1998. As reviewed above financial asset prices are highly correlated with those in the US and hence, including these variables, shocks appear more symmetric. However, the argument is also that given a Monetary Agreement with the US, the amplitude of these kinds of shocks may also decline.

Finally, as also discussed previously, the initial conditions emphasized by the traditional OCA literature are endogenous, and are likely to be affected by the currency union. For instance, a Monetary Agreement with the US is likely to increase trade between the two countries and would then align more closely the cycles of the two economies.

4.3.2 Costs in terms of other objectives

A Monetary Agreement with the US also rules out other alternatives such a Monetary Union with Europe. Considering current trade-links, Europe may appear to be a more natural candidate than the US as Argentina trades

more with the EU than with the US³⁴. Having said that, virtually all, foreign currency financial contracts in Argentina are expressed in US dollars and not in Euros. However, adding the possibility of ‘Euroizing’ in the future increases the option value of the current currency board arrangements and, in terms of CraineCraineCraine’s (2001) analysis, would reduce the attractiveness of ‘stopping’ today via a currency union with the US.

Moreover, according to current Argentine legislation when the Euro reaches parity with the US\$ then the current currency board will switch to a 50/50 Euro-Dollar peg. In our view, while this change could bring the benefit of allowing the nominal exchange rate to fluctuate more in line with the real shocks affecting Argentina from commodity and currency movements, it has also clearly increased the perception that Argentina might float in the future, hence reducing the credibility of the current currency board³⁵.

Also, many have raised the issue of how a Monetary Agreement might affect Mercosur. Mercosur has been a very important strategic objective for Argentina during the past nine years as a free trade area as well as a custom union. Moreover, the strategy has been to start with Mercosur and progressively expand the free trade area eg: Chile and Bolivia have recently joined the free trade area. It is clear that a Monetary Agreement with the US, while not changing the current Argentine monetary policy (which implies a fixed exchange rate to the dollar anyway), would rule out a single independent currency for Mercosur and may have deeper consequences as well.

Indeed, the issue of a single Mercosur currency is a complex one and is perhaps more of a political issue rather than a monetary one. Viewing the issue first, in strict economic terms, it might be hypothesized that a Mercosur single currency may not reduce the problem of imperfect credibility to the same degree as a currency union with the US (in the language of Alesina and

³⁴ It is difficult to separate the 11 EMU countries in the trade statistics due to the importance of Rotterdam as a European and not only as a Dutch or EMU 11 port.

³⁵ The announcement of this policy led to a rise in Argentine risk spreads bringing forward to some extent the cost in terms of a higher endogenous probability of future floating. The Argentine authorities also attempted to bring forward the benefits by introducing a variable subsidy and tariff system for exports and imports as a function of the movement of the US\$/Euro exchange rate.

Barro a Mercosur anchor may not be one that solves a Barro-Gordon imperfect credibility problem whereas a US may do exactly that), but may allow Argentina to have an exchange rate that adjusts better to real shocks affecting the economy and in particular shocks that emanate from Brazil. However, there are clearly also wider issues at stake. One argument in favor of Mercosur is that as a bargaining unit for an FTAA, Mercosur may have more weight than individual countries bargaining bilaterally with the US. How the deepening of Mercosur through the adoption of a single currency affects that bargaining game is a complex issue. Moreover, if the final objective is an FTAA with a single currency, then this may also change the nature of the bargaining game.

4.4 Specific benefits for the Monetary Agreement

In this section we review a set of specific benefits of the full dollarization of the Argentine economy under the auspices of a Monetary Agreement as described in section 4.1.

4.4.1 Elimination of the perceived risk of devaluation

There has clearly remained a market perception of a risk of currency depreciation in Argentina. Markets measures of this risk manifest themselves in the spread between yields on peso and dollar denominated public securities, and in the peso-dollar forward rate. These indicators have been positive virtually throughout the currency board period and have also been highly volatile, rising every time there is a shock to the economy. At the time of writing the perceived devaluation risk is extremely high by any historical standard.

Arguably, it might be the case that Convertibility could eventually gain full credibility. However, experience suggests that this would be a long process and with fluctuating and potentially significant devaluation risk on the way. Thus, a currency union with a Monetary Agreement with the US would essentially eliminate the currency risk during the whole intermediate period between the moment it is implemented and the (distant) point in the future when a process of increasing credibility had eliminated all lingering perceptions of currency risk within the currency board.

Elimination of the risk of currency depreciation during this significant period of time may have substantial net benefits for the Argentine economy. These benefits spring from the more certain environment for investment and economic activity in general, that would be brought about. Argentina has a very open capital account and capital flows are extremely important for continued growth. Disruptions to these flows have had very significant negative effects on growth. To the extent that eliminating currency risk reduces the probability of such disruptions, full-dollarization could have substantial benefits.

Moreover, significant exchange rate changes generate sudden changes in relative prices that disrupt normal economic activity. Even with a credible fixed exchange rate, a remote possibility of a maxi-devaluation creates the risk of there being large and sudden redistributions of incomes and wealth with very adverse effects on the economic environment in which plans are formulated. Thus, all economic agents must take this source of uncertainty into account when formulating their plans, which means that investment demand will be lower, planning horizons will be shorter and growth and incomes will be lower.

4.4.2 Reduction in the perceived country risk

There is also a relationship between currency and country risks and simple correlations between different measures of these two concepts are very high. However, it is very difficult to distinguish the causality and quantify the potential benefit in terms of a reduced country risk premium from eliminating devaluation risk. In this section we discuss first the theoretical arguments and then review briefly the empirical relationships.

First, whenever perceptions of exchange rate risk increase, government solvency is reduced. As most Argentine government debt is dollar-denominated (and as much as 93% is foreign currency-denominated) whereas revenues are almost exclusively peso-denominated (and foreign currency-denominated debt by far exceeds international reserves in the Central Bank), a depreciation of the peso would reduce the government's solvency increasing the perceived risk of government default. Consequently, the cost of financing government deficits and refinancing amortization of government debt would

increase. In Table 3 we give some summary statistics of balance sheet foreign currency mismatches in Argentina.

[Insert Table 3]

Second, increases in exchange rate risk perceptions also increase the perception of solvency risk in the financial system. In turn this implies a potential risk to the Central Bank's and to the Government's balance sheets, if assistance to the financial sector is required. This then may increase the risk premium of government debt. The solvency risk of the financial system is affected by currency depreciation through various channels, including flow currency mismatches between assets and liabilities (even if the stocks are currency matched), and increases in the credit risk of clients that have peso incomes and revenues. Hence, the funding costs of banks increase whenever there is an increase in currency risk even if they are dollar denominated.

Third, currency depreciation would without a doubt cause a very serious upheaval in the domestic economy and would most likely foster a very serious recession. For a country with a very recent hyperinflationary experience that has been under a currency board during seven years, it would be very unlikely that there would be a 'soft landing' out of the fixed exchange rate. So the market perception of a devaluation scenario is one of a major devaluation. Hence, any increase in the exchange rate risk increases the probability of the 'worst case' scenario and makes interest rates generally rise. Moreover, any currency depreciation would reduce the solvency of borrowers in dollars. So whenever there is an increase in the perceived exchange rate risk, the cost of funding to firms with dollar debts rises.

Fourth, the increase in exchange rate risk perceptions may result in an outflow of capital and through the currency board mechanism an increase in interest rates which then depresses economic activity. In turn this worsens the Government's fiscal position and hence increases the risk of default.

Fifth, there is also a set of very different argument that the elimination of currency risk may reduce country risk. The above four arguments are based on the assumption that financial markets evaluate country risk perfectly and that there are no 'contagion' effects, no herd instincts and that there are no multiple equilibria which might justify even in a model of purely rational

investors different valuations of country risks. However, there has been a great deal of recent literature that suggests that these types of market imperfections are indeed important in country risk valuations. If eliminating currency risks shifts the valuation of Argentine country risk from one equilibrium to another or reduces herd-type behavior by differentiating Argentina from other emerging markets where currency risk remains important, then this may have a very significant effect on country risk spreads. Naturally, almost by definition these effects are extremely difficult to quantify however, to the extent that such market imperfections are important, they may be very significant.

Sixth, there may also be feedback from country risk to devaluation risk. Although as we have noted, due to the structure of assets and liabilities a devaluation would actually worsen the Government's accounts in Argentina many perceive that if the Government were faced with a position where it had to default it might provoke a devaluation following the experience of other countries where devaluations have been used to reduce the (dollar) value of domestic debt. Secondly, an increase in country risk may induce greater hedging of currency risks of (particularly) foreign financial and non-financial institutions in Argentina. Indeed, there is evidence that when country risk spreads rise, it is foreign companies who generally seek protection in the somewhat shallow market for peso forwards perhaps due to head office directives to balance currency positions.

Having argued that there are theoretical reasons to believe that there is a link between devaluation risk and credit risk and hence that eliminating devaluation risk should reduce even local dollar interest rates, the question is whether this is likely to be significant in practice. It turns out that this is actually a very difficult question to answer empirically due to causality problems. While we have argued above that it is quite reasonable to think that devaluation risk may cause default risk, it is also the case that default risk could cause devaluation risk. Hence any simple correlation between the two is clearly not necessarily evidence of a causal relationship in either direction in particular. In this section, we discuss three potential methodologies that might be employed, and give some preliminary results for the case of Argentina. Then, we propose an alternative methodology to obtain a market measure of the potential reduction in country risk that would follow dollarization.

(i) Vector Auto Regression (VAR) Analysis

The first method is simply to run a VAR with the two series - devaluation risk and default risk- as endogenous variables. VAR analysis is frequently employed to analyse causal relationships between potentially endogenous variables, where the causal relationships is unclear or where there may be complex causal relationships between different variables, and hence it is a natural choice in this context. In the example we provide below, we measure default risk as Argentina's sub-index spread against US Treasuries of JP Morgan's EMBI+ index. We measure devaluation risk as the annual discount on the Argentine peso forward contract traded over the counter in New York (known as the Non-Deliverable Forward or NDF - figures also supplied by JP Morgan). For both we use daily closing prices. We also include, as exogenous variables the ratio of the reserves of the Central Bank to the Money Base, the EMBI+ index (excluding Argentina) and the US Treasuries 30 year bond yield to control for other factors which may affect default or devaluation risk.

The results are shown in Table 4. In this specification, it turns out that devaluation risk is significant in explaining default risk but not vice versa. The point coefficient estimate however is not quantitatively very large. Using that estimate gives a benefit to eliminating devaluation risk of some 120 basis points (in this and all results to follow we use as a base the average Argentine EMBI+ sub-index spread over the period June 1997 to February 1999 which was 594 basis points) that is, a 20% reduction in the default spread.

[Insert Table 4]

However, this methodology has two very significant drawbacks. The first is that empirically the specification reported here (as was the case with other alternative regressions that were estimated) was not robust to alternative specifications that gave different results. A reasonably robust result, confirmed by bilateral Granger Causality tests was that there is a dual causality between the two variables. However, coefficient estimates in different VAR specifications were frequently non-significant. But there us an even more serious conceptual drawback regarding this methodology. Both spreads that are being using here are derived from market instruments.

Hence, given an assumption that these markets are perfectly efficient, any news should be picked up immediately by both. It would then not be particularly surprising to find no lagged relationship between these variables. Of course in practice these markets may not be perfectly efficient. In particular the NDF market, and peso markets in general, are probably less liquid and less ‘efficient’ than the market for dollar Argentine assets. It would not then be surprisingly to find country risk ‘causing’ devaluation risk but simply because of this potential difference in market liquidity or efficiency.

(ii) An “event study” approach

An alternative approach is to consider particular events and to analyse how devaluation and default risk changed over those periods. The idea here would be to select events where it could be argued that the “news” incorporated into the market spreads reflected news regarding currency risk rather than default risk. In the case of Argentina there are a number of such events which might be analysed including, for example: (i) the devaluation of the Mexican peso in December 1994, (ii) the speculative attack against Hong Kong in October 1997, (iii) the devaluation of the Brazilian real in January 1999 and (iv) an interview with Domingo Cavallo in the Financial Times when he was a presidential candidate and was interpreted as supporting floating the peso. In Table 5 we give the results. In particular we detail the changes in devaluation risk and default risk from 10 days before these events to the end of the business day of the event itself. We also give the change in both variables from the day of the event to 10 days later.

[Insert Table 5]

As can be seen from the table, each event produces a very significant rise in both devaluation and default risk. The movement pattern after the events differ such that in some cases subsequent to the event (Mexican devaluation and Cavallo interview), although devaluation risk falls, default risk rises reflecting changes in default risk not associated with devaluation risk. However, on the ‘announcement effect’ (day of the event versus 10 days before) all show a positive relation. Powell and Sturzenegger (2001) extend this analysis for Argentina, for other Latin American countries and for European countries in the run-up to EMU and perform the relevant statistical

tests for significance. These authors find that for countries in the region with high de facto dollarization (where one would expect the balance sheet effects to be strong), events identified as increasing (decreasing) currency risk lead to increases (decreases) in default risks. Interestingly, they find insignificant effects or even coefficients going in the opposite direction for countries that have less de facto dollarization. For Europe they find that events that are judged to be positive news in favour of EMU going ahead reduce default risk in those countries that eventually joined EMU but increases default risk for those countries that did not with Portugal being an exception to this rule³⁶.

(iii) a simulation analysis based on Berg and Borenstein (1999)

The final methodology that we report here uses a simulation analysis based on a simple model of probabilities as outlined in Berg and Borenstein (1999). The idea is as follows: the probability of default on government debt can be disaggregated into the probability of default, given no currency crisis and the probability of default, given a currency crisis with these probabilities weighted by the appropriate probability of whether a currency crisis will occur or not. Using the spreads on Government debt and an assumption on the recovery ratio given default, a total probability of default over the next 12 months can be estimated. Using the spreads on peso forward contracts and assumptions on the size of a devaluation given a currency crisis, the probability of a currency crisis can also be estimated. These probabilities are derived from simple no-arbitrage equations. Hence, if we assume what the probability of default given a currency crisis is, then we can solve for the probability of default given no currency crisis. This can then yield an estimate of what the default spread would be if there was no currency crisis risk at all ie: if devaluation risk were eliminated.

To see this argument mathematically, we start from the decomposition of the probability of default,

$$P(d) = P(d/cc)P(cc) + P(d/ncc)P(ncc)$$

³⁶ Although we note that Portugal was arguably the country that entered EMU with the other 10 but where there was most uncertainty ex ante about whether it was going to be deemed to have complied with the Maastricht criteria.

where $P(d)$ is the total probability of default, $P(d/cc)$ is the probability of default given a currency crisis, $P(d/ncc)$ is the probability of default given no currency crisis and $P(cc) [=1-P(ncc)]$ is the probability of a currency crisis occurring. Rearranging this equation, we have:

$$P(d/ncc) = [P(d) - P(d/cc)P(cc)] / [1 - P(cc)]$$

As we discussed above we can estimate $P(d)$ from the sovereign bond spreads and an assumption of the recovery ratio, and $P(cc)$ from the spreads on peso forwards and an assumption on the size of devaluation if there is a currency crisis. Hence with an assumption on $P(d/cc)$, we can calculate $P(d/ncc)$ from which we can calculate the default spread that would be appropriate if currency crisis risk was eliminated.

Once again, we use data on the EMBI+ Argentine sub index spreads to calculate $P(d)$ and we use the Non Deliverable Forward spreads from the New York OTC market to calculate $P(cc)$. In order to complete this calculation, we essentially use the covered interest parity condition and an assumption on the extent of the devaluation if there is a currency crisis. Moreover, as mentioned above we also need to assume a probability of default if this devaluation actually occurred.

As Berg and Borenztein (1999), in Table 6 we illustrate the results with different quantitative assumptions on these two variables. The different columns of the table represent different assumptions regarding the extent of devaluation given a currency crisis. The different rows represent different assumed default probabilities if such devaluation occurs. The figures in the body of the table then, represent the calculated reduction in the spread given a particular set of assumptions and using the average spreads of the EMBI+ Argentine sub-index and the average, 12 month, yields on the peso forward market. We include default probabilities in the case of a currency crisis, $P(d/cc)$, of 35%, 42% and 50% given that, for the assumptions on the extent of the devaluation detailed these values yield a reduction in default spreads of 100% i.e.: the full 594 basis points which is the average of the EMBI+ series. We view this diagonal of the table as determining an extreme set of assumptions and that the meaningful values are above these. Moreover, for higher values of $P(d/cc)$ we find negative calculated probabilities of default

given that there is no currency crisis $P(d/ncc)$ for the devaluation assumptions employed. We leave these combinations blank in the table.

[Insert Table 6]

The results show significant potential reductions. For example, in the case of a 40% devaluation in the case of a currency crisis and a 20% probability of default (a case highlighted in Berg and Borenzstein), there is a reduction in the average spread of 220 basis points. In our view, given the extent of currency mismatches in Argentina and Argentine monetary history, the figures to the right and perhaps further down in the table may be more relevant. For example, in the case of a 50% devaluation and a 30% risk of default, the reduction is some 325 basis points.

Escudé et al (2000) note that a critical ingredient in the Berg and Borenzstein methodology is the assumption of risk neutrality by investors whereas there is considerable evidence that investors in bond markets tend to be risk averse. For example, the arbitrage equation from which $p(d)$ is calculated is

$$(1 - p(d))(1+i_A) + p(d)(1+i_A)\alpha = 1 + i_{US}$$

so the expected return on an Argentine dollar bond should equal the expected return on US Treasuries of similar duration. If there is risk aversion this equation should be modified to:

$$(1 - p(d))(1+i_A) + p(d)(1+i_A)\alpha = 1 + i_{US} + \delta_d$$

where δ_d is the market default risk premium. Similarly, the no-arbitrage equation for peso-denominated Argentine bonds vs. dollar-denominated Argentine bonds needs to be modified in the same way to:

$$(1 - p(cc))(1+i_p) + p(d)(1+i_p)[1/(1+\beta)] = 1 + i_A + \delta_{cc}$$

where δ_{cc} is the currency risk premium.

Using data on Argentine Republic-07peso-denominated notes and Argentine Republic-06 dollar-denominated un-subordinated bonds, as well as data from

Merrill Lynch's Master II High Yield bond index and from Carty and Lieberman (1996) on average default and recovery rates for Ba (or, equivalently, BB in the S&P classification) they obtain reductions in default spreads that are lower than those shown in Table 6 in the case of risk neutrality but nevertheless high. For example, assumptions on $P(d/cc)$ and δ of 40% (both) give way to a reduction of 310 basis points in the default spread.

When risk aversion is assumed, and using the same risk premium for default risk and for currency risk, the reduction in the default spread achieved as a consequence of full dollarization diminishes by around 25% with respect to the risk neutrality case. For example, assumptions on $P(d/cc)$ and δ of 40% (both) give way to a reduction of 234 basis points in the default spread.

Therefore, even correcting for risk aversion, it can be seen that the reduction in the default spread that could be achieved by full dollarization is quite significant.

(iv) an alternative methodology

The methodologies presented above suggest that dollarization not only eliminates "pure" devaluation risk but also is likely to reduce significantly default risk. However, given the relatively small set of information on which the tests are performed, the results should be interpreted with caution. In particular, although it is encouraging that the three methodologies used point in the same direction, the quantitative estimate of the effect of dollarization on the default risk lies within a fairly large range.

Thus, it is useful to consider alternative practical means of obtaining a market estimate of the potential effect of dollarization on the risk of default. One way to obtain such estimate can be found by involving a AAA-rated institution (for instance, the World Bank) in a financial transaction designed to extract from sovereign bond prices the necessary information to separate effectively default risk from currency risk. Such transaction would imply the World Bank issuing a AAA bond denominated in Argentine Pesos (of course, the World Bank would be expected to hedge the corresponding foreign

exchange risk).³⁷ The market price of such bond would then reflect the “pure” devaluation risk associated with the Argentine Peso. Hence, by comparing the spread over US Treasuries of a bond (of the same duration) denominated in pesos issued by the Argentine Republic with the World Bank bond, a market measure of the “pure” default risk is obtained.

Finally, by comparing the measure of “pure” default risk with the spread over US Treasuries of a bond (of the same duration) denominated in US dollars issued by the Argentine Republic, a market estimate of how much dollar spreads would fall following dollarization would be obtained.

4.4.3 Reduction in the volatility of country risk

It should be noted that the elimination of the exchange rate risk would not only cause a reduction in the level of country risk but also in the volatility of this risk, further diminishing the uncertainty that the economy faces. This reduction in the volatility of country risk would have an impact on the level of investment and thus also on the level of growth. It would also diminish the amplitudes of economic cycles in Argentina.

4.4.4 More stable economic environment and more Openness

Besides the benefits of the reduction in the uncertainty already discussed, the elimination of currency risk would have several indirect effects due to the creation of a more stable economic environment.

First, a more stable economic environment would lead to a larger financial system. Although the Argentine financial system has grown substantially it remains small for a country of Argentina's level of development. In turn this reduces the availability of credit (especially to small and medium sized companies who cannot access international credit markets) and increases banking sector costs (as economies of scale cannot be fully exploited). A larger financial system would then result in lower costs

³⁷ It is to be noted that this proposal may not imply a significant departure from current practice, since the World Bank normally issues bonds denominated in some emerging-market currencies as part of its financing policy.

and greater efficiency and hence lower interest rates and a greater availability of credit.

Second, a more stable economic environment would increase the attractiveness of Argentina as a recipient of foreign investment. Indeed, given dollarization it might be conjectured that particularly for US investors the elimination of currency risk and the creation of a more stable economic environment would enhance investor interest in Argentina. Naturally this would also lead to greater efficiency gains and improvements in management capabilities and systems, and greater technology transfer, hence greater growth.

Third, a more stable economic environment, the elimination of exchange rate risk and the lowering of government default risk, would also increase legal security for investments in Argentina.

Fourth, it is our view that these effects would also increase openness and foreign trade with their multifaceted benefits to the Argentine economy. Indeed, Frankel and Rose (2000) find a very significant effect of a common currency on trade and that this has subsequent positive effects for growth.

5. Concluding Remarks

In this Chapter, we have attempted to give an account of the events, through the late 1990s, that prompted the then Argentine government to consider a full dollarization of the economy subject to a Monetary Agreement with the United States. The emerging economy financial crises of the 1990s, and the contagion in international markets, highlighted the problem of the less than perfect credibility of the currency board regime and hence increased the cost of maintaining the option value of floating. Moreover, given the experience of those countries that had floated, the value of that option did not appear to be very high. Furthermore, estimates of the potential gain of eliminating currency risk, especially in terms of a reduction in country risk, appeared to be significant. This view was reinforced by the experience of the peripheral countries in Europe and the perceived ‘convergence gains’ through the process leading up to European Monetary Union.

Nevertheless, although it might be argued that there were compelling economic arguments for a country such as Argentina to explore the dollarization proposal discussed in this paper, the successful implementation of this proposal requires a degree of political and social consensus that was clearly not present in Argentina at that time. This consensus is critical to the political processes required to implement such a project and to reap the rewards in terms of lower interest rates and higher growth.

It was not our objective in this paper to discuss more recent events in Argentina that have led to the current economic crisis although it is interesting to note that the dollarization debate has recently resurfaced. In the current context, however, dollarization is seen more as an emergency measure than a positive step towards a deepening of the institutional ties across the region. While the project may, depending on how the current crisis evolves, gain greater consensus as an emergency measure, it is not clear that all of the benefits to this project that we have outlined above remain available.

References

- Alesina, A & R. Barro (2000) "Currency Unions" NBER working paper, wp 7927, 2000.
- Baliño, T. , A. Bennet and E. Borenzstein (1999) Monetary Policy in Dollarized Economies, IMF Occasional Paper 171, Washington DC 1999.
- Berg, A. and E. Borenzstein, "Should Each Country Have its Own Currency? The Pros and Cons of Full Dollarization," IMF, October 1999.
- Bussiere, M. and C. Mulder, "Which Short-Term Debt over Reserve Ratio Works Best: Operationalizing the Greenspan Guidotti Rule," IMF, January 2000.
- Calvo, G., "On Dollarization", mimeo. University of Maryland, April 1999.
- Calvo, G. and C. Reinhart, "Fear of Floating: Theory and Evidence," mimeo, University of Maryland, 1999.
- Calvo, G. and P. Guidotti, "Indexation and Maturity of Government Bonds: A Simple Model," in R. Dornbusch and M. Draghi (eds.), Public Debt Management: Theory and History, MIT Press, 1990.
- Calvo, G. and P. Guidotti, "On the Flexibility of Monetary Policy: The Case Of the Optimal Inflation Tax," *Review of Economic Studies*, Vol. 60 (July 1993), pp. 667-687.
- De La Torre, A and Roberto García-Saltos, and Yira Mascaró (2001) "Banking, Currency, and Debt Meltdown: Ecuador Crisis in the Late 1990s". mimeo. World Bank, Washginton DC.
- Craine, R (2001) "Dollarization: an irreversible decision" mimeo. University of Berkeley, California.
- Currie, D. (1992) EMU: Institutional structure and economic performance *Economic Journal*, Vol. 102, No 411.

- Eichengreen B., 1997 "One Money for Europe?" in Eichengreen, B. ed "European Monetary Unification: Theory, Practice, Analysis" _ (MIT Press 1997, reprinted from Economic Policy 1992).
- Escudé, Guillermo J., María Elena Grubisic and Verónica Cohen Sabban (2000), The effect of risk aversion in the evaluation of the default risk reduction due to full dollarization: comments on "The Pros and Cons of Full Dollarization" by Andrew Berg and Eduardo Borensztein. Technical Note #7, Central Bank of Argentina.
- Craine (2001) "Dollarization: an irreversible decision" mimeo. University of Berkeley, California.
- Frankel, F and A. Rose (2000) Estimating the effect of currency unions on trade and output, NBER Working Paper no W7857, 2000.
- Giavazzi, F. and A. Giovannini (1989) Monetary Policy under Managed Exchange Rates, *Economica*, vol 56, No 222, May. 1989, pp199-213.
- Harris, R. and T. Courchene, "Towards a North American Common Currency: An Optimal Currency Area Analysis," Mimeo, 1999.
- Hausmann, R., and A. Powell, (1999) "Dollarization: Issues of Implementation" mimeo. Inter American Development Bank. Presented at Conference on Dollarization, Panama, July 1999.
- Hausmann, R., Gavin, M. Pages-Serra, C. and E. Stein, "Financial Turmoil and the Choice of Exchange Rate Regime, IDB, 1999.
- Greenspan, A. "Currency Reserves and Debt," World Bank, Washington D.C. April 1999.
- Group of Twenty Two, Report of the Working Group on Strengthening Financial Systems, Washington. D.C. 1998.
- Guidotti, P. "From Floating Exchange Rates to Full Dollarization: What

Works for Latin America”, IABD Annual Meetings Conference Proceedings, Deutsche Bank Research, April 1999a.

Guidotti, P. “On Debt Management and Collective Action Clauses,” in P. Kenen and A. Swoboda (eds.) Reforming the International Monetary and Financial System, IMF, 2000.

Guidotti, P. “Debt, Monetary, and Banking Policy in Emerging Markets: Reflections from the Tequila Effect,” Working Paper in International Economics No. 28, University of Maryland, December 1996.

Levy Yayati, E. and F. Sturzenegger eds. “Dollarization” MIT Press, Mass.

Pou, P. (1999) Presentation to the National Cabinet 19/1/99.

Pou, P. (2001) Pablo: this is Pedro’s Ambito article: do you have a copy?

Powell, A., and F. Sturzenegger, (2001) “Dollarization: the link between devaluation and default risk” forthcoming in Levy Yayati, E. and F. Sturzenegger eds. “Dollarization” MIT Press, Mass.

ANNEX 1

Table 1: Economic Results Pre and Post Convertibility

	1985-91	1992-98	1999	
GDP	-1.4%	5.1%	-3.0%	
Fiscal Deficit (% GDP)	5.8%	0.9%	2.6%	
Investment	-6.3%	10.9%	-7.6%	
TFP	-1.3%	2.7%	n.a.	
Employment	2.0%	1.8%	1.7%	
Inflation	564%	4.3%	-1.8%	

Annual average growth rates

Table 2: European Convergence

Country	Fiscal Deficit (as % of GDP)		Inflation		Long Term Interest Rates		Real Interest Rates (L.T.)	
	1992	1998	1992	1998	1992	1998	1992	1998
Germany	2.6	2.1	5.1	0.8	7.9	3.7	2.8	2.9
France	3.9	3	2.4	0.7	8.6	3.8	6.2	3.1
Spain	3.8	2.3	5.9	1.8	11.8	3.9	5.9	2.1
Italy	9.6	2.7	5.4	2	13.3	3.9	7.9	1.9
Portugal	3.0	2.5	8.9	2.2	13.8	3.9	4.9	1.7

Table 3: Balance Sheet Effects in Argentina

Argentina Balance Sheet Effects

US\$ Mismatches (in bn. November 1999)

	Assets	Liabilities	Position
Public Sector	2.7	111.0	-108.3
Central Bank,1	25.8	8.9	16.9
Non-Financial Private Sector,2	191.9	144.2	47.7
Financial Sector	119.1	98.9	20.2
Total	339.5	363.0	-23.5

(1) Assets include International Reserves + Argentine US\$ Government Bonds

(2) Assets include external assets + dollar denominated deposits in the financial system + AFJP assets + US\$ cash holdings. Liabilities include external liabilities + dollar denominates loans of the financial system

Table 4: Vector Auto-Regression Results

	Default Risk	Deval. Risk
Default Risk (t-1)	0.709 (0.024)	0.014 (0.029)
Deval. Risk (t-1)	0.048 (0.017)	0.884 (0.020)
Reserves/Mon.Base (t)	0.017 (0.006)	0.005 (0.007)
EMBIWARG (t)	0.224 (0.017)	0.037 (0.021)
US30YRS (t)	0.224 (0.052)	0.020 (0.062)
Constant	0.001	0.007

Standard Errors in parentheses

Table 5: Event Study Results

Event	Δ Devaluation Risk	Δ Default Risk
Tequila (20/12/94)		
10 days before	107	110
10 days after	-52	221
Hong Kong (27/10/97)		
10 days before	872	287
10 days after	-500	-50
Brazil (14/01/99)		
10 days before	650	526
10 days after	-350	-129
Cavallo's FT Interview		
10 days before	465	176
10 days after	-60	111

Table 6: Results of a Simulation Exercise

Reduction in Dollar Spread on Eliminating Currency Risk
 (Results using average data: Jun97/Feb99)

EMBI+		Devaluation in event of Currency Crisis		
		30%	40%	50%
Probability of default in the event of a currency crisis	10%	65.1	50.2	41.8
	20%	286.8	221.9	185.6
	30%	499.7	388.4	325.6
	35%	594.4	461.7	387.4
	42%		594.4	498.2
	50%			594.4

Figure 1: Peso-Dollar and Country Risk Spreads

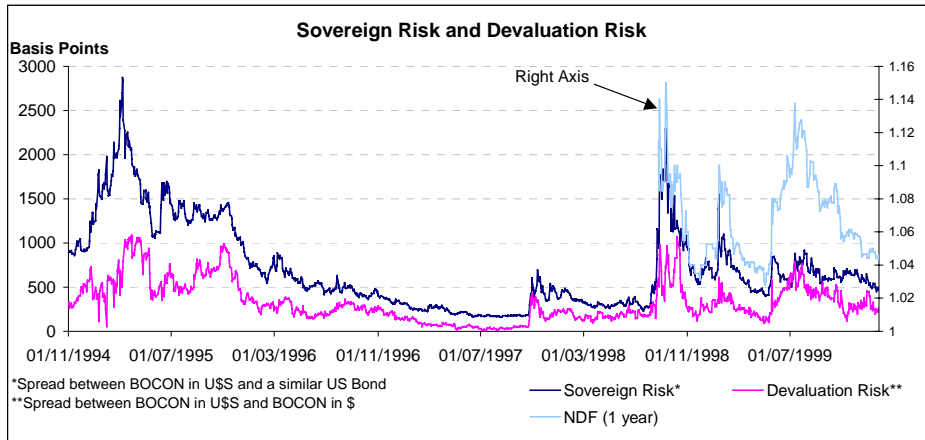


Figure 2: Deposit and Reserves Growth Rates

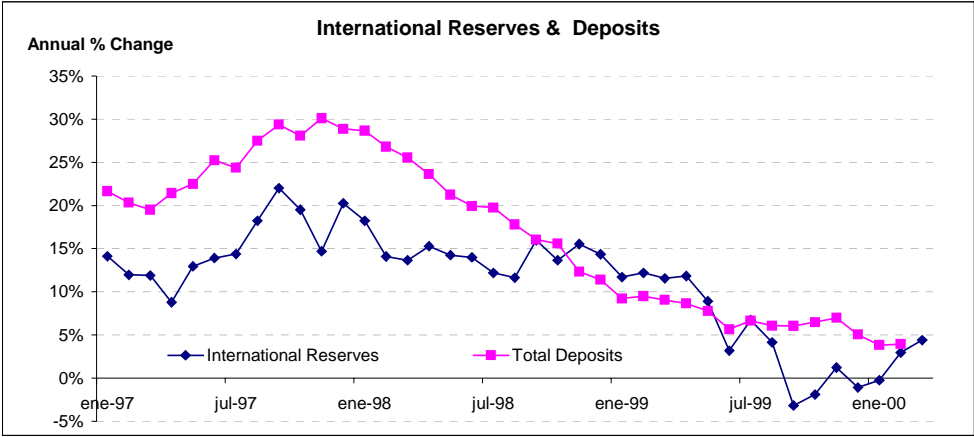


Figure 3: European Convergence

