DISCUSSION PAPER SERIES

No. 2412

SHOULD ARGENTINA ADOPT THE US DOLLAR?

Myrvin L Anthony and
Andrew Hughes Hallett

INTERNATIONAL MACROECONOMICS

Centre for Economic Policy Research

ISSN 0265-8003

SHOULD ARGENTINA ADOPT THE US DOLLAR?

Myrvin L Anthony, University of Strathclyde
Andrew Hughes Hallett, University of Strathclyde and CEPR

Discussion Paper No. 2412
March 2000

Centre for Economic Policy Research
90–98 Goswell Rd, London EC1V 7RR
Tel: (44 20) 7878 2900, Fax: (44 20) 7878 2999
Email: cepr@cepr.org, Website: http://www.cepr.org

CEPR Discussion Paper No. 2412

March 2000

ABSTRACT

Should Argentina Adopt The US Dollar?

A popular suggestion among emerging or transition economies is to 'dollarize' or 'euro-ize'; that is to adopt the currency of a larger, richer neighbour in order to import the monetary discipline and financial stability of that neighbour. This Paper examines the pros and cons of that suggestion in Argentina, where it has become a serious political concern. We argue that the usual Optimal Currency Area criteria, while important, may not be the dominant consideration where a currency board, or where exchange rate fixing or stabilization, is the natural alternative. This is because such a fixing arrangement creates risk premia against the possibility that the exchange rate parity cannot be maintained, and against the possibility that the domestic economy will be unable or unwilling to fund the bonds, securities or reserves used to back the domestic currency issue. We find the growth and investment benefits of removing the risk premia outweigh any optimal currency area difficulties. But that produces its own difficulties in that there may be a conflict between the need to develop an economy's real side, which depends on the optimal currency area criteria, and the conditions of financial stability needed to realize that developments depend on the discipline effects from outside that currency area.

JEL Classification: E42, E58, F33
Keywords: dollarization, credibility, seigniorage, risk premium

Myrvin L Anthony
Andrew J Hughes Hallett
Department of Economics
University of Strathclyde
100 Cathedral Street
Glasgow, G4 0LN, UK
Tel: (44) 141 548 3581
Fax: (44) 141 552 5589
Email: myrvin.anthony@omam.co.uk
a.hughes-hallett@strath.ac.uk

Submitted 10 March 2000

NON-TECHNICAL SUMMARY

This Paper examines the pros and cons of the recent proposal that Argentina should adopt the US dollar as its official currency, rather than have a currency board in which the units of domestic currency are backed 'one-to-one' by dollar reserves. This type of suggestion is quite common among emerging and newly industrialising economies, with dollarization being the focus in the Latin American and Caribbean economies, and 'euro-ization' in several Eastern and Central European countries (and one or two Asian economies). Although the Argentine case has a number of particular features, this Paper's analysis is intended to form a general framework for evaluating such 'dollarization' proposals.

The main motivation for adopting the dollar appears to be that it could guarantee credibility in monetary policy, and thereby eliminate the risk premium that keeps the Argentine peso interest rates above the corresponding US dollar rates. The resulting reduction in interest rates – it is argued – would cut the cost of capital, reduce the risk in borrowing abroad, and increase the economy's rate of growth. That would be a very helpful development for an emerging economy with incomplete capital or financial markets. In Argentina, even with an effective currency board system, there will be a risk premium against the possibility that economic difficulties and political pressures may, one day, force a weakening of the currency board's ability to preserve the exchange rate by eroding the US dollar reserves used to back the Argentine peso's one-to-one convergence rate and thereby allow the peso to be devalued. In fact, the Argentine currency board is also allowed to back the peso (to an extent) with dollar denominated Argentine government debt. That means there is a second risk premium against the possibility that the Argentine government gets into fiscal difficulties with servicing that debt, or finds it inconvenient to do so (in dollars, at the specified exchange rate).

The second motivation for dollarization is that it provides protection against the kind of financial crises, and their contagion effects, that have hit Brazil, Mexico and other Latin American economies in recent years – as well as Russia and some Asian economies. Once again, the credibility of the exchange rate link, the stability of financial conditions and reducing the risk of capital flight appear to be the key concerns here. Under the currency board system, the Central Bank of Argentina has retained some limited powers with which to control monetary conditions. The danger is that they may be too weak to do anything useful, but strong enough to undermine the credibility and control which the currency board has over the supply of domestic currency.

Against the benefits of lower interest rates and the removal of risk premia, we must evaluate the economic costs of such an arrangement (we do not look at

the political costs). First Argentina and the US do not satisfy the criteria for an optimal currency area very well. Monetary policy mismatches may therefore result. In fact the main difficulty appears to be relatively weak trade connections and considerable structural differences with the US. On the other hand, the trade connections and factor mobility that are needed appear to hold in larger measure with Argentina's Mercosur trading partners. Yet the capital flows and a sizeable part of investment appear to be dominated by US dollars and the economy is relatively undiversified. That means Argentina, as a dollar economy, would be split between a real side which is more heavily influenced by developments in the Mercosur region; but with nominal quantities which are dominated by events in the US economy.

Thus dollarization might interrupt the benefits from, and progress towards, greater integration with Argentina's main trading partners in Latin America. But no dollarization might mean higher costs of capital, slower growth and development, and greater risk of financial instability and limited capital markets. And then there is the issue of lost seigniorage.

We evaluate these various factors and conclude that dollarization is probably advantageous for Argentina. The optimal currency areas are not well satisfied, but are probably less significant than the conditions of high capital costs and constrained access to capital markets (or uncertain access, at least, when there is imperfect credibility in the exchange rate and the risk of contagion from elsewhere) which hold at present.

Hence the decision comes down to a trade-off between the desire for greater stability and development on the real side and the need to secure greater credibility on the financial side. That is a trade-off between the transactions costs and stability in trade and the savings and extra growth from lower interest rates (allowing for the loss of seigniorage and the 'menu costs' in the transition). Here the calculations are emphatic – dollarization would be advantageous for Argentina because:

a) It is the only credible way of securing long run monetary discipline and stability, and of demonstrating the same to others;

b) It underwrites fiscal discipline too;

c) The growth and investment benefits of eliminating the double risk premia currently operating dominate our calculations (other costs allowed for) and produce a clear recommendation.

1. INTRODUCTION

In the wake of the financial crisis that forced Brazil to devalue its currency in January 1999, the Argentine peso also became the victim of speculative attacks. Similar waves of speculation had hit the Argentine peso following the Mexican crisis in 1994/95. One interesting feature of these speculative attacks is that they occurred despite Argentina having a currency board system in place which, since its establishment in April 1991, has been remarkably successful in maintaining the parity of the Argentine currency with respect to the US dollar.

However the latest round of speculation has prompted the Argentine government to announce its intention to replace the domestic currency altogether by adopting the US dollar and thus end speculation against the Argentine peso.[1]

The US dollar is already widely used throughout Argentina as store of value, unit of account and medium of exchange. Argentine banks accept US dollar deposits, make loans in US dollars, and hold their required reserves in US dollars. Contracts can be made easily in either pesos or US dollars. The US dollar already has legal tender status with the peso. It is therefore correct to say that Argentina already has a "bi-monetary" system, with the US dollar providing the traditional functions of money simultaneously with the peso. Adopting the US dollar would therefore end this bi-monetary system by eliminating the peso. Argentina's money system would then be similar to Panama's which has used the US dollar since 1904.

[1] "No more peso?", *Economist*, 23rd January, 1999, p.89.

The purpose of this paper is to examine the pros and cons of this suggestion to adopt the US dollar and completely dollarise the Argentine monetary system. We first examine some of the reasons for economic agents' lack of confidence in the Argentine central bank's ability to maintain the convertibility of the Argentine peso into US dollars at the existing rate. Second, we discuss the costs and benefits of adopting the US dollar completely, and argue that those benefits exceed the costs on financial grounds - if not in real terms- so that Argentina would actually gain from giving up its domestic currency altogether.

2. ARGENTINA'S CURRENCY BOARD AND SPECULATION AGAINST THE PESO

The very existence of the Argentine peso, however rigidly tied to the US dollar, means there will always be a non-zero probability that one day the Argentine authorities could renege on their commitment to exchange the domestic currency, at the specified rate, for the US dollar. The government of the day can always change the rules of the game. However, the more difficult it is for the government to change the rules and renege on its commitment to convert the domestic currency for the US dollar, the more credible would be its exchange rate policy - and hence the more stable the financial conditions within the Argentine economy.

Argentina's currency board is not a pure orthodox currency board system.[2] For this reason economic agents have had lingering doubts about whether the Argentine authorities can maintain their commitment to the convertibility of the Argentine peso for the US dollar at the specified rate. In an orthodox currency board, the monetary authority is essentially a money changer with no discretionary monetary powers or central banking functions. Its sole function is to exchange the domestic currency for the foreign currency at the specified fixed exchange

[2] See Balino, et al, (1997) and Hanke and Schuler (1999) for excellent descriptions of the Argentine currency board system.

rate. To fulfil this function the currency board is required to hold sufficient liquid assets in the foreign currency that are at least equal in value to the domestic currency base, and possibly larger. Thus the currency board cannot make any *fiat* issue. It is also typical that the convertibility of currencies does not cover bank deposits and other financial assets.[3]

In contrast to this orthodox view, the Argentine currency board system contains several features that are different from the standard arrangement.[4] First, the Argentine monetary base (currency in circulation plus commercial banks' reserves held at the central bank) has a *minimum* of sixty-six percent foreign reserves backing since up to one-third of the backing can be met by US dollar denominated Argentine government debt. However, in practice, the foreign reserves backing of the monetary base has always exceeded this minimum, though still falling short of one hundred percent in most years. Nevertheless, the absence of one hundred percent foreign reserves backing could undermine confidence in the Argentine peso, and lead to speculative attacks against the currency. That has created a (currency) risk premium on Argentine peso interest rates, above US dollar rates.

Indeed, backing the peso issue (up to one third) by Argentine government debt is bound to lead to the possibility of large risk premia since the rate of return on Argentine bonds can vary with the size and solvency of the governments deficits or debt, with the rate of growth in the Argentine economy, and with the perceived sustainability of the anticipated future deficits, whatever currency the backing bonds are denominated in. In other words, backing the peso by US dollar denominated government debt has introduced an *additional* source of credibility risk. First there is the risk that the Argentine authorities might want to revise their commitment to the current dollar parity or abandon the currency board regime altogether.

[3] See Walters (1992) for a good description of currency boards.

That is the currency risk. Second there is a risk that the debt backing the current parity becomes difficult to finance because it is too large, or the future fiscal path is considered unsustainable, or because the exchange rate or interest rates make financing it too expensive. That is a default risk. Consequently the credibility problem and risk premia in the existing dual currency system could become quite serious - especially if the imposed monetary discipline demands a more vigorous use of fiscal policy instruments to compensate for the fact that conditions for a single currency area do not fit too well.

A second problem is that the Argentine currency board is administered by a central bank that still has some discretionary power over monetary policy, though much less than the typical central bank. The instruments of discretionary monetary policy available to the Argentine central bank include; variations in reserve requirements (these were replaced in 1995 by "liquidity" requirements), rediscounts and advances, repos and reverse repos, and swaps. Since there are no laws stipulating a maximum or minimum, the reserve or liquidity requirements are entirely at the discretion of the Argentine central bank. The central bank has used repurchases to lend to commercial banks and to influence short-term interest rates. Foreign reserves in excess of the minimum reserves ratio have been used to intervene in the foreign exchange market and also influence short-term interest rates and hence the quality of the bonds backing the peso (Hanke and Schuler, 1999, and Bennett, 1994). Finally the bank may levy taxes on foreign exchange transactions. These discretionary powers therefore imply that there is always the risk that the currency board functions can be undermined, particularly when there are financial crises faced by the government or the private sector. In addition there is no lender of last resort facility which must add to the risk premia charged on loans advanced in Argentina - especially as financial deregulation proceeds.

[4] In fact, several of the currency boards in existence today contain unorthodox features (see Balino, et al 1997).

3. OPTIMAL CURRENCY AREA CRITERIA AND ARGENTINA'S DOLLARISATION

3.1 The Criteria

In theory, if two countries are to be able to share a common currency successfully, they need to satisfy the traditional optimal currency area (OCA) criteria effectively. The OCA literature, starting with Mundell (1961), McKinnon (1963) and Kenen (1969), has focused on four crucial inter-relationships. They are:

a) that the participants should predominately trade, and be open to trade, among themselves;
b) that there should be a similarity of economic and institutional structures, and a tendency to be subject to broadly similar shocks and policy preferences; or that there should be a wide diversification in industrial structure in each participating economy;
c) that the degree of factor (labour and capital) mobility should be significant, or that the degree of wage and price flexibility should be sufficient as a substitute; and/or
d) there should be a system of fiscal transfers between countries to substitute for any lack of labour mobility/wage-price flexibility.

The stronger the linkages between participants on these four criteria, the more suitable is a common currency between them. But if they are not satisfied, then the participating countries are likely to be subject to exaggerated boom and bust cycles, or to prolonged recessions with larger unemployment and trade deficits than under their national currencies.

3.2 How well does Argentina meet the criteria?

In Argentina, conditions (c) and (d) are clearly <u>not</u> satisfied - although flexibility within the labour market has evidently been improving, and continues to improve. Similarly, although

the US is Argentina's second largest trading partner (Table 1), and although Argentina's trade policies have been significantly liberalised in the 1990s, these two countries are not dominant trading partners. In fact Argentina does about 15% of her trade with the US, which is only about half as much as her trade with Brazil (27%) or the eight next most important partners (26%) - see again Table 1. On the other hand, nearly 50% of her trade is done with the US and the Mercosur group of countries together (who themselves trade to a large extent in US dollars). It is important to note that Argentina's trade with the Mercosur group is now rising at twice the rate of trade with her other partners;[5] and that Argentina's trade barriers were substantially removed during the 1990s - tariffs fell from 39% to an average of 9%, while import licensing and export tariffs were scrapped. Consequently it is possible to argue that Argentina trades substantially with dollar-zone countries, if not overwhelmingly with the US itself. Similarly one might also say that Argentina is open in terms of *market access*. But it is not so obviously open in terms of the *volume* of trade - trade accounts for just 18% of Argentine GDP, i.e. for only a little more than in the US or the EU, and considerably less than in, say, France or Germany. And Argentina is of course rather unimportant to the US in trade terms. All this amounts to saying that there is relatively little mutual dependence in direct trade, or output or employment. Developments in the surrounding Mercosur economies would be more important to the Argentine economy. But direct and indirect dependence on the dollar, via trade with the US and dollar based (dollar linked?) Mercosur economies, would still mean a considerable sensitivity in nominal or financial terms to developments in the US economy.

Figures on capital flows are harder to come by, but tend to reinforce the conclusion just reached (see Table 3). Capital inflows have increased fast with the currency reforms, and

[5] See Table 2. Argentina's trade with Brazil has increased at an annual rate of 22% during the 1990s, and 18%

with the macro stabilisation programmes and privatisations of the 1990s. They tend to ebb and flow with financial conditions elsewhere (and the Mexican and Brazilian crises in particular), but US investment - at 36% of total foreign investment (FDI) in Argentina - is certainly the most important element. The Mercosur countries, Chile excepted, are unimportant in this regard - except in so far as they represent alternative investment destinations.[6] All of this swamps European or Asian investment. So on this score again, Argentina appears open to US or dollar based capital flows - and those flows probably constitute around one third of all investment in Argentina.

Factor mobility there may be in capital therefore, but it is not reflected in an equivalent mobility of labour. In fact the Argentine labour force is the best paid in Latin America and Argentina is now a net importer of labour from elsewhere (especially from the Mercosur countries who have agreed to allow the free movement of labour). Consequently the incentive to migrate to the US (or to other Mercosur countries) is not there. On the other hand labour market liberalisation has moved ahead since 1991, with laws which tie wage rises to productivity and which allow a variety of flexible time/temporary contracts and reduced hiring/firing costs. As a result real wages (and wage costs) are now flexible to a certain degree, and are lower than they were at the start of the 1980s (Table 4). Moreover the new government in 2000 has acted to push this flexibility further, and to reduce the fiscal deficit which underpins some of the subsidies, direct or indirect, to employment.

On the face of it therefore, the labour market may seem to be flexible enough. But the fact that unemployment has been high (16% in 1997), and slow to fall, suggests that *sufficient*

---

with Chile, but only 9% with the US.

[6] To this point we should add that returning Argentine capital has been nearly as important as US investment in the 1990s.

flexibility may not have yet arrived - at least by comparison with Europe where similar labour market conditions have accompanied the introduction of a single currency. This is important because, like Europe, there is no question of any fiscal transfers between the US and Argentina - except for the possibility of seigniorage rebates which would amount to less than 1% of GDP at best (see below).

Similarly it would be hard to argue that Argentina was as diversified an economy as the US, or was subject to the same shocks and economic structures in terms of market institutions, industrial structure, or market behaviour. Industrial diversification has been proceeding, with primary commodities (including agriculture) falling in importance and manufacturing (including machinery, chemicals etc.) rising. On the other hand, the shares of agricultural processing and fuels remain broadly constant and of a similar size to the other two sectors. That hardly suggests a similar or as diversified a structure as the US, and it is hardly surprising that GDP has shown rather little correlation with US output (Table 5).

Thus it appears that the US and Argentina face rather different disturbances - whether from different shocks or different economic structures hardly matters at this stage. The conclusion has to be that the symmetry condition b) is not satisfied,[7] even if the trade condition and some parts of the factor mobility/market flexibility conditions are approximately satisfied. That raises the question of whether there is actually a real (economic) reason to adopt the US dollar? If there is, it must be in the savings on transactions costs, less any losses in

[7] As Bayoumi and Eichengreen (1996) point out, one important limitation in using the correlation in output movements to determine whether countries face similar disturbances is that output movements reflect the influence of both disturbances and responses, and it is difficult therefore to tell whether a given correlation in output reflects the degree of symmetry in shocks or asymmetry in responses. But with output correlations as low as this (they are lower than those found in Europe by factors of 5 or 10, and are negative on balance), one or other component must be seriously asymmetric - if not both - and there is no point in decomposing the overall correlations as Bayoumi and Eichengreen do for Europe.

seigniorage, and in the lower interest rates that come with increased credibility and financial stability.

3.3 Has there been sufficient convergence?

If Argentina has found it difficult to pursue disciplined and credible monetary policies in the past, then, by entering a monetary union with the US, she will be "constrained" to enjoy the benefits of the credibility and discipline of the US policy makers. This is the advantage seen by those who argue that one should "tie ones hands" to some suitable international institutional structure (De Grauwe 1997; Giavazzi and Pagano 1988). The implication is that in order to get the full benefit, Argentina should go all the way and adopt the currency of that institution.

In fact, by adopting the dollar, Argentina allows the US Fed to run Argentine monetary policy and imports US financial credibility and lower interest rates wholesale - unless, of course, it turns out that US and Argentine economic interests, preferences and circumstances are clearly at odds, or that this new regime would induce unsustainable fiscal policies in response. The fact that Argentina has already had trouble in reducing both her large fiscal deficits and high unemployment rates during the years of pegging to the dollar, shows that this could in time become a real problem. Such a concern also reflects the fact that Argentina's adoption of the dollar would necessarily be a unilateral act, not a joint one. Argentina could, according to US Treasury secretary Summers, not expect any favours in the form of modified policies to suit Argentina's particular circumstances. That raises the question of whether Argentina is sufficiently well converged on US economic performance, or would become so under the pressure of living with a currency managed by the US for US conditions.

Convergence in the form of a stable exchange rate and sufficient foreign reserves on entry has already been arranged by the currency board system. Similarly if the current public sector debt to GDP ratio and external debt to export ratios are not a serious problem under the currency board system, then they will get easier as a constraint in the future so long as the interest rate does not exceed the growth rate of nominal GDP; i.e. as long as growth does not falter and real interest rates do not rise.[8] Dollarisation should help here since real interest rates are currently higher in Argentina than those in the US by a good 650 basis points.[9] Falling interest rates should, if anything, ease the burden of debt and encourage growth.

So if the lack of convergence should prove to be a problem, it will be because trade patterns switch towards the Mercosur region, and/or because there are strong asymmetries in shocks and structures. Indeed, unless the Mercosur countries also decide to adopt the dollar,[10] a unilateral switch to the dollar in Argentina might produce a clash with the process of integrating with her Mercosur partners because it will reintroduce a tendency to follow the US economy with whom Argentina has less in common. On the other hand, such a conflict might actually be less serious than it appears since, according to Frankel and Rose (1998), countries integrate better and face less serious asymmetries under a single currency if they engage in a great deal of intra-industry (rather than inter-industry) trade.

However the pattern of trade which is likely to make that happen is largely absent in this case. First the single market is with Mercosur (not the US), and that market will presumably

[8] De Grauwe, 1997.
[9] Figures for end-1999 over those of a year earlier (Source: The Economist, 18 February 2000).
[10] This is a possibility which might well help to overcome the dichotomy, which we had already identified in Section 3.2, in which Argentina is financially integrated with the US, but is more integrated in real terms with

encourage greater regional or national specialisation in order to gain the advantages of scale economies and greater comparative advantage. Second, intra-industry trade is almost always found in the trade of manufactured goods and between large, industrially diversified economies. It is not found among the smaller and more specialised or developing economies with a relatively limited scope for industrial diversification - like, for example, Argentina whose exports are primary commodities (22%), fuels (12%), and agricultural processed products (35%).

Consequently, if there is going to be a problem with trade convergence and adopting the dollar, it is likely to stem from structural asymmetries and be a fairly permanent problem. And once again, if there are benefits from dollarisation, they will come from better and more disciplined policies, greater financial credibility and lower interest rates.

4. THE CASE FOR COMPLETELY DOLLARIZING THE ARGENTINE ECONOMY: CREDIBILITY WITH LOWER INTEREST RATES

We now consider some of the benefits and costs of dollarising the Argentine economy.[11]

First, the adoption of the US dollar is the *most credible way* for Argentina to be tied to the US dollar. By giving up the peso, the possibility of the currency being devalued (with respect to the dollar) is finally eliminated.

Second, the use of the US dollar allows Argentina to obtain the monetary and fiscal discipline *directly* (as opposed to indirectly via the currency board system). In effect, that would make

her Mercosur neighbours. Once again the logic of the proposal is that Argentina and her partners should go all the way with respect to the dollar.

[11] The benefits and costs of dollarisation discussed here do not constitute an exhaustive list. For a discussion of other benefits and costs of dollarisation, see Schuler (1998).

the US Federal Reserve Board responsible for monetary policy in Argentina. This would be so whether the USA agrees to Argentina's use of the dollar or not. The reputation and credibility of the Fed is well known. Therefore, the risks associated with the currency board running the peso, even if it had all the rules to do so efficiently, are at once avoided by the adoption of the US dollar. As Fischer (1982) correctly argued, the discipline imposed by the use of a foreign currency, is greater than that imposed by the pegging of the domestic currency to a foreign one.

Third, Argentina would not be able to resort to money creation to finance its fiscal deficit as it would no longer have a domestic currency. Thus, the adoption of the US dollar would impose a more severe restriction on monetisation than the currency board presently does. Argentina's recent difficulties with containing her fiscal deficit shows that this is potentially an important point.

Fourth, if Argentina adopts the US dollar as its currency it can at once benefit from the elimination of the currency risk premium on peso-denominated assets and liabilities and the transaction costs associated with its trade with the USA (or with the dollar area, which may be just as important).

Finally, it is very unlikely that Argentine citizens would object to the adoption of the US dollar as the country's currency. In effect they have already expressed their approval by using the US dollar as a store of value, medium of exchange and a unit of account. Such currency substitution or dollarisation already occurs widely throughout the country under the dual currency system. The formal adoption of the US dollar as the currency of use can therefore be

viewed as a credible way of legitimising the Argentines' revealed preference for the US dollar.

On the other hand, the most obvious cost to Argentina of dollarising is the loss of seigniorage.[12] That is, the US Fed gets the seigniorage when the US dollar is used as the sole currency, whereas the Argentine government gets it when the peso is used. However Argentina need not necessarily, under certain circumstances, suffer this loss of seigniorage. The seigniorage gained by the US Fed can be viewed as a *transfer* from Argentina to the USA. Since such a transfer is being made from a smaller and relatively less well-off country to a large rich one, Argentina could presumably persuade its richer neighbour to "refund" this transfer. This can be done in several ways. For example, Argentina and USA could collectively reach an agreement to increase the US "technical assistance" to Argentina by an amount equivalent to the new seigniorage that would accrue to the USA.[13]

Argentina would also face one-off costs associated with the conversion of its peso pricing and payment system to a dollar one. Peso notes and coins in circulation will have to be called in an exchanged for dollars. Firms and banks will face some "menu costs" as they convert any non-dollarised prices, balances, wages and contracts into dollars. Accounting and computing systems, vending and teller machines and other equipment that take peso coins and notes will have to be altered. But these are all transitional costs.

[12] Seigniorage is the revenue that accrues to the government from its monopoly power to print money.
[13] This is a point which has already been made by Summers (1992). Johnson (1972) suggested some other arrangements for Panama.

5. A COST-BENEFIT ANALYSIS OF THE DOLLARISATION

In this section we evaluate whether Argentina would be better off adopting the US dollar completely or retaining its own currency. The main benefits of dollarisation are the elimination of the peso-dollar risk premium and transaction costs from dollar trade. On the other hand, the principal costs associated with dollarisation are the seigniorage revenues that the Argentine government loses and the one-time costs of adjusting to using the dollar.

(i) The calculation of lost seigniorage revenue

We compute the seigniorage that Argentina would lose were it to dollarise. We measure seigniorage as the annual change in high-powered money (or currency in circulation). Following Fischer (1982) we divide the seigniorage, relative to GDP, that Argentina would lose into two parts. The first is the "stock cost": the one-time cost of initially obtaining the dollar notes and coins needed to replaces the peso notes and coins in circulation. This "stock cost" of dollarisation can be easily calculated as the ratio of the domestic monetary base to be converted to GDP as shown in equation 1 below:

$$S_t = \frac{H_t}{GDP_t} = \frac{C_t}{GDP_t} + \frac{R_t}{GDP_t} \qquad (1)$$

where H_t = high-powered money, C_t = currency in circulation, and R_t = reserves held by the commercial banks with the central bank Between 1992-1998, the Argentine monetary base/GDP ratio has averaged five percent. We use this figure as our estimate of the stock cost of lost seigniorage from dollarisation.

The second part of lost seigniorage from dollarisation is the "flow cost". This is the revenue that the Argentine government loses annually from relinquishing the peso. One way of

calculating *flow* seigniorage is as the annual change in high-powered money.[14] According to this method, flow seigniorage as a proportion of GDP in a given year *t* can be computed as:[15]

$$S_{ft} = \frac{\Delta H_t}{GDP_t} = \frac{\Delta C_t}{GDP_t} + \frac{\Delta R_t}{GDP_t} \qquad (2)$$

where terms are as defined previously and Δ = the annual change in a variable. We can express the flow seigniorage/GDP ratio slightly differently as is shown in equation (2a) below.

$$S_{ft} = \left(\frac{\Delta H_t}{H_t}\right)\frac{H_t}{GDP_t} = \left(\frac{\Delta C_t}{C_t}\right)\frac{C_t}{GDP_t} + \left(\frac{\Delta R_t}{R_t}\right)\frac{R_t}{GDP_t} \qquad (2a)$$

From equation (2a) it can be seen that, in order to estimate the likely flow seigniorage which the Argentine government would lose, we need to make various assumptions about the time path of high-powered money (currency and required reserves), the time path of nominal GDP

[14] This measure of seigniorage is sometimes referred to as the cash flow or monetary measure of seigniorage. An alternative measure of seigniorage is the opportunity cost measure which computes seigniorage as: (a) the value of the nominal interest payments which the private sector foregoes when it holds non-interest bearing money instead of interest-bearing assets (see, for example, Auernheimer (1974), Barro (1982), Herrendorf (1997), and Klein and Neumann (1990)); and (b) the savings in the nominal interest payments that the government makes by issuing money which can be considered as a non-interest bearing government bond (see for example, Gros, 1993; and Gros and Vandille, 1995).

[15] Equation (2) assumes that commercial banks do not earn interest on the reserves which they hold at the central bank. This is the situation in Argentina where the central bank is prohibited by law from paying interest on required reserves held with it. However, commercial banks hold these reserves abroad in foreign accounts and do earn interest on them. In countries where the central bank does pay interest on commercial banks' reserves, the seigniorage to GDP ratio should be calculated more precisely as follows:

$$S_{ft} = \frac{\Delta H_t}{GDP_t} = \frac{\Delta C_t}{GDP_t} + \frac{\Delta R_t}{GDP_t} - i_t \frac{R_t}{GDP_t} \qquad (2b)$$

where i_t = nominal interest rate on the commercial banks' reserves held at the central bank. It is easy to see that when i_t = 0, (2b) collapses to (2) - the relevant equation for the Argentine case.

(which we can equate to the sum of the real GDP and inflation), and the time path of the ratio of high-powered money to GDP (the sum of the ratios of currency in circulation and required reserves to GDP respectively).

For simplicity, we estimate the flow seigniorage, relative to GDP, using the formula given in expression (3) below:

$$S_{ft} = \left(\frac{\Delta H_t}{H_t}\right)\frac{H_t}{GDP_t} = \left(\eta_y \frac{\Delta RGDP_t}{RGDP_t} + \eta_p \frac{\Delta P_t}{P_t}\right)\frac{H_t}{GDP_t} \qquad (3)$$

where, of terms not previously defined, η_y = real income elasticity of the demand for high-powered money, $\frac{\Delta RGDP_t}{RGDP_t}$ = real GDP growth rate, η_p = price elasticity of the demand for high-powered money, and $\frac{\Delta P_t}{P_t}$ = rate of inflation.

In our implementation of (3) we make the following simplifying assumptions. First, we assume that both the real income elasticity of high-powered money (η_y) and the price elasticity of high-powered money demand (η_p) are equal to unity.[16] A unit price elasticity of high-powered money demand is in effect an assumption that economic agents do not suffer from money illusion (in the long run).

Second, we assume that Argentina's average real GDP growth rate will be 3 percent annually. Third, we assume that the average (long-run) inflation rate in Argentina will be equal to that

[16] We also tried a real income elasticity of high-powered money demand of 0.5, as in Fisher (1982), but our conclusions are not different and so we do not report these calculations here. This shows that our calculations are not sensitive to reasonable variations in the parameter values chosen.

in the USA, given that the peso will continue to be tied to the US dollar in the absence of dollarisation. This we assume to be two percent. Both assumptions are in line with the average performance of the US economy over recent years. With regard to the high-powered money/GDP ratio, it is assumed that it is equal to the average high-powered money/GDP ratio for the period 1992-1998. Based on these assumptions flow seigniorage lost would be one-quarter of a percent of GDP annually. Assuming a discount rate of three percent (the average real long-term interest rate in most developed countries), the present value of the annual flow seigniorage is 8.3 percent of GDP.

(ii) The calculation of the one-off cost of dollarisation

Argentina would face one-time costs associated with replacing the peso with the dollar as the medium of exchange and unit of account. Firms and financial institutions would be faced with some "menu costs" as they translate peso prices, balances, wages and contracts into dollars. Accounting and computing systems, vending and teller machines and other equipment that take peso coins and notes will have to be changed to accommodate the use of the dollar. We assume that these one-off costs would be equivalent to one percent of Argentina's GDP. This is not an unreasonable assumption given that the one-time cost of countries converting to the Euro is also considered to be about one percent of the European Union's GDP (EC Commission, 1990).

(iii) The calculation of the elimination of transaction costs from currency conversion

Economic agents (firms, households and the governments) in Argentina face currency conversion costs when they conduct their respective international transactions. These international transactions when conducted with US economic agents would involve the use of

the US dollar. Since the US dollar is the main international vehicle currency, economic transactions with third parties would also involve the significant use of the US dollar.

Following the European Commission (1990), foreign exchange transaction costs can be segmented into two components:

(i) first, there are the financial costs - bid-ask spread, commission fees, and other administrative costs - that economic agents pay to commercial banks and other foreign exchange dealers for foreign currency conversion; and

(ii) there are those in-house costs - resources tied up in accounting and treasury departments to deal with foreign exchange management, payment delays, and sub-optimal returns on cash management - that firms with international transactions have to face.

Here we focus only on the financial costs associated with US dollar-peso transactions. In general, these costs depend on the volume of US dollar-peso transactions and the prices that foreign exchange dealers charge economic agents for the conversion of US dollar into pesos and vice versa. Thus, we can estimate these financial transaction costs as the product of these financial charges and the volume of US dollar-peso transactions as shown in (4) below:

$$T_t = \rho_t \frac{Y_t}{GDP_t} \tag{4}$$

where T_t = transactions costs (as a percent of GDP), ρ_t = the average charges for US dollar-peso conversion (expressed in percentages), and Y_t = the volume of US dollar-peso transactions.

In principle, we can estimate the volume of US dollar-peso transactions (Y_t) as the sum of Argentina's gross flow of transactions resulting from the purchase and sale of goods, services and financial assets denominated in US dollars - that is the US dollar denominated gross flows in the current and capital and financial accounts of the balance of payments. Here we measure Y_t (as a proportion of GDP) as the sum of the value of Argentine exports and imports of goods and services with respect to the USA. That is, we use the openness measure given in Table 2. For the sake of simplicity, we have therefore opted to use only current account transactions in our calculations. The capital account is largely in dollars anyway.[17]

To complete our estimation of T_t requires information on the average transaction charges (ρ_t) imposed by foreign exchange dealers on economic agents in the respective economies. These transaction charges would depend, inter alia, on the size of the transactions, the type of foreign currency transaction (spot, forward, futures, options etc.), the nature of the economic agent (the government, firms or individuals), and the specific forms of payments which economic agents use (bank transfers, traveller's cheques, credit cards, foreign bank notes etc).

We do not have the relevant detailed information on the various transaction charges, nor on the size and distribution of the current account transactions we are employing. Moreover, given that the US dollar is already legal tender in Argentina, Argentine international transactions may not lead to a large conversion of pesos into US dollars and vice versa. We have chosen to utilise the European Commission's (European Commission, 1990) estimate of the average currency conversion cost associated with current account transactions within the

[17] We also decided against incorporating transactions from the capital and financial accounts of the balance of payments because, in the absence of the appropriate and relevant information, we would have had to make quite arbitrary assumptions about (a) the currency composition of these transactions and (b) the proportion of these

European Union as our bench mark to estimate the average transactions cost in Argentina. The European Commission estimated this average currency conversion cost to be 0.3 - 0.35 percent. Using the lower average cost of 0.3 percent and an average volume of peso-dollar current account transactions of 2.8 percent of GDP in 1998 gives a conservative estimate of the transaction cost savings as 0.0084 percent of GDP annually.[18] This translates to a present value equivalent to 0.28 percent of GDP (assuming an average long-term real interest rate of three percent).

(iv) The calculation of savings from the elimination of currency-risk premium

Dollarisation in Argentina would see the end of the peso-dollar exchange rate and the elimination of the corresponding currency risk premium paid by Argentines on peso loans. As Figure 2 and Table 6 both show, Argentines face a higher interest rate on peso-denominated loans than on dollar-denominated loans offered in Argentina. Since peso and dollar loans offered in Argentina face the same "political risk", the difference between these two interest rates reflects the currency risk that would be eliminated once dollarisation occurs.[19] Argentina would therefore face lower interest rates, and that would tend to raise its growth rate. A recent study done by the Argentine government estimates that lower interest rates resulting from dollarisation would increase the trend growth rate by as much as two percent.[20] Even if we were to assume, more conservatively, that dollarisation would raise the growth rate annually by one percentage point then this would translate into a gain with a *present value* of 33.3 percent of GDP (assuming again a long-term interest rate of three percent in

transactions which involved actual currency conversions and therefore would have been subject to various conversion costs (instead of having been kept with dollar accounts).

[18] The figure estimated by the European Commission (1990) for the average European country was four times larger (0.4%) reflecting the fact that Argentina is surprisingly "closed", in trade terms, to the US.

[19] i.e. any default risk washes out of the calculation, being common to both types of loans.

[20] See "Menem Forces Dollar Plan to Top of Political Agenda", *Financial Times*, 27th January, 1999, p.3.

real terms).[21] Based on this estimate, the elimination of currency risk would be the principal benefit that Argentina would obtain from dollarisation: see Table 7.

6. CONCLUSION

Argentina, like so many smaller economies on the edge of a larger trading zone, finds herself caught between the desire for greater stability and development in real terms - meaning the desire to exploit the opportunities for trade, sustainable growth and employment - and the need to secure greater credibility on the financial side in order to realise those gains.

Against this background dollarisation is probably advantageous. The optimal currency area criteria with respect to the USA are pretty finely balanced, although the symmetry condition is almost certainly not satisfied. Closer links with Mercosur, and a currency board linking the Argentine Peso to the dollar might therefore appear to be an attractive option. But the currency board system involves a double risk premium. And that means the problem comes down to a trade-off between the benefits of lower transactions costs in trade, and more importantly the savings and extra growth from lower interest rates and the elimination of the currency risk premium which a currency board system entails, versus the loss of seigniorage and the "menu costs" of the transition itself.

Here the calculations are emphatic: dollarisation would be advantageous for Argentina because:

a) the logic of the currency board system shows that, ultimately, adopting the US dollar is the only credible way of guaranteeing long term monetary discipline and financial

[21] From this we should subtract any losses in inputed income from lower asset values, in consumption and investment, because interest rates are lower. However, those losses are likely to be relatively small in a country

stability. The discipline imposed by a foreign currency, and the reputation of the Fed in particular, is greater than that imposed by pegging the peso to a foreign currency.

b) adopting the US dollar would prevent the Argentine authorities from creating money to finance their fiscal deficits.

c) adopting the US dollar allows Argentina to eliminate the double risk premium inherent in their current system of tying their domestic currency to the US dollar. Given the figures for that risk premium (Table 6), that gain is substantial - even allowing for a residual risk premium for the loss of any lender of last resort facility.

d) our optimal currency area analysis shows that Argentina is split between the need to link more closely with her trading partners in the Mercosur region - in order to develop the real side of her economy - and the need to link with the US in order to guarantee the monetary and financial discipline necessary to make that development possible. That conflict makes the optimal currency area test inoperative; Argentina will fail in real terms if she adopts the dollar, and in financial terms if she does not. Either way costs are incurred. As a result, lower interest rates and the elimination of risk premia dominate in the dollar cost-benefit calculations.

---

at Argentina's stage of financial development, and well within the one percent already subtracted from the Argentine governments own estimates of this growth rate gain.

REFERENCES

Auernheimer, L. (1974), 'The Honest Government's Guide to the Revenue from Money Creation', *Journal of Political Economy*, **82**, 598-606.

Balino, T. J. T., and C. Enoch, A. Ize, V. Santiprabhob, and P. Stella (1997), 'Currency Board Arrangements', *IMF Occasional Paper*, No. 151.

Barro, R. J. (1982), 'Measuring the Fed's Revenue from Money Creation', *Economics Letters*, **10**, 327-332.

Bayoumi, T. and B. Eichengreen (1996), 'Operationalizing the Theory of Optimum Currency Areas', *CEPR Discussion Paper*, No. 1484.

Bennet, A. G. (1994), 'Currency Boards: Issues and Experiences', in T. J. T. Balino and C. Cottarelli (eds.), *Frameworks for Monetary Stability: Policy Issues and Country Experiences*, (Washington, D.C.: International Monetary Fund).

De Grauwe, P. (1997), *The Economics of Monetary Integration*, 3rd edition (Oxford: Oxford University Press).

EC Commission (1990), 'One Market, One Money', *European Economy*, **44**.

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

Frankel, J. and A. Rose (1998), 'The Endogeneity of the Optimum Currency Area', *Economic Journal*, **108**, 1009-1025.

Giavazzi, F. and M. Pagano (1988), 'The Advantage of Tying One's Hands: EMS Discipline and Central Bank Credibility', *European Economic Review*, **32**, 1055-82.

Gros, D. (1993), 'Seigniorage and EMU', *European Journal of Political Economy*, **9**, 581-601.

Gros, D. and G. Vandille (1995), 'Seigniorage and EMU: The Fiscal Implications of Price Stability and Financial Market Integration', *Journal of Common Market Studies*, **33**, 175-196.

Hanke, S. H. and K. Schuler (1999), 'A Dollarisation Blueprint for Argentina', *Cato Institute Foreign Policy Briefing*, No. 52, March.

Herrendorf, B. (1997), 'Time Consistent Collection of Optimal Seigniorage: A Unifying Framework', *Journal of Economic Surveys*, **11**, 1-46.

Johnson, H.G. (1972), 'The Panamanian Monetary System', *Euromoney*, **3**, 8, 48-52 (reprinted in H.G. Johnson (1972), *Further Essays in Monetary Theory* (London: Allen & Unwin, 223-228).

Kenen, P. B. (1969), 'The Theory of Optimum Currency Areas: an Eclectic View', in R. Mundell and A. Swoboda (eds.), *Monetary Problems of the International Economy*, University of Chicago Press, Chicago.

Klein, M. and M.J.M. Neumann, (1990), 'Seigniorage: What is it and who gets it?', *Weltwirtschaftliches Archiv*, **126**, 205-221.

McKinnon, R. (1963), 'Optimal Currency Areas', *American Economic Review*, 53, 717-25.

Mundell, R. A. (1961), 'A Theory of Optimal Currency Areas', *American Economic Review*, 51, 657-65.

Schuler, K. (1998), *So You Want to Dollarize*, unpublished paper available on the World Wide Web at http://www.erols.com/kurrency/

Summers, L. (1992), 'Rules, Real Exchange Rates, and Monetary Discipline', in N. Liviatan (ed.), Proceedings of a Conference on Currency Substitution and Currency Boards, *World Bank Discussion Papers*, No. 207.

Walters, A. (1992), 'Currency Boards', in P. Newman, M. Milgate and J. Eatwell (eds.), *The New Palgrave Money*.

Table 1: Argentina's Trade Shares in 1997

Trade Partner	Total Trade ($ bn)	% of total trade	Openness (%)[1]
Brazil	14.90	26.4	4.81
US	8.29	14.6	2.67
Chile	2.60	4.8	0.84
Italy	2.47	4.6	0.80
Germany	2.16	4.0	0.70
Spain	1.87	3.5	0.60
China	1.87	3.5	0.60
Japan	1.68	3.1	0.54
France	1.68	3.1	0.54

Source: inventir.com

Table 2: Exports and Imports of Argentina to the USA, Brazil and the World (as a percent of GDP)

		USA	
Year	**Exports**	**Imports**	**Openness[1]**
1991	1.13	0.78	1.91
1992	1.42	0.60	2.03
1993	1.59	0.55	2.14
1994	1.73	0.71	2.45
1995	1.62	0.73	2.35
1996	1.66	0.90	2.56
1997	1.98	0.81	2.80
1998	1.97	0.82	2.79
		Brazil	
Year	**Exports**	**Imports**	**Openness**
1991	0.82	0.85	1.67
1992	0.74	1.47	2.21
1993	1.19	1.51	2.70
1994	1.42	1.66	3.08
1995	2.07	1.56	3.64
1996	2.43	1.96	4.39
1997	2.65	2.33	4.98
1998	2.63	2.38	5.01
		World	
Year	**Exports**	**Imports**	**Openness**
1991	6.62	4.49	11.11
1992	5.39	6.56	11.95
1993	5.47	7.06	12.53
1994	6.15	8.39	14.54
1995	8.07	7.76	15.83
1996	8.41	8.73	17.14
1997	8.86	10.40	19.26
1998	8.85	10.53	19.39

Source: Datastream

Notes: 1. Openness is the sum of the export and import shares of GDP.

Table 3: Foreign Investment in 1997

Partner	% of Total FDI
US	>36.0
Spain	16.0
Chile	9.6
France	9.5
Italy	7.0
Brazil	2.1

Source: inventir.com

Table 4: Changes in Labour Costs in Argentine Manufacturing (%, p.d.)

1993	11.2
1994	6.5
1995	-9.6
1996	-1.9
1997	-12.9

Source: International Labour Office/IMF (International Financial Statistics).

Table 5: Correlations between the Argentine and US GDP's in Constant Prices

1970-1982	1983-1998
-0.02	-0.19

Source: authors calculations, IMF (International Financial Statistics).

Table 6: Average Currency Risk on Argentine Peso-denominated 30-day loans (in basis points), April, 1993 – September, 1999*

Year	1993	1994	1995	1996	1997	1998	1999
Currency Risk	250	206	402	141	140	178	173

Source: Datastream

* Currency risk is measured as the difference between the 30-day Argentine peso prime rate and the 30-day dollar prime rate in Argentina.

Table 7: Cost-Benefit Analysis of Dollarisation for Argentina (as a percent of GDP)

Calculation :-	**% of GDP**
Stock Seigniorage Costs	5.0
PV of Flow Seigniorage Costs	8.3
Other One-time Costs	1.0
Total Costs	**14.3**
PV of Currency Conversion Benefit	0.28
PV of Currency Risk-premium Benefit	33.33
Total Benefits	**33.61**
Net Benefit(Cost)	***19.31***

Figure 1: US and Argentine Growth Rates, 1970-98

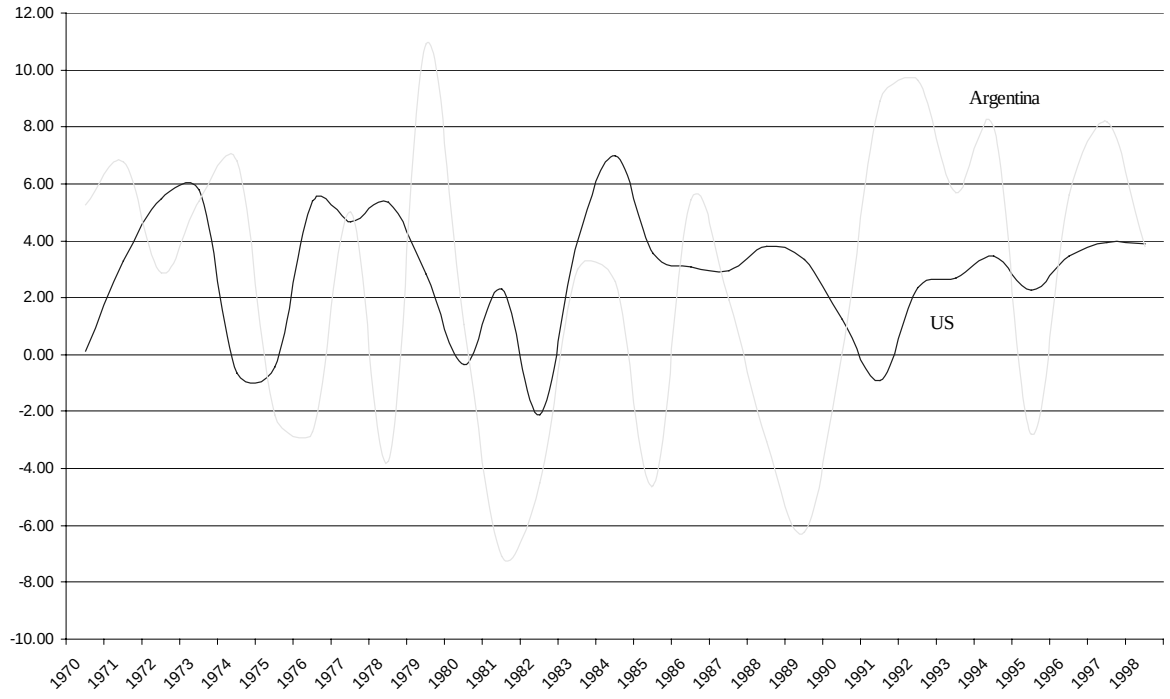

Figure 2: The Argentine Risk Premium on 30 Day Prime Rate Loans, April 1993 - September 1999, vs. Dollar Loans made in Argentina