ENSAYOS

sobre política económica

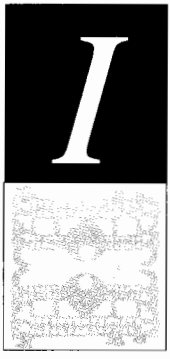
Market Reforms and the Limitations of Monetary Policy: The Case of Colombia

Frank R. Gunter
Carolyn Fabian Stumph

Revista ESPE, No. 38, Art. 02, Diciembre de 2000
Páginas 45-69

Market Reforms and the Limitations of Monetary Policy: The Case of Colombia

Frank R. Gunter
*Carolyn Fabian Stumph**



In the early 1990s, Colombia moved rapidly to reform its economy including a dramatic opening to foreign trade and capital. This study shows that as a result of this opening, the Colombian economy has become much more economically integrated with that of the rest of Latin America, especially Venezuela and Ecuador. The implications for monetary policy of trade liberalization are then examined. It appears that the cost-benefit trade off may have shifted against the Central Bank's existing policy of steady peso depreciation and in favor of an Argentinean type of currency board. The possible framework of a Colombian currency board is then discussed.

JEL Code: O

Key Words: Colombian monetary policy, currency board, economic integration.

* The authors appreciate the generous financial support of the Martindale Center for the Study of Private Enterprise. Earlier versions of this study were presented at the Lehigh University Conference on the Economic and Social Implications of Colombian Market Reforms in April 1999 and the Southern Economic Association Annual Meeting in November 1999.

Frank R. Gunter, PhD Economics Department Lehigh University 621 Taylor Street Bethlehem, PA 18015 frg2@lehigh.edu.

Carolyn Fabian Stumph, PhD Economics Department Illinois Wesleyan University.

I. INTRODUCTION

Banco de la República, the central bank of Colombia, has a well-deserved reputation as an independent, professionally managed organization. However, over the last several years, Colombia's Central Bank has been increasingly unable to achieve its stated goals with respect to both the domestic and international values of the peso. The market reforms of the last decade, especially trade liberalization, may have dramatically reduced the ability of Colombia to use a flexible exchange rate to achieve its currency goals. As a result, the country experiences the disadvantages of a flexible exchange rate without being able to capture any of the benefits. It may be time to reconsider the adoption of a truly fixed exchange rate such as that provided by a currency board.

Every non-autarkical country must think of its monetary policy in terms of both its domestic and external goals. For Colombia, the three dominant goals are reducing the rate and variance of inflation and achieving an exchange rate that will preserve or enhance the competitiveness of its non-traditional exports.[1]

Through a combination of good macroeconomic management, good luck, and by taking advantage of the institutional rigidities, Colombia was relatively successful at achieving at least two of its somewhat contradictory currency goals. Inflation was relatively stable and exchange rates were such that the non-traditional exports were able to maintain or expand their foreign markets. However, the level of inflation remained stubbornly high.

Rennhack and Mondino found that lack of capital mobility played a major role in the monetary authority's control over domestic interest rates and the money stock (1988). Based on the period examined, 1975 to 1986, these authors found that much of Colombia's short-term monetary control came from the presence of capital controls. In other words, Colombian policy makers were able to "...trade off macroeconomic flexibility against microeconomic efficiency." (Krugman, 1993).

Colombia began a process of economic liberalization combined with fiscal decentralization in the early 1990s. The liberalization process included a sharp reduction or elimination of tariff and non-tariff barriers, an opening of the country

[1] Colombia's traditional exports are natural resource based such as coffee, coal, petroleum, nickel, emeralds, and gold. The non-traditional exports include both agricultural products such as bananas and flowers as well as industrial products such as chemicals, paper goods, leather manufactures and food items.

to international capital flows, a movement away from directed or managed credit, and the creation of a more independent monetary authority in the *Banco de la República*. Financial barriers affecting credit and liquidity were also lifted (see Carrasquilla, 1995). Furthermore, in 1991, Colombia monetary authorities decided to move from a crawling peg exchange rate system to a system involving exchange rate target zones.

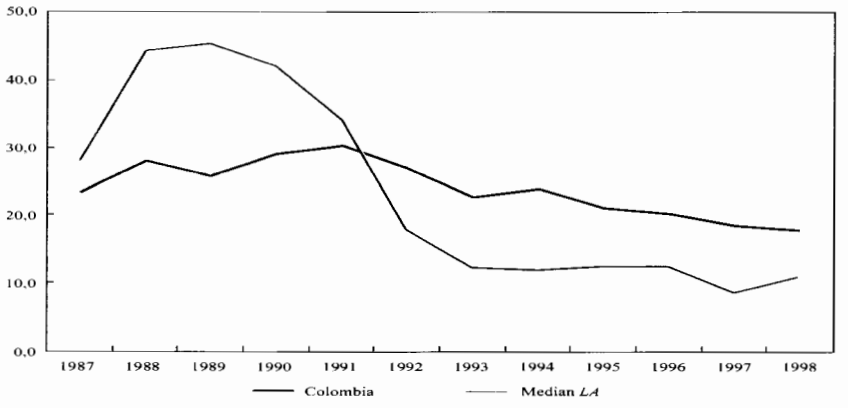
The opening of the Colombian economy to foreign trade and finance, a key component of this liberalization, raises the question of whether the movement towards microeconomic efficiency has had the effect of significantly reducing the degree of macroeconomic flexibility formerly enjoyed by Colombian policymakers. Has greater economic integration reduced or eliminated the ability of Colombian policymakers to pursue somewhat inconsistent policies with respect to the internal and external value of the peso? Section II discusses current monetary policy in Colombia including the role of capital controls. This is followed in Section III by a discussion of some empirical evidence of the degree of economic integration of Colombia with its major trading partners. The impact of this increased integration on flexible exchange rate policies is then examined in Section IV followed by a discussion of a currency board as an alternative in Section V.

II. INFLATION, DEPRECIATION AND CAPITAL CONTROLS

As Carrasquilla argues, "the Central Bank...has two objectives; the first is the defense of a 'target' real exchange rate and the second is inflation." (1999, p. 212; see also Ocampo, 1999, p. 40) Of course, it is difficult to achieve both of these targets simultaneously. A slowdown in monetary growth in order to reduce inflation will tend to lead to an appreciation of the peso that will injure non-traditional exports. Consequently, Colombia appears to have followed a policy of seeking lower inflation rates only during periods of relatively healthy exports and real growth. These efforts to reduce inflation have had only limited success.

Colombia had traditionally enjoyed lower rates of inflation than many of its neighboring Latin American countries (Fullerton, 1993). However, this pattern changed in the early part of the decade. Following several years of increase, consumer prices rose in excess of 30% in 1991. Since then, as can be seen in Figure 1, inflation in Colombia has been above that of the median of the other large Latin American countries. This comparative deterioration may have an impact on the perception of Colombia by foreign banks and investors. (See Gunter, 1999).

Figure 1
Inflation Rates in Latin America
(Colombia and Average of Twelve Largest Countries)
(Inflation)



Sources: 1987-1997, *IDB*; 1998, The Economist.

In response to stubborn inflation and other difficulties, Colombian monetary authorities set out to make the central bank independent and achieved this goal with the establishment of the new constitution in 1991 (Junguito, 1994). In 1994, the previous exchange rate policy of a crawling peg was abandoned in favor of explicit exchange rate bands. These bands were put in place to allow exchange rate flexibility and to obtain independence for the conduct of monetary policy (Carrasquilla, 1995). Since these policies were adopted, Colombia has experienced inflation in the range of 18-23% during the 1990s, which is significantly above the targeted levels.

According to the 1999 *IMF* Staff Country Report on Colombia, the primary reasons for this persistent high rate of inflation were the existence of indexation in wages, housing finances (*UPAC*), tax brackets and other sectors as well as the crawling peg system (p. 21). The problems with the latter system have been exacerbated by the recent large inflows of foreign capital. These inflows, which resulted at least in part from the market liberalization of the early 1990s, have bid up the price of the peso, which has threatened the competitiveness of non-traditional exports. (*IMF*, p. 46).

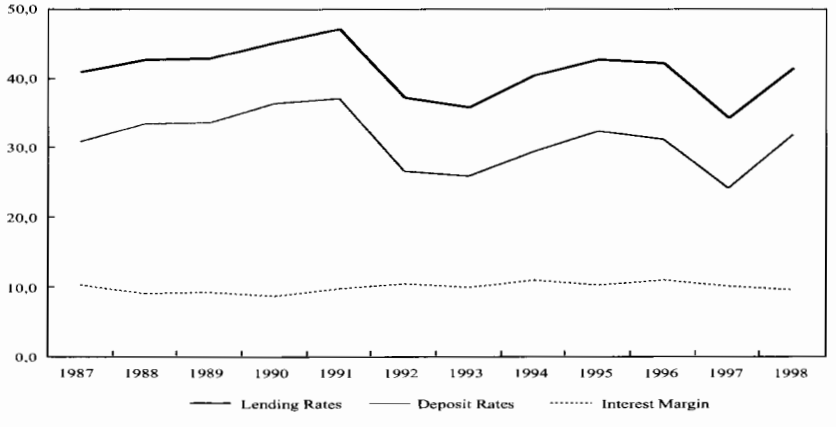
Initially, the monetary authorities dealt with the capital inflows by partially sterilizing the inflows through open market operations, increasing reserve requirements and

issuing dollar-denominated certificates in exchange for foreign exchange (*IMF*, p. 46). In addition to leading to a sharp rise in international reserves, these policies weakened the Central Bank's budget and increased commercial banks' interest margins. As can be seen on Figure 2, these interest margins have averaged about ten percentage points over the last decade that is large by both developing and industrialized country standards. According to Barajas, Steiner and Salazar (1999, Table 9, p. 219), about a quarter of this margin are accounted for by the large mandatory reserves, reserves that are required as part of the sterilization process. This large margin imposes significant costs on the economy by making financial intermediation more expensive.

As these costs continued to rise and faced with the expectation of an acceleration of capital inflows, capital controls were imposed in September 1993. The severity of these controls is periodically revised in response to changes in capital flows, the real exchange rates and the domestic economy.

In summary, prior to the 1990s, existing restrictions prevented international capital flows from disrupting the attempts of the monetary authorities to simultaneously gradually reduce and stabilize (or at least prevent any further acceleration of) inflation while maintaining a competitive exchange rate. The opening of the capi-

Figure 2
Interest Rates and Interest Margins
(Nominal Rates)



Source: *Revista del Banco de la República* (Lending rate = tasa activa, deposit rate = tasa pasiva).

tal markets removed the ability of the monetary authorities to simultaneously pursue these often-contradictory policies. In response, capital controls were imposed to regain policy flexibility although at the cost of reduced economic efficiency.

III. TRADE LIBERALIZATION AND MONETARY POLICY INDEPENDENCE

But the liberalization of the early 1990s also resulted in a dramatic reduction in Colombia's barriers to trade in goods and services. As Hallberg and Takacs reported, the import-licensing regime was essentially dismantled in 1990, quotas were replaced by tariffs and then there was a general reduction in both the levels and dispersion of those tariffs (pp. 264-275). And if Colombia has become more economically integrated with its major trading partners then the ramifications for its monetary policy are potentially serious. Flows of goods and services will act like flows of capital to prevent Colombia form pursuing inconsistent inflation and exchange rate targets. This is the familiar Keynesian dictum that with respect to the level of inflation, the rate of exchange rate change and free trade, a country's decision makers can only choose two (Keynes, 1923, see also Friedman and Schwartz 1982, pp. 290-291). If Colombia's trade liberalization of the early 1990s has led to free trade then Colombia's policy makers must choose either inflation reduction or exchange rate stability. It cannot have both without some sort of institutional change.

One method of testing whether economic integration has occurred is to test for the existence of purchasing power parity (*PPP*). The argument is as follows. Trade in goods and services will ensure that the real exchange rate between any pair of countries will be relatively stable, *i. e.* the nominal exchange rate will reflect the ratio of the general price levels. For example, if the real exchange rate began to appreciate then cross border arbitrage in goods and services would lead to a deceleration in domestic inflation and a fall in the nominal exchange rate until the real rate stabilized.

We used the Augmented Dickey Fuller technique to test for the existence of *PPP* with respect to Colombia and its Andean partners as well as the members of Mercosur and its major trading partners among the industrial countries. The results are reported in Tables 1 through 3 for each country pair tested. If the null hypothesis of a unit root was rejected, then the real exchange rate exhibited stationary behavior for the time period examined. The rejection of the null hypothesis of a unit root therefore provides an indication that a weak form of *PPP* held for Colombia and

the country tested during this time frame. If the null hypothesis of a unit root was not rejected, the time series is non-stationary and yields no evidence of *PPP*.

A comparison of the before and after-time frames is reported in the last column of the tables. If the null hypothesis was either accepted or rejected in both time series, this was reported as 'no change' in the *PPP* condition. If the time series changed from stationary to non-stationary, this was reported as deterioration in the *PPP* condition. If the time series changed from non-stationary to stationary, this was reported as an improvement in the *PPP* conditions for Colombia and the country analyzed.

When analyzing these results, it is important to keep in mind the three traditional reasons why *PPP* may fail to hold in the long run: the Balassa-Samuelson effect, price rigidity and real shocks to the economy. For this analysis, since it in part compares industrialized countries with *LDCs*, the first two are most important. The disparity in the levels of development between these countries is great and the rates of inflation differ significantly. While these effects will not stop *PPP* from occurring, given increased trade and lowered tariff barriers, what is relevant for the purposes of this analysis is that these effects may seriously slow down movement toward *PPP*. In the terminology of this analysis, movement toward *PPP* or mean reversion may not be observed within the nine years time frame of this study.

However, contrary to what might have been anticipated considering the vast differences in levels of development and inflation, the empirical results provided evidence that Colombia's goods market has shown increased integration with the goods markets of several of the other members of the Andean Group (Table 1) as well as several of its major industrialized trading partners (Table 2). Colombia showed improvement in the *PPP* condition with both Ecuador and Venezuela. No change was found in Colombia's *PPP* status vis-à-vis Peru and deterioration in the *PPP* condition was found when Colombia was tested against Bolivia. With some of Colombia's major industrialized trading partners, improvement in the *PPP* condition was found when Colombia was tested against Germany, Japan and Italy. No change was found when Colombia was tested against the Netherlands. The Colombia/ United States *PPP* condition deteriorated.

Colombia was also tested against the countries of Mercosur for purposes of comparison and no movement toward goods market integration was detected. These results are reported in Table 3.

While the results for Colombia and the United States are surprising given the volume of trade between the two countries, they are actually not unexpected given the nature

Table 1
Colombian Trading Partners
Andean Group

Country	1985-1991			1991-1998			Improve (*I*),
	DF t-stat	*Lag*	Rejects Null (5%)(*)	*DF t*-stat	*Lag*	Rejects Null (5%)(*)	Deteriorate (*D*) or No Change (*N*)
Bolivia	-4,6151	3	Yes	-2,524257	3	No	*D*
Ecuador	-1,7656	4	No	-4,652911	3	Yes	*I*
Peru	-2,2699	1	No	-2,433778	2	No	*N*
Venezuela	-1,1748	1	No	-3,341321	4	Yes	*I*

(*) Rejects null hypothesis of a unit root.

Table 2
Colombian Trading Partners
(Other Major rading Partners)

Country	1985-1991			1991-1998			Improve (*I*),
	DF t-stat	*Lag*	Rejects Null (5%)(*)	*DF t*-stat	*Lag*	Rejects Null (5%)(*)	Deteriorate (*D*) or No Change (*N*)
US	-3,3194	2	Yes	-2,84141	3	No	*D*
Germany	-2,1154	4	No	-3,492959	6	Yes	*I*
Japan	-2,1755	2	No	-4,391325	1	Yes	*I*
Italy	-2,181445	4	No	-4,869958	1	Yes	*I*
Netherlands	-2,101477	2	No	-3,403238	6	No	*N*

(*) Rejects null hypothesis of a unit root.

Table 3
Colombian Trading Partners
(Mercosur)

Country	1985-1991			1991-1998			Improve (*I*), Deteriorate (*D*) or No Change (*N*)
	DF t-stat	*Lag*	Rejects Null (5%)(*)	*DF t*-stat	*Lag*	Rejects Null (5%)(*)	
Argentina	-1,6439	2	No	-2,646078	3	No	*N*
Brazil	-2,4848	1	No	-1,333019	1	No	*N*
Chile	-4,4315	1	Yes	-4,232174	1	Yes	*N*
Paraguay	-3,3641	1	Yes	-2,587384	2	No	*D*
Uruguay	-1,0183	3	No	-1,911496	2	No	*N*

(*) Rejects null hypothesis of a unit root.

of the test for *PPP* and the use of the dollar as the unit of account for homogeneous exports worldwide. The real exchange rate series tested in this analysis is defined as:

$$(1) \qquad r = e - p + p^{*},$$

where e is the log of the nominal exchange rate and p and p^* are the logs of the Colombian and other country's respective price levels. In the case of the U. S.-Colombia, the implicit assumption contained in this equation is that Colombian exports are peso denominated and U. S. exports are dollar denominated. However, almost 55% of Colombia's export trade (1997 data, *IMF* 1999, Table 43, p. 123) is in homogeneous goods such as coffee, petroleum, coal, non-monetary gold, and nickel. These homogeneous goods are dollar denominated but a large proportion of these goods do not involve trade with the U. S. Thus a change in the dollar-peso exchange rate directly affects Colombia's trade with many countries other than just the U. S. As a result, it is unlikely that a depreciation of the peso, for example, will lead to sufficient reduction in U. S. inflation and an acceleration of inflation in Colombia so as to approximate *PPP* in a reasonable period of time.[2] Effectively,

[2] This divergence is similar to the fact that the U. S. Federal Reserve must account for foreign demand and supply of dollars when it plans a monetary policy change.

the two countries are already members of a common currency region for a large proportion of their trade. However, only the nominal bilateral adjustment is captured by the above test for *PPP*.

IV. THE NEW COLOMBIA AND ITS MONETARY POLICY CHOICES

The empirical results of Section III clearly indicate that the Colombian economy is moving toward free trade. It is not clear that the ramifications of multilateral tariff reductions were accounted for in the monetary and exchange rate policy overhaul of 1991. Given that Colombia has a stated goal of inflation control and that, because of trade liberalization, their economy is more susceptible than ever to international disturbances, the Colombian economy may be better off abandoning the nominal exchange rate bands and pursuing an alternative exchange rate arrangements. Possibilities, together with an analysis of the costs and benefits of these, are the subject of this section.

With economic liberalization leading both to a *PPP* relationship between Colombia and its major trading partners as well as increasing the economic burden from inflation by facilitating capital flight or dollarization, (See Gunter, 1992 and 1994) it would seem that the current "crawling band" exchange rate system has all of the disadvantages of a floating exchange rate without any of the advantages. The floating rate feeds inflation and creates uncertainty while the integration with the world capital market and the dependence on foreign loans and investment severely restricts monetary policy.

This, of course, resurrects the question of whether Colombia is an optimal currency area or should fix its currency to that of another country. However, any country that adopts a fixed rate regime faces severe problems of monetary policy constraints, currency speculation, and credibility. The first two issues have received extensive treatment in both the technical and popular exchange rate literature. A pure fixed rate system places severe constraints on monetary policy because it forces the developing country to mirror the policy of the country or countries whose currency (*ies*) are used in the fixed exchange rate equation.

In addition, riskless currency speculation ensures that a pure fixed rate system that allowed any assets denominated in domestic currency to be converted into foreign currency on short notice would eventually fail. Currency raiders can easily take out loans to create domestic assets such as demand deposits in order to exchange them for foreign currency. The failure of the nations of the *EC* several years ago to

maintain their system of fixed exchange rates despite their influence in the world capital markets makes it unlikely that a developing country with less influence could maintain a fixed rate under a system that allowed conversion of broadly defined assets.

Compared to the problems of loss of monetary policy options and currency speculation, less attention has been paid to the issue of credibility. Most developing countries have tried to reduce the constraints on monetary policy and the risk of currency speculation while still trying to provide some confidence in the foreign exchange value of the domestic money by developing complex exchange rate systems. These systems deviate from a pure fixed rate system by restricting the institutions, the instruments or the timing of foreign exchange rate transactions. For example, only certain commercial banks and financial corporations will be allowed to exchange the proceeds of certain types of transactions and often with restrictions on the length of time that such instruments can be held. These complex systems tend to experience periodic modification as a result of policy changes as well as in response to innovations in domestic and international finance.

The sheer complexity and periodic change of these exchange rate regimes encourage the holding of foreign currency or capital flight for two reasons. First, the complexity of the process discourages the use of the legal exchange rate system. Institutions and individuals will move to the parallel market to handle their foreign exchange transactions (Gunter, 1994). Second, complexity and change make it difficult for institutions and individuals in a developing country to determine whether the government's rules are consistent with and supportive of its avowed polices or whether the rules have been "hijacked" for either some unexpressed government policy or for private gain. This lack of credibility tends to undermine compliance with the regulations.

An alternative to developing increasingly complex foreign exchange rules in order to defeat currency speculators is to adopt a credible exchange rate regime built on a commitment of 100% reserves of foreign currency or liquid foreign currency denominated assets. The best known such regime is the currency board.

V. CURRENCY BOARD

According to Enoch and Gulde, "A currency board combines three elements: an exchange rate that is fixed to an 'anchor currency', automatic convertibility... and a long-term commitment to the system, which is often set out directly in the cen-

tral bank law" (1998, p. 41). As Walters and Hanke point out "The main characteristic of the currency board system it that the board stands ready to exchange domestic *currency* for the foreign reserve currency at a specified and fixed rate." (1992, p. 558, see also Hanke and Schuler, 1994, pp. 2-10).

After a long period of unpopularity, currency boards are experiencing a revival. From about nine boards in the late 1980s, the number of nations using this system has increased to fourteen, including Argentina (whose board is now in its seventh year) and six nations in the Caribbean. (Enoch and Gulde, 1998 p. 40).

A currency board system is more capable of dealing with the problems caused by currency speculation and generally has greater credibility. Under a currency board system, the currency board authorities stand ready to exchange domestic *currency* for foreign *currency* at a pre-announced rate. Anyone who wishes to convert deposit accounts, government bonds, or any other instrument into foreign currency must first convert these instruments into domestic currency in the private market before approaching the currency board. In other words, the currency board system ensures that domestic currency (and only domestic currency) is 100% backed by foreign currency or liquid foreign currency denominated assets.

The balance sheet of a currency board could be represented as follows:
In Table 4, the first capital letter of each variable represents the type of instrument whether bonds (*B*), currency (note that *M* stands for currency alone *i. e. M-0*, demand deposits are treated separately) and net worth (*W*). The small letter following the capital letter represents the current holder of the instrument, the currency board (*c*), the government (*g*), the private banking sector (*b*), and the non-bank private sector (*p*). If the second letter is omitted then the variable represents the entire instrument regardless of the identity of the current holders.

Table 4
Balance Sheet of Currency Board

Assets	Liabilities
eBc'	M'
eMc'	$W'c'$

The peso/dollar exchange rate is represented by "e" while the presence of an apostrophe indicates that either the instrument or the current holder or both is the country of interest, *e. g.* Colombia. For example, eBc' represents the peso value of a foreign bond currently held by the Colombian currency board. Using this nomenclature, the currency board constraint can be expressed as follows:

(2) $M' = e\left(Bc' + Mc'\right) - W'c'$

To the extent that the board keeps its 100% reserves in the form of liquid foreign currency denominated assets (Bc'), the currency board receives earnings that can be used to cover its expenses or transferred to the government. Thus the board system allows the country to earn seignorage.

Currency boards have been successful at both reducing inflation and maintaining exchange rate stability. With respect to the former, econometric results show an average decrease of 3.5 percentage points in inflation rates without any negative effects on real growth. (Enoch and Gulde, 1998, p. 41). Generally, currency board economies tend to experience inflation rates that are roughly the same as that of the foreign currency and interest rates that are only slightly above those of the foreign currency. With respect to exchange rate stability, Walters and Hanke (1992, p. 558) point out that no orthodox currency board has ever failed to maintain convertibility.

Along with equation (2) above, the operation of the monetary system in the currency board country is dependent upon the desired ratio of generally short-term deposits and the legal and accepted reserve assets. If a government requires a certain minimum reserve ratio in terms of the domestic currency then this can be expressed as below:

(3) $r' <= \left(M'b'/D'\right)$

With a currency board, the government can influence the supply of liquidity (and therefore interest rates) by adjusting either the amount of reserves available to the banking system ($M'b' + B'b'$) or by adjusting the r''.

In order to limit the foreign exchange rate risk faced by domestic banks that offer deposit accounts denominated in dollars, a government may also enforce a similar reserve requirement for these accounts such as in equation (4):

(4) $r <= \left(eMb'/D'\right)$ for D' denominated in pesos

With the constraints given by equations (2), (3) and (4), the operation of a currency board can be quickly described. Any individual government or non-government institution that sought to increase its holdings of domestic currency could do so, of course, by selling another asset or borrowing in the private market. However, the entire economy could only increase its holdings of domestic currency by exchanging the reserve currency *e. g.* dollars (*Mg´*, *Mb´* or *Mp´*) at the currency board at the declared exchange rate of *e*.

The rate of increase in domestic currency is not necessarily a function of a country's international balance of payments. Regardless of whether a country is in external balance, surplus or deficit, the government could expand the amount of domestic currency in circulation by either borrowing dollars internationally (simultaneously increasing *Mg´* and increasing some combination of *B´g*, *B´b* or *B´p*) or by selling an asset to a foreign entity for dollars (increasing *Mg´* while decreasing some combination of other *g´* holdings). Once in possession of the foreign currency, *Mg´*, the government could then exchange the foreign currency at the currency board leading to an increase in the volume of domestic currency, *M´g´*.

A balance of payments deficit, where net exports plus net private capital flows sum to less than zero, can be expected to lead to an accumulation of holdings of the developing country's reserves in foreign portfolios (*i. e.* an increase in *M´g+B´g*, *M´b+Bb* and/or *M´p+B´p*). These foreign holders will have several options. First, they can choose to continue to hold the currency board country's currency or government debt. This choice might make sense in the case of the currency board country's government debt (*B^*) that could be expected to have a positive return. However, foreign entities are unlikely to hold the currency board country's currency (*M^*), which by definition is barren of return.

A second option of foreigners is to use their accumulated reserves to purchase assets from or make loans to the developing country's government, banks, or private non-bank sector. For example, foreign entities could use their developing country reserves to open deposits at the currency board country's banks (simultaneously increasing *M´b´* and either *D´g*, *D´b* or *D´p*), or to purchase existing assets of the currency board country's banks, either those denominated in the domestic currency (*B´b´*, *L´b´* or *K´b´*) or those denominated in foreign currency (*Bb´*, *Mb´*, *Db´* or *Lb´*). Of course, the final option is for the foreign holder of the currency board country's currency (*M^*) to convert it to foreign currency (*M*) by using the currency board. Only this last option actually changes the amount of domestic currency in circulation.

Is there a tendency toward a stable volume of domestic currency under a currency board? Or will the volume of domestic currency experience sharp increases and contractions based, for example, on the state of the balance of payments discussed above? Assuming that domestic and foreign currencies are not perfect substitutes, the operation of a currency board should tend to stabilize rather than exacerbate the effect of external shocks. The argument for stability is basically one of supply and demand. Domestic currency is valued both to facilitate domestic transactions and as a form of reserves that supports deposit creation by domestic banks as expressed in equation (3) above.

As foreign or domestic holders extinguished domestic currency by converting it to foreign currency at the currency board, this reduction in supply would tend to increase the return on domestic currency deposits relative compared to foreign currency. This would provide the incentive to slow and eventually stop the conversion of domestic currency short of its disappearance. This intuitive argument appears to be supported by the historical experience of currency boards where a fractionally higher interest rate on accounts denominated in the domestic currency relative to those in foreign currency has been sufficient to provide stability.

If it seems likely that Colombia would benefit through lower inflation rates, reduced interest margins, and greater exchange rate stability by the establishment of a currency board then how might this board be organized? There are four key issues. First, the country must choose a reserve or "anchor" currency. Second, the exchange rate for the reserve currency must be selected. Third, a decision must be made about to what degree the currency board will be allowed to hold excess reserves which provide a measure of monetary flexibility. Finally, the currency must be incorporated in the legal and commercial system in such a manner so as to increase its credibility. (For a detailed discussion of these issues, see Hanke and Schuler, 1994).

A. WHICH RESERVE CURRENCY?

Ideally, the reserve or "anchor" currency should be stable (low inflation), internationally accepted, and denominate a significant amount of the trade and finance of the currency board currency. This rules out all but a few of the world's currencies. In fact, the fourteen currency boards that are currently in existence involve only three currencies; the dollar (ten boards), the deutsche mark (3 boards) and the board of Brunei which uses the Singapore dollar as its reserve currency. (Enoch and Gulde, 1998, pp. 40-41).

With respect to Colombia, the U. S. dollar would appear to be the most likely candidate. In 1998, about 39% of Colombia's exports and 35% of its imports involved the United States. In addition, Colombia does about 2% of both its exports and imports with the twenty-five countries around the world that already fix their domestic currencies to the U. S. dollar. Of these twenty-five countries, the most important with respect to trade with Colombia were Argentina, Hong Kong and Panama (*IMF*, Balance of Trade Statistics, 1999, pp. 167-168). In addition, as discussed above, a substantial portion of Colombia's exports are homogeneous natural resource based products that tend to be dollar denominated.

A similar story can be told with respect to capital flows. At the end of 1998, the value of U. S. direct investment in Colombia totaled approximately $3.8 billion (Bureau of Economic Analysis, 1999) while total U. S. bank exposure reached $3.6 billion (*FFIEC*, 1999, p. 10). To this amount should be added the dollar denominated debt owed to non-U. S. banks. Also to be considered is the extent to which there already exists a large informal dollar economy in Colombia. A successful currency board will provide current dollar holders the choice of a new instrument, the currency board peso. And to the extent that the informal economy adopts this new instrument, the earnings from seigniorage will increase.

Of course, a rational decision should be based on future rather than current patterns of trade and financial flows. One view is that to the extent that there is greater progress over the next decade in establishing a hemisphere, as opposed to a world wide, free trading area, the volume of dollar denominated trade and financial flows will probably increase in the future. While there might be political arguments against increasing dependence on the dollar, the economic arguments show the U. S. dollar to be the best choice for reserve currency.

B. WHAT SHOULD THE EXCHANGE RATE BE?

The choice of the exchange rate is subject to both macroeconomic and accounting considerations. After the exchange rate is chosen, adjustments to the real exchange rate will tend to be real not nominal. If an overvalued exchange rate is chosen then Colombia will tend to experience an economic slowdown until relative inflation rates have diverged sufficiently so as to achieve a sustainable balance of payments. Conversely, if an undervalued exchange rate is selected then a temporary acceleration of the economy will probably occur accompanied by an acceleration of inflation above that of the reserve currency. In addition, this process of selecting an exchange rate must deal with inflationary and exchange rate momentum. This momentum is caused by the fact that there are existing contracts that are either

based on past inflation or devaluation or that incorporate expectations of future inflation or devaluation that are inconsistent with an expected decline in inflation. It will be necessary to develop adjustment mechanisms to make contracts not only forward looking but consistent with the inflation rate that will result from the establishment of a currency board. (See Giambiagi, 1994, Annex 1, for a short discussion on the role of institutions in exacerbating inflation reform in Colombia).

A final complication is brought about by the likelihood that the adoption of a currency board will change both trade and capital flows at least temporarily. As Kopcke states, the country might have to choose between an overvalued exchange rate that would better balance the flow of funds during this initial surge or a lower valued exchange rate that would be more consistent in the long-term. (1999, p. 25).

Some commentators have argued that the difficulty of choosing an exchange rate is a serious or even fatal flaw to the adoption of a currency board. However, unless a country is willing to adopt a purely floating exchange rate, it is already choosing the current level of its exchange rate, creating more or less credible expectations of future levels of its exchange rates, and imposing risk and uncertainty on many domestic and foreign agents. In the case of a country suffering high inflation and unexpected exchange rate changes, it is likely that the benefits from reducing or eliminating exchange rate risk or uncertainty exceed the costs of getting the specific exchange rate right. A final constraint on the choice of exchange rate is the accounting issue of sufficient reserves.

Before forming a currency board, a country must possess a sufficient volume of foreign currency or liquid foreign currency denominated assets to provide at least 100% backing for the existing domestic currency stock at the chosen conversion rate. These assets and currency can come from several sources, the conversion of all or a portion of the country's international reserves (Estonia used the gold held by England and the *BIS* since the occupation of Estonia by the former *USSR*), loans from foreign governments, international agencies or foreign private organizations or, possibly, the results of taxing existing foreign assets.

In the case of Colombia, it appears that existing international reserves are more than sufficient to support the existing amount of issued currency as well as monetize the existing volume of non-currency commercial bank reserves. Tables 5 and 6 provide a rough picture of how the assets and liabilities of the current Central Bank of Colombia could be used to establish a currency board. Table 5 shows a summary of the October 1998 balance sheet of the Central Bank. Table 6 illustrates the balance sheets of the currency board and the modified Central

Table 5
Central Bank Balance Sheet
(October 1998, Pesos billion)

Assets		Liabilities & Capital	
International Reserves	13,515	International Debts	219
Public Sector	784	Public Sector	112
National	776	National	111
Other	8	Other	1
Financial Institutions	1,212	Financial Institutions	2,673
Commercial Banks	406	Commercial Banks	1,990
Other	806	Other	683
Other Assets	857	Private Sector	3,579
Total Assets	16,368	Total Liabilities	6,583
		Capital	9,786
		Total Liabilities and Capital	16,368

Source: *Revista del Banco de la República*, cuadros 2.1 y 2.2.

Bank. Note that these balance sheets assume that the currency board was established at the October 1998 exchange rate.

The creation of a currency board reduces but does not eliminate the ability of the government to engage in monetary policy. To the extent that the Central Bank continues to control whatever foreign exchange remains after the creation of the currency board, it can increase the money supply by exchanging this foreign exchange at the currency board for domestic currency. As can be seen in Table 6, the Colombian Central Bank in October 1998 would have almost 6.6 trillion pesos to use for such purposes. However, once the Central Bank has used up its foreign currency holdings in this fashion then it must borrow more foreign currency if it wishes to continue to expand the money supply.

Table 6

Currency Board Balance Sheet

(Pesos billion)

Assets		Liabilities & Capital	
Foreign Securities (*)	7,109	Monetary Base (**)	
		Currency	3,429
		Commercial Bank Deposits	3,034
Total Assets	7,109	Total Liabilities	6,463
		Capital	646
		Total Liabilities and Capital	7,109

Central Bank (Minus) Balance Sheet

(Pesos billion)

Assets		Liabilities & Capital	
International Reserves	6,406	Total Liabilities	120
Public Sector	784	Capital	9,139
Financial Institutions	1,212	Total Liabilities and Capital	9,259
Other Assets	857		
Total Assets	9,259		

(*) Currency and liquid securities denominated in the reserve or "anchor" currency.
(**) *Revista del Banco de la República*, Cuadro 1.2.

C. SHOULD EXCESS RESERVES BE ALLOWED?

The short discussion above concerning monetary policy after currency board creation can be extended to the issue of ,whether a currency board should be allowed to keep excess reserves. Most currency boards are encouraged to keep a 5% -10% "buffer" to ensure that 100% reserve coverage is maintained even if an unexpected spike in reserve currency interest rates reduces the value of its liquid short-term bonds denominated in the reserve currency. (Hanke and Schuler, 1993, p. 15) The example of Colombia in Table 6 incorporates a 10% buffer.

However, to the extent that a currency board is able to accumulate reserves in excess of the desired buffer amount then is it desirable to allow the currency board to engage in actions intended to change the monetary base? for example, the currency board could increase the money supply by converting a portion of its excess $W'c'$ (net worth or capital) into Mc' (reserve currency) and then exchanging this for M' (domestic money) at the fixed exchange rate, e. (See equation (2) above and Table 6).

Allowing the currency board to engage in such activities may injure its credibility. As long as the board is entirely passive, exchanging pesos for dollars and dollars for pesos based entirely on the demand and supply of the two currencies, the simplicity and transparency of its transactions will reinforce its credibility. However, if the currency board is perceived to be engaged in a process of expanding or contracting the money supply for policy reasons then suspicions and expectations will undermine its credibility. This possibility can be avoided by requiring that the currency board transfer to the government any excess funds over the sum of 100% reserves, a buffer amount, and the capital value of its necessary buildings, etc. It should be noted that several countries encourage excess reserves. For example, in 1998 Argentina's board held reserve currency equal to about 140% of its base money while Estonia reached 145% (Kopcke, 1999, 23).

D. HOW SHOULD THE BOARD BE INTEGRATED INTO THE LEGAL AND COMMERCIAL SYSTEM?

Operation of a currency board does not require a high level of administrative or financial sophistication. The simplicity and transparency of the operations of a currency board not only increase the credibility of its operations to the general public but also allow it to possibly better resist the pressures of the fiscal and monetary authorities. There is relatively little "fudge" room about whether a board is carrying out its mandate. Further reducing the administrative burden is the use of the private sector to perform most of the intermediation activities with respect to the board. At the limit, the board could be established in one office in the capital and only deal with all customers on a walk-in basis. With this type of establishment, anyone interested in buying or selling foreign or domestic currency would go to private dealers. Of course, the rates offered by these private dealers would be constrained by "currency points" (similar to the "gold points" of the old international gold standard). Customers would only use the private dealers who were willing to buy and sell foreign currency at a margin less than or equal to the cost of carrying out the transaction through the currency board directly.

The most serious constraint placed on a country that adopts a currency board is the restriction on fiscal and monetary policy. With a board, governments are unable to use the printing press to supplement taxes and borrowing from the general public. Countries in Latin America that are highly dollarized tend to have high government deficits financed in part by inflationary money creation. Adoption of a currency board forces the governments to forego this source of finance. Unless the government can credibly make this sacrifice, trust in the long-term independence of the board must suffer.

One additional means of increasing the credibility of a currency board would be to have the currency board managed either jointly or solely by another country or an international agency.[3] Although this further emphasizes the loss of government control over the monetary system, it may be an effective way of restoring confidence in the long-term convertibility of the domestic currency.

VI. PROSPECT

As a result of Colombia's trade liberalization of the early 1990s, trade arbitrage has begun to undermine the ability of its central bank to simultaneously set the domestic and international values of the peso. To re-impose tariffs or quotas in order to reduce such goods arbitrage would have adverse long-term effects on the real economy. And yet without such restrictions, Colombia seems to bear all the costs of a flexible exchange rate system without being able to capture many of the benefits. One can argue that Colombia's current situation is untenable and the decision has to be made to either retreat to the trade and capital restrictions of the past or change the exchange rate regime.

The adoption of a fixed exchange rate regime, giving up the flexibility of an independent monetary policy in return for lower inflation, decreased interest margins and more rapid real growth would provide a route for escaping from the current untenable situation. While the traditional fixed exchange rate systems have generally failed, there is growing interest in achieving a fixed exchange rate through the establishment of a currency board. While is seems clear that Colombia currently

---

[3] As Walters and Hanke discuss, the existence of such international management of the currency board allowed the issue of John Maynard Keynes North Russia Caisse to continue to maintain an unchanged sterling value even as the region was completely overrun by the Bolsheviks. (1992, p. 559).

possesses the economic and financial characteristics needed for a successful currency board establishment of a currency board can be expected to be very controversial because of its implication of increased dependency on another country's monetary authority. It will require a great deal of political will and skill to deal with this controversy.

REFERENCES

Barajas, Adolfo; Roberto Steiner and Natalia Salazar (1999), "Interest Spreads in Banking in Colombia, 1974-96," *IMF Staff Papers*, Vol. 46, No. 2, June, pp. 196-224.

Bennett, Adam G. G. (1993), "The Operation of the Estonian Currency Board," *International Monetary Fund Staff Papers,* Vol. 40, No. 2, pp. 451-470.

Carrasquilla, Alberto (1999), "Recent Exchange Rates and Monetary Policy in Colombia," in Colleen M. Callahan and Frank R. Gunter (*eds.*) *Colombia: An Opening Economy?* Stamford, Connecticut: *JAI* Press, pp. 205-220.

Carrasquilla, Alberto (1995), "Exchange Rate Bands and Shifts in the Stabilization Policy Regime: Issues Suggested by the Experience of Colombia," *IMF* Working Paper; *WP*-95-42, April.

Clavijo, Sergio (1992), "Overcoming Financial Crisis During Transition from a Repressed to a Market-Based System: Colombia 1970-89," In Cohen, Alvin and Frank R. Gunter (*Eds.*) *The Colombian Economy: Issues of Trade and Development* Boulder Colorado: Westview Press, pp. 93-118.

Enoch, Charles and Anne-Marie Gulde (1998), "Are Currency Boards a Cure for All Monetary Problems?" *Finance and Development*, December, pp. 40-43.

Federal Financial Institutions Examination Council (*FFIEC*, 1999), "Country Exposure Lending Survey," Mimeo.

Friedman, Milton (1984), "Comment on McCloskey and Zecher's 'The Success of Purchasing Power Parity: Historical Evidence and Its Implications for Macroeconomics'," in Bordo, Michael and Anna Schwartz (*eds*) *A Retrospective on the Classical Gold Standard, 1821-1931*, Chicago: *NBER*, pp. 157-162.

Fullerton Jr., Thomas M. (1993), "Inflationary Trends in Colombia," *Journal of Policy Modeling*, Vol. 15, No. 4, pp. 463-468.

Giambiagi, Fabio, et al. (1994), *Socioeconomic Report: Colombia*, Inter-American Development Bank, Report No. *DES*-13.

De Gregorio, José (1994, June), *Inflation, Growth and Central Banks* Paper presented at Seminario Latinoamericano sobre Crecimiento Económico, Bogotá, Colombia.

Gunter, Frank R. (1999), "Absolute Stability and Comparative Deterioration: Has Apertura Gone Too Far or Not Far Enough?" in Colleen M. Callahan and Frank R. Gunter (*eds.*) *Colombia: An Opening Economy?* Stamford, Connecticut: *JAI* Press, pp. 343-354.

Gunter, Frank R. (1994), *The Policy Implications of Capital Flight Repatriation: A Transaction Costs Approach*, Working Paper, Inter-American Development Bank: Washington D. C.

Gunter, Frank R. (1992), "Colombian Capital Flight: 1982-1990," in Cohen, Alvin and Frank R. Gunter (Eds.) *The Colombian Economy: Issues of Trade and Development* Boulder Colorado: Westview Press, pp. 353-375.

Gunter, Frank R. and Carolyn Stumph (1998), "*PPP* in Latin America: A Cointegration Test of the Casselian Hypothesis," Mimeo.

Hallberg, Kristin and Wendy E. Takacs (1992), "Trade Reform in Colombia: 1990-1994," in Alvin Cohen and Frank R. Gunter (*eds.*) *The Colombian Economy: Issues of Trade and Development*, Boulder, Colorado: Westview Press, pp. 259-299.

Hanke, Steve and Kurt Schuler (1994), *Currency Boards for Developing Countries: A Handbook*, San Francisco: *ICS* Press.

Hanke, Steve and Kurt Schuler (1993), "Currency Boards for Latin America," in Liviatan, Nissan (*ed.*) (1993) *Proceedings of a Conference on Currency Substitution and Currency Boards* World Bank discussion Papers, No. 207, World Bank: Washington D. C., pp. 13-21.

International Monetary Fund (1999), *Colombia: Selected Issues and Statistical Appendix*, *IMF* Staff Country Report No. 99/6, Washington D. C.

International Monetary Fund (1999), *Direction of Trade Statistics*, *IMF*: Washington D. C.

Junguito Bonet, Roberto (1994), "La Independencia de la Banca Central en América Latina," Paper presented at Seminario Latinoamericano sobre Crecimiento Económico, Bogotá, Colombia.

Kopcke, Richard W. (1999), "Currency Boards: Once and Future Monetary Regimes?" *New England Economic Review*, May/June, pp. 21-37.

Krugman, Paul (1993), "What Do We Need to Know about the International Monetary System?" *Essays in International Finance*, No. 190, Princeton: International Finance Section.

Liviatan, Nissan (*ed.*) (1993), *Proceedings of a Conference on Currency Substitution and Currency Boards,* World Bank Discussion Papers, No. 207, World Bank: Washington D. C.

Ocampo, José Antonio (1999), "The Economic and social Strategy of the Samper Administration, 1994-1998," in Colleen M. Callahan and Frank R. Gunter (*eds.*) *Colombia: An Opening Economy?* Stamford, Connecticut: *JAI* Press, pp. 31-48.

Osband, Kent and Delano Villanueva (1993), "Independent Currency Authorities," *International Monetary Fund Staff Papers*, Vol. 40, No. 1, pp. 202-216.

Rennhack, Robert and Guillermo Mondino (1988), "Capital Mobility and Monetary Policy in Colombia," *IMF* Working Paper; *WP*-88-77, August.

Uribe E., José Darío (1994), "Inflación y Crecimiento Económico en Colombia: 1951-1992," Paper presented at Seminario Latinoamericano sobre Crecimiento Económico, Bogotá, Colombia.

Walters, Alan and Steve Hanke (1992), "Currency Boards," *New Palgrave Dictionary of Money and Finance* The Stockton Press: New York, pp. 558-561.