INTRODUCTION

The term "balance of payments" may be defined in a number of ways. In the narrowest definition, the term refers to changes in the international reserve position of a central bank. When a central bank follows a policy of fixing the exchange rate between its currency and a reserve currency, it does so by offering an infinitely elastic supply of the reserve currency in exchange for the domestic currency at a price equal to the established par value. When domestic currency is exchanged for the foreign currency, the central bank is said to be running a balance of payments deficit. The main issues relating to the process of balance of payments adjustment, under this definition, are concerned with the factors that induce a balance of payments deficit and the adjustment mechanism through which a balance of payments deficit restores equilibrium in the local financial markets. Throughout most of this paper, the narrow definition of the balance of payments will be taken to be the appropriate one.

At the other end of the spectrum, a wide definition would refer to the balance of payments as the change in the net foreign assets of the economy as a whole. From the national accounts, this definition may be equivalently interpreted as the current account balance or as the difference between national income and expenditure. The economics of the determination of the current account balance are quite different from the economics of the determination of the narrow definition of the balance of payments. The two are not, however, completely unrelated because the financial policies of the central bank may influence the income and expenditure decisions of the public and private sectors. Although the determinants of the current account balance will not be addressed in the paper, some thoughts on the relationship between recent current account difficulties and the central bank policy of fixed exchange rates are presented in the last section.

The plan of the paper is as follows. In the first section, certain institutional and accounting features of a fixed exchange rate regime are discussed.
Although the topic appears elementary, one intention is to demonstrate that many contemporary balance of payments problems can be traced to the institutional and accounting structure of the system. To illustrate this point, the conventional system is compared with an alternative system in the fourth section of the paper. The adjustment dynamics of the two systems is compared, and some macroeconomic implications described.

In the second section, the traditional “monetary” approach to the balance of payments is restated in a way that recognizes some of the features of the current international monetary system. In contrast to the expositions of this approach that were common in the 1960s, the approach is more concerned with the effects of financial instability in the reserve currency country than with the balance of payments implications of domestic policy. These issues are further discussed in the third section, where a modern “asset market” approach to the balance of payments is adopted. This approach, which is based upon the model developed in Dornbusch (1976), considers the transmission of financial disturbances in a world in which financial markets are integrated but in which commodity markets are segmented.

In the fourth section, the discussion centers on how to fix the exchange rate and what to fix it to. Given the extreme volatility in both exchange rates and interest rates during the past few years, the standard approach of fixing to the U.S. dollar may not be appropriate. The natural alternative of fixing to a basket of currencies—and the procedures for doing so—is considered; then some alternative strategies are examined. In each case, the choice of the reserve asset is linked to the procedures by which the choice is implemented. In every type of fixed exchange rate regime, it is necessary to follow certain rules if the system is to be successful. The purpose of an economic analysis is to describe the constraints and the implications of the fixed exchange rate system.

In the final section, the process of adjustment to economy-wide balance of payments difficulties is addressed. Each of the preceding systems describing central bank operations influences this process of adjustment, and each has associated costs and benefits for the economy as a whole. The paper contains no magic cure for the problems that have arisen in the past year in many countries whose exchange rates have been tied to the dollar, but it is hoped that some suggestions can be made which will limit similar problems in the future.

1. INSTITUTIONAL AND ACCOUNTING FEATURES

In its institutional and accounting structure, a central bank operating under a fixed exchange rate regime is very similar to an ordinary commercial bank. The commercial bank’s liabilities consist of its stock of deposits, and its
assets consist of its holdings of debt and liquid reserve assets. The balance sheet of a commercial bank, in its simplest form, is as follows.

<table>
<thead>
<tr>
<th>Assets</th>
<th>Liabilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reserves</td>
<td>Deposits</td>
</tr>
<tr>
<td>Debt</td>
<td></td>
</tr>
</tbody>
</table>

The operational rules of commercial banks and central banks under fixed exchange rates are also similar. Under the simplifying assumption that all of the deposits are sight deposits, the commercial bank is obligated to exchange deposits for reserves on demand. The bank meets this obligation by holding a sufficient quantity of reserves to meet the flow of deposits and withdrawals, and by holding a sufficient base of assets to guarantee its pledge. In the central bank case, the reserves are reserves denominated in the reserve currency, the deposits are the monetary base, and the debt represents central bank holdings of government securities and (sometimes) private debt. The central bank is obligated to exchange the reserve currency for the monetary base at the established par value. To meet its commitments, the central bank must also hold a sufficient quantity of liquid reserves and must also preserve the capital value of its assets.

Under normal conditions, both commercial banking and central banking are profitable and socially productive activities. The profitability arises because the debt typically bears an interest rate that exceeds the interest rates paid on the liabilities. The social productivity arises because the depositor, or money holder, is not forced to hold the deposit so that, by revealed preference, the liquidity of the deposit exceeds the interest forgone on directly holding debt.

The concept of forgoing interest in exchange for liquidity is a fundamental consequence of this type of banking system, and it has influenced the way in which economists have developed their theories and empirical tests of the demand for money. The basic idea is that of a trade-off between the demand for liquidity, as represented by income or the volume of transactions, and the opportunity cost of money, as represented by interest forgone. In both the commercial bank and central bank cases, the equilibrium is reached by an adjustment in the quantity of liquid assets issued.

This concept has led to specifications of the demand for money which are purely determined by the demand for liquidity. The standard specification states that the real value of a currency depends upon real income or wealth and the nominal rate of interest. Within this specification, the real value of the assets backing the money has no influence on its real value. The reason for this result is that the bank is assumed to have enough capital to ensure that variations in the real value of the portfolio are absorbed by owner’s equity rather than by the depositors. There has been, however, a recent resurgence of interest in giving value to money through its asset backing, rather than through its usefulness as a medium of exchange. The discussions of a return
to the gold standard, or of the adoption of other commodity-based moneys, are examples of this trend.

These are important questions in the discussion of a fixed exchange rate system because this system is a method for giving a value backing to a currency. In this regard, it is important to distinguish between two problems that the system faces: liquidity and bankruptcy. Until recently, most discussions of both domestic and international banking have been concerned with the liquidity problem; that is, the assets of the bank are sufficient to cover the liabilities but the immediate reserve assets are insufficient to cover the demand for them. In order to ensure liquidity, governments typically require that banks hold a certain proportion of their assets in reserve assets and, internationally, the ratio of international reserves to domestic credit is considered an important indicator of the ability of a central bank to defend its parity. The problem of bankruptcy, on the other hand, arises when the value of the debt, expressed in terms of the reserve asset, falls below the level required to maintain the commitment to the par value. In a fixed exchange rate system, bankruptcy may arise either because of increases in interest rates on the reserve asset or because fears of depreciation cause local debt to sell at a discount related to reserve asset denominated debt. Both factors have been important in recent cases of balance of payments difficulties.

Of the two problems, the bankruptcy problem is certainly the most serious. If a bank has sufficient assets to cover its deposits, it should not have difficulty borrowing funds to cover its liquidity requirements. On the other hand, if the value of assets falls below the value of liabilities, then depositors will have an incentive to withdraw their deposit while its value is still guaranteed. This situation leads to a run on the bank culminating in a depreciation of the value of the deposit. Seen in this light, the role of a depreciation is to restore the balance between the value of assets and the value of liabilities in the bank portfolio. The bankruptcy problem also illustrates the inherent instability of the system when the value of the bank’s equity approaches zero. Even though deposit insurance has helped to mitigate this instability for commercial banks, it nonetheless still remains a major concern on the national level because the government itself may not have sufficient assets to cover losses on the central bank portfolio.

The obvious solution to the bankruptcy problem is to have sufficient equity so that any conceivable swing in the market value of the portfolio can be covered. In the case of the private bank, bankers would require a large spread between loan rates and deposit rates in order to bear this risk. From a national point of view, the nation’s taxpayers would, in effect, be pledging their taxes to the support of the value of the money supply. In both cases, there would be a tendency to trade off the security of the equity base for a smaller commitment cost. Many small countries have such obvious alternative needs.
for capital that the support of a fixed exchange rate regime cannot be given the highest priority in the budget.

There are alternatives to the established institutional and accounting structures of present day banking systems, and these alternatives will be discussed in the fourth section of the paper. Before moving on to these topics, however, we shall first explore the adjustment dynamics of the conventional fixed exchange rate system. This shall first be done within the context of the traditional monetary model of the balance of payments and then within the more recent asset market approach.

2. MONETARY APPROACH TO THE BALANCE OF PAYMENTS

The monetary approach to the balance of payments¹ offered a simple and empirically appealing model of the determinants of the stock of foreign assets held by a central bank under a fixed exchange rate regime. By the end of the 1960s, this approach had become a standard model that was widely accepted within both the academic and policy communities. Its successor, the monetary approach to the exchange rate,² has recently been subject to widespread criticism for its failure to predict the evolution of exchange rates and interest rates during the current episode with floating exchange rates. It is therefore interesting to look at the monetary theory of the 1960s from the perspective of the 1980s. Two questions are of primary interest. First, why did the theory gain wide acceptance in the 1960s when our experience in the 1970s illustrated its serious deficiencies. Second, what are the implications of the new “asset market” theories (Dornbusch (1976)) of the exchange rate for balance of payments analysis.

The specific model that I will consider is contained in the following equations.

\[
\begin{align*}
    m &= k + p + y - \epsilon i \\
    m &= \theta r + (1-\theta) d \\
    p &= p^* \\
    i &= i^* \\
    m^* &= k^* + p^* + y^* - \epsilon i^*
\end{align*}
\]

All variables, except interest rates, are expressed in logarithms. The notation is as follows:

- \( m \) = the monetary base
- \( k \) = a shift factor in the demand-for-money function

¹See Frenkel and Johnson (1976).
²See Frenkel and Johnson (1978).
Equation (1) represents the Cagan semi-elastic form of the demand-for-money function. The income elasticity of the demand for money has been set equal to unity, and the interest rate semi-elasticity has been assumed to be the same in both countries, but these assumptions will be of little consequence in what follows. Equation (2) is a log-linear expression for the central bank balance sheet identity. Equation (3) represents the purchasing power parity condition, with the log of the exchange rate normalized to zero. Finally, equation (4) represents the interest rate parity condition. Normally, this equation would also include a term representing the expected change in the exchange rate, but this term is unnecessary if we restrict our attention to a system with a rigidly fixed exchange rate and no political risk premium.

The virtue of the monetary approach is its straightforward solution for the international reserves held by the central bank. For the particular model given above, this solution is given in equation (6).

\[ \theta r = m^* + (k-k^*) + (y-y^*) - (1-\theta) d \]  

In this equation, there is only one variable, the stock of domestic debt held by the central bank, that is directly under the control of the local government. Within the terms of the model, the domestic monetary authority can only influence the composition of the base; it cannot influence its total quantity. Consider, for example, an expansionary domestic credit policy whereby the central bank purchases domestic debt in exchange for currency. If the economy were closed, this action would put upward pressure on prices and downward pressure on interest rates. However, given the openness of the economy, as expressed in the purchasing power and interest rate parity conditions, the policy would give rise to current account and capital account deficits that would lead to a loss of international reserves. This process would continue until the loss in reserves was exactly equal to the initial expansion in the holdings of domestic debt.

For a given stock of domestic debt, the main influences on the stock of reserves are the reserve currency money supply and the factors influencing the demand for the domestic currency relative to the reserve currency. A contraction in the world money supply would lead to downward pressure on
prices, and upward pressure on interest rates, in the reserve currency country. These developments would tend to decrease the demand for local exports, increase the local demand for imports, and lead to a capital flow toward the reserve currency country. Hence reserves would decrease, leading to a decrease in the local money supply which would continue until the monetary contraction in the center had been fully transmitted to the local economy.

The main criticism of the monetary approach has been directed toward its assumption of complete price flexibility and integrated world commodity markets. The issues relating to the failure of these conditions in the “real world” will be taken up in the next section. Even on its own terms, however, the model neglects some important aspects relating to the process of balance of payments adjustment.

The first point that we will consider are the issues relating to the demand for international reserve assets. In the monetary approach literature, it is standard practice to treat the stock of domestic debt as an exogenous policy instrument. However, the discussion of the liquidity problem in the previous section demonstrated that a properly functioning fixed exchange rate system requires that domestic credit policy be directed toward the maintenance of sufficient international liquidity. Furthermore, studies of the demand for international reserves demonstrate that countries do have a well-specified demand in international reserve assets and that deviations of actual reserves from the desired level predicted by the demand function do trigger an adjustment in actual reserves.³

It is consequently inaccurate to view domestic credit as an exogenous policy instrument. The rules of a fixed exchange rate system imply the following dynamic adjustment process. As suggested by the monetary approach, the central bank offers an infinitely elastic supply of international reserve assets to the market in order to maintain the par value. Hence the stock of reserves in the short run is determined by the demand for money and world monetary conditions. However, central banks use their domestic credit policies to ensure an adequate long-run level of international reserve assets. Thus, in the long-run the stock of reserves is determined by the central bank’s demand for international liquidity.

Assume, for example, that the central bank’s policy is to maintain a target ratio of international reserves to the monetary base.

\[ H = \frac{R}{R + D} \]  

(7)

In this equation, \( R \) represents the level of reserves, \( D \) the level of domestic

³See Bilson and Frenkel (1979).
debt held, and $H$ is the target liquidity ratio. In log-linear form, this relationship may be expressed as

$$r = h + d$$

(8)

where $h = \log(H/(1-H))$. Since the central bank does not directly control the stock of reserves in the short run, equation (8) will not tend to hold exactly at each point in time. Instead, one could envisage the central bank adjusting domestic credit in order to maintain the target ratio in the long run. One plausible rule is represented in equation (9).

$$Dd = \phi (r - h - d)$$

(9)

Equation (9) assumes that the rate of growth of the domestic credit component of the base, $Dd$, is proportional to the difference between actual and desired stocks of international reserve assets. If a transitory shock causes a loss of reserves, the bank will undertake a contractionary domestic monetary policy to regain the lost reserves.

The dynamics of this system are illustrated in Chart 1. The $MM$ locus represents the combinations of domestic credit and international reserves that are consistent with equilibrium in the money market. The $Dd$ locus represents the reaction function of the central bank. The noticeable feature of the diagram is that the stock of reserves tends to “overshoot” its equilibrium value in response to a money market disturbance. In the long run, an increase in the demand for money will have a roughly proportional effect on both domestic credit and international reserves. The long-run reserve adjustment equation is consequently not equation (6) but equation (10).

$$r = m^* + (k - k^*) + (y - y^*) + (1 - \theta)h$$

(10)

In this formulation, the stock of reserves is proportional to the reserve currency monetary base in the long run. Increases in the demand for the domestic currency relative to the reserve currency will increase the factor of proportionality, as will the central bank’s desired liquidity ratio.

Another problem with the monetary approach is its failure to consider the capital gains and losses that occur when interest rates change. These capital transfers were not very important in the 1960s, when interest rates were relatively low and stable, but they have come to be of paramount importance in more recent analyses of balance of payments difficulties. A number of cases can be enumerated. With long-term fixed rate debt, an increase in the interest rate lowers the present discounted value of the interest and capital payments and transfers a real capital gain from the borrower to the lender. With floating rate debt, higher nominal interest rates—due to correctly
Chart 1. Dynamic Adjustment to a World Monetary Expansion

An expansion in the world money supply shifts the domestic money market equilibrium locus from $MM$ to $M'M'$. Initially, central bank holdings of international reserve assets expand from $R_0$ to $R_1$. To regain portfolio balance, the central bank expands the money supply by purchasing domestic credit instruments, and its holdings of international reserves decline from $R_1$ to $R_2$.

perceived changes in the rate of inflation—have no real economic consequences as the increase in interest payments is offset by a decline in the real value of the debt. In this case, the higher interest payments may be considered as a prepayment of the debt. Finally, higher real interest rates on floating rate debt transfers a capital gain from the borrower to the lender.

Within the traditional monetary approach, the only role for interest rates was to influence the demand for money, but now, with many countries having large amounts of floating rate debt, the macroeconomic consequences of higher world interest rates are mainly felt in the form of higher debt service payments. Within the framework of the monetary approach, the debt issue is best handled by relating the level of real income in the home country to the interest rate. Higher interest rates depress real income both by increasing debt service payments and by the business cycle effects. If the local economy business cycle is more sensitive to interest rates than the reserve currency country business cycle, then increases in interest rates could induce a far larger balance of payments deficit than would be suggested by
the money demand effect taken in isolation. Indeed, since the high interest rates should influence the demand for money in both countries, the money demand effect should not be of particular importance.

When the reserve currency money supply is reduced and the country is a net debtor with floating rate debt, private and public sector income declines because of the increase in interest rates. The decline in income will create an excess supply of money and a balance of payments deficit. Because of the fact that money is a liquid asset, it is likely that the initial reduction in money balances will exceed the long-run reduction. This fact, in combination with the overshooting dynamics arising out of the central bank’s portfolio management strategy, will lead to a sharp short-run fall in international reserves.

This deficit may be complicated by capital losses on the central bank portfolio. If the domestic credit component of the monetary base comprises fixed rate government obligations, higher interest rates would lower the market value of these obligations and this fact could hinder central bank efforts to sterilize the reserve outflow. To maintain the long-run viability of the fixed rate system, the central bank should sell its domestic debt in order to absorb the reduction in the demand for money. In doing so, however, it will realize a capital loss on the transactions and hence lower the asset backing of the monetary base.

This process, then, has a potential for a vicious circle leading to a breakdown in the fixed exchange rate system. When interest rates rise, the central bank realizes a loss on its holdings of domestic debt instruments. This loss could reduce confidence in the ability of the central bank to maintain the parity and create a further drain on reserves and a further increase in interest rates. In fact, the fixed exchange rate system is inherently unstable whenever the dollar value of the assets backing the monetary base falls short of the dollar value of the base. In this case, it is either necessary to devalue the currency, so that the dollar value of assets and liabilities are brought back into line, or to obtain additional assets from the government.

The instability of a fixed rate system was not a serious problem when reserve currency interest rates were stable. However, the recent volatility of U.S. interest rates, in conjunction with unstable exchange rates between the major reserve currencies, has given this problem a central place in the analysis of fixed exchange rate systems. It is a problem that we shall return to in Section 4.

3. ASSET MARKET APPROACH TO THE BALANCE OF PAYMENTS

Seen from a recent perspective, the most obvious weakness of the monetary approach to the balance of payments lies in its reliance on the
assumption of purchasing power parity. Indeed, it is difficult to understand how this assumption survived in the 1960s when the experience of the 1970s provided so much contrary evidence. However, the facts of the matter are that inflation rates were very similar in the 1960s. In addition, the relatively low and stable rates of inflation were associated with equally low and stable interest rates. Was the experience of the 1960s an accident, or can this performance be attributed to the system of fixed exchange rates?

In this section of the paper, this question will be answered through a reliance on an unusual source, Professor Dornbusch’s model of exchange rate dynamics (Dornbusch (1976)). The source is unusual because one of the purposes of Dornbusch’s model was to demonstrate that a flexible exchange rate system induces volatility in real exchange rates through the differential speed of adjustment between asset markets and commodity markets. We shall see, however, that the differential speed of adjustment, while a source of volatility in a flexible exchange rate system, is consonant with the maintenance of purchasing power parity in a fixed rate system. It is consequently possible to develop a standard model that is consistent with both exchange rate systems.

A fixed rate model based on Dornbusch’s model is specified in the following equations.

\[
\begin{align*}
  m &= k + p + y - \epsilon i \\
  m &= \theta r + (1 - \theta) d \\
  Dp &= \phi(m - k - p - y) + \Delta(p^* - p) \\
  Dp^* &= \phi(m^* - k^* - p^* - y^*) \\
  i &= i^*
\end{align*}
\]

The notation is the same as in Section 2. The main difference between this model and the monetary approach is that inflation is specified as a partial adjustment mechanism. In the local economy, the inflation rate responds to both the domestic monetary conditions and to the deviation from purchasing power parity. In the reserve currency country, the inflation rate purely responds to domestic monetary conditions. Although an expansion of the money supply does not have any immediate impact on prices, it does lead to a fall in interest rates which leads to an expansion in aggregate demand, a reduction in inventories, and an increase in the rate of inflation. This model of inflation, with its emphasis on adjustment to domestic monetary conditions, is quite different from the open economy, flexible price, model used in the traditional monetary approach. In fact, the only concession to the open economy in this model is the retention of the interest rate parity condition. As we shall see, this single element is enough to give the model a strong monetary flavor.

Although the inflation rate is determined by a partial adjustment
mechanism, this is not a disequilibrium model. In the large country, the interest rate adjusts to clear the money market in the short run. Since the interest rate in the local economy is fixed to the world interest rate through the interest rate parity condition, the local money supply must adjust, through induced changes in central bank holdings of foreign assets, to maintain equilibrium in the local financial market. In all of this analysis, it should be emphasized that we are considering the consequences of an unanticipated change in domestic or foreign monetary policy. Consequently, the previous level of expected inflation is netted out of the model. It would be possible to incorporate rational expectations of future inflation resulting from the shock, but this would not really change any of the conclusions to be drawn from the model and so this complication is dropped from the model.

The short-run dynamics of this model are best illustrated by an example. Suppose that the reserve currency country undertakes a contractionary monetary policy. In order to clear the money market, the nominal rate of interest must increase. (To the extent that the policy lowers inflationary expectations, real interest rates will increase by more than the nominal rate increase.) In the absence of capital flows, local interest rates would then be below the interest rates on the reserve currency, and local currency would be exchanged for the reserve currency in order to obtain a higher yield. This balance of payments deficit would decrease the local money supply until local interest rates are once again equal to world interest rates. During the subsequent period of adjustment, the inflation rates in both countries would become negative and interest rates would gradually return to their long-run level as real liquidity is restored.

This description of the adjustment process is certainly more consistent with the informal evidence relating to the expansionary policy of the United States in the late 1960s and to the contractionary policies of the early 1980s. Within the monetary approach, a contractionary monetary policy is assumed to immediately lead to a decline in commodity prices, thereby leading to a fall in world commodity prices through the purchasing power parity arbitrage arguments and to a balance of payments deficit as the lower prices decrease the demand for money. At best, the model posits that the inflation rate and the rate of growth in the money supply will be contemporaneously correlated under a fixed exchange rate regime, whereas evidence suggests that the expansion in the money supply tends to lead the increase in the inflation rate.

Despite these important differences between the two models, it would be impossible for standard tests of the monetary approach to distinguish between the two models. For example, if the model presented above is solved for the reserve flow equation, the solution will be found to be that given in equation (16).

\[ \theta r = m^* + (k - k^*) + (p - p^*) + (y - y^*) - (1 - \theta) d \]

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This formulation differs from the earlier one only in the presence of the relative price term. However, successive substitutions into the price adjustment equations lead to the following relationship between the two inflation rates.

\[ Dp = Dp^* + \Delta(p^* - p) \]  

(17)

In words, if the economies start from a position in which purchasing power parity holds, there is nothing within the model that will induce a divergence from purchasing power parity. Although this result relies on the assumption that the adjustment velocities are the same, the general point that fixed exchange rate regimes lead to correlated inflation rates independently of the degree of commodity arbitrage will continue to hold. In essence, the fixed exchange rate correlates the monetary policies of the two countries through the interest rate parity condition, and it is the coordinated monetary policies that lead to the coordinated inflation rates.

In retrospect, it is possible to devise tests that distinguish between the monetary approach and the asset market approach. Although the reserve flow equation, the purchasing power parity condition, and the interest rate parity condition are common to the two models, the monetary approach implies a contemporaneous correlation between inflation and monetary expansion, while the asset market approach suggests that unanticipated changes in the money supply will tend to lead unanticipated changes in the inflation rate. The Granger-Sims causality analysis is consequently a natural starting point for a comparative testing of the two models.

Another method would be to analyse the response of an economy to a devaluation of its currency. Within the assumptions of the monetary approach, a devaluation would cause an instantaneous increase in domestic prices, leading to an increase in the nominal demand for money, and hence leading to a balance of payments surplus. Within the asset market approach, a devaluation has no immediate effect. Over time, however, the prices will increase because of increases in the price of imported intermediate and final goods and because of increased world demand for local exports. As prices increase, the demand for money will increase and there will be a tendency for local interest rates to increase. This tendency will result in an inflow of funds, a balance of payments surplus, and an increase in the money supply.

In the same way that the monetary approach may be criticized for its reliance on purchasing power parity, the asset market approach may be inappropriate because of its excessive reliance on the interest rate parity condition. Nominal interest rates may not be held equal to world interest rates for a number of reasons. First, the probability of a devaluation may be positive so that expectations of the probable change in the exchange rate should be factored into the interest rate differential. Within an extended
model of this type, dynamic instability is a real possibility if the probability of a devaluation is related to the level of reserves held by the central bank. Consider, for example, a decrease in the demand for money that leads to a balance of payments deficit. The deficit lowers confidence in the currency, and the expectations of a depreciation cause the local interest rate to rise above the world interest rate. The increase in interest rates decreases the demand for money and lowers the local currency value of fixed rate long-term government debt held by the central bank. We consequently have an additional balance of payments deficit and a reduction in the bank's ability to defend the parity. This leads to a further increase in interest rates and so on.

The other case in which the interest parity condition is invalid is when capital controls effectively prevent the arbitrage from taking place for small differences in nominal interest rates. In this case, there is effectively a combination of two models. For modest interest rate differentials, the local interest rate adjusts to clear the domestic money market and the money supply is an exogenous policy instrument because the government effectively controls access to the central bank's holdings of international reserves. However, if the interest rate diverges by too great a magnitude from the world rate, then the economic incentives to avoid the controls on capital flows become large and further attempts to control the flow of capital become ineffective. The system consequently resembles a closed economy that is interrupted, on occasion, by immersion in the cold waters of international arbitrage. The instability of this system is assured unless the government remains aware of the international constraints on its actions. Capital controls may be a solution to the importation of very short-run financial instability from the rest of the world, but in the long run they are unlikely to be productive.

4. CHOICE OF A PARITY

In the preceding section, we have assumed the existence of a fixed exchange rate system and have analysed the process of adjustment under that system. The fixed exchange rate system is basically a combination of two policies: first, the choice of a reserve currency, and second, the policies adopted to maintain the par value. For most of the past century, the choice of a reserve currency was not a particularly important decision as all of the prospective currencies were themselves tied through a fixed exchange rate system; however, at the present time, when the exchange rates between the major currencies do vary over a wide range, the choice of a reserve currency is an important and difficult decision. As far as the policies required to maintain the par value are concerned, relatively little has been said on the topic. The model adopted in Section 2, in which the central bank adjusted domestic credit to achieve a target ratio of international reserves to the
monetary base, appears to be the standard prescription. There are, however, alternatives to this approach and some of these alternatives may reduce the economic costs of the fixed exchange rate system.

In the discussion of the viability of a fixed exchange rate system, a great deal of emphasis has been placed on the reserve currency value of the assets backing the monetary base. There are, in fact, two views of the determinants of the value of a currency. Within the traditional monetary theory, money attains its real value because of its productivity as a medium of exchange. Within this approach, the real value of a unit of currency is increased by reducing the supply of the currency available. At the other end of the scale, there are those who argue that the value of a currency is determined by fixing its price in terms of some other asset, typically gold or foreign currency. In emphasizing the value of the assets backing the monetary base, the point is being made that a commitment to fix a par value is of doubtful value if the central bank does not have the financial resources to back the commitment. While maintaining a constant ratio of international reserves to the monetary base may help to preserve international liquidity, it does not solve the fundamental problem of capital losses on the domestic debt component of the base.

There is, of course, a great deal that can be done to limit these capital losses. Because of the recent volatility of interest rates, many financial managers have had to resort to hedging interest earnings and interest expense in forward and futures markets. To the extent that the central bank holds assets denominated in nonreserve currency currencies, hedging of the associated foreign exchange exposure may also be called for. It is indeed unfortunate that countries with a great deal of exposure to U.S. interest rate movements because of floating rate debt have not engaged in this type of hedging, nor have they encouraged private borrowers to do so. It is certainly true that much of the disruption caused by recent developments in international financial markets could have been avoided had financial hedging strategies been adopted.

There has, however, been another response to recent financial uncertainty, which is even more relevant to central bank financial policy. This development relates to the growth of money market funds as an alternative to traditional banking institutions. Money market funds differ from banks in their operating procedures: Whereas a bank promises to exchange dollars for deposits at a fixed exchange rate of unity, money market funds adjust the number of shares so that the dollar value of the shares is always equal to the dollar value of the portfolio. Most money market funds only hold short-term paper so that capital gains and losses are small, but the interest paid on money market funds varies with the rate of interest.

With money market funds, the general practice has been to adjust the number of shares owned by the depositor rather than to adjust the dollar value
of a fixed number of shares. This is a reasonable practice since the money market fund retains complete control over the ownership of the shares in the fund. It would, for example, be more difficult to adopt this procedure if money market fund shares were bearer certificates whose ownership could be transferred without the knowledge of the fund management. In the case of bearer certificates, a procedure through which the price of the share is adjusted to reflect changes in the value of the portfolio would be preferable to the standard procedure. Currencies are, of course, the most widely used form of bearer certificate; equities and bearer bonds are other examples.

The procedure for fixing the exchange rate in the money market fund model is simplicity itself. At each point in time, the exchange rate is set such that the dollar value of the assets in the fund is equal to the dollar value of the shares issued. In symbols, we have

\[ S(L/$) V($) = M(L) \]  

(18)

or

\[ S(L/$) = M(L)/V($) \]  

(19)

where \( S(L/$) \) is the exchange rate, expressed as the number of units of local currency, \( (L) \), required to purchase one dollar, \( ($) \), \( V($) \) is the dollar value of the portfolio, and \( M(L) \) is the number of shares issued. The exchange rate is set at this level by the commitment of the fund to exchange shares for dollars at the current market price.

This model has a number of important implications for the economy. First, assume that the portfolio pays an instantaneous dollar rate of interest, \( i^* \). For a given number of shares, the evolution of the exchange rate over time is described by equation (20).

\[ S(t) = M/(V \exp(i^* t)) \]  

(20)

The rate of change in the exchange rate is consequently

\[ Ds = - i^* \]  

(21)

where \( Ds \) represents the rate of change in the exchange rate and \( i^* \) is the short-term interest rate on dollar-denominated assets. In words, the local currency will appreciate against the dollar at the rate of interest. This appreciation is feasible because it results from the increase in the dollar value of the assets held by the fund.

An immediate consequence of equation (21) is the result that interest rate parity will cause local interest rates to be zero. The uncovered interest rate parity condition may be expressed as

\[ i = i^* + Ds \]  

(22)
where \( i \) is the interest rate on assets denominated in local currency. Substituting equation (21) into this condition leads to the result that the local currency nominal interest rate is zero. It should be stressed that this is purely an arbitrage argument. Assume, for example, that the local interest rate was not zero. Then an investor who currently holds dollar-denominated assets could transfer these assets into local currency. Since all of the dollar interest is paid through the appreciation of the local currency, and since the local currency also pays interest, the investor would be unambiguously better off. It is reasonable to suppose that enough investors would be willing to take advantage of this opportunity to drive the local interest rate to zero.

Another characteristic of the model is that the money supply is infinitely elastic at the established exchange rate. An expansion of the money supply would not cause a depreciation because both the assets and the liabilities would rise in the same proportion. The rapid rise, and subsequent decline, in the assets of U.S. money market funds would not have any effect on the dollar value of the remaining shares. The only determinant of the exchange rate in this model is the dollar value of the assets backing each unit of currency issued.

The money market fund model also offers stable world commodity prices, when expressed in local currency, if interest rates are forecasts of inflation rates. The local currency price of world-traded goods may be expressed as

\[
S(t)P^*(t) = S \exp(-i\ t) P^* \exp(i - r) t
\]  

(23)

where \( r \) now represents the real rate of interest. This expression may be simplified to equation (24).

\[
S(t)P^*(t) = S P^* \exp (-r \ t)
\]  

(24)

In other words, the local currency price of tradables will decline at the real rate of interest. This is, of course, the condition required by Milton Friedman for the optimum quantity of money. There is, however, an important difference between the mechanism for reaching this optimum. Friedman argues that the central bank should achieve the optimum by setting a certain target growth rate for the money supply. If the demand for money was stable, this money growth rate would eventually result in the optimum being reached. In contrast, the money market fund model achieves the optimum as an arbitrage condition, and it does not require any assumptions concerning the stability of the demand for money or a prolonged contraction in the monetary base. In fact, it is likely that the base would expand rapidly when the money market fund model was adopted.

The model implies that the long-run rate of inflation will be equal to the negative of the real rate of interest. Since negative inflation may not be
desirable on macroeconomic grounds, it would be possible to modify the
model by including a tax on the monetary base equal to the real rate of
interest. This modification would provide some government revenue from the
creation of money, and it would also lead to longer-run price stability.
Higher taxation rates would, of course, lead to higher steady state inflation
rates.

The stability of the rate of inflation obviously depends upon the stability of
the real interest rate. When real interest rates are high, the appreciation of the
local currency will exceed the rate of increase in world prices, so that the
prices of goods traded in local currency will fall. This characteristic of the
model should correctly be of concern to exporters, who would find the world
price of their goods, calculated as the product of a fixed local currency price
and an appreciating exchange rate, rising when high real interest rates are
depressing world demand. However, it is also important to note that the price
of imported traded goods, many of which are intermediate inputs, would also
be falling and this would tend to increase aggregate supply. In the modern
world, it is not at all clear that currency depreciation helps to maintain
employment since the consequent increase in the local currency price of
imported inputs tends to depress aggregate supply.

It may, however, still be the case that a system that ties the appreciation of
the currency to the reserve currency interest rate results in an unacceptable
level of exchange rate instability. There is nothing within the money market
fund model that restricts the assets to be either local or reserve currency debt,
and there may be good reasons, both from the viewpoint of financial
management and economic policy, for holding a more diversified portfolio.
In the remaining part of this section, two such alternative standards will be
considered, a multicurrency asset fund and a fund comprised in part of
domestic equities.

Let us first consider the multicurrency fund. In this case, the dollar value
of the assets can be expressed as

\[ V(\$) = V_0 + S_1 V_1 + S_2 V_2 + \ldots + S_n V_n \]  

(25)

where \( S_n \) is the dollar price of the \( n \)'th currency and \( V_n \) is the \( n \)'th currency
value of the assets denominated in that currency. The evolution over time for
each currency can be described as

\[ S_n(t) V_n(t) = S_n(0) \exp(Ds_n t) V_n(0) \exp(i_n t) \]  

(26)

where \( Ds_n \) represents the ex post rate of change in the \( n \)'th currency exchange
rate relative to the dollar, and \( i_n \) represents the interest rate on \( n \)'th currency
assets. \( V_0 \) represents the value of dollar-denominated assets in the portfolio.

If uncovered interest rate parity held, there would be little advantage to be
gained from multicurrency diversification. The evidence suggests, however,
that uncovered interest rate differentials have been very large during the
current floating rate period. If the other ex post yields are below the yield on
U.S. dollar-denominated assets, it is because the exchange rates on the other
currencies have depreciated by an amount that exceeds the interest rate
differential. It may be reasonable to suppose that if the major currencies have
depreciated against the dollar, then it is probably correct for small currencies
to also depreciate against the dollar. This, then, is the major argument for
diversification of a central bank portfolio.

The effects of this diversification can be substantial. Consider, for
example, when U.S. interest rates reached their peak in September 1981.
The ex post yields on the major currencies for one-year money market
certificates from September 1981 to September 1982 were as follows.

<table>
<thead>
<tr>
<th>Currency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>U.S. dollar</td>
<td>17.58</td>
</tr>
<tr>
<td>Canadian dollar</td>
<td>17.75</td>
</tr>
<tr>
<td>Japanese yen</td>
<td>-7.18</td>
</tr>
<tr>
<td>French franc</td>
<td>-7.04</td>
</tr>
<tr>
<td>Deutsche mark</td>
<td>4.33</td>
</tr>
<tr>
<td>Swiss franc</td>
<td>-1.19</td>
</tr>
<tr>
<td>British pound</td>
<td>-0.31</td>
</tr>
<tr>
<td>Average</td>
<td>3.42</td>
</tr>
<tr>
<td>Standard Deviation</td>
<td>10.51</td>
</tr>
</tbody>
</table>

The lesson to be drawn from these results is that while a fund consisting
solely of U.S. instruments would have appreciated in value by 17.58 percent
over this period, a fund with an equally weighted portfolio of these
currencies would actually have only appreciated by 3.42 percent. The
difference constitutes a foreign exchange translation loss on the holdings of
foreign currency denominated instruments.

It is important to note that domestic interest rates would still be zero with
multicurrency portfolios. This result again follows from an arbitrage
argument. An investor could hedge the foreign exchange risk of the fund
portfolio by selling the foreign exchange in the forward market. The cost of
this hedging would, from the covered interest parity condition, be equal to
the interest rate differential. Hence the covered return on the portfolio, ex
ante, would remain equal to the interest rate on the reserve currency.

The purpose of a multicurrency portfolio is, then, to create unanticipated
movements in the exchange rate that would act as a stabilizing force in the
economy. Although it is difficult to specify the characteristics of this
portfolio without delving into special cases, the general idea would be to hold
assets denominated in currencies in proportion to the need for a stable
exchange rate with that currency. In making this decision, the weakness or
strength of a particular currency is not of great importance because
anticipated changes in value will be discounted into the interest rate paid on assets denominated in that currency.

It may, however, be possible to extend the case to consider holdings of domestic equity in the portfolio. There are two reasons why this approach, possibly in conjunction with a multicurrency portfolio, may be valuable. First, domestic equities could lead to a direct countercyclical exchange rate policy. For example, if the demand for a country’s exports falls, the effect of this development could be mitigated by a depreciation of the exchange rate. If the central bank held the stock of companies engaged in exporting in its portfolio, then a decrease in the demand for exports would lower the value of the companies’ stock, hence lower the dollar value of the portfolio, and hence automatically create the required depreciation. Second, the inclusion of local equity in the central bank portfolio may act as a substitute for international borrowing by the companies concerned and may spread the ownership of the national capital stock over a larger number of citizens. The extreme version of this model, in which the money supply is backed solely by equity holdings, is discussed in Bilson (1982). Engels (1981) also suggests a monetary standard in which the value of the currency is tied to the value of equity.

This has been a relatively long discussion, and it is now time to summarize the arguments presented. We have seen that the traditional mechanism for fixing an exchange rate relies on variations in the quantity of money, interacting with the demand for money, to bring about adjustment in the economy. We have noted that this mechanism may lead to substantial instability if financial conditions in the reserve currency country are unstable, and that it effectively ignores the value of the assets backing the monetary base. At the same time, we have seen that the central bank faces a bankruptcy problem when the value of the assets backing the base falls short of the value of the liabilities. In this section, we have explored an alternative adjustment mechanism that avoids most of these problems by continually adjusting the exchange rate so that the value of assets and liabilities are always equal. The consequences of this system are zero nominal interest rates, an infinitely elastic quantity of money, and a rate of inflation that is approximately equal to the negative of the real rate of interest. Furthermore, we have found that it is possible to build in an automatic countercyclical exchange rate policy by a judicious choice of the assets backing the money supply. In the final section of the paper, the various models of balance of payments adjustment from an economy-wide viewpoint are considered.

5. CURRENT ACCOUNT IMPLICATIONS

The current account deficits experienced by many countries in the past few years may be traced to both external and internal forces. Externally, the high
level of U.S. nominal and real interest rates, the appreciation of the dollar, and the rise and fall of oil prices have all played a part. Internally, the present difficulties may be traced to an excessive use of external debt during an earlier period when real rates of interest were low and to the funding of projects whose economic viability was uncertain. Although it is not possible to go back into the past and correct the mistakes that were made, it is worthwhile to consider how the structure of the exchange rate system might prevent these types of problems from arising again. In this regard, two developments are of particular importance: the stability of real interest rates and the growth of domestic savings.

Within a conventional system of fixed exchange rates, we have seen that the real rate of interest on domestic debt is basically determined by the real rate of interest on the reserve currency. This fact, by itself, is of little importance, since most developing country debt is denominated in dollars. However, we have shown that the high real interest rates experienced during the past two years have been almost entirely a North American phenomenon. Ex post real interest rates on the major European currencies have been low and, in some cases, negative. Although it is not possible to predict that these conditions will continue during the next few years, elementary principles of financial diversification do suggest that debt should be issued in a variety of currencies, rather than being restricted to U.S. dollars.

In choosing the currency composition of the debt portfolio, an economy-wide perspective should be taken. The country should be considered as an entity generating a cash flow, and the object of the diversification is to choose a borrowing currency whose real value is positively correlated with the real value of local income. Thus, if income declines, the value of the debt will decline, while if income increases, the value of the debt will increase. As a simple example of these principles, an oil exporting country like Mexico or Venezuela should borrow in British pounds, since the value of the pound is likely to decline when oil prices fall. On the other hand, an oil importing country would be better off borrowing in Japanese yen or deutsche mark. In terms of its diversification characteristics, the U.S. dollar is not a particularly suitable currency for international lending because the United States is simply so different from other countries that predictable correlations cannot be established.

The correlations between developing country income and the exchange rates of the major currencies are also quite weak and unpredictable. This fact leads to the equity standard model whereby the value of debt would be linked to the performance of local equity. For example, a central bank could purchase domestic equity in exchange for currency. The exchange rate could again be set such that the dollar value of the assets is equal to the dollar value of the liabilities. As dividends were paid to the central bank, either the money supply would expand or the currency would appreciate. By reducing
the paperwork required to own equity, such a system would encourage savings and reduce the need for external borrowing. To the extent that foreign borrowing was required, the government would encourage participants to denominate the debt in the local currency.

It has often been suggested that this type of equity debt would bear a high interest cost because of the riskiness of equity stocks in developing countries. It is true that the variance of the equity return is large, but this variance may not be of great concern to lenders in the developed world. Modern financial theory suggests that risk is not measured by variance, but by the covariance of the return with the return on the lender’s portfolio. Seen in this light, the use of the U.S. dollar for foreign borrowing has probably not served the U.S. banks as well as some foreign currency borrowing. What the banks typically call currency risk is what their shareholders call international portfolio diversification. Hence, although debt tied to local indicators may be initially difficult to sell, it does offer a mechanism for reducing the problems associated with volatile dollar interest rates.

Mention was made above of the role of the financial system in encouraging private savings, but it may be worthwhile to stress this point again. The outstanding recent success stories in the national economic sweepstakes—Hong Kong, Japan, Korea, and Singapore, for example—have all experienced very high savings rates in comparison with other countries. One role for a financial system is to ensure that citizens do have an incentive to save and that the savings are used efficiently and productively. Any policy which leads to large and unstable inflation rates invariably encourages unproductive savings in real goods. An effective monetary system must be able to assure those who hold money that its real value will be preserved. Furthermore, the real assets sacrificed in exchange for money should also be used effectively to promote development, particularly of small businesses that are likely to be the most important sources of employment and growth in income.

The current account is, by definition, the difference between national income and national expenditure. Current account problems arise in the short term because of unpredictable changes in income and expenditure. During the past few years, instability in real exchange rates, real raw materials prices, and real interest rates have been the dominant causes of current account instability. The financial system, including the choice of an exchange rate regime, has an important role to play in insulating the economy from these external factors. Unfortunately, the traditional methods of operating a fixed exchange rate regime do not provide any insulating properties, and the choice of a purely flexible exchange rate is often not appropriate for a small country. This is the reason why so much time has been spent discussing alternative systems in the main body of this paper.
6. CONCLUSION

This paper began with a traditional definition of the balance of payments as the change in the international reserve holdings of a central bank. Within the confines of this definition, balance of payments theory has been concerned with the determinants of the balance of payments and with the implications of a fixed exchange rate regime for the economy as a whole. These issues have been explored on a number of levels. First, the traditional monetary approach to the balance of payments was re-examined from a perspective that recognized the importance of developments in the reserve currency country on the local economy. Emphasis was also placed upon the policies and conditions required for the central bank to maintain the parity. In the following section, the same issues were examined from the perspective of the more recent asset market approach to international finance. Although the asset market approach differs from the monetary approach when the exchange rate is flexible, the analysis demonstrated that the two models produce very similar behavior in aggregate economic time series when the exchange rate is fixed. In particular, similar reserve flow equations and the approximate maintenance of purchasing power parity are shared by the two models.

While fixed exchange rate systems may be appropriate for a small country when there is a stable reserve currency to fix to, these systems do have adverse consequences when financial conditions in the reserve currency country are unstable. These problems are increased by the adoption of flexible exchange rates between the major currencies and by the sharp changes in raw materials prices experienced during the last decade. As a result, developing countries have experienced unprecedented instability in real interest rates, real exchange rates, and real raw materials prices.

It is unlikely that this instability will disappear in the near future. Although inflation rates and interest rates are declining, the large deficits of the major developed countries have not yet been brought under control, and there is a prospect for problems arising in some major international banks. Given these considerations, it is important for small countries to adopt financial policies that insulate the economy from developments in the rest of the world. In a wide sense, this implies less reliance on external financing through the growing use of internally generated savings and it may imply the adoption of an exchange rate system that insulates the economy and interest rate movements. In Section 3, one system of this type was described in which money is directly tied to a real standard by defining money as an equity claim over the assets held in the central bank portfolio. The theory behind these types of equity standards is still in its developmental phase. Even so, the results so far obtained are of sufficient interest to provide a base for policy discussion.
BIBLIOGRAPHY


In analyzing Mr. Bilson’s paper I will surely be unable to cast aside the “underdeveloped” bias of my economic training, even though it may perhaps interfere with my understanding the subtleties of the industrial countries’ economic problems. I therefore hope that this audience will excuse these shortcomings, but it seems likely that the following general remarks will reflect my background. I note that economists continue to analyze economic behavior as if the concept of the welfare state had never come into being or spread. As a result, the activities of the government and its bureaucracy, extending all the way to the public enterprises engaged in rendering services and producing basic inputs (particularly in the underdeveloped countries) are conveniently ignored in all the models.

Perhaps there is an epistemological justification for skirting this small problem, namely, that economics assumes economic rationality and therefore disregards any behavior that implies economic irrationality. Regrettably, more and more often that which is considered to be political rationality is the counterpart of economic irrationality. Consequently, any attempt to analyze economic problems in terms of economic optimization can lead us to decidedly false conclusions.

For example, in his celebrated article “A Theoretical Framework for Monetary Analysis,” Friedman compares the virtues of the quantitative theory with the so-called Keynesian income-expenditure model. To simplify his analysis, Friedman eliminates all equations which include government expenditure. As you know, it was Friedman who postulated the dictum that “money matters” even though, in the article in question, he qualified it by saying that money is all that matters where prices and nominal income are concerned. My own biased view, however, is that what matters is government and that, what is more, it is almost all that matters; and the greater its participation in the economy, the more it matters, as is the case in our countries.

I would now like to refer to a number of individual aspects of Bilson’s paper. In the first part, “Institutional and Accounting Features,” the author raises the subject of liquidity, relating it to the bankruptcy problem. To distinguish between the two, Bilson states “both domestic and international banking have been concerned with the liquidity problem; that is, the assets of the bank are sufficient to cover the liabilities but immediate reserve assets

*The original version of this paper was written in Spanish.
are insufficient to cover the demand for them. . . . The problem of bankruptcy, on the other hand, arises when the value of the debt, expressed in terms of the reserve asset, falls below the level required to maintain the commitment to the par value" (page 37).

This is truly an important topic, which we will analyze within the framework of a fixed exchange rate system, a special case of which would be what has been called a preannounced exchange rate system when the depreciation rate is zero (see chart, page 42). My first remark is that what Bilson calls the liquidity problem and the bankruptcy problem are equivalent to what the IMF refers to as disequilibrium and fundamental disequilibrium, respectively. For example, the second case requires an adjustment of the exchange rate or, to use Bilson’s terms, the restoration of the balance between the value of the assets and the value of the liabilities in the bank portfolio. If my understanding is correct, Bilson analyzes this problem both for the case of central banks and for that of private banks even though the devaluation solution would be applicable to the former.

Unfortunately, Bilson once again approaches this problem from a strictly monetary point of view, which prevents him from investigating the root causes of monetary problems, such as public spending and the terms of trade, for example. This is a fundamental question which could be explained as follows: in the case of the terms of trade, when relative prices change definitively against a country, we have a fundamental disequilibrium or a bankruptcy situation which cannot be resolved by monetary management. One example of this was the increase in oil prices, which in my opinion has been the principal factor behind the current disequilibrium of the international financial system.

I should like in this connection to refer briefly to a theory I have been supporting for some time. Because of certain restrictions, among which political factors must be included, equilibrium in the economic world is not possible with any system of relative prices. Whenever the financial system tries, and for some time succeeds, in financing a particular structure of relative prices which, in the medium and long term, lead to the increasing impoverishment of one sector in favor of another—or of some countries in favor of others—the obvious result ultimately occurs, namely, debtors cannot pay and creditors cannot collect. This is a bankruptcy situation, or a fundamental disequilibrium, which is currently affecting the world economy as a whole and cannot be solved by any devaluations which may be applied in future.

Accordingly, at one moment or another creditors conclude, because they cannot collect, that credit is excessive. They therefore endeavor to reduce what they call their exposure. The debtors, however, consider there to be a scarcity of credit, since when there is a reduction in the credit which they had been using in the place of revenue, the demand for credit increases. The result is an increase in interest rates which harms debtors and creditors alike because, as noted by Antwerp bankers in the Middle Ages, usury is not a sin, it is bad business.
The second question I wish to raise relates to the impact of public expenditure on the domestic and external equilibrium of the economy, and on domestic interest rates in particular. This brings us to Section 2 of Bilson’s paper, where he discusses the monetary approach to the balance of payments. According to this model, the only variable directly under the control of the monetary authorities is the stock of domestic debt. In other words, the monetary authorities can influence the composition of the monetary base but not its total quantity. According to Bilson, the main criticism of the monetary approach is its assumption of complete price flexibility and integrated commodity markets. This assumption implies that there is purchasing power parity of the currency, which historically has been demonstrated not to exist.

The model also assumes the parity condition of domestic and external interest rates, a condition shared by the “asset market approach” model. I shall now try to examine both models at the same time in that the problem of public expenditure I referred to earlier relates primarily to the integration of these two parities.

The only difference between these models, as shown in equations (10) and (16), is that the second incorporates $(p - p^*)$, namely, the possibility of disparity between domestic and external prices. The first problem posed by the theory of purchasing power parity is that this parity is treated homogeneously in both models and there is no differentiation between marketable and nonmarketable goods. The effect on the overall balance of payments, particularly the current and the capital accounts, depends on changes in the relative prices of marketable and nonmarketable goods. In other words, a change in these relative prices has an impact on the balance of payments even if on average they are raised or kept on a par with international prices.

Let us now examine the mechanics of this process, which also has an impact on the relationship between domestic and external interest rates, thereby eliminating the interest rate parity condition from both models. Disregarding for the moment Bilson’s observation on the relationship between domestic credit and the reserves target (or the demand for reserves of the monetary authorities), we shall take as valid the assumption made in both models that domestic credit is the only variable under the direct control of the authorities. This principle amounts to saying that the expansion of domestic credit is the determining factor in domestic equilibrium (price stability) and external equilibrium (no change in international monetary reserves).

In accordance with this principle it is the budget deficit, the major component of domestic credit, which is the most important determining factor in this equilibrium. In other words, it is the budget deficit which affects external equilibrium and not the level of expenditure, in that the latter may be compensated for by higher taxes. This is where I disagree most, however, for in my view, overall expenditure, and principally the change in government spending, is the greatest single determining factor of domestic and external disequilibrium.

I would like at this juncture to restate the concept of domestic and external
equilibrium. For domestic equilibrium I shall adopt Wicksell’s definition, whereby equilibrium occurs when the domestic market interest rate coincides with its natural rate. I would define external equilibrium as the existence of parity between domestic and external interest rates.

Public expenditure is the greatest single determining factor in domestic interest rates. When public spending increases, the domestic interest rate goes up. When the domestic interest rate rises, two things can happen. One is that there is a budget deficit, and therefore domestic credit expands. Unlike the case in the monetary approach with fixed or preannounced exchange rates (see chart, page 42), reserve losses will not occur so long as the domestic interest rate exceeds the international rate, or

\[ i > r \ (tp) \]  

where

- \( i \) = nominal domestic rate of interest
- \( r \) = external rate of interest
- \( tp \) = exchange rate.

The second possibility is that there is no budget deficit, with the result that domestic credit will not expand. In this case, the difference between the domestic and external interest rates will result in a capital inflow which will finance domestic inflation. Argentina from 1977 to 1981 serves as an example of the first case, while Chile from 1979 to 1982 illustrates the second.

Let us turn now to an examination of what happens to domestic prices. Gradually, the prices of nonmarketable goods (including government services and wages) increase by more than the prices of marketable goods if the latter are subject to external competition. We therefore have the following:

\[ p = P_1 + P_2 \]  

where

- \( p \) = general price level
- \( P_1 \) = prices of marketable goods
- \( P_2 \) = prices of nonmarketable goods.

Logically, the domestic interest rate will have to be somewhat higher than the average rate of inflation, and therefore well above the rate of prices for marketable goods. The change in relative prices even further disrupts the activities of producers of marketable goods as a consequence of the increase in their costs resulting from price increases for nonmarketable inputs. Many fail, others go into debt abroad in order to take advantage of the difference between domestic and external interest rates, while still others continue to borrow domestically in order to cover operating losses.

As a result of this process, the current account deteriorates in that the change in relative prices makes exporting more difficult and provides an incentive to import. The interest rate differential gives rise to a capital inflow, making it possible still to record a balance of payments surplus and, as a consequence, a net inflow of international reserves. This would mean that
the international reserves target is neither a function of domestic credit (monetary approach) nor, as Bilson argues, a factor limiting the expansion of domestic credit. The change in reserves will in each case depend on the difference between the domestic interest rate and the external interest rate. The expression “in each case” is not used lightly. Rather, it has a specific and particular meaning. It means that when the current account increases, the rate differential required to avoid reserve losses also increases. For example, when the current account deficit expands there is a risk of devaluation, as a result of which the difference between domestic and external interest rates will reflect the increased exchange risk.

Demand for Money

Another matter which must be discussed is the very notion of the demand for money. Traditionally, and in Bilson’s view, money is considered strictly as \( M_1 \), or currency outside banks plus current account deposits. As Bilson states: “Within the traditional monetary approach, the only role for interest rates was to influence the demand for money.” This deviates sharply from Keynes’s view, wherein the demand for money is considered infinitely elastic to the interest rate after a certain level has been passed.

The problem to which I wish to refer, however, is the concept itself. Regardless of whether the demand for money influences the interest rate or vice versa, we would have the following function:

\[
MD = f(r) \tag{3}
\]

According to the earlier concept of the demand for money, whenever the interest rate falls the demand for money decreases, after which the opportunity cost for maintaining idle balances increases. In other words, the interest rate and the demand for money are inversely proportional.

When an inflationary process is under way, the opportunity cost of the demand for money is without question the rate of inflation. When the interest rate on time deposits and savings accounts is greater than the rate of inflation, there is a shift away from \( M_1 \) to what is known as quasi-money, and if interest is paid on current accounts, the difference between \( M_1 \) and quasi-money becomes blurred. We thus come back to the question of what is the demand for money? If money is, as Friedman once observed, anything that acts like money, we would have to include \( M_2 \) in its entirety in this definition. This being so, we find that the relationship between the demand for money and the interest rate is reversed. That is, the demand for money becomes a function of the interest rate.

Let us then analyze the implications of these definitions on the demand for international reserves. In the first case, an increase in the domestic interest rate brings about a decline in the demand for money. This drop-off in the demand for money, however, is not transformed into an increase in the demand for international reserves. To the contrary, when \( M_2 \) is taken to be money, the decline in the demand for money corresponds to a reduction in the interest rate, which can mean an increase in the demand for international reserves.
Bilson’s confusion on this matter is apparent on page 43, where he writes: “To maintain the long-run viability of the fixed rate system, the central bank should sell its domestic debt in order to absorb the reduction in the demand for money.” In other words, in order to absorb the reduction in the demand for money, it would be necessary to increase the market interest rate. But it happens that, if we follow the traditional terminology adopted by Bilson, the increase in the interest rate brings about an even greater reduction in the demand for money ($M_1$). Nevertheless, Bilson describes a process similar to the one I described earlier in connection with the interest rate and reserves. Bilson states: “When interest rates rise, the central bank realizes a loss on its holdings of domestic debt instruments. This loss could reduce confidence in the ability of the central bank to maintain the parity and create a further drain on reserves and a further increase in interest rates” (page 43).

We see here that an interest rate increase is perceived to be a symptom of disequilibrium, and that therefore there is greater pressure on reserves, giving rise to a further increase in interest rates. It may be noted, however, that the dynamics of this process are the same as those I have pointed out, except that Bilson provides no explanation outside the monetary framework of the why and wherefore of the initial pressure on reserves. In the case I referred to, I identified the change in relative prices as the determining factor in the deterioration of the current account and the subsequent pressure on the capital account.

In my view, it is the absence of an exogenous explanation of the behavior of reserves that prompts Bilson to state the following: “In fact, the fixed exchange rate system is inherently unstable whenever the dollar value of the assets backing the monetary base falls short of the dollar value of the base” (page 43). According to this assumption, the stability of the system depends on the level of reserves; presumably, when this level declines, in Bilson’s view, a devaluation becomes necessary. I hold the opposite view, namely that reserves are not necessary when the system is stable, or when the exchange rate does not give rise to growing current account deficits, but when, to the contrary, such deficits do arise, no level of reserves can impart stability to the system.

**Asset Market Approach**

In explaining the asset market approach, Bilson reaches the following conclusion: “...the general point that fixed exchange rate regimes lead to correlated inflation rates independently of the degree of commodity arbitrage will continue to hold. In essence, the fixed exchange rate correlates the monetary policies of the two countries through the interest rate parity condition, and it is the coordinated monetary policies that lead to the coordinated inflation rates” (page 46).

Here, we once again return to the problem created by the condition of parity between domestic and external interest rates. This problem stems from the assumption followed in both models that monetary policy alone has
the power to solve or define the balance of payments position. In reality, however, the interest rate structure reflects purchasing power parity.

The differences in inflation rates per se determine different nominal rates of domestic and external interest. When the exchange rate is fixed or the preannounced changes in it do not keep up with the difference between domestic and external inflation rates, the greater the difference in those rates, the greater will be the differential between domestic and external interest rates. As a result, the assumption that there will be no capital flows does not hold; instead the problem actually lies in the fact that such flows are insufficient at all times to bring domestic and external interest rates into line. This is because both rates respond not to different levels of productivity or of return on capital, but to different rates of inflation.

Although Bilson does acknowledge the weakness of the interest rate parity condition, this weakness affects both models equally. Here again we arrive at some confusion with regard to the demand for money, and Bilson states: "The increase in interest rates decreases the demand for money and lowers the local currency value of fixed rate long-term government debt held by the central bank. We consequently have an additional balance of payments deficit and a reduction in the bank's ability to defend the parity" (page 47).

We thus have, according to Bilson and in line with the asset market approach, the increase in the domestic interest rate vis-à-vis the world interest rate causing an increase in the balance of payments deficit. This is the same process described with regard to the monetary approach, and thus calls forth the same remarks made earlier in that regard.

Choice of a Parity

In Section 4, Bilson presents the problem of the choice of a parity in a world of floating exchange rates. By definition, however, this problem is not posed for countries that are part of the floating exchange rate system. Bilson's first proposal is that to avoid losses in the capital value of their assets, central banks should hedge in the markets.

Bilson appears to be more concerned by capital losses on the domestic debt component of the monetary base. From the standpoint of the balance of payments, this has only an indirect impact, that is, the effect of interest rate increases on the demand for money.

Bilson goes on to describe an exchange rate system functioning along the lines of a money market fund. I will not discuss the form of the model itself but do wish to refer specifically to the conclusion he reaches on page 50, where he states: "Then an investor who currently holds dollar-denominated assets could transfer these assets into local currency. Since all of the dollar interest is paid through the appreciation of the local currency, and since the local currency also pays interest, the investor would be unambiguously better off. It is reasonable to suppose that enough investors would be willing to take advantage of this opportunity to drive the local interest rate to zero."

As is obvious from the recent histories of Argentina, Chile, and Uruguay, at no time has there been a situation in which capital inflows matched the
differential in domestic and external interest rates. As I will explain below, this is because the difference in question basically corresponds to differences in inflation rates. Furthermore, revaluation of the domestic currency causes increased commercial account and current account deficits as a result of larger debt service payments. Consequently, the exchange risk and even the risk of default on the debt become greater, which increases the interest rate differential required to maintain the level of reserves.

This process is touched upon by Bilson when, on page 51, he writes: “This characteristic of the model should correctly be of concern to exporters, who would find the world price of their goods, calculated as the product of a fixed local currency price and an appreciating exchange rate, rising when high real interest rates are depressing world demand.”

In view of the fact that the criterion of achieving interest rate parity is not met for the reasons expressed earlier, it would appear that all the other conclusions derived from the model are fundamentally in error. This does not imply, however, that the criterion is wrong with regard to the advisability of maintaining reserves in a basket of currencies, provided that and so long as the market itself does not equalize their purchasing power through differences in interest rates. However, it is not at all certain that the concept of bankruptcy refers to the value of the central bank assets which constitute its external debt. Likewise, it is by no means certain, except in Bilson’s utopia, that the domestic interest rate would be driven to zero, that the money supply is infinitely elastic, or that the rate of inflation will be equal to the negative of the real rate of interest.

Current Account Implications

Here we find another assumption that I believe I have disproven in my earlier remarks. Bilson begins his comments by stating that: “Within a conventional system of fixed exchange rates, we have seen that the real rate of interest on domestic debt is basically determined by the real rate of interest on the reserve currency” (page 54). He goes on to observe that this is of little importance since all the debt of the developing countries is denominated in dollars.

Bilson nevertheless proceeds to establish a golden rule with respect to decision making on the currency in which each country should incur debt. Assuming that the relative weaknesses of different currencies are discounted in the market through the interest rate mechanism, this problem does not arise since the results would be the same for all currencies. Let us assume that this is not the case, however, and follow Bilson’s reasoning on page 54. There, he states that oil exporting countries should borrow in pounds sterling, since when the price of oil falls, the value of the pound will also. But what about when the price of oil rises? Does the value of sterling go up as well? What advantage is there for the oil exporting countries to borrow in a dearer currency?

Bilson goes on to say the obverse, namely, that the oil importing countries should borrow in yen or deutsche mark. I fail to see why, since for any
country it is best to have the debt in the currency which is devalued or depreciates, provided and so long as this is not offset by the interest rate.

Conclusions

I should like to end my remarks by referring briefly to Bilson’s conclusions. The first of these is that both models, the monetary approach and the asset market approach, yield the same results in the case of fixed exchange rates. The problem is that the results are not valid because in no case are the assumptions made with respect to purchasing power parity or interest rate parity borne out.

We of course agree on the greater difficulties represented by floating exchange rates for setting the parity in small countries. Once again, however, Bilson refers to the instability in real interest rates, real exchange rates, and real raw materials prices, without explaining them. In other words, he makes no effort to trace and understand the problem posed in his paper, namely the adjustment process.

Bilson then recommends that small countries endeavor to insulate their economies from the rest of the world (although to my way of thinking, he must mean the industrial countries). But this suggests less reliance on external financing, which in my opinion is ambiguous. External financing is essential for the real investment and development needs of the (small) developing countries, as is the stability of raw materials prices. What must be avoided is the artificial financing that has arisen as a consequence of policies on revaluing domestic currency which created differentials between domestic and external interest rates even when the latter were reaching their maximum levels.

Although I may not have properly understood the model proposed in Section 4, I do not believe that its approach to interest rates and exchange rates really serves to insulate the small countries from events in the rest of the world.