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CAUSES OF APPRECIATION AND VOLATILITY OF THE DOLLAR

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with comment by
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ABSTRACT

In 1981 real interest rates in the United States increased spectacularly, and the dollar appreciated in real terms by about 20 percent. Since the end of 1981, long-term real interest rates have remained in the range of 5-10 percent, with nominal long rates above short rates. The dollar appreciated further, but more gradually, until early 1985. This paper argues that these movemnets in real interest rates and the real exchange rate are due to the shift in the high-employment deficit by some $200 billion that was announced in the 1981 budget program. This requires an increase in real interest rates and a real appreciation to generate the sum of excess domestic saving and foreign borrowing to finance it. The argument is a straightforward extension of the idea of "crowding out" at full employment to an open economy.

The current situation is not sustainable, however. Eventually international investors will begin to resist further absorption of dollars into their portfolios, so U.S. interest rates will have to rise further, as the markets seem to expect, and the dollar will have to depreciate. This will continue until the current account is back in approximate balance, and the entire load of deficit financing is shifted to excess U.S. saving.

In his comments on Branson's paper, Jacob A. Frenkel discusses additional factors that have contributed to the evolution of the dollar since 1980. He concludes that in addition to U.S. fiscal policies, monetary policy in the United States and the fiscal position of the U.K., West Germany and Japan have also contributed to the dollar's strength.

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CAUSES OF APPRECIATION AND VOLATILITY OF THE DOLLAR

I Introduction and Summary

In 1981 real interest rates in the United States increased spectacularly, and the dollar appreciated in real terms by about 20 percent. Since the end of 1981, long-term real interest rates have remained in the range of 5-10 percent, with nominal long rates above short rates. This suggests that the financial markets expect rates to rise. The dollar appreciated further, but more gradually, until early 1985, and has come down by 6-7 percent since then. This paper argues that these movements in real interest rates and the real exchange rate are due to the budget program that was announced in March 1981, and has been subsequently executed. In particular, the shift in the high-employment -- or "structural", as the responsible parties have taken to calling it -- deficit by some $200 billion requires an increase in real interest rates and a real appreciation to generate the sum of excess domestic saving and foreign borrowing to finance it. The argument is a straightforward extension of the idea of "crowding out" at full employment to an open economy.

The current situation is not sustainable, however. It is a "temporary equilibrium," to use the jargon of macroeconomic dynamics. Eventually international investors will begin to resist further absorption of dollars into their portfolios, so U.S. interest rates will have to rise further, as the markets seem to expect, and the dollar will have to depreciate. This will con-

tinue until the current account is back in approximate balance, and the entire load of deficit financing is shifted to excess U.S. saving. The following sections of this paper describe the mechanisms that will generate this outcome, if it occurs.

Sections II and III of the paper present the "fundamentals" framework of the analysis. This is fundamental in the sense that it emphasizes the variables, such as the high-employment deficit, that the market should look to when it is forming expectations about movements in interest rates or the exchange rate. The focus is on real interest rates and the real (effective) exchange rate; these are the variables whose movements have been surprising. The argument that the shift in the budget can explain the rise in real interest rates and the dollar is presented in these two sections.

The role of expectations and the timing of the jump in interest rates and the dollar is discussed in section IV. The Economic Recovery Tax Act of 1981 provided a credible announcement of a future shift in the budget. The financial markets reacted by raising interest rates and the dollar well in advance of the actual fiscal shift, contributing to the recession of 1981-82.

The volatility of the dollar is briefly discussed in section V. Modern models of the foreign exchange market emphasize the idea that the exchange rate is proximately determined in financial markets, and should be expected to fluctuate like a stock price. Exchange-rate fluctuations may be of more concern to policy-makers than stock-price fluctuations, because the exchange rate influences

directly the price of tradeable goods.

Finally, in section VI, three alternative explanations of recent movements in the dollar are analyzed. The arguments that these could be due to tax changes that have increased investment incentives or to financial deregulation are plausible, but would require evidence of an investment boom to be quantitatively important. The argument that the strong dollar is due to a shift in international portfolio demands -- the "safe haven" effect -- runs up against the old problem of identification. If this were driving the dollar, U.S. interest rates should have gone down, not up.

I have attempted to make the exposition here as non-technical as possible, to maximize accessibility. The paper draws heavily on Branson (1977, 1983, 1985) and Branson, Fraga, and Johnson (1985). The technical details are given in those references; here I attempt to lay out the logic and the implications for policy.

II Short-Run Equilibrium in a Fundamental Framework

A good start for our discussion of the causes of the strength and volatility of the dollar since 1980 is exposition of a "text-book-ish" framework that describes the determination of movements in real interest rates and the real exchange rate. The focus is on real rates because these have been the source of surprise and concern. If nominal interest rates had simply followed the path of expected or realized inflation and the exchange rate had followed the path of relative prices, the world would be perceived to be in order. It is the movement of interest rates and the exchange rate relative to the price path that is of interest here. So we begin by taking the actual and expected path of prices as given, perhaps determined by monetary policy and focus on real interest rates and the real exchange rate. In this section we develop a framework that integrates goods markets and asset markets to describe simultaneous determination of the interest rate and the exchange rate. It is "short run" in the sense that we take existing stock of assets as given. Movement in these stocks will provide the dynamics of section III. It is a "fundamentals" framework because it focuses on the underlying macroeconomic determinants of movements in rates, about which the "market" will form expectations. The latter are discussed in section IV. The framework is useful because it permits us to distinguish between external events such as shifts in the budget position (the "deficit"), shifts in international asset demands (the "safe haven effect"), and changes in tax law or financial regulation by analyzing their differing implications for movements in the interest rate and the exchange rate. We begin

with the national income, or flow-of-funds,identity that constrains flows in the economy, then turn to asset-market equilibrium that constrains rates of return, and finally bring the two together in Figure 1.

A. Flow Equilibrium: The National Income Identity

The national income identity that constrains flows in the economy is generally written as

$$Y = C + I + G + X = C + S + T,$$

with the usual meanings of the symbols, as summarized in Table 1. Note that X here stands for net exports of goods and services, the current account balance. All flows are in real terms. We can subtract consumer expenditure C from both sides of the right-hand equality and do some re-arranging to obtain a useful version of the flow-of-funds identity:

$$(1) \qquad G-T = (S-I)-X.$$

In terms of national income and product flows, equation (1) says the total (federal, state, and local)government deficit must equal the sum of the excess of domestic private saving over investment less net exports.

Let us now think of equation (1) as holding at a standardized "full-employment" level of output, in order to exclude cyclical effects from the discussion. This allows us to focus on shifts in the budget at a given level of income. If we take a shift in the full-employment deficit (G-T) as external, or exogenous to the economy, equation (1) emphasizes that this shift requires some endogenous adjustment to excess private saving (S-I) and the current

account X to balance the flows in income and product. In particular, if (G-T) is increased by $200 billion, roughly the actual increase in the "structural" deficit, a combination of an increase in S-I and a decrease in X that also totals $200 billion is required.

Standard macroeconomic theory tells us that for a given level of income, (S-I) depends positively on the real interest rate r, and X depends positively on the real exchange rate e (dollars per unit of foreign exchange, adjusted for relative price levels).[1] So the endogenous adjustments that would increase S-I and reduce X are an increase in r and a reduction in e. Some combination of these changes would restore balance in equation (1), given an increase in G-T.

We can relate this national income view of the short-run adjustment mechanism to the more popular story involving foreign borrowing and capital flows by noting that net exports X is also net foreign investment from the balance of payments identity:

X - private NFI = public NFI, or

(2) X = national NFI.

Since national net foreign investment is minus national net foreign borrowing (NFB), so that X = NFI = -NFB, the flow-of funds equation (1) can also be written as

$$(3) \quad (G-T) = (S-I) - NFI = (S-I) + NFB.$$

This form of the identity emphasizes that an increase in the deficit must be financed either by an increase in excess domestic

saving or an increase in net foreign borrowing (decrease in net foreign investment). One way to interpret the adjustment mechanism is that the shift in the deficit raises U.S. interest rates, increasing S-I. The high rates attract foreign capital or lead to a reduction in U.S. lending abroad, appreciating the dollar, i.e., reducing e. This process continues, r increasing and e falling, until the increase in S-I and the decrease in X add up to the originating shift in the deficit.

The actual movements in the government deficit, net domestic saving (S-I), and net foreign borrowing, and the associated movements in the real long-term rate r and the real exchange rate e (indexed to 1980) = 100) are shown in Table 2. The total deficit was roughly zero at the beginning of 1981. It expanded to a peak of $175 billion in the bottom of the recession in the fourth quarter of 1982, and then shrank in the recovery. But the shift in the federal budget position leaves the total government deficit at $140 billion in early 1985, after two years of recovery. The recent World Development Report (1985) estimates that the inflation-adjusted shift in the total deficit from 1979 to 1984 is $160 billion. Initially the deficit was financed mainly by net domestic saving, which also peaked at the bottom of the recession. But since 1982 the fraction financed by net foreign borrowing has risen; by early 1985 three-quarters of the government deficit was financed by foreign borrowing.

The movements in the real interest rate and the real exchange rate roughly reflect this pattern of financing. The real interest rate jumped from around 2.0 percent to over 5 percent in 1981, fell during the recession, and rose in the recover, staying in the 5-10 percent range since mid 1983. The real exchange rate shows an initial fall of 20 percent in

1981, and a more gradual decrease beginning in early 1983. The standard lags in adjustment of net exports to changes in the exchange rate can explain the slow reaction of net exports (net foreign borrowing) to the dollar appreciation.

The data in Table 2 are roughly consistent with the story of maintenance of the flow-of-funds equilibrium in equation (1), with one big exception and one major loose end. The exception is that interest rates and exchange rates jumped in 1981, while the structural deficit only began actually to emerge in 1982. Below in section IV we argue that this reflects the market's anticipation of the shift in the budget. The loose end is that we have not said anything about what determines the precise mix or combination of rise in r and e that achieves short-run equilibrium. For this we turn to the financial markets.

B. Financial Market Equilibrium and Rate of Return

We can obtain a relationship between r and e that is imposed by financial market equilibrium by considering the returns that a representative U.S. asset-holder obtains on domestic and foreign assets of the same maturity. The return on the domestic asset is i in nominal terms, and $r = i-\hat{P}$ in real terms, where $\hat{P}$ is the (exogenous, from our point of view) expected rate of inflation. The return on the foreign asset is $i^* + \hat{e}$ in nominal terms, where $\hat{e}$ is the expected rate of change in the exchange rate. In real terms the U.S. asset-holder's return would be $i^* + \hat{e} - \hat{P}$. In equilibrium, the difference between the two returns must be equal to the market-determined risk premium $\rho(B)$. Here we assume that dollar-denominated bonds are imperfect substitutes

for foreign-exchange-denominated bonds, so that the risk premium on dollar bonds increases with their supply: $\rho'(B) > 0$. The equilibrium condition for rates of return in real terms is then

$$(4) \qquad r - (i^* + \hat{e} - \hat{P}) = \rho(B).$$

Next we need to relate the expected rate of change of the exchange rate to the actual current rate. If we denote the perceived long-run equilibrium real rate that sets the full-employment current account balance at zero as $\bar{e}$, one reasonable assumption is that the current rate is expected to return gradually toward long-run equilibrium. Following Dornbusch (1976), we can write this as a proportional adjustment mechanism:

$$(5) \qquad \hat{e} = \theta(\bar{e} - e).$$

If e is below the long-run equilibrium, it is expected to rise, and vice versa. If we put expression (5) into the equilibrium condition (4), and re-arrange a bit, we obtain the financial-market relationship between e and r:

$$(6) \qquad e = \bar{e} - \frac{1}{\theta}\left[r - (i^* - \hat{P}) - \rho(B)\right].$$

This condition says that for given values of the bond stock B, inflation $\hat{P}$, the foreign nominal interest rate i^*, and the long-run equilibrium real exchange rate $\bar{e}$, an increase in r requires a decrease in e to maintain equilibrium in financial markets. Why? If the home interest rate rises, equilibrium can be maintained for a given foreign rate only if the exchange rate is expected to rise. From (5), this means that the actual current rate must fall to establish $\hat{e} > 0$. In terms of market operations, the rise in domestic rates r causes sales of foreign assets and a

fall in e until equilibrium is re-established.

Below we argue that this is essentially what happened in 1981 with the announcement of a path of future deficits. This did not substantially change the long-run $\bar{e}$ that would balance the current account, but it did move r and e.

C. Interest Rates and the Exchange Rate

We can now join the flow equilibrium condition (1) and the rate-of-return condition (6) to form the short-run framework for simultaneous determination of r and e. Let us re-write equation (1) to show the dependence of S and I on r, and of X on e:

$$(7) \quad G-T = S(r) - I(r) - X(e).$$

For a given level of the full-employment budget, the trade-off between r and e that maintains flow equilibrium is given by the positively-sloped IX curve in Figure 1.[2] For a given G-T, an increase in r, which reduces (S-I), requires an increase in e, which increases X, to maintain flow equilibrium. An increase in G-T will shift the IX curve up or to the left, requiring some combination of a rise in r and fall in e to maintain flow equilibrium.

The rate-of-return condition (6) gives us the negatively-sloped FM curve in Figure 1, for given $B, i^*, \hat{P}$, and $\bar{e}$. Its slope is $-\theta$, the speed-of-adjustment parameter for expectations. An increase in the risk premium ρ, due to a rise in the supply of U.S. bonds B, will shift the FM curve up and to the right, requiring an increase in r for any given value of e.

In the short run, equilibrium r and e are reached at the intersection of IX and FM in Figure 1; there both equilibrium con-

ditions are met. For the purposes of the analysis here, we assume that initially $e = \bar{e}$, with no expected movement in exchange rates. This is taken to represent the equilibrium around 1980, before the surge in interest rates and the exchange rate that we are trying to explain.

D. Effects of a Shift in the Budget

A shift in the full-employment, or structural, budget towards deficit shifts the IX curve up, as shown in Figure 2. The real interest rate rises, and the real exchange rate falls, as described earlier. The compositon of these movements is determined by the slope of the FM curve, representing financial market equilibrium. The movement of r and e from E_0 to E_1 raises excess domestic saving $(S-I)$ and reduces net exports X by a sum equal to the shift in $G-T$. This also produces the short-run equilibrium financing of the shift in the deficit by domestic saving and foreign borrowing. The results of the shift in G-T are the movements in excess domestic saving and foreign borrowing, and in r and e, that are shown in Tables 2 and 3. Thus the framework of Figure 2 roughly captures the movements or r and e from 1981 to 1985.

III Dynamic Adjustment to Long-Run Equilibrium

In Figure 2, point E_o is taken to represent the initial equilibrium of 1980 or 1981, before the shift in the structural deficit, and point E_1 may represent the economy in 1984 or 1985, after the full shift in the budget was completed. The next question that arises is: is the equilibrium E_1 sustainable? The short answer is no. This takes us to the dynamics of debt accumulation.

At point E_1 in Figure 2, the economy is running a substantial current-account deficit, perhaps $150 billion in 1985. This is adding, on balance, that amount each year to the holdings of dollar-denominated assets in international portfolios. Either the U.S. is borrowing abroad to finance partially the budget deficit, or it is reducing its lending as U.S. asset-holders shift into government debt. In either case, the net foreign position in dollar-denominated assets is growing. This will lead eventually to international resistance to the absorption of further increases in dollar-denominated assets, and to a rise in U.S. interest rates and the exchange rate.

At any given set of interest rates and exchange rates such as point E_1 in Figure 2, international investors will have some desired demand distribution of their portfolios across currencies. This will depend, of course, on a whole array of expectations as well as current market prices. As the U.S. current account deficit adds dollars to these portfolios from the supply side, this disturbs the initial portfolio balance, shifting the distribution towards dollar assets. In order to induce investors

to hold the additional dollar assets, either U.S. interest rates have to rise or the exchange rate must be expected to rise, offering investors a higher rate of return on dollars. This is the dynamic adjustment of the exchange rate discussed in terms of sustainability by Krugman (1985). As the dollar depreciates, the current account deficit will shrink, if the long-run equilibrium is stable. As the deficit shrinks, the rate at which international portfolio distributions are changing is reduced, and so is the rate at which the dollar depreciates. Eventually, the economy returns to a long-run equilibrium where the current account is again balanced, and excess domestic saving finances the budget deficit. The dynamics of this adjustment mechanism in a fundamentals model were described in detail in Branson (1977); the version with a rational expectations overlay is given in Branson (1983). Krugman (1985) explores the question of whether the U.S. economy is currently on such a stable path back to long-run equilibrium.

This adjustment mechanism has a straightforward interpretation in the fundamentals framework of section II. Consider the position of the economy at point E_1, reproduced in Figure 3. Remember that $\bar{e}_o$ was the initial value of the real exchange rate that produced current-account balance. At point E_1, the current account is in deficit, and dollar-denominated debt in international portfolios is increasing. This tends to raise the equilibrium U.S. interest rate r or the exchange rate e. In Figure 3, this is captured by a continuing upward drift in

the FM curve. In equation (6) for rate-of-return equilibrium, the bond stock B is growing. This raises the risk premium ρ, shifting FM up.[3] As FM shifts up, driven by the current-account deficit, the interest rate and exchange rate rise along IX. This movement continues until the current balance is again roughly zero, at point E_2 in Figure 3. There the real interest rate has risen enough that S - I = G - T at full employment.

If most of the increase in S - I has come from a reduction in investment, the E_2 equilibrium will have a significantly lower growth path than the original E_o equilibrium. Through the shift in the budget, the economy will have traded an increase in consumption (including defense) for a reduction in investment.

The point E_2 in Figure 3 has an exchange rate above $\bar{e}_o$, suggesting that in the new equilibrium the dollar will have depreciated in real terms relative to its initial 1980 position. Why? In the transition from E_1 to E_2, the U.S. is running a substantial current-account deficit. This will reduce the U.S. international investment position. In fact, it is shifting this position from net creditor to net debtor. As Krugman (1985) shows, the E_2 equilibrium could produce a U.S. debt position similar to that of Brazil in the early 1980s. The consequence of this shift in the international credit position of the U.S. is a reduction in the investment income item in the current account. In the current situation, the former positive flow of investment income will become a negative flow of debt service.

At the original E_o equilibrium, with a surplus on investment

income and the service account, the current account balanced with a trade deficit. The deficit on trade in goods offset the surplus in services. But at the new E_2 equilibrium, the service account will be in deficit, requiring a trade surplus to produce current account balance. The real exchange rate at E_2 will have to be higher than at E_o to produce the required shift in the trade balance from deficit to surplus. It should be clear that the result does not depend on the investment income account actually becoming negative. A series of current account deficits that reduces the investment income surplus would lead to a new equilibrium with a smaller trade deficit and therefore a higher value for $\bar{e}$. This consequence of the dynamic adjustment through current-account imbalance is discussed in Branson (1977).

The reversal of the movement of the dollar in spring 1985 may be the beginning of the movement for equilibrium E_1 toward E_2. The dollar peaked in early 1985 and has fallen by 6 to 7 percent in real terms up to July. Interest rates began to rise in June 1985. In addition, the mix of financing of the current-account deficit has shifted from U.S. foreign borrowing towards a reduction in U.S. bank lending abroad. This may signal the rise in foreign resistance to further lending in dollars. So there is some evidence that the movement from equilibrium E_1 toward E_2 has begun. Whether is can proceed fast enough to converge to E_2 without the U.S. foreign debt growing unstably is another question, to be discussed by Krugman (1985).

IV Expectations and Timing

Sections II and III presented the "fundamentals" framework for analyzing the determinants of movements in real interest rates and the exchange rate, both in a short run with asset stocks fixed, and in a longer run in which the budget and the current account gradually change the country's international investment position. This framework suggests that agents in financial markets should form expectations about the exogenous variables that move the IX and FM curves -- the flow and stock equilibrium loci -- in order to anticipate movements in real interest rates and the exchange rate. The timing of the jump in these variables in 1981 suggests that this is, indeed, the case.

The Economic Recovery Tax Act of 1981 had one particular aspect that is unusually useful for macroeconomic analysis. It provided an example of a clear-cut and credible announcement of future policy actions at specified dates. A three-stage tax cut was announced in the Tax Act in March 1981. Simultaneously, a multi-stage buildup in defense spending was announced. This implied a program of future high-employment -- now "structural" -- deficits, beginning late in 1982. The fundamentals framework tells us that this would begin a process which starts with the IX curve shifting up, to E_1 in Figures 2 and 3, causing a rise in real interest rates and appreciation of the dollar. It then continues with a current-account deficit, a further rise in interest rates, and a real depreciation of the dollar toward a new long-run equilibrium E_2, which may or may not be stable. The initial movement to E_1 is more certain than the eventual convergence to E_2. If the tax changes were enacted when they

were announced, British-style, we would expect to see the jump in real interest rates and the exchange rate come on the heels of the tax changes.

But in the U.S. case, the 1981 announcement implied a forecast of a growing high-employment deficit beginning in 1982. During the period from March to June of 1981, projections of the likely structural deficit emerged from sources such as Data Resources, Inc., and Chase Econometrics and circulated through Washington and the financial community. This meant that the financial markets could look ahead to the shift in the budget (and the IX curve) and anticipate its implications for bond prices and interest rates.

The expected emergence of a persistent structural deficit provided a prediction that real long-term interest rates would rise (moving from E_o to E_1 in Figure 2), and bond prices fall. Once that expectation took hold in the market, the usual dynamics of asset prices tells us that long rates should rise immediately, in anticipation of the future shift in the budget. Indeed, in the early fall of 1981 the long rate moved above the short rate, and has remained there since, through recession and recovery.[4] This is consistent with the bond market anticipating the movement not only to E_1 as the budget shifts, but also toward E_2 as the effects of debt accumulation are felt.

The markets could also anticipate an appreciation of the dollar, i.e., the fall in e from E_o to E_1 in Figure 2, as the structural deficit emerged. This expectation could have been

derived from national income reasoning or from thinking about capital movements. One could ask the series of questions: 1) What will have to be crowded out to make room for the deficit?; Answer: investment and net exports. 2) How will net exports get crowded out?; Answer: dollar appreciation. Or one could reason that the rise in interest rates would attract financing from abroad, leading to appreciation of the dollar. Section II showed that these are two views of the same adjustment mechanism. Either says that the dollar would appreciate. Once that expectation takes hold, the dollar should be expected to jump immediately.

Indeed, the steepest appreciation of the dollar came across 1981, well before the emergence of the structural deficit. The deficit data are summarized in table 3, taken from the 1984 Council of Economic Advisers Annual Report. Real interest rates and the dollar show their major movements across 1981; the structural deficit begins to appear in 1982. This is consistent with the view that the markets anticipated the shift in the budget position when they understood the implications of the program that was announced in 1981. The anticipation of the shift in the budget by real interest rates and the real exchange rate in 1981 provide an important example of the effect of credible announcements and expectations in financial markets.

The implied reversal of the path of the real exchange rate as the fundamentals model moves from E_o to E_1 to E_2 also has its influence through expectations. If, as the exchange rate falls (the dollar appreciates) from E_o toward E_1 in Figure 2, agents in the market believe that the movement will eventually

be reversed towards E_2, this anticipated depreciation of the dollar will temper their increase in demand for dollar assets as real interest rates in the U.S. rise. This would tend to reduce the magnitude of the appreciation from E_o to E_1, and the subsequent depreciation to E_2. This dampening of price fluctuations is a general property of rational expectations analysis (it used to be called "stabilizing speculation"). An example is given in Branson (1983).

The downward jump in the exchange rate from E_o to E_1, and gradual movement back toward E_2, are also consistent with market agents' anticipating the shift in the U.S. international position from creditor to debtor. This is implied by a sufficiently long period of current-account deficits to finance the budget deficit. This, in turn requires an initial appreciation of the dollar. But, eventually, the dollar must fall again, to a point somewhat below (e above) its original position. In anticipation of this swing, the market would generate an initial jump smaller than the one from E_o to E_1, smoothing the path somewhat.[5]

Thus, expectations of the implications of first, the shift in the budget position, and second, the implied switch of the U.S. from international creditor to debtor, would generate the movements in real interest rates and the exchange rate that we have seen since 1980. In particular, anticipation of the budget shift based on the March 1981 program can account for the movements on rates that came before the actual emergence

of the structural deficit. Finally, it should be noted that anticipations of reversals as the path of asset market prices (generally known as "overshooting") reduce the magnitude of their fluctuations. It is shifts in the fundamentals that cause the fluctuations; in general, expectations can be expected to stabilize.

V Volatility

The expected volatility of exchange rate movements, resembling stock prices, is by now commonplace. In a comment on Marina Whitman in 1975, I characterized exchange rates as being approximately determined by asset market equilibrium. In 1976, Jacob Frenkel and Michael Mussa described the exchange rate as the relative price of national monies. In an important paper in 1981, Frenkel surveyed and extended results that showed that exchange rates fluctuate like stock prices rather than goods prices. The fundamentals model of section II shows exchange rates and interest rates being determined by the same set of equilibrium forces.

When we add the expectations layer to the fundamentals model, the expected volatility of exchange rates becomes more obvious. Forward-looking financial markets bring the future consequences of real disturbances into the present. As discussed in Branson (1983), news about the trade balance can be interpreted as a predictor of the future accumulation of the foreign asset position, a future shift in B in equation (6). This will lead the market to anticipate a movement in the real exchange rate, and the rate will jump immediately. As noted in section IV, expectations will also bring the consequences of future policy actions into the present. The anticipation of a future shift in the budget position resulted in a jump in the real exchange rate in 1981.

Volatility of exchange rates, following time series processes like stock prices, is thus a normal feature of modern thinking

about exchange-rate determination. Considerations of current account balance and purchasing-power-parity, which were in the center of models of exchange-rate determination in the 1960s, now are part of the longer-run equilibration process. Analysis of exchange-rate fluctuations and their consequences is essentially the same as the analysis of stock price fluctuations and investment flows.

While volatility is a normal feature of the exchange market, its consequences may be more important than stock price volatility, and therefore policy reactions may differ. In an open economy, fluctuations in the exchange rate must emerge as fluctuations either in the prices of tradeable goods or in the profits of the firms producing them. Volatility in either may be of concern for policy. If fluctuations in exchange rates cause price fluctuations (as opposed to persistent inflation), this may discomfort consumers. If exchange-rate fluctuations are absorbed in profits, the resulting variability increases risk in investment in the tradeable goods industry. This may reduce such investment, and raise legitimate policy concerns. Thus the statement that volatility is a normal and expected feature in the exchange market does not imply that it is a good thing, or even acceptable. Policy regarding this volatility is rightly an urgent matter. for discussion.

VI. Alternative Explanations

This paper has argued that the major cause of the historic increase in real interest rates and the real value of the dollar in the first half of the 1980s was the shift in the federal budget position that was announced in early 1981. The movements shown in Figures 2 and 3, and the anticipation by interest rates and the exchange rate of the shift in the budget position are consistent with this view. There are at least three other explanations for the strength of the dollar that we will consider here, if too briefly. The first is the effect of tax changes in 1981 on investment incentives in the U.S. The second is the "safe haven" argument that we have seen in a shift in international portfolio demands toward the dollar. The third is the effect of financial deregulation pulling foreign funds into the U.S. We will consider each in turn.

A. Tax Effects

A reduction in profits or investment taxation could yield results similar to those in Figure 2. The increase in the after-tax yield would increase investment demand, shifting the IX curve up; the rest would follow, with the U.S. borrowing abroad to finance investment at home. There are three points to make concerning this argument as an "alternative."

First, it is unclear how much changes in the tax laws have actually changed after-tax yields or the cost of capital. In a fairly detailed analysis, Bosworth (1985) argues that the 1982 tax bill reversed most of the incentive effects of the

Tax Act of 1981. He ascribes most of the change in the cost of capital to a reduction in the price of capital goods relative to output. Given the increasing share of imports in expenditure on capital goods in the U.S. since 1981, some of this relative price effect probably comes from dollar appreciation. Thus the shift in the budget may have indirectly stimulated investment by reducing the price of capital goods imports via dollar appreciation. The argument stands on its head.

Second, it is not clear that investment is booming in the U.S., as we would expect if the IX shift came from tax changes stimulating investment. The 1980-82 recessions generated a severe slump in investment, and the 1983-85 recovery brought it back. But the level of investment relative to GNP is not unusually high, as we would expect from this argument.

Finally, if we think an investment boom would lead to a rise in real interest rates and real dollar appreciation, via a shift in the IX curve in Figure 2, we should also believe that a major shift in the structural budget deficit would do the same. In one case the stimulant is investment spending; in the other, it is consumer spending and defense. Both would raise real interest rates and pull in foreign capital. It is clear that the budget deficit has shifted. So the logic of the investment argument should lead one to accept the budget argument.

B. Safe Haven Effects

The second alternative explanation is a shift in international portfolio preferences toward the dollar, generally

called a "safe haven" effect. This can be easily analyzed using Figure 1. A shift in preferences toward the dollar would effectively reduce the risk premium ρ in equation (6) for any given level of B. This would shift the FM curve in Figure 1 down by the same amount. The result would be a reduction in e, but a fall in real interest rates.

The safe haven argument is based on a shift in the supply of funds to the U.S.; the shift in the budget deficit moves the demand for funds. Both would result in dollar appreciation in the short run, but the budget deficit delivers the rise in real interest rates. So while there may well have been some supply shift, the dominant effect must have come from the demand side.

C. Financial Deregulation

The final alternative, more promising than the safe haven argument, is financial deregulation. This would raise deposit rates, drawing funds from abroad. If it signaled an increase in financial competition in the U.S., it might draw foreign funds into non-bank lending. This would contribute to downward pressure on bank lending rates, contributing to a narrowing of the spread. It is obvious from Figure 4 that this narrowing has indeed occurred. The inflow would also result in dollar appreciation.

This alternative is susceptible to the second two counter-arguments presented to the tax effect. It should be expected to yield an investment boom as lending rates fall, and its logic says that a major shift in the budget deficit should have

the effects shown in Figure 2. So to this writer the conclusion is clear: the shift in the budget did it!

Footnotes

[1]Here, for simplicity, I ignore changes in the term structure of interest rates and focus on "the" real rate. See Branson, Fraga, and Johnson (1985) for the analysis of relative movements of short and long rates consistent with the story being told here.

[2]The slope is given by $X'/(S'-I')$.

[3]The vertical measure of the shift is just $\rho'(B)$.

[4]The technical analysis of the movements in long and short rates with expected fiscal policy, complete with speculative bubble dynamics, is given in Branson, Fraga, and Johnson (1985).

[5]The technical analysis of a switch from creditor to debtor position is provided in Buiter (1984) and in Branson (1985). The switch moves the market onto a saddle path into the new debtor equilibrium.

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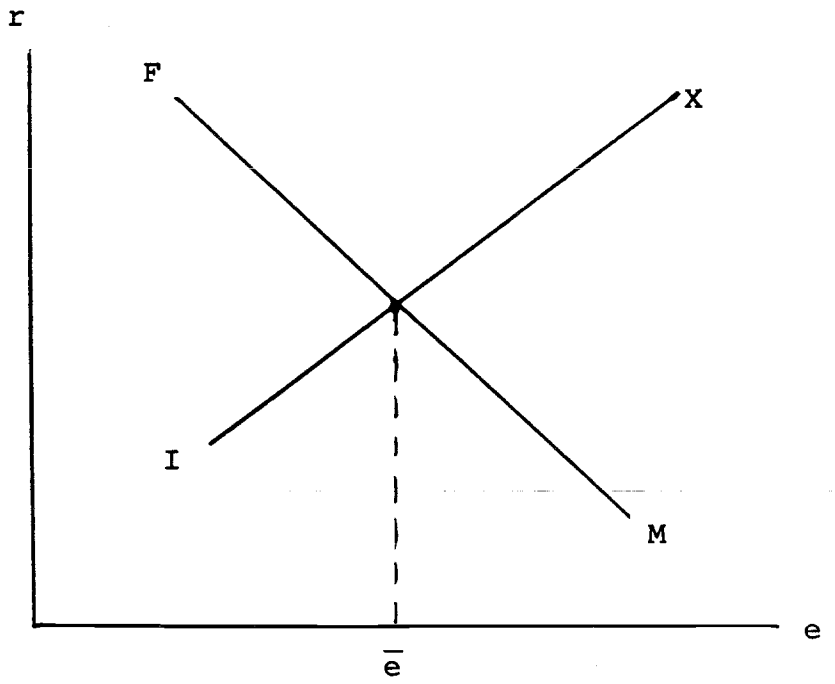

Figure 1: Equilibrium r and e.

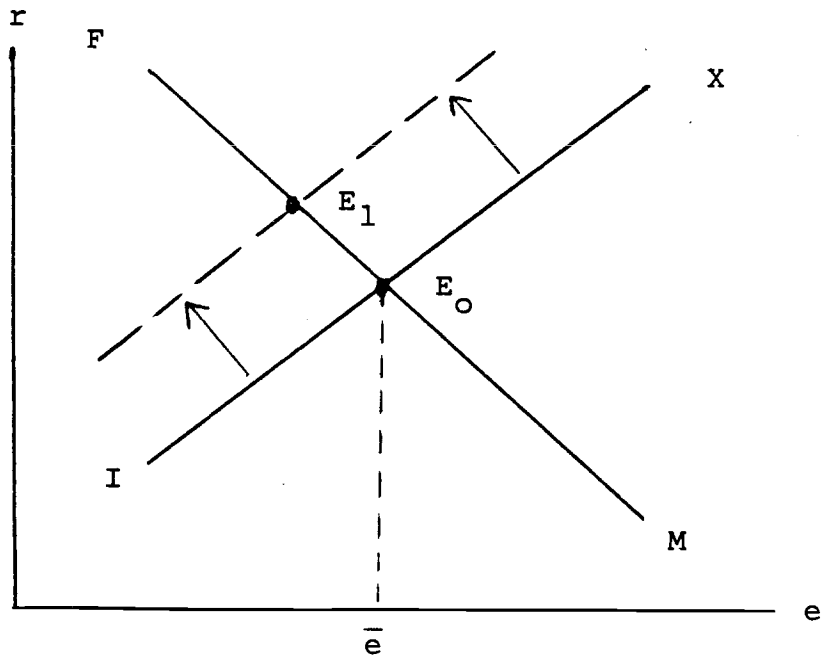

Figure 2: Shift in the Structural Deficit.

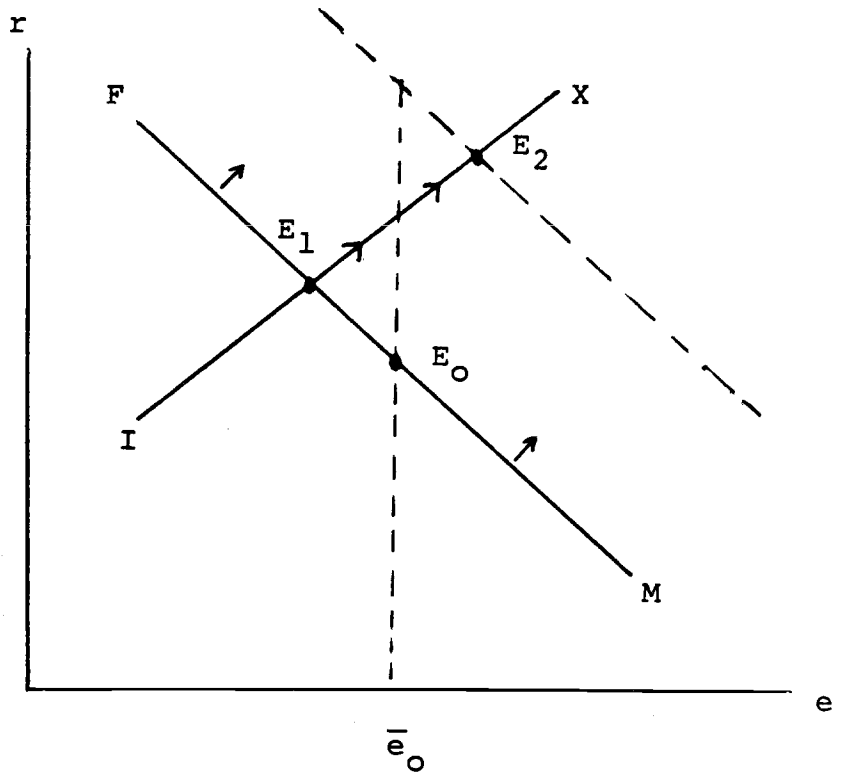

Figure 3: Accumulation of Dollar-denominated Debt

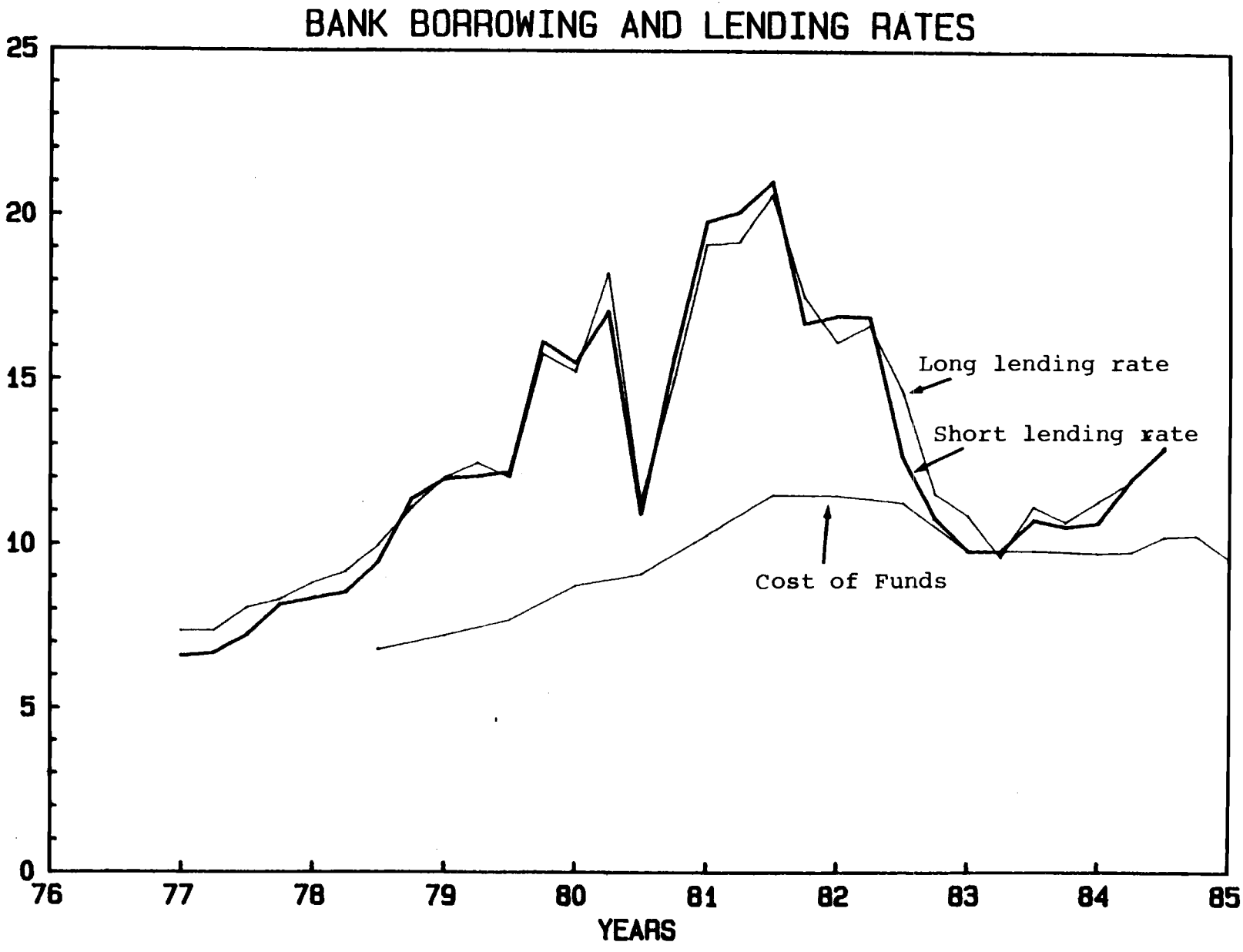

Figure 4: Bank Lending and Borrowing Rates

Lending rates: Commercial Loans and Investments
Cost of funds: To Savings and Loans

Table 1: Definitions of Symbols

National Income Flows (all in real terms)

Y = GNP

C = Consumer expenditure

I = Gross private domestic investment

G = Government purchases of goods and services

X = Net exports of goods and services, or the current account balance

S = Gross private domestic saving

T = Tax revenue

NFI = Net foreign investment by the U.S.

NFB = Net foreign borrowing = − NFI

Prices and Stocks

r = Real domestic interest rate

i = Nominal domestic interest rate

i^* = Nominal foreign interest rate

e = Real effective exchange rate (dollars per unit of foreign exchange); an increase in e is a depreciation of the dollar

$\hat{e}$ = Expected rate of change of e

$\hat{P}$ = Expected rate of inflation

ρ = Risk premium on dollar-denominated bonds

B = Outstanding stock of government debt

TABLE 2: NATIONAL INCOME FLOWS, INTEREST RATES, AND EXCHANGE RATES.

YEAR	CURRENT ACCOUNT DEFICIT (billions) $	EXCESS DOMESTIC SAVING (billions) $	TOTAL BUDGET DEFICIT (billions) $	REAL LT INTEREST RATE (%)	REAL EXCHANGE RATE ($/composite	RATIO BUDGET DEF. TO GNP (%)
1979:1	-3.4	-15.4	-22.2	0.5	1.01	0.4
1979:2	4.3	-17.4	-20.1	-.2	0.99	0.2
1979:3	-2.7	-14.6	-12.9	0.3	1.03	0.7
1979:4	4.6	-15.6	-2.1	1.6	1.01	1.1
1980:1	2.9	-7.3	7.5	3.6	1.00	1.5
1980:2	-7.9	43.0	38.1	2.1	0.99	2.5
1980:3	-21.5	61.3	43.3	1.9	1.02	2.8
1980:4	-3.5	37.1	33.9	3.0	0.99	2.5
1981:1	-13.6	9.5	9.7	2.5	0.95	1.6
1981:2	-1.8	5.1	11.4	2.9	0.88	1.7
1981:3	-2.9	19.5	23.3	5.1	0.83	2.0
1981:4	-9.3	69.0	62.4	4.4	0.87	3.2
1982:1	-2.5	84.6	73.8	5.3	0.83	3.5
1982:2	-11.1	91.8	77.6	6.4	0.80	3.6
1982:3	18.9	112.4	130.4	5.8	0.76	5.3
1982:4	20.9	147.8	179.2	5.2	0.76	6.8
1983:1	4.1	140.1	151.7	6.6	0.78	5.8
1983:2	30.9	88.5	123.4	6.4	0.76	5.1
1983:3	41.5	96.7	133.5	8.1	0.74	5.4
1983:4	59.1	75.0	129.3	8.4	0.74	5.2
1984:1	77.7	27.5	107.4	8.3	0.73	4.5
1984:2	85.0	33.2	109.2	9.6	0.72	4.4
1984:3	119.4	26.6	133.0	9.0	.	4.8
1984:4	81.5	71.6	140.1	7.8	.	5.1

Data from Citibase and IFS tapes. Real long term interest rates are the net of the long term (20 year) bond rate and inflation. The real exchange rate series (IFS) is based on relative normalized unit labor costs. A decrease in the real exchange rate represents an appreciation. The TOTBDEF series include the federal balance as well as the state and local balances. The CAB is NIPA net foreign investment summed with net capital grants received by the U.S.. XDOMSVNG is the difference between Gross Domestic Savings and Gross Domestic Investment in the U.S. . FDEFGNP is the ratio of the U.S. federal deficit to GNP (multiplied by 100).

Table 3: CYCLICAL AND STRUCTURAL COMPONENTS OF THE FEDERAL BUDGET DEFICIT, FISCAL YEARS 1980-89.

(Billions of Dollars)

FISCAL YEAR	TOTAL	CYCLICAL	STRUCTURAL
Actual:			
1980	60	4	55
1981	58	19	39
1982	111	62	48
1983	195	95	101
Estimates (current Services):			
1984	187	49	138
1985	208	44	163
1986	216	45	171
1987	220	34	187
1988	203	16	187
1989	193	-4	197

Sources: Budget of the United States Government Fiscal Year 1985 and Council of Economic Advisers.

comment on

CAUSES OF APPRECIATION AND VOLATILITY OF THE DOLLAR

by

Jacob Frenkel

INTRODUCTION

Our experience with flexible exchange rates has been very sobering. We have been reminded again and again that exchange rates, and especially short-term changes in exchange rates are unpredictable.

I am sure that many of us, academics, policy makers, and market practitioners alike have shared at one point or another the frustration of what Governor Henry Wallich termed as "the allusive dollar". When we thought that the purchasing-power-parity model worked, it collapsed; when we thought that the simple monetary model worked, it failed; when we thought that a richer portfolio-balance model worked, it also failed; when we turned to the current-account model, we did not get much help--and so on and so forth. In fact, as a first approximation, exchange rates seem to follow a random walk. Therefore, by and large, changes in exchange rate (aside for trends) are unforecastable.

In view of these inherent difficulties market analysts have adopted one of the following two alternative strategies. First, they have been mainly concerned with long-term forecasts. In this vein we have recently been offered doomsday forecasts on the future course of the dollar. According to such forecasts the dollar is bound to fall at some future time and, when it falls it will fall very fast. Such crash-landing forecasts may at best be useful in highlighting possible implications of inconsistent macroeconomic policies. They are of little use for the short and the medium runs. Furthermore, since such long-run forecasts are typically open ended, in many cases they cannot even be refutable. In this sense the usefulness of such predictions may not be much greater than Keynes' dictum that "in the

long run we are all dead"--a dictum about which Robert Solow of MIT once remarked that Keynes was always good in making long-term forecasts.

The alternative strategy adopted by market analysts reflects the belief that "if you can't forecast well, forecast often". The basis for such a belief must probably be the notion that "a theory a day keeps your critics at bay". As a result there has been nothing more confusing than reading through the ex-post journalistic explanations offered for the day-to-day changes in the U.S. dollar. For example, over the past few years we were told that:

> "the dollar fell because the money supply grew faster than expected--thereby generating inflationary expectations"

but, on another occasion we were told that:

> "the dollar rose because the money supply grew faster than expected--thereby generating expectations that the Fed is likely to tighten up and raise interest rates."

On another date we were told that:

> "the dollar fell since the budget deficit exceeded previous forecasts--thereby generating inflationary expectations on the belief that the Fed will have to monetize the deficit"

but, on another occasion we were told that:

> "the dollar rose since the budget deficit exceeded previous forecasts--thereby generating expectations that government borrowing-needs will drive

up interest rates since the Fed will be unlikely to give up its firm stance."

On yet another day we were told that:

"the dollar fell since oil prices fell--thereby hurting Mexico and other debt-ridden oil-producing countries whose bad fortune may bring about the collapse of important U.S. banks"

but, on another occasion we were told that:

"the dollar rose since oil prices fell--thereby helping the debt-ridden oil-consuming countries whose improved fortune will help the vulnerable position of important U.S. banks."

How did the "theory a day" approach explain the zig-zag in the value of the dollar during the past three days? Here the explanation was given in terms of the estimates of GNP growth rate; accordingly we were told:

"the dollar changed again because the extent of the revision of the estimated GNP growth rate was smaller than the expected revision of previous forecasts of these estimates".

One cannot but sympathize with the difficulties shared by newspaper reporters and financial analysts who feel obliged to come up with daily explanations for daily fluctuations of exchange rates, and one can only imagine the deep frustration that yielded the recent headline in the International Herald Tribune according to which:

"the dollar rose on no news."

BRANSON'S ANALYSIS

Evaluated against this background, Bill Branson's paper on the "Causes of Appreciation and Volatility of the Dollar," represents a serious effort to provide a logical story accounting for the evolution of the U.S. dollar since early 1981. His framework is attractive in that it recognizes that even though day-to-day changes in exchange rates are intrinsically unpredictable, economic theory and experience have taught us that broad trends can frequently be accounted for in terms of conventional economic fundamentals. Accordingly, in explaining the evolution of the dollar Branson focuses on one important fundamental--the budget deficit--which he believes did it all--in his words "...the conclusion is clear: the shift in the budget did it."

In order to establish his thesis Branson constructs a simplified real model in which the monetary sector is not even invited to make a guest appearance. According to the basic story, the announcement of The Economic Recovery Tax Act of early 1981 along with the announcement of a multi-stage build-up of defense spending, implied large structural budget deficits and started the process of dollar appreciation. Treating the structural deficit as the exogenous shock and using the identities of national income accounts, Branson shows that the budget deficit must crowd out domestic spending by raising the saving-investment gap; alternatively (or in addition) the deficit can be financed by the rest of the world through the generation of a deficit in the current account of the balance of payments. Branson concludes, sensibly, that the rise in the rate of interest and the real ap-

preciation of the dollar were necessary in order to bring about the saving-investment gap and the current account deficit needed to finance the large U.S. budget deficit.

This brings us up to February 1985. But what about the decline of the dollar that took place in the subsequent few months (and which I assume resulted in a change in the title of this conference from the original title on the "strong U.S. dollar" to the present title on "the U.S. dollar")? In order to account for that reversal Branson introduces the critical issue of sustainability. He argues that the rise in U.S. debt-service requirement and the path along which U.S. debt increases continuously are not sustainable. For the cumulative current account deficit will eventually make foreign investment in the United States risky and will command a risk premium. As a result it is likely that further capital inflows into the United States will not be forthcoming. The limited capital inflow will make the deficit in the current account of the balance of payments unsustainable, and will necessitate its reduction. The mechanism that will bring about such a reduction is a drastic depreciation of the dollar. According to Branson the depreciation which took place after the dollar has reached its peak in February 1985 may have signaled the start of that process.

Even though this story seems consistent with the general course of events, Branson recognizes that there is a bit of a problem in accounting for the precise timing of the events at both ends of the process. To begin with the announced Tax Act of 1981 implied that the structural deficit will occur only by late 1982. Yet, interest rates and the dollar started their upward trend much earlier. A similar difficulty is also present at the other end of the process. Specifically, it is not clear what caused the

start of the reversal in late February 1985 (leaving aside the more important question whether the process of depreciation has actually began?) In order to deal with the difficult question of timing Branson relies on the powerful (but somewhat arbitrary) argument--expectations. Accordingly, the early 1981 credible announcement of the future deficit induced asset holders to anticipate a future appreciation of the dollar and a rise in interest rates. As a result, like all good asset market theories tell us, these anticipated future changes were translated into immediate changes in interest rates and exchange rates even though the policies which have allegedly induced these changes have not yet been undertaken. Similarly, Branson argues that the decline of the dollar can also be explained in terms of expectations. Accordingly, the inevitable future implications of continuous debt accumulation have already raised current risk premia and, thereby, have induced the dollar depreciation that started in late February 1981.

ADDITIONAL FACTORS

Branson's analysis is consistent with the facts and, as such, it cannot be rejected on purely logical grounds. He designed his analytical framework in order to highlight the unique role that U.S. budget deficits have played in effecting the path of the dollar and of real interest rates. Within this framework he accomplished his task. My main comment, however, is that by focusing the discussion on U.S. policies alone and by constraining the analysis to a "real" model, Branson's explanation does not allow for two important additional factors--those which stem from the

monetary sector and those which stem from development in the rest of the world.

Monetary Policy

Concerning the first, is seems clear to me that the drastic (and highly successful) course of the disinflationary monetary policy that was undertaken by the United States has surely contributed significantly to the early rise in real interest rates and to the early phase of dollar appreciation. Most likely during those early phases actual monetary policy rather than expected future fiscal policy was at the center stage. The evidence that lends credence to this alternative explanation is provided by the fact that short-term rates of interest rose. Such a rise can be easily accounted for in terms of tight money. It is much more difficult to account for it in terms of expectations about future budget deficits. Similarly, the recent depreciation occurring at the other end of the period under analysis (since February 1985) can also be explained in terms of conventional monetary factors. Accordingly, the dollar's drop owes much to the significant slowdown in the rate of growth of the U.S. economy coupled with the prevailing growth of the money supply. The combination of the path of monetary policy and the slow growth of real GNP has meant that, in relative terms, money was more loose than before and, therefore, the dollar depreciated. In view of these considerations I would suggest that in explaining the evolution of the dollar a stronger role be given to the course of monetary policy.

The Budget Deficit: A Broader Perspective

Branson's formulation views the "budget deficit" as the basic measure of the stance of fiscal policy. I believe that this concept, even when modified to allow for cyclical factors, may not be sufficiently operational for concrete policy recommendations. Almost any macroeconomic model suggests that there is a significant difference between the effects of budget deficits arising from a change in government spending and the effects of equivalent deficits arising from a change in taxes. (And one does not need to believe in the extreme version of the "Ricardian equivalence" proposition in order to make this assertion). Further, most models suggest that the structure of taxes and government spending maybe critical. For example, it matters very much whether the tax cut falls on the corporate sector or on households and whether the tax cuts are transitory or permanent. Likewise, it matters whether government spending falls on goods produced by the tradable-goods sector or by the non-tradable goods sector and whether changes in spending are permanent or transitory. Finally, the exchange-rate and real interest-rate effects of budget deficits depend critically on whether the deficits are likely to be financed through borrowing or through monetary expansion. All of these issues are of prime importance. The entire profile of the relations among exchange rates, interest rates and fiscal policies may hinge on them. Therefore, even in a "real" model that focuses on the role of fiscal policies I would prefer to see the budget deficit decomposed into its components.

I wish to emphasize that I am in full agreement with Branson's conclusion that fiscal policies in the United States have played a major role in recent years. It is almost self evident that the evolutions of the U.S.

dollar and real rates of interest during the past few years cannot be fully explained without attaching a significant weight to U.S. fiscal policies. At the same time, however, it is noteworthy that the historical record concerning the relation between budget deficits and real exchange rates is not unambiguous. As a matter of fact the experiences of other countries as well as that of the United States during other periods do not suggest a clear cut, strong and universal relation. In view of this ambiguity it would be useful if we supplement the date from the most recent U.S. experience with additional data pertaining to other experiences here and abroad during other historical episodes.

Knowledge of the broader historical record could be instrumental in preventing the repetition of past mistakes and could be justified by George Santayana's famous dictum according to which "those who cannot remember the past are condemned to repeat it". Unfortunately, when applying this dictum to the study of the relation between two macroeconomic variables like budget deficits and the real exchange rate one faces significant difficulties since it is frequently observed that "the past is not what it used to be". Furthermore, and in contrast with many of the experimental sciences, when forecasts of the impact of policies on the behavior of individuals are made on the basis of past experience one may frequently observe that also "the future is not what it used to be". The inherent difference between social and physical sciences reflects the impact of experience and memories on individual behavior. It renders the study of past records somehwat less useful since once we go through an experience (as individuals or as a society) we cannot ignore it and start all over again. Therefore, it can only be expected that statistical correlations which prevailed at some point

in time may not remain intact under different circumstances. The present (and the future) are likely to differ from the past not because "people and governments have never learned anything from history" as argued by Wilhelm Friedrich Hegel but rather because the present has the benefit of hindsight whereas the past did not have the benefit of foresight. In view of these considerations, and in recognition of the fact that the recent episode represents a narrow segment of U.S. and other countries' experience, I would be a bit more cautious in drawing far reaching conclusions concerning the singular role of the budget deficit.

The Role of Foreign Economies

The second factor that could be usefully added to Branson's analysis of the causes for the evolution of the U.S. dollar concerns fiscal policies in the rest of the world. In this context it is relevant to note that during the same period that the United States followed expansionary fiscal policies, the U.K., West Germany and Japan adopted a relatively contractionary fiscal stance. The real appreciation of the dollar owes a great deal to the combination of tight fiscal policy abroad and loose fiscal policy at home. Further, the pace of economic recovery in Europe has been much slower than the U.S. pace--a lack of synchronization that has also contributed to the real appreciation of the dollar.

In addition to helping to account for the evolution of the dollar, the incorporation of the foreign economies into the analysis may also serve another useful role--it may contribute to the reduction of the pressures for protectionism. It is hard to recall another period in which sentiments for protection have been so widespread in the United States as they are at the

present. An excessive emphasis on the U.S. budget deficit as the sole cause for the dollar strength and the growing frustration with the efforts to reduce the U.S. fiscal deficit by conventional measures have brought about new desperate arguments for the adoption of protectionist measures like import surcharges. The danger with such recommendations is that they might receive the political support of two otherwise unrelated groups. They are likely to gain the support of the traditional advocates of protectionism who claim to defend local industry and workers from foreign unfair competition. But, more dangerously, they may gain the support of those whose exclusive concern with the budget deficit leads them to support almost any policy that raises fiscal revenue. Import surcharges, once in place (even those surcharges that are adopted as "temporary measures") are hard to remove since, as George Stigler once remarked "a sustained policy that has real effects has many good friends". At the present there are very few measures whose long term costs to the interdependent world economy may be as high as protectionist measures. Taxes on trade will hurt exports, and will restore inward looking economic isolationism instead of outward looking economic coordination. Protectionist measures will transmit the wrong signals to those developing countries that are still attempting to resist domestically popular pressures to default on their debt, and, further, they may ignite trade war. Therefore, in analysing the causes for the evolution of the U.S. dollar it is useful to recall that out there, there are other economies whose own fiscal stance has contributed to the dollar's strength and who are likely to retaliate and open up a trade war if the United States attempts to "solve" its budgetary difficulties by means of import tariffs.

The Safe-Haven Argument

Following his analysis of the mechanism by which the value of the dollar and the real rates of interest have been related to the path of the budget deficit, Branson mentions several additional explanations that have been advanced at one point or another. Among these explanations is the "safe haven" argument according to which the dollar strength can be explained in terms of portfolio shifts towards the relatively safe dollar-denominated assets. There are at least two interpretations of the safe-haven argument. The first emphasizes the political stability of the U.S. relatively to other parts of the world in which the risks of expropriations and defaults are higher. The difficulty with this interpretation is that, except for special situations associated with the Iranian revolution and with some of the Latin-American crises, it is hard to associate the periods of sharp rises in the value of the dollar with corresponding deteriorations in political stability abroad. Further, we have not observed a corresponding decline in stock-market indexes in Europe and Japan (a drop that should have taken place if indeed foreign investors divested themselves from other assets in order to purchase U.S. assets), nor did we observe a significant differential between rates of return on dollar denominated assets issued in New York and other dollar denominated assets issued in the Euro-currency markets.

The second interpretation of the safe-haven argument emphasizes the confidence that asset holders have in the overall course of U.S. macro-economic policies. Thus, it focuses on the economic stability that is implied by U.S. policies. Accordingly, the successful disinflation and the economic recovery have made dollar denominated assets attractive. The

difficulty with this argument is that, as with the previous one, it is hard to identify those developments in recent U.S. macroeconomic policies that have contributed to enhance confidence by market participants exactly during periods corresponding to dollar appreciation. This difficulty is magnified once we recall that, on the whole, during the period of dollar appreciation the market interpreted the sustained record budget deficits as bad news concerning the stabilizing effects of U.S. macroeconomic policies.

In principle, the short phase of dollar depreciation following its peak level in February 1985 could also be interpreted in terms of the safe-haven argument. Accordingly the rise in external U.S. liabilities consequent on the cumulative current-account deficit changed the ratio of the outstanding supply of U.S. to foreign bonds. This change raised the risk premium on dollar denominated assets and reduced their attractiveness. The difficulty with this argument (as well as with Branson's own interpretation of the depreciation) is that, as an empirical matter, various studies have found that the quantitative magnitude of the risk premium is extremely small. Furthermore, as a theoretical matter, by ignoring the role of stocks and other real assets the specification of the risk premium as depending exclusively on the relative supplies of bonds of different currency denominations focuses on a very narrow segment of asset holders portfolios. On the basis of these considerations I share Branson's skepticism concerning the force of the safe-haven argument.

CRASH LANDING?

One of the great attractions of Branson's approach is his attempt to explain the evolution of the dollar in terms of fundamentals. My own comments attempted to supplement his choice of fundamental (the U.S. budget deficit) with two additional ones--U.S. monetary policy and foreign fiscal policies. The virtues of the "fundamentals-approach to the analysis of the dollar" are that once we identify the relevant list of fundamentals, we may proceed in making concrete policy recommendation as well as in making reasonable forecasts of the prospects for the dollar (based, of course, on forecasts on the likely course that will be followed by the fundamentals). These characteristics are not shared by other approaches like the "bubble approach" that has gained popularity in recent years in spite of the mounting evidence against it.

If the fundamentals approach is to be taken seriously then forecasts of the path of the dollar must be conditional on forecasts on the paths of the fundamentals. Since all the evidence suggest that at least for the medium run the U.S. budget deficit is there to stay, and since by all indications the Federal Reserve Board is unlikely to depart to a significant extent from its anti-inflationary posture, it is difficult to rationalize forecasts of dollar collapse and crash landing as long as these policies remain (and are expected to continue to remain) in place. Can expectations behave erratically and in so doing lead to a collapse of the entire house of cards? Of course they can. But, as long as expectations are based on the model whose outcomes they are purport to be forecasting, it is unlikely that they will behave in a manner that is entirely divorced from the implications

of the actual changes in the Fundamentals. Thus, I conclude that a crash landing is unlikely.

EXCHANGE-RATE VOLATILITY

In addition to dealing with the secular trends of the dollar, Branson points out that volatility is an intrinsic part of flexible exchange-rate regimes. As it were, volatility comes with the territory. In this context Branson notes that the fact that volatility is normal, does not imply that it is good. Thus he concludes without amplification that "policy regarding this volatility is rightly an urgent matter".

I definitely agree with Branson's statement that under a flexible exchange-rate regime exchange rates are likely to be volatile expecially if the underlying factors (including, of course, the underlying policies) are volatile. I also share Branson's judgment that volatility is an urgent matter. I am concerned, however, that such pronouncements, unless they specify how and whether we should act on that urgency, may lead (even unwillingly) towards the adoption of undersirable policies. They may result in the adoption of various intervention rules that may reduce the volatility of exchange rates at great cost. The key point to realize is that the volatility of exchange rates is not the likely source of the difficulties but rather a manifestation of the prevailing package of macroeconomic policies. Fixing or manipulating the rates without introducing a significant change into the conduct of policies may not improve matters at all. It may amount to breaking the thermometer of a patient suffering from high fever instead of providing him with proper medication. The absence of the thermometer will only confuse matters and will reduce the information

essential for policymaking. If volatile events and macropolicies are not allowed to be reflected in the foreign exchange market, they are likely to be transferred to, and reflected in, other markets (such as labor markets) where they cannot be dealt with in as efficient a manner.

The preceding argument ignored, however, one of the important characteristics of the gold-dollar system which various proposals for reduced flexibility of exchange rates attempt to promote, i.e., the characteristic of the "discipline of the exchange." Accordingly, it could be argued that the obligation to peg the rate or to follow a predetermined intervention rule would alter fundamentally the conduct of policy by introducing discipline. Experience seems to suggest, however, that national governments are unlikely to adjust the conduct of domestic policies so as to be disciplined by the exchange-rate regime. Rather, it is more reasonable to assume that the exchange-rate regime is more likely to adjust to whatever discipline national governments choose to have. It may be noted in passing that this is indeed one of the more potent arguments against the restoration of the gold standard. If governments were willing to follow policies consistent with the maintenance of a gold standard, then the standard itself would not be necessary; if however, governments are not willing to follow such policies, then the introduction of the gold standard per se will not restore stability since, before long, the standard will have to be abandoned. In short, no exchange-rate system can protect us from bad policies.

ON INTERNATIONAL MONETARY REFORM

In view of the disruptive effects exerted by the strong and the highly volatile dollar, various proposals for reform of the international monetary system have been put forward. Is this the time for reform? I believe not! If indeed the root cause for the current difficulties lies in the fiscal positions of the United States, Europe and Japan, then the solution for the problems does not call for a monetary reform, for tariff and protectionism, for taxes on capital flows (or for other measures which throw sand in the wheels), nor does it call for intervention rules. Rather, it calls for a restoration of fiscal order in which the United States adopts more contractionary fiscal stance while Europe and Japan adopt a more expansionary stance. I believe that the central difficulties with the current regime do not rest with the exchange rate system or with the exchange-rate policies; rather, they rest with the overall mix of the uncoordinated macroeconomic policies. It is unlikely, therefore, that the introduction of exchange-rate targets or other superficial measures dealing only with the symptoms of the disease can do any good unless they are accompanied by drastic changes in the way in which macropolicies are being designed. In fact, the adoption of policies that deal with anything but the ultimate root cause may do more harm than good. For, placing excessive weight on the role of exchange rates may divert attention from the more central role that global macroeconomic policies play in the interdependent world economy.

In general, in assessing various plans for reform it is pertinant to recall that a critical feature of any operational monetary system must be a formal resolution of the so-called (n-1) problem. We have n currencies and only $n-1$ independent exchange rates. We thus have one degree of

freedom and its disposal must be explicitly specified. It takes two to tango and it takes one for intervention. The original Bretton Woods system allocated the degree of freedom to the United States which obliged itself to peg the price of gold at $35 an ounce; the other n-1 countries then committed themselves to peg their currencies to the U.S. dollar. A design of the international monetary system is not complete unless it provides a resolution of this (n-1) problem. Therefore, in evaluating the alternative proposals my question would be how do these alternative systems deal with the extra degree of freedom. A reform of the international monetary system might be viewed as a constitutional change that occurs once in a lifetime, a "step of last resort" which might be thought of as the available bullet. Reforming the international monetary system is unlikely to solve our current problems unless the world fiscal system gets its act together. Last bullets should be used reluctantly. Once fired, they better not miss.