

Commentary on "Is the Strong Dollar Sustainable?"

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It is a pleasure to discuss Paul Krugman's stimulating paper, "Is the Strong Dollar Sustainable?" and to comment more generally on the factors responsible for the dollar's recent remarkable strength and on the prospects for the future course of the dollar. The organizers of this conference are to be congratulated for selecting an especially appropriate locale for consideration of these issues. **O**ur plane ride through the turbulent air currents prior to landing at Jackson Hole, our raft trip down the rapids of the Snake River, and the jagged profile of the Tetons should remind all of us of the dominant facts of our experience with floating exchange rates. Exchange rates fluctuate, sometimes by large amounts over relatively brief periods, causing at least occasional discomfort to many whose prosperity is linked directly or indirectly to international trade and finance.¹

As a member of the Business Forecast Panel of the University of Chicago's Graduate School of Business, I occasionally hazard predictions of the **future** behavior of key macroeconomic variables. In my forecast of November 29, 1984, I suggested that the foreign exchange value of the dollar was likely to decline by eight or ten percent over the coming year and a half. At least since March, this forecast has proved accurate. Before claiming excessive prescience, however, I should note that in December 1983, I forecast a similar decline in the foreign exchange value of the **dollar**—a forecast that has not proved remarkably accurate.

I mention these forecasts for two reasons. First, they illustrate that any forecast of the behavior of exchange rates needs to be taken with a substantial grain of salt. The fact is that most exchange rate changes are essentially random. They are difficult to forecast in advance. In most cases, they are difficult to explain even after they have occurred. Second, and more impor-

¹ Of course, fixed exchange rate systems also have their problems. The purpose here, however, is not to discuss the relative merits of fixed and floating exchange rate systems.

tant for the purposes of the present discussion, these forecasts indicate a view I share with Paul Krugman and with many other economists at this conference and elsewhere that the foreign exchange value of the dollar is presently above its sustainable long-run equilibrium level and that it is likely to decline (probably over a jagged and erratic course) during the next few years. Moreover, I share the view of many economists and policymakers that such a downward adjustment in the foreign exchange value of the dollar, provided it is not too large, would be generally beneficial from the perspective of the United States and of other countries.

In this context, the foreign exchange value of the dollar means the "real exchange rate of the dollar" defined as an appropriate weighted average of nominal exchange rates of the dollar, adjusted for the ratio of U.S. prices to an appropriate weighted average of the prices of our major trading partners. The sustainable long-run equilibrium value of the dollar refers to the real exchange rate of the dollar that is consistent with a sustainable level of our current account under normal economic conditions. For reasons to be discussed later, the sustainable level of our current account balance (on average over a ten or 20-year horizon) might not be zero, but it is almost surely not a deficit of about three percent of GNP that now appears likely for 1985. Absent a dramatic and unanticipated exogenous shift of world demand toward U.S. products, a significant decline in the real foreign exchange value of the dollar (which would make U.S. products more competitive in our markets and in foreign markets) appears essential if this current account deficit is to be reduced to a sustainable level in the longer run.²

Thus, I have no disagreement with Paul Krugman concerning the necessity and desirability of some significant downward adjustment in the foreign exchange value of the dollar. I do disagree, however, with Krugman's analysis of what is responsible for the present strength of the dollar, and I question Krugman's estimates of the extent of real depreciation of the dollar that is required to establish a sustainable level of the current account balance. Using a simple formal model, Krugman argues that the current value of the dollar exceeds any reasonable estimate of what can be accounted for by rational evaluation of economic determinants of the dollar's value. He concludes that the overvaluation of the dollar (above the level that can be rationally accounted for in his model) must be due to an irrational "speculative bubble" that may be expected to burst at some unspecified future time. He estimates that a 33 percent real depreciation would be required to reach equi-

² If there were rapid improvement of technical efficiency in U.S. tradable goods industries, then adjustment could be achieved through real depreciation of the dollar measured using production cost indices. In this case, the real value of the dollar measured using consumer price indices could remain steady or even rise.

librium if adjustment occurred immediately and that a 56 percent real depreciation would be required if the United States continues expanding its international indebtedness (along the path predicted by Krugman's model) for another **23.3** years before reaching a sustainable equilibrium.^{3,4}

I shall argue that the evidence is too weak to justify strong assertions that the dollar's current **strength** must be at least partly attributable to an irrational "**speculative bubble**." I shall maintain that under plausible assumptions, the dollar's current value can be explained as a rational economic phenomenon within the context of Krugman's own model. In addition, I shall argue that a real depreciation of **20** percent or less may suffice to achieve a sustainable level of the current account under normal economic conditions.

To develop these arguments, it is first useful to give a brief summary of the **analytical** basis of Krugman's conclusions. (Consideration of some more technical issues relating to Krugman's formal analysis is deferred to an appendix.) With this background, I shall then discuss the following points which are relevant in assessing the validity of Krugman's conclusions. First, it is questionable whether the real foreign exchange value of the dollar was at its long-run equilibrium value in 1980 when it was barely above the minimum real value experienced during at least the past 40 years.⁵ Rather, it is plausible to suppose that the dollar may have been below the real value consistent with a sustainable level of the current account balance in 1980, and that perhaps a real appreciation of ten or 15 percent was justified as a move toward a sustainable long-run equilibrium. Second, a substantial part of the **real** appreciation of the dollar since 1980 is probably attributable to factors that play no role in Krugman's analysis but do play an important role in many other analyses of exchange rate behavior; namely, the important shift in the actual and expected monetary policies of the United States and other countries since 1980. The substantial shift in perceptions of Federal **Reserve** policy from being quite lax in the late 1970s to being quite tight in the early 1980s almost surely contributed to the remarkable strengthening of

³ These percentage changes are measured as logarithmic **first** differences: that is, a 33 percent real depreciation of the dollar means that the natural logarithm of the real exchange rate of the **dollar** declines by 0.33. This translates into a 39 percent increase (in the normal sense) of the real value of other currencies in **terms** of the dollar, or a 28 percent reduction (in the normal sense) of the real value of the dollar in terms of other **currencies**. Logarithmic changes are used because they treat "percentage" increases and decreases symmetrically.

⁴ A 33 percent real depreciation is required immediately based on **Krugman's** assumption that the United States now has a zero net foreign debt—our foreign assets exactly offset our foreign obligations. The 56 percent real depreciation takes account of the effect of accumulating foreign debt equal to 45.7 percent of our GNP.

⁵ Estimates of the real exchange rate **are** generally available starting **around** 1970. It is clear that if these series **are** extended backward, the dollar was stronger in real terms before 1970 than from 1973 through 1980.

the dollar in foreign exchange markets in both nominal and real terms. Third, it is doubtful that projected or actual growth of the federal deficit was the predominant cause of the strengthening of the dollar since 1980. Experience in the United States and other countries does not indicate that government deficits have a uniformly powerful and positive effect on real exchange rates. Fourth, the present current account deficit of the United States is partly the consequence of a variety of temporary disturbances whose gradual abatement should be expected to improve the current account balance even without any significant depreciation in the real foreign exchange value of the dollar. This, in turn, implies a reduction in the estimated extent of real depreciation required to achieve a sustainable level of the current account balance. Fifth, the probable excess of desired saving over desired investment in many of the other industrial countries and the likely **impediments** to rechanneling this excess saving into investment in developing countries imply that the equilibrium level of the U.S. current account balance is probably one of substantial deficit. The sustainable and desirable level of this deficit is probably not as large (relative to U.S. gross national product) as the deficit we will have in 1985, but any substantial and sustainable deficit implies a smaller real depreciation of the dollar at least in the intermediate term. Sixth, the capacity of the United States to absorb foreign investment (in government bonds, in private securities, or in direct foreign holdings of assets located in the United States) is undoubtedly very large. Hence, we need not be excessively concerned, as Krugman is, that there will be a sudden revolt of foreign investors leading to a precipitous decline in the value of the dollar. Seventh, when we take account of these considerations and make other appropriate adjustments to Krugman's analysis, there is no convincing case that the dollar is irrationally overvalued. For this reason, and for another important reason that I stress in my concluding remarks, I reject Krugman's basic conclusion that the market is necessarily wrong and that we are reduced to "theories" of irrational behavior in which exchange rates are allowed "to drift at will."

Krugman's analytical framework

Krugman's conclusions are based on an admirably simple analytical framework that encompasses five basic elements. First, the current account deficit as a fraction of GNP (exclusive of interest payments on our net foreign debt), B , is assumed to be proportional to the deviation of the logarithm of the real exchange rate, E , from its (trade balance) equilibrium value, \bar{E} ; that is, $B = \gamma (E - \bar{E})$, where the factor of proportionality, $\gamma = 0.1$, is such that a one percent increase in E relative to \bar{E} implies a one-tenth of one percent deficit relative to GNP. The equilibrium value \bar{E} is assumed to be the logarithm of the real exchange rate that prevailed in 1980. The cur-

rent excess of E over E is estimated to be 0.33, implying a current account deficit (exclusive of interest payments on foreign debt) equal to 3.3 percent of GNP.

Second, the logarithm of the real exchange rate, E , is assumed to decline at a rate equal to the real interest rate differential between the United States and its major trading partners. This real interest rate differential is estimated to be 2.4 percent per year until our foreign debt to GNP ratio stabilizes and the economy achieves a steady state equilibrium.

Third, the declining value of E gradually improves the current account balance, but this is partially offset by increasing real interest payments on our expanding foreign debt. The rate of growth of foreign debt relative to GNP that results from our interest payments is equal to $(r-g)D$, where $r-g$ is the excess of our real interest rate over our real growth rate (estimated to be a constant five percent per year) and D is the ratio of foreign debt to GNP (assumed to be zero in 1985). Together, the two factors affecting the growth of the ratio of foreign debt to GNP yield Equation (4) in Krugman's paper.

Fourth, from Equation (4) one can calculate the time it takes for the ratio of foreign debt to GNP to stabilize and the ratio of foreign debt to GNP at that time. The results under Krugman's assumptions are 23.3 per year and a ratio of 45.7 percent. With a growth rate of real GNP of three percent per year and a nominal GNP of \$4 trillion in 1985, this implies that foreign debt would rise to \$3.64 trillion of 1985 dollars in the year 2008.

Fifth, Krugman argues (somewhat tentatively) that this huge level of foreign indebtedness is not achievable. Either foreign investors would revolt and refuse to lend us the money, or we would refuse to accept so large a liability against our future consumption. By considering different limits on the maximum ratio of foreign debt to GNP and prospects for sudden action to stem the growth of foreign indebtedness within five or ten years, Krugman is able to calculate (see Krugman's Table 5) the extent of overvaluation of the dollar beyond that which can be explained by his model. This excess overvaluation he attributes to a "speculative bubble" that must be the consequence of irrational behavior by market participants and that should be expected to collapse at some unpredictable future time.

The equilibrium value of the dollar

The first issue to be addressed in assessing Krugman's analysis and conclusions is his assumption that the real foreign exchange value of the dollar in 1980 represents the relevant estimate of the real value of the dollar that would induce a zero current account balance exclusive of interest payments on foreign debt and receipts of income on our investments abroad. In support of this assumption, it should be noted that the measured current account balance (including \$30 billion of net investment income) was almost zero in

1980 and that the current account outcome may have been aided by the brief but sharp recession of the spring of 1980. On the other hand, it should be noted that the current account balance improved during the first half of 1981, despite a substantial increase in the real foreign exchange value of the dollar and despite very strong real **growth** in the first quarter of 1981. Given the lags typically observed in the response of the current account to exchange **rate** movements and business cycle developments, it is arguable that some of the improvement of early 1981 was a delayed response to the weak dollar of 1980 (and earlier) that was partially offset by the strengthening dollar and strengthening economy of early 1981. In addition, the sharp upsurge in oil prices occasioned by the Iranian revolution of 1979 was probably exerting a depressive effect on the current account balance in 1980 that would be less significant now because of the weakness of the world oil **market**.⁶

Another important factor that needs to be taken into account in judging the appropriate equilibrium value of the dollar is the relationship between prices and cost for **U.S.** industries **significantly** exposed to international competition and the general level of prices and costs for the whole **U.S.** economy. 1980 was the end of a long period of weakness of the dollar in foreign exchange markets. This weakness allowed industries subject to significant international competition to remain competitive with relatively high levels of costs (including wage costs) in comparison with other **U.S.** industries. In contrast, the strong dollar of the past four years has put great pressure on **U.S.** industries exposed to international competition to improve efficiency **and** cut costs in order to remain competitive. Thus, if the dollar today fell to the same real foreign exchange value it had in 1980, based on general measures of prices and cost for the whole **U.S.** economy, industries exposed to significant international competition would probably be in substantially stronger competitive positions than they were in 1980.

Further, in assessing the equilibrium real exchange rate for the dollar, it is relevant to examine the past behavior of the real exchange rate. A variety of measures of the real exchange rate are available, using different weights for different countries and different measures of domestic and foreign prices or costs. **Virtually** all of these indices show that the real foreign exchange value of the dollar was near its all-time minimum in 1980. In particular, John Williamson's (1983) composite index of the real foreign exchange value of the dollar stood at 97.6 in 1980, only slightly above the minimum average level of 96.3 recorded in 1979, and well below the average level of the index for every other year except 1978. Essentially the same story is told by the graph

⁶ A decline in the dollar would raise oil prices in the United States and reduce them in other countries at a given dollar price of oil. Given the state of the world oil market, it is extremely unlikely that the dollar price of oil would be raised to the point where the real oil import bill of the United States rose to the level of 1980.

of the real effective exchange rate of the U.S. dollar based on the Morgan Guaranty Trust series that is shown as Chart 4 in Richard Levich's paper in this volume.

The question is whether a real foreign exchange value for the dollar that is near the minimum ever experienced and below the average level recorded for every year but three out of the past 40 can be taken as a reasonable estimate of the long-run equilibrium value of the dollar. The answer could possibly be yes, but it also could quite probably be no. As Richard Levich carefully notes in his paper, "Estimates of [equilibrium real exchange rates] could easily be in error by ten percent or more." For Krugman's purpose of demonstrating that the dollar is irrationally overvalued due to some form of speculative bubble, however, it is not appropriate to use an estimate of the equilibrium value of the dollar that may be ten percent or more too low.⁷ It is necessary to use the maximum reasonable estimate of the long-run equilibrium real value of the dollar. This estimate is almost surely ten percent or more above the level of the real exchange rate in 1980.

Monetary policy and the strong dollar

Krugman does not discuss the factors responsible for the remarkable rise in the real foreign exchange value of the dollar since 1980. He focuses instead on whether the current value of the dollar can be rationalized on the basis of expected future economic developments. This is an appropriate analytical strategy for assessing the value of an "asset price" that ought to reflect the expected discounted sum of its underlying future fundamentals.⁸ Failure to analyze the factors responsible for the rise of the dollar, however, leaves open the suggestion that a substantial part of this rise was a magical levitation supported by an irrational speculative bubble. It also raises the danger that economic factors relevant in explaining the rise of the dollar will be neglected in attempting to explain why the dollar is now so high. In particular, Krugman's model contains no explicit mechanism through which changes in monetary policy can influence the real exchange rate. In contrast, I believe that changes in actual and perceived monetary policy played an important role in the strengthening of the dollar, in both nominal and real terms, since 1980.

⁷ If one adopts Krugman's theory that the dollar is affected by irrational speculative bubbles, then there ought to be times when such bubbles artificially depress the dollar (and raise the values of other currencies), as well as times when they artificially raise the dollar. The obvious candidate for a bubble depressing the dollar is the period from 1978 to 1980.

⁸ This notion of exchange rates as "asset prices" is discussed in Frenkel and Mussa (1980 and 1985) and in Mussa (1979, 1982, and 1984.)

In the long run, of course, monetary policy should have little sustainable effect on real exchange rates. The long run for this purpose, however, might be as long as five years. For example, it was widely believed that Sterling was overvalued when reset on its prewar parity in May 1925. It took more than six years, however, until September 1931, for Sterling to be forced off its parity.⁹ During the period of floating exchange rates since 1973, it is apparent that nominal exchange rates between major currencies move much more rapidly than relative nominal price levels, thereby inducing shorter term movements in real exchange rates that parallel rather closely shorter term movements in nominal exchange rates. Here, "shorter term" can refer to anything from a month out to two or three years, especially for large movements in nominal exchange rates. This phenomenon can be explained by noting that nominal exchange rates are "asset prices" that are highly responsive to changes in expectations about the likely future behavior of their economic determinants. In this respect, nominal exchange rates are like common stock prices or prices of other durable assets traded on organized exchanges. In contrast, national price levels (used in computing real exchange rates) are relatively slowly moving variables that appear to respond gradually to, and rarely in anticipation of, changes in underlying economic conditions. Thus, when people become concerned about the prospect that a country's monetary policy will become more inflationary, the impact is first felt as a nominal depreciation of the foreign exchange value of its currency that induces a parallel real depreciation. Later, prices begin to catch up with the depreciation of the nominal exchange rate and the real exchange rate starts to rise. The reverse occurs when people come to expect that monetary policy will be less inflationary than they previously thought. The nominal exchange rate appreciates, perhaps in conjunction with a continuing relatively high domestic inflation rate, and this induces a parallel upward movement in the real exchange rate. Later, as domestic inflation slows against a relatively constant nominal exchange rate, the real exchange rate tends to decline.

I believe that these considerations are important in explaining the remarkable real appreciation of the dollar from its very low level in 1978-80 to its very high recent levels. In 1977-78, as concerns increased about the prospects for a more highly inflationary monetary policy in the United States, the dollar depreciated sharply in nominal terms against other major currencies, especially the Deutsche mark, the Japanese yen, and the Swiss franc. With more slowly moving relative price levels, this sharp nominal depreciation

⁹ A fixed exchange rate regime in the 1920s and 1930s may be different from a floating exchange rate regime in the 1970s and 1980s. In Krugman's analytical model, however, there is no reason why the nominal exchange rate regime or the time period should make an important difference.

translated into a **sharp** real depreciation.¹⁰ The support measures announced by the Carter administration in early November 1978 helped the dollar to recover modestly in both nominal and real terms. But, renewed concerns about the inflationary bias of U.S. monetary policy, especially in the summer of 1979 and the summer of 1980, kept the dollar depressed in both nominal and real terms. The shift to a much tighter monetary policy that began in late 1980 stimulated a considerable rise in the nominal foreign exchange value of the dollar." Continued high domestic inflation in the first half of 1981 contributed to the rise in the real foreign exchange value of the dollar. Further strengthening of the nominal exchange rate, arguably due to increasingly persuasive evidence that the Federal Reserve was serious about its anti-inflation policy, induced further strengthening of the real exchange rate in 1982.

The strengthening of the real value of the dollar since 1982 has also been closely related to further strengthening of the dollar's nominal exchange value. This further strengthening is more difficult to explain in terms of changes in the actual or perceived monetary policy of the Federal Reserve. The objective here, however, is not to attempt to provide a complete explanation of all major movements in the real value of the dollar. (We know that such explanations are exceedingly difficult, if not impossible, for major movements in virtually all asset prices; a point convincingly made in Richard Levich's paper.) Instead, the objective is to emphasize that monetary factors should be allowed a considerable role in explaining intermediate-term movements in real exchange rates, and to reinforce the earlier point that an important part of the real appreciation of the dollar since 1980 is plausibly attributable to a correction of overdepreciation in 1978-80 rather than wholly attributable to excessive over appreciation since 1980.

Fiscal deficits and the dollar

Another factor widely touted as a cause of the strong real appreciation of the dollar since 1980 is the growth of the federal fiscal deficit. Indeed, in this

¹⁰ Throughout the floating rate period, relative national price levels (measured by consumer price indices or national product deflators) have shown much smaller quarter-to-quarter changes than have nominal exchange rates. When there is a large movement in a nominal exchange rate, therefore, this is almost always reflected in a parallel movement of the real exchange rate between two countries.

¹¹ There is some ambiguity about when the move to a tighter monetary policy began, depending on the indicator of monetary policy. Measured by growth rates of monetary aggregates, monetary policy **appears** loose in early 1981. But this is probably because of an endogenous response of monetary aggregates to **strong** growth of the economy. Measured by real or nominal interest rates, there is little doubt that monetary policy began to tighten in late 1980, remained quite tight through mid-1982, and (**perhaps** until recently) has been **significantly** tighter than it was during the 1970s.

conference, William **Branson** attributes virtually all of the rise in the real value of the dollar since early or mid-1981 to the prospective and actual growth of the federal fiscal deficit which he argues became predictable with the proposal and passage of President Reagan's tax reduction program in 1981. Specifically with respect to the cause of the dollar's rise, **Branson** states, "...to this writer the conclusion is clear: the shift in the budget did it!" **Krugman** does not state such a strong position on the growth of the deficit as the cause of the dollar's rise, but he does argue that announcement of "...a joint program of fiscal reform-contraction in the United States, expansion in Japan, Germany, and the United Kingdom — would almost surely lead to an immediate sharp decline in the dollar."

I am somewhat skeptical both about the growth of the deficit as the dominant cause of the dollar's rise and about the effects of an agreement for substantial deficit reduction in inducing a sharp decline of the dollar. Rather, I share somewhat in the view that Otmar **Emminger** expressed in his luncheon address that there was something a little strange about the dollar's ability to rise in the face of budget deficits when such deficits appear often to weaken the currencies of other countries. I also share Richard Cooper's view that "...positive action [to reduce] the budget deficit might lead to a strengthening of the dollar in the short run, as foreign confidence in the U.S. ability to manage its affairs increases. . . ."

In assessing the effect of the deficit on the value of the dollar, it is relevant to consider episodes other than the recent strong real appreciation of the dollar. The last time the United States ran a fiscal surplus was in 1969, thanks partly to the tax surcharge in effect that year. In 1969, of course, we were still operating under the Bretton Woods system of fixed exchange rates. But this should make little difference to **Branson's** or **Krugman's** analysis since their models are exclusively "real" models that ought to be invariant to the nominal exchange rate regime. If fiscal deficits cause currencies to be strong, then fiscal surpluses ought to cause currencies to be weak. Hence, 1969 should have been a year of weakness for the dollar. However, the official settlements balance, which measures the strength of a currency under a fixed exchange rate regime, showed an unusual surplus for the United States in 1969, indicating a strong rather than a weak dollar.

Another example of a similar sort from the floating rate period is the behavior of Sterling in 1975-76, a period when I was in England on the staff of the International Monetary Research Programme. This was a period in which the value of Sterling sank in both nominal and real terms, with **Williamson's** composite index of real effective exchange rate of Sterling reaching its all-time **minimum** (at least up to 1983) during the fourth quarter of 1976. This, however, was not a period in which the government of the United Kingdom was running unprecedented fiscal surpluses. Indeed, the public sector **borrowing** requirement was probably at a postwar high relative

to gross national product.

These examples clearly do not establish that fiscal deficits are generally correlated with weak currencies. Nor are they meant to suggest that recent fiscal deficit in the United States has played no role (under the circumstances) in strengthening the dollar. There are examples where large fiscal deficits have been associated with strong currencies, especially when governments use extensive foreign borrowing to finance official **intervention** in support of an overvalued currency. Official intervention clearly played no role in the recent strengthening of the dollar. However, it is arguable that the combination of a relatively loose fiscal policy (actual and prospective) and a relatively tight monetary policy did help to drive up interest rates or hold them higher than they would otherwise have been, and that the high level of U.S. interest rates helped attract an inflow of foreign capital that contributed to the strength of the dollar. It is also likely that the tax cut stimulated U.S. economic growth (through both supply side and demand side effects), thereby contributing to growth of demand for U.S. money, and also made the United States more attractive to investors throughout the world. These likely or possible effects of U.S. fiscal policy in contributing to the recent strength of the dollar, however, should not be exaggerated to the point where the fiscal deficit is seen as the dominant cause of real dollar appreciation since 1980.

Other causes of current account deterioration

In Krugman's theoretical model, the current account balance (exclusive of net interest payments) is uniquely and proportionately related to the deviation of the real exchange rate from its equilibrium value.¹² Efforts to estimate such a simple empirical relationship between the current account balance and the real exchange rate have not proved remarkably successful. Normally, to obtain a stable statistical relationship it is necessary to include lagged values of dependent and independent variables and to take account of other factors influencing the current account balance. Even then, a substantial fraction of movements in the current account remains unexplained. Thus, it is fair to conclude that a variety of factors other than the real exchange rate must be influencing the current account. In particular, Henry **Wallich** has suggested that about two-thirds of the U.S. current account deficit is to be explained by the strong dollar and the remaining one-third by

¹² In principle, it would be possible in Krugman's model to allow for variations in the parameter E that measures the real exchange rate at which the current account balance exclusive of net interest payments is in equilibrium. Krugman's theoretical analysis, however, makes no allowance for changes in E .

other factors. It is reasonable to ask whether these other factors that have contributed to the current account deficit might reverse themselves, thereby reducing the extent of real depreciation of the dollar necessary to reach a sustainable level of the current account balance.

One factor that has almost surely contributed to the deterioration of the U.S. current account is the relatively strong economic recovery in the United States, in comparison with economic recoveries in our major industrial trading partners. This is true both of the recovery from the world recession of 1974-75 and the world recession of 1980-82. In comparison with the growth performance of the United States relative to other industrial countries earlier in the postwar period, in the past decade our relative growth rate has increased by about 50 percent. This is apparent in the fact that most Western European countries and Canada now have unemployment rates around ten percent, (versus a U.S. unemployment rate of seven percent), while earlier in the postwar period most Western European countries had unemployment rates two or three percent below the U.S. unemployment rate (with Canada running about the same unemployment rate as the United States.)¹³ Stronger real growth in the United States means that at a given real exchange rate our demand for foreign products tends to grow more rapidly than foreign demand for our products, thereby contributing to deterioration of the current account. If one takes the optimistic view that over the next five years or so our major industrial trading partners will resolve some of the problems responsible for their relatively poor recent growth performances, then there is reason to hope that the current account deficit of the United States will decline (but probably not disappear), even without a major real depreciation of the dollar.

Another factor that has contributed to the deterioration of the U.S. current account is sharp recessions in many developing countries that were important customers for U.S. products and efforts of many of these countries to reduce their own trade deficits in order to limit their external borrowing. Economic recoveries in some of these countries, the success of some of these countries in dealing with their debt problems, and the easing of these problems due to the decline in world interest rates may allow some expansion of their demand for U.S. exports. Significant assistance for the U.S. current account from this quarter, however, is probably a few years off. It will require reconstruction of a world financial system that allows developing countries to borrow funds needed to finance worthwhile investment projects in excess of what can be financed out of domestic savings.

¹³ Real growth in Japan has proceeded more rapidly than in the United States, but the excess of Japan's real growth rate over that of the United States has fallen substantially from what it was prior to 1973.

A third factor contributing to the deterioration of the U.S. current account has probably been the growth of the federal fiscal deficit and the rapid growth of investment during the current recovery. Our current account deficit is the excess of our spending over our income. When investment spending grows very rapid as it has during the current recovery, and this is not offset by a growth of domestic saving, the current account deteriorates. Similarly, if the government increases its spending relative to its revenue, and this is not offset by an increase in private saving, the current account deteriorates. In either case, this deterioration can occur with little or no change in the real exchange rate. In the future, if the pace of investment spending recedes to more normal levels and if efforts to reduce the federal fiscal deficit are at least partially successful, this should improve the current account balance, even at a constant level of the real exchange rate.

The sustainable level of the current account deficit

If the United States could not attract foreign funds with which to finance the current account deficit, then the real foreign exchange value of the dollar would probably need to decline and other adjustments would need to be made that would achieve a zero current account balance, or even a current account surplus. There are reasons to believe, however, that a substantial deficit in the U.S. current account balance may be a natural equilibrium phenomenon for some years to come. If so, then the normal equilibrium value of the dollar consistent with equilibrium in the U.S. current account should be higher than it would be if a zero current account balance represented the normal equilibrium.

One reason why a deficit in the U.S. current account might be a natural equilibrium is measurement error. As current account balances are measured and reported, the world as a whole now runs a substantial current account deficit. This indicates that for the world as a whole, the procedures used to measure current account balances have a bias in the direction of showing deficits. If a proportionate share of this bias applies to the United States, then a current account deficit of as much as one-half of one percent of **GNP** (about \$20 billion) might be accounted for simply by measurement error.

Perhaps more important, demographic factors imply that for the next 15 years or so, the natural equilibrium may be one in which there is an excess of savings over investment in other industrial countries which helps to finance an excess of investment over saving in the United States. In most Western European countries and Japan, population is growing very slowly if at all, and there is very little immigration. In contrast, in the United States, population is growing through natural increase, and there is very substantial **immigration**. Hence, less needs to be invested in Western Europe and Japan than

in the United States in order to equip new members of the labor force with the same amounts of physical capital as used by existing workers. Less also needs to be invested in human capital in Western Europe and Japan than needs to be invested in human capital in the United States. Demographic factors also influence desired savings rates. In Western Europe and Japan, the average age of the population is rising more rapidly than in the United States. Hence, in these other countries there will be in the future relatively fewer younger workers to pay the social security taxes and make other contributions that **are** needed to support older retired workers. It therefore makes sense for these countries to have relatively high savings rates now in order to acquire assets that will fund retirements in the future. If profitable domestic investment opportunities **are** growing relatively slowly in these countries because of demographic factors, then it makes sense to channel part of current savings into acquisitions of foreign assets. The reverse proposition presumably applies in the United States with its more rapidly growing population.

Of course, developing countries with expanding populations and good prospects for future economic growth would also be natural repositories for the surplus savings of Western Europe and Japan. The world debt crisis, however, has impaired the operation of the system that channels funds from countries with excess desired savings to countries with excess desired investment. It will probably be some time before many developing countries can resume net real borrowing on a substantial scale. Indeed, for this to happen it may well be necessary to restructure the system in ways that give both greater assurance to creditors that they will be repaid in a timely manner and greater assurance to borrowers that they will not be caught in a sudden credit squeeze. Pending these developments, the United States may well remain the repository of choice for a **significant** fraction of the excess desired savings of other industrial countries.

It is difficult to quantify the level of the U.S. current account deficit that might be sustained by the equilibrium desired excess of savings over investment in other industrial countries and desired excess of investment over savings in the United States. If we suppose that the excess of the savings rate over the investment rate in other industrial countries is equal to one percent of their GNP, and if we assume that half of this excess savings will be directed toward the United States, then given the relative economic size of the United States, **we should** have an equilibrium current account deficit of roughly one percent of our GNP. The actual deficit or surplus, of course, should fluctuate from year to year depending on economic conditions; but for the next 15 years or so it should fluctuate around an equilibrium level in which there is a current account deficit of perhaps one percent of GNP. As **explained** earlier, this implies that the average real foreign exchange value of the dollar should be somewhat higher than if the current account balance

fluctuated around an equilibrium level of zero.

The foreign debt capacity of the United States

Krugman is concerned that under the projections of his model, the foreign debt of the United States will rise to a level (relative to GNP) at which either we will be unwilling to sacrifice the consumption necessary to pay the interest on this debt or foreigners will become so concerned with the possibility of default or so saturated with claims on the United States that they will refuse to expand their lending. In my view, these concerns are exaggerated, even if we believe that the required steady state ratio of foreign debt to GNP is on the order of 50 percent. Moreover, as will be indicated shortly, there is substantial reason to suspect that the steady state foreign debt ratio may be well below 50 percent.

In a steady state equilibrium when foreign debt is expanding in real terms at the same rate as real **GNP** (and hence the ratio of foreign debt to GNP, D in **Krugman's** formal model, is constant), the amount of debt service we need to pay to foreigners, as a fraction of our GNP, is equal to the excess of the real rate of interest on our foreign debt, r , over the real rate of growth of the U.S. economy, g . **Krugman** assumes that $r-g$ equals five percent per year.¹⁴ With an assumed real growth rate $g =$ three percent per year (just about the postwar average real growth rate for the United States), this means that the assumed real interest rate on our foreign debt is eight percent per year.

Admittedly, real interest rates have been high in the United States since 1981, but eight percent per year is an excessively high estimate of the real interest rate we should expect to pay on our foreign indebtedness in the long run. In their study of yields on stocks, bonds and bills for the 50 years from 1926 to 1976, Ibbotson and Sinquefeld (1977) found that the real yield on U.S. Treasury bills was zero, the real yield on long-term U.S. government bonds was one percent per year, the real yield on long-term corporate bonds was 1.7 percent per year, and the real yield on common stocks was 6.7 percent per year. Much foreign investment on U.S. assets takes the form of foreign holdings of U.S. government obligations, including large amounts of shorter term government bills, notes, and bonds. Foreigners also hold

¹⁴ There is a possible problem with **Krugman's** own analysis on this point. **Krugman** assumes that when the steady state is reached the real interest rate differential between the United States and the rest of the world, $r-r^*$, falls from 2.4 percent per year to zero. (Or, if he does not make this assumption, then the ratio of foreign debt to U.S. GNP declines and ultimately the United States ends up owning the whole world.) If the gap between r and r^* is eliminated wholly or partly by a decline in r , then **Krugman's** conclusions need to be modified to take account of this. In my view, it is unrealistic to assume that the general level of real interest rates around the world will stabilize at 8 percent per year.

deposits in U.S. banks, corporate stocks and bonds, and direct claims on physical assets located in the United States. All together, I believe that five percent per year is a reasonable (perhaps upward biased) estimate of the long-run real yield on foreign investment in the United States and hence of the long-run real interest rate we must pay on our foreign indebtedness.¹⁵ In this regard, it is interesting to note that five percent per year is the real rate of return that the Board of Trustees of the University of Chicago decided to use, after careful study, in calculating the income earned from the University's endowment which is invested in a diversified portfolio of stocks, bonds, and other assets.

Use of a five percent real **interest** rate rather than an eight percent **real** interest rate has a dramatic effect on the estimated reduction in U.S. consumption that is necessary to **sustain** any substantial level of foreign indebtedness relative to **GNP**. Specifically, rounding off **Krugman's** estimate of a 45.7 percent steady state ratio of foreign debt to U.S. **GNP** at an even 50 percent, U.S. **real** consumption must be reduced by 2.5 percent of **GNP** to keep the foreign debt ratio constant when $r = \text{eight percent}$ and $r-g = \text{five percent}$. In contrast, when $r = \text{five percent}$ and $r-g = \text{two percent}$, the reduction in U.S. consumption required to sustain the ratio of foreign indebtedness is only one percent of U.S. **GNP**. Of course, one percent of U.S. **GNP** is a substantial sum (about \$40 billion in 1985), but it is equal to only one-third of a year's normal real growth.

If foreign debt of the United States rose to 45 percent or 50 percent of our **GNP**, we would be relatively as large a foreign debtor as Brazil, but on a much larger absolute scale. **Krugman** suggests that we might then be subject to a foreign debt crisis similar to those recently experienced by Brazil and other developing countries. I believe this unlikely, even if our ratio of foreign debt to **GNP** grew to be quite large. Brazil's foreign debt is primarily government debt and is mostly denominated in foreign currencies, especially the U.S. dollar. Actual and prospective foreign claims on the United States are more broadly diversified across types of asset and are either dollar denominated or are direct claims on specific U.S. assets. In comparison with Brazil and other large debtor countries, the United States has had a long history of political, economic, and financial stability that should instill confidence in both domestic and foreign holders of U.S. assets. The fiscal deficit of the U.S. government that has received much attention over the past two years pales in comparison with the fiscal problems of Brazil and other large debtor countries. Canada, which has a somewhat larger fiscal deficit

¹⁵ As Roger Brinner pointed out in the conference session, the United States typically earns a higher real rate of return on its holdings of foreign assets (which include many *d i t* investments) than foreigners earn on their holdings of U.S. assets (which are dominated by lower yielding bills, bonds, and bank deposits). If this situation continues, then estimates of significantly less than five percent per year for r and considerably less than two percent per year for $r-g$ would be justified.

than the United States (relative to GNP) but is in other ways similar to the United States, has long maintained a ratio of foreign debt to GNP of around 25 percent to 33 percent. Canadians have occasionally expressed some concern about the extent of foreign investment and its concentration in particular industries. However, there is no indication of imminent revolt by Canada's foreign creditors.

Finally, in assessing the foreign debt capacity of the United States, it is relevant to compare foreign debt with U.S. wealth. Using a five percent real interest rate, the capitalized value of the U.S. economy which sustains current consumption (including consumption of public services) of over \$3 trillion and has an expected real growth rate of three percent per year should be in excess of \$100 trillion. Thus, a foreign debt of \$1 trillion or \$2 trillion, which seems like and is a large absolute amount, is still a relatively small fraction of U.S. wealth.

Steady state equilibrium of foreign debt and the dollar

Within Krugman's analytical framework, many of the points that have been discussed so far imply significant modifications in Krugman's conclusions concerning the steady state equilibrium level of U.S. foreign indebtedness (relative to GNP), the time it takes to reach this steady state equilibrium, and the extent of the decline in the real foreign exchange value of the dollar along the path to this equilibrium. Before describing these modifications, however, it is necessary to evaluate Krugman's assumption that the real interest rate in the United States, r , will exceed the real interest rate in our major trading partners, r^* , by a constant 2.4 percent per year until a steady state equilibrium is achieved, and then $r - r^*$ will be zero.

It is arguable that $r - r^*$ is currently greater than 2.4 percent per year. The assumption of a larger constant differential between r and r^* would imply a more rapid convergence to steady state equilibrium, a smaller steady state ratio of foreign debt to U.S. GNP, and a smaller decline in the real foreign exchange value of the dollar. However, I do not believe that a constant real interest rate differential of 2.4 percent or larger for a period of 20 years is a reasonable assumption. Whatever the current real interest rate differential is, it is reasonable to expect that this differential will decline over a period of 20 years. Krugman's model could be modified to incorporate a declining real interest rate differential, but this would require redoing Krugman's mathematics and explaining the results. Instead, I shall simply reduce Krugman's estimate of the difference between r and r^* from 2.4 percent per year to 1.5 percent per year and, like Krugman, I shall assume that this differential is constant until steady state equilibrium is achieved and then disappears.

With this assumption in mind, consider the following modification of

Krugman's assumptions about parameter values which are broadly justified by the preceding discussion. Suppose that one-third of the increase in the real foreign exchange value of the dollar since 1980 represents a return to equilibrium and that two-thirds of this rise (rather than Krugman's assumption of the whole rise) represents a movement about the value of the dollar that would balance the **current** account exclusive of interest payments on foreign debt and of receipts of interest on foreign investments. (Formally this means that E-E is assumed to equal **0.22** rather than **0.33**.) Following Henry Wallich's estimate, suppose that two-thirds of the present deficit in the current account (which Krugman assumes to equal **3.3** percent of GNP) is attributable to the overly strong dollar and that the remaining one-third of the current account deficit is attributable to temporary disturbances that will rapidly abate. (Together, these assumptions allow us to preserve Krugman's assumption that the parameter γ in his model has a value of $\gamma = 0.1$.) In line with previous discussion, assume that $r-g$ is equal to two percent per year (rather than Krugman's estimate of five percent per year), and assume that $r-r^*$ remains constant at **1.5** percent per year until the steady state is reached. Applying these assumptions about parameter values to Krugman's formulas yields the following conclusions. It takes 17.4 years to reach steady state equilibrium, rather than Krugman's result of **23.3** years. The steady state ratio of foreign debt to GNP is **20.0** percent, rather than Krugman's result of 45.7 percent. The decline in the real foreign exchange value of the dollar along the path of convergence to the steady state is **26** percent (measured as a logarithmic change), rather than Krugman's implied result of a **56** percent real decline in the real value of the dollar.¹⁶

Obviously, it is possible to push these results in either direction with suitable and not unreasonable modifications in the assumed values of the parameters. Krugman's assumptions indicate how the results for the time to reach the steady state, the steady state ratio of foreign debt to GNP, and the extent of decline in the real foreign exchange value of the dollar can be made larger, more dramatic, and more disturbing. To make the results smaller, suppose that half of the real rise in the dollar was a movement toward equilibrium (so E-E is assumed to equal 0.165), suppose that half of the present deficit in the current account is attributable to temporary disturbances that will rapidly abate, suppose that $r-g$ equals one percent per year, and suppose that $r-r^*$ averages two percent per year for the next nine years. Under these assumptions, the time to reach the steady state declines to **8.6** years; the steady state ratio of foreign debt to GNP is a modest 7.2 percent; and the real

¹⁶ In calculating these results and the results discussed in the next paragraph, I employed Krugman's assumption that the United States has zero net foreign debt. I also ignored the effect of the temporary factors contributing to the present deficit in the current account on the steady state level of the ratio of foreign debt to GNP.

value of the dollar falls by 17.2 percent.

Within Krugman's **analytical** framework, it is difficult to find reasonable assumptions about the **parameter** values which imply that the real foreign exchange value of the dollar rises along the path to steady state equilibrium. To induce this result it is necessary to go outside of Krugman's framework and assume something like a strong exogenous shift of world demand toward U.S. products or a substantial and prolonged increase in the rate of productivity growth in the tradeable goods sector of the United States relative to our major trading partners. An increase in productivity growth in tradeable goods in the United States would allow the real foreign exchange value of the dollar measured using general consumer price indices to remain high or even rise while the real foreign value of the dollar measured using unit labor costs for tradeable goods is declining and thereby improving the competitive position of U.S. industries exposed to international competition. This is essentially what has happened in Japan in the postwar period. The real value of the yen measured using consumer prices has been on an upward trend for 30 years, but Japanese industries have remained competitive in international markets because of high productivity gains.

I would regard either a massive shift of world demand toward U.S. products or a substantial and prolonged increase in the relative rate of productivity growth in U.S. tradeable goods industries as "unforeseen events" that would push the dollar above its otherwise expected path of gradual real decline. Of course, "unforeseen events" happen all the time. In my view, they are the reason why exchange rates fluctuate so much and why most of the fluctuations are random and unpredictable. However, while we may all be confident that there will be many surprises that will push the dollar away from its presently expected path, it is hazardous to forecast exactly what these surprises will be or in what direction they will happen to push the dollar.

Conclusion

No useful purpose is served by attempting to summarize what has been said in these already overly long remarks. There **are**, however, four general points that do deserve emphasis.

First, there is reason to believe that the **real** foreign exchange value of the dollar is above the level consistent with a sustainable current account position in the intermediate or longer run. Correspondingly, there is reason to expect that the real foreign exchange value of the dollar will decline, probably along an erratic path. Of course, there is no absolute guarantee that this will happen. Unforeseen events could push the dollar even higher than it is now. But, it is a better than even bet that the real foreign exchange value of the dollar will be lower five years from now or ten years from now than it is

today.

Second, the extent of the required decline in the dollar and the amount of foreign debt we *are* likely to accumulate on the path to a sustainable equilibrium *are* difficult to estimate with a high degree of precision. Expected real declines in the value of the dollar of as little as 15 percent or as much as 50 percent cannot be excluded as completely unreasonable. Foreign debt accumulation from five percent of GNP to 50 percent of GNP also *are* within the bounds of reasonable error. Accordingly, we should not be complacent that the problem of the overvalued dollar is trivial and easily self-correcting. Nor should we despair that we are necessarily on the turnpike to disaster.

Third, there is no firm basis for Krugman's confident assertion that the dollar is irrationally overvalued and supported by some form of speculative bubble that should be expected to burst at some unspecified time in the future. Even the results of Krugman's model with Krugman's assumptions about parameter values do not demonstrate an unsustainable path for the dollar under the hypothesis of rational asset valuation. With what I regard as more reasonable assumptions about parameter values, the case is even less convincing.

Finally, I wish to register a general criticism of undisciplined theories of irrational behavior of exchange rates. By "undisciplined theories," I mean theories that allow exchange rates to be influenced by "speculative bubbles" that appear and disappear, and expand and contract, without any well-defined limitations on their behavior. Such theories are unscientific in the sense that they are incapable of being falsified by evidence. If, for example, the dollar is now within the range that such a theory regards as "rational," then the market is temporarily rational. If the dollar is above the rational range by, say, 20 percent, then it must be supported by some form of speculative bubble that presumably will collapse (though not necessarily all at once) at some unspecified **future** date. Suppose that it does drop by 20 percent over the next three years. Would not it be claimed that the theory of irrational overvaluation had been validated? The market had finally, if perhaps only temporarily, come to its senses. Suppose instead that the dollar does not fall, or even strengthens, over the next three years. Would not this be interpreted as a yet further indication of irrational overvaluation that will need to be corrected some date further in the **future**? If so, then we have a theory that can rationalize virtually everything and is capable of being contradicted by virtually nothing. Without more specific content that somehow limits the range of potential outcomes, such a theory must be rejected." It must be

¹⁷ The "theory" that exchange rates are rationally determined asset prices is also without empirical content until something more explicit is said about what rational evaluation implies. Empirical content can also be introduced into models that allow for some specific forms of speculative bubbles. See, in particular, Flood and Garber (1979 and 1980) and Okina (1984 and 1985).

rejected not because it is wrong, but because it is incapable of being wrong.

Appendix

The purpose of this appendix is to point out a technical difficulty in Krugman's formal model of the dynamic interactions among the logarithm of the real exchange rate, E , the net stock of foreign debt relative to GNP, D , the real interest rate differential, $r-r^*$, and the current account deficit relative to GNP, $B + rD = \gamma(E-E) + rD$ with $\gamma > 0$. The key dynamic equations of this model are given by

$$(1) \dot{E} = -(r-r^*)$$

$$(2) \dot{D} = \gamma(E-\bar{E}) + (r-g)D$$

where $r-g$ is the excess of the domestic real interest rate over the real growth rate of GNP and a "dot" superscript indicates differentiation with respect to time.

The problem is that this model does not generally have a stable steady state position; one needs to be imposed by assuming fortuitous behavior of the exogenous variables, in particular the real interest rate differential. To illustrate this problem, consider the parameter values and initial conditions assumed by Krugman; namely, $\gamma = 0.1$, $r-r^* = 0.024$, $r-g = 0.05$, $D(0) = 0$, and $E(0)-\bar{E} = 0.33$. Under these assumptions, D rises to a peak of 0.457 when $t = 23.3$. Subsequently, if $r-r^*$ remains at 0.024 and the other parameters remain unchanged, the current account balance moves into surplus because E continues to decline. As E declines further and further, the current account surplus grows larger and larger. Hence, after reaching its peak, D starts to decline at an ever accelerating rate. Ultimately D tends toward minus infinity which means that the United States ends up owning the world. To stop this from happening and impose a steady state, Krugman must assume that $r-r^*$ falls to zero at precisely the moment ($t = 23.3$) when $D = 0$. For other assumptions about parameter values and initial conditions, it is also possible to impose a steady state, provided that there is a time when $D = 0$ and provided that $r-r^*$ falls to zero at this time. The time at which $r-r^*$ must fall to zero in order to establish a steady state, however, changes with changes in the assumed parameter values and initial conditions.

To deal with this problem in a theoretically more satisfactory manner, it would be desirable to **endogenize** the determination of the real interest rate differential and **make** other modifications of Krugman's model that would ensure the existence of a steady state position, at least for a range of values of the parameters of the model. In such a model, it would also be desirable to incorporate relevant monetary elements, including sluggishness in the

adjustment of nominal prices, that might have an important influence on the dynamic behavior of real interest rates and the real exchange rate. A model that incorporates many of these **features** is described in Mussa (1984).

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