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The Pitfalls of Exchange Rate Targeting: A Case Study from the United Kingdom

"My advice has been for Britain to retain its system of flexible exchange rates and to stay out of the present arrangements of the ERM.... It would not be in Britain's or, I believe, Europe's interest to join the present half-baked system."

Alan A. Walters

SINCE THE BREAKDOWN of the Bretton Woods System of fixed exchange rates in the early 1970s, the search for a new monetary order has continued. In theory, the system that was adopted nearly 20 years ago seems ideal: it allowed exchange rates to float freely and each country to pursue an independent domestic monetary policy while the exchange rate compensated for differences in economic conditions across countries. The actual behavior of nominal exchange rates during this floating period, however, has been extremely volatile in the short run; moreover, over longer periods, prolonged swings in real exchange rates have occurred, which appear hard to explain in terms of economic fundamentals.[1]

Although, in one sense, this volatility is *prima facie* evidence that the major currencies *have* floated freely, the desirable characteristics of floating exchange rates have been offset, in the minds of many observers, by substantial disruptions in trade flows that such currency fluctuations are thought to have caused. In the United States, for example, the strong appreciation of the dollar in the early 1980s and the large, per-

[1]Typically, factors such as relative rates of economic performance, foreign-domestic interest rate differentials, relative inflation rates and changes in a nation's trade deficit or surplus come under the umbrella of economic "fundamentals," linked by economic theory to exchange rate movements. See Coughlin and Koedijk (1990) for a review of movements in the real exchange rates of the major currencies and tests of alternative approaches to explain them.

sistent U.S. current account deficit that developed during the same period are often cited as the adverse consequences of unbridled free-floating exchange rates.[2] At less aggregated levels, the loss of jobs and market share by firms in the automobile and steel industries are viewed by some observers as a consequence of freely floating exchange rates.

In this article, we discuss the benefits of using monetary policy to peg the value of the exchange rate at some desired level and analyze the mechanics and likely effects of resorting to exchange rate targeting as an approach to conducting monetary policy. We first outline a simple model of exchange rate determination and use this framework to argue that exchange rate pegging could produce desirable monetary policy actions only when the real economy is stable. This proposition is illustrated with a case study of exchange rate pegging in the United Kingdom and the economic consequences associated with this policy.

SOME FUNDAMENTAL EXCHANGE RATE DISTINCTIONS

Before discussing the mechanics of exchange rate determination, one must understand the difference between real and nominal exchange rates. Such an understanding will explain why pegging the value of the exchange rate is attractive to some policymakers.

The nominal exchange rate is the relative price of one currency in terms of another. For example, if it takes two dollars to buy one British pound, the exchange rate could be quoted as \$2.0/£; alternatively, it could be quoted as 0.5£/\$. Many newspapers quote the exchange rate both ways.

The nominal exchange rate tells us nothing, however, about the "purchasing power" of one currency vis-a-vis another. The real exchange rate is useful for this purpose; it is obtained by multiplying the nominal exchange rate by the ratio of the domestic and foreign price levels. The real exchange rate (RER) can be written as $RER = E\left(\frac{P}{P^*}\right)$, where E is the nominal exchange rate expressed as units of foreign currency per domestic currency unit, P is the domestic price level and P* is the foreign price level. Unlike the nominal exchange rate, the real exchange rate is not observed in financial markets; instead, it must be approximated by a calculation similar to this.[3]

Distinguishing between real and nominal exchange rates would be pointless if the nominal exchange rate and the prices of goods and services in different countries all responded to a common influence at the same rate and by the correct magnitudes so that no relative prices were changed, even in the short run. As a general rule, however, nominal exchange rates adjust more quickly than prices to actual or expected changes in economic variables.[4] Because E adjusts more quickly than does $\left(\frac{P}{P^*}\right)$ to economic factors, the real exchange rate will mimic, at least temporarily, movements in the nominal exchange rate. These differences in the speed of price adjustments are important because, until both the nominal exchange rate and prices adjust fully to a change in another variable, a nation's pattern of trade and trade balance may be disrupted.

Consider, for example, some good news about the U.S. economy that leads to a 10 percent appreciation of the dollar but no immediate response in either U.S. or foreign prices. This event causes a 10 percent appreciation of the real exchange rate. This change immediately makes foreign goods 10 percent less expensive to U.S. citizens and U.S. goods 10 percent more expensive to foreigners. Eventually, the increased demand for foreign goods and reduced demand for U.S. goods (through a variety of mechanisms) will result in higher prices of foreign goods and lower prices of U.S. goods; in the interim, however, foreign exports to the United States will rise and U.S. exports to the rest of the world will decline. Thus, while U.S. consumers will enjoy a temporary boost in their purchasing power, some U.S. firms will be harmed tem-

[2]See, for example, Destler and Henning (1989).

[3]Among the problems in making this calculation are the choice of a conceptual measure for P and the potential measurement errors associated with this choice. The CPI, PPI and indexes of unit labor costs have been used to calculate real exchange rates, sometimes with significantly different results. See Batten and Belongia (1987) for a discussion of factors that may affect the measurement of the real exchange rate.

[4]Contracts, both for goods prices and wages, often are cited as a reason for sluggish price level adjustments.

porarily by a decline in their domestic and export sales. After domestic and foreign goods prices adjust fully to the news that caused the dollar appreciation, the real exchange rate will have returned to its original level and neither U.S. consumers nor U.S. exporters will be better or worse off.

The Exchange Rate as a Policy Target

Typically, policymakers have made the nominal exchange rate a primary target for policy actions when real exchange rate changes were judged to have had significantly adverse effects on their country's domestic and export sales. Economists have investigated the exchange rate-export relationship from two perspectives: (1) How much does a change in the *level* of the real exchange rate affect trade and (2) How much does exchange rate *variability* affect trade? The responsiveness of export sales to changes in the level of the real exchange rate has been estimated for a variety of commodities; in general, economists have found significant effects.

From the policy standpoint, however, moving the real exchange rate to a new level has not been a frequent topic of policy discussions.[5] Instead, the issue has been one of stabilizing the nominal value of the exchange rate and, specifically of reducing the adverse trade effects of exchange rate variability associated with a free-floating exchange rate system. Indeed, the European Monetary System (EMS), a cooperative agreement among members of the European Community, was created in 1978 to reduce exchange rate volatility because it was widely felt that intra-European Community trade was being impeded by the costs of this volatility. It has never been clear, however, what those costs are.[6] Moreover, arguments that volatile exchange rates impede trade because of the "increased uncertainty" they generate have found weak or no empirical support.[7] Finally, even economic theory does not demonstrate that reducing exchange rate variability will contribute to improved economic performance.[8] Whether a real exchange rate that is too high or too volatile really produces short-run damage to the export sector, the presumption that such damage does occur is the main reason behind efforts to peg the value of the nominal exchange rate.

A SIMPLE MODEL OF THE EXCHANGE RATE

Any discussion of the implications of attempting to peg the value of exchange rate must begin with a simple notion of why exchange rates change in the first place—that is, with a model of the factors that influence the exchange rate. Suppose that there are two countries: the home country and the rest of the world, whose economic variables are denoted by an *. The nominal exchange rate between these two currencies can be written as (all variables, except interest rates, are in logarithms):[9]

$$(1)\quad e = (m^* - m) - h(i^* - i) - k(y^* - y) + s$$

where:

- e = the nominal exchange rate in units of foreign currency per unit of domestic currency;
- m = nominal money supply;
- i = nominal interest rate;
- y = real GNP;
- k = the income elasticity of real money demand;
- h = the interest semi-elasticity of real money balances;[10]
- s = a "shift" factor that reflects the impact on the exchange rate of all factors other than those shown.

[5]While the September 1985 Plaza Accord may seem to be one exception to this discussion, subsequent meetings to that agreement have tended to focus on *stabilizing* the exchange rate around some target value.

[6]See Ungerer, et al. (1986), pp. 17-18, for a discussion of the ambiguity associated with arguments of how exchange rate variability might affect trade.

[7]For a review of the evidence, see Farrell et al. (1983) who conclude that, generally, the relationship is not supported by the empirical evidence. DeGrauwe (1988), however, finds some evidence suggesting a negative association.

[8]See Meltzer (1990) for a review of the alternative arguments.

[9]This exchange rate model, based on the standard monetary approach to the balance of payments, is taken from Dornbusch (1980). The model assumes that "uncovered interest parity" holds, which means that, at every point in time, the interest rate differential (i*-i) is equal to the expected change in the exchange rate. Thus, any shock that affects the expected path of the exchange rate will be reflected in the interest differential.

[10]An elasticity, such as k or h, represents the percentage change in one variable (e) in response to a 1 percent change in some other variable [(i*-i) or (y*-y)]; h is a semi-elasticity because the interest rate terms are not expressed in logarithms.

The equation states that a country's currency will depreciate (e will decline) if domestic money growth accelerates, domestic nominal interest rates decline, or domestic real economic growth slows relative to changes in the same variables in the foreign country; moreover, there also are exogenous shocks that can adversely affect the exchange rate independent of the three influences just described. In this model, policymakers can affect the nominal exchange rate either through monetary policy, which affects m, or through policies that affect domestic interest rates or output; their influence on e, of course, depends on relative changes in these variables. The shift factor, s, presumably is beyond the ability of policymakers to control.

Equation 1 can be modified to express the real exchange rate as follows:

$$(2)\ rer = (m^* - m) - h(i^* - i) - k(y^* - y) - (p^* - p) + s,$$

where p^* and p are the logarithms of the foreign and domestic price levels, respectively. Thus, equations 1 and 2 show that the nominal and real exchange rates are affected by essentially the same variables. And, empirical work shows that the nominal and real exchange rates typically move together in the short run, suggesting that aggregate price levels and their differential adjust more slowly than the other factors discussed above.[11]

Policy Levers and the Exchange Rate

A comparison between equations 1 and 2 highlights a key conclusion for any policymaker concerned with exchange rate targets. While changes in domestic monetary policy that affect m relative to m^* could move the nominal exchange rate in equation 1 permanently to a new level, monetary policy can change the *real* exchange rate only if the nominal exchange rate and aggregate price level differential adjust at different speeds. Even in this case, the change in the *real* exchange rate will be only temporary. In equation 2, for example, an increase in the domestic money supply (m) reduces rer while an increase in the domestic price level (p) increases it. If one believes that changes in the domestic price level ultimately are proportional to changes in the domestic money supply—a standard interpretation of the quantity theory of money—equation 2 shows that these effects will offset each other, at least in the long run; thus, the real exchange rate, but not the nominal rate, will return to its former level. Indeed, this "netting out" effect could occur even in the short run if people anticipated the monetary policy change and responded to it by quickly raising prices. The conclusion from equation 2, then, is that monetary policy actions have no permanent effects on the real exchange rate; any effect is strictly temporary.

Given equations 1 and 2, we can now consider two possible "sources" of exchange rate changes. Broadly speaking, the two sources are nominal factors that originate from a change in the money supply and real factors that originate outside of the monetary sector of the economy. What difference does the source of the change in the exchange rate make?

Suppose that the source of the exchange rate movement is a nominal one—that the domestic money stock is growing rapidly relative to that in the foreign country. By itself, this would produce some domestic inflation and a continuing fall in the currency's nominal value. If the monetary authority were pegging the nominal value of the exchange rate, however, it would be forced to buy back the "excess" money with foreign reserves or otherwise tighten monetary policy. As long as the foreign money supply growth were unchanged, pegging the exchange rate would have had the beneficial effect of forcing the monetary authority to slow money growth and domestic inflation.

In contrast, suppose some supply-side improvement boosts domestic real GNP, causing the nominal exchange rate to rise. The effect on the real exchange rate depends on how much the effect of a lower domestic price level (or slower inflation rate) offsets the effect of the higher real income level (or growth rate). If the monetary authority resists this rise in the nominal exchange rate, however, the result will be faster money growth and a higher unnecessary inflation.

The problem for policymakers is that only the nominal exchange rate can be observed in world financial markets and, as such, exchange rate targets also are expressed in nominal terms. For

[11]See, for example, Mussa (1986).

a variety of reasons, however, policymakers have trouble distinguishing whether changes in the nominal exchange rate are due to nominal or real sources. Moreover, they are generally ignorant as well as to whether these changes are permanent or temporary.

An early example of the problem associated with this confusion was experienced by the United Kingdom in 1977. The United Kingdom had recently started producing oil and was beginning the transition from net importer to substantial exporter of oil. Both a nominal and real appreciation of the currency would be expected under the circumstances. The monetary authorities, however, initially resisted the nominal appreciation by selling pounds and buying massive amounts of foreign currencies.[12] This strategy was later abandoned because of its unacceptable implications for domestic inflation.[13] We now turn to a more recent episode of attempted exchange rate pegging, which followed the same pattern as the earlier episode.

A CASE STUDY OF THE UNITED KINGDOM SINCE 1987

In figure 1, the daily DM/£ exchange rate is plotted over the most recent three-year period. Overall, there are four striking aspects of these data: a large appreciation of pound against DM in February 1987, an extremely stable rate at close to DM 3.0/£ between February 1987 and March 1988, another large appreciation of the pound in March 1988 and a general and sharp depreciation of the pound throughout 1989. Each of these episodes is discussed briefly below.

The appreciation of the pound from DM 2.747/£ on February 3, 1987, to DM 2.95/£ by March 18 is associated with the Louvre Accord. This agreement pledged cooperative monetary policies among the G-7 countries to strengthen what was then a weakening value of the dollar. This agreement presumably implied relatively restrictive monetary policy in the United States and relatively expansionary monetary policies among the other G-7 members. In theory, there is no reason for the pound to appreciate against the DM if both the United Kingdom and West Germany are intervening similarly to support the value of a third currency (the dollar). Pepper (1990) has argued, however, that Nigel Lawson, then Chancellor of the Exchequer, used the Louvre Accord as an opportunity to introduce a nominal exchange rate target of DM 3.0/£.[14]

Although data on intervention in specific currencies are not available, the actual pattern of net foreign exchange reserves at the Bank of England, shown in table 1, is broadly consistent with Pepper's view. The one-year interval of a nearly stable DM 3.0/£ exchange rate is associated with frequent, and often massive, foreign exchange interventions. Instead of steady interventions in one direction, as one would expect from an effort to support the value of the dollar, the amount of intervention varies widely across months; it even switches direction, with reductions in foreign exchange reserves in some months.

The data in figure 1 confirm this view as well. They show that, while the DM/£ exchange rate was flat over the period, the pound appreciated steadily and substantially against the dollar—rising from $1.52 on February 3, 1987, to $1.90 by January 1988. Thus, the evidence in both the table and figure is consistent with the view that the Bank of England varied the amount of intervention to keep the DM/£ rate near a rate of DM 3.0/£ while paying less attention to the movement in the $/£ rate.

Although the United Kingdom apparently directed its monetary policy to achieve an exchange rate target of 3.0DM per pound throughout most of 1987, it is unclear why this objective was chosen. In view of the earlier discussion, countries direct monetary policy to exchange rate objectives when exports are weak and unemployment in export industries is rising. In the United Kingdom, however, exports were strong at the time this policy strategy was adopted and, overall, the United Kingdom economy was performing quite well: inflation had declined substantially, real growth was strong and the government was running an increasing budget surplus.

[12]U.K. foreign exchange reserves rose from SDR2.3 billion in 1976 to SDR16.1 billion in 1977, a seven-fold increase.

[13]See Chrystal (1984) for a thorough discussion of this episode.

[14]In the United Kingdom, the Chancellor of the Exchequer has ultimate responsibility for monetary policy. The Bank of England is under the Chancellor's direct control.

Figure 1
The DM/Pound and $/Pound Exchange Rate

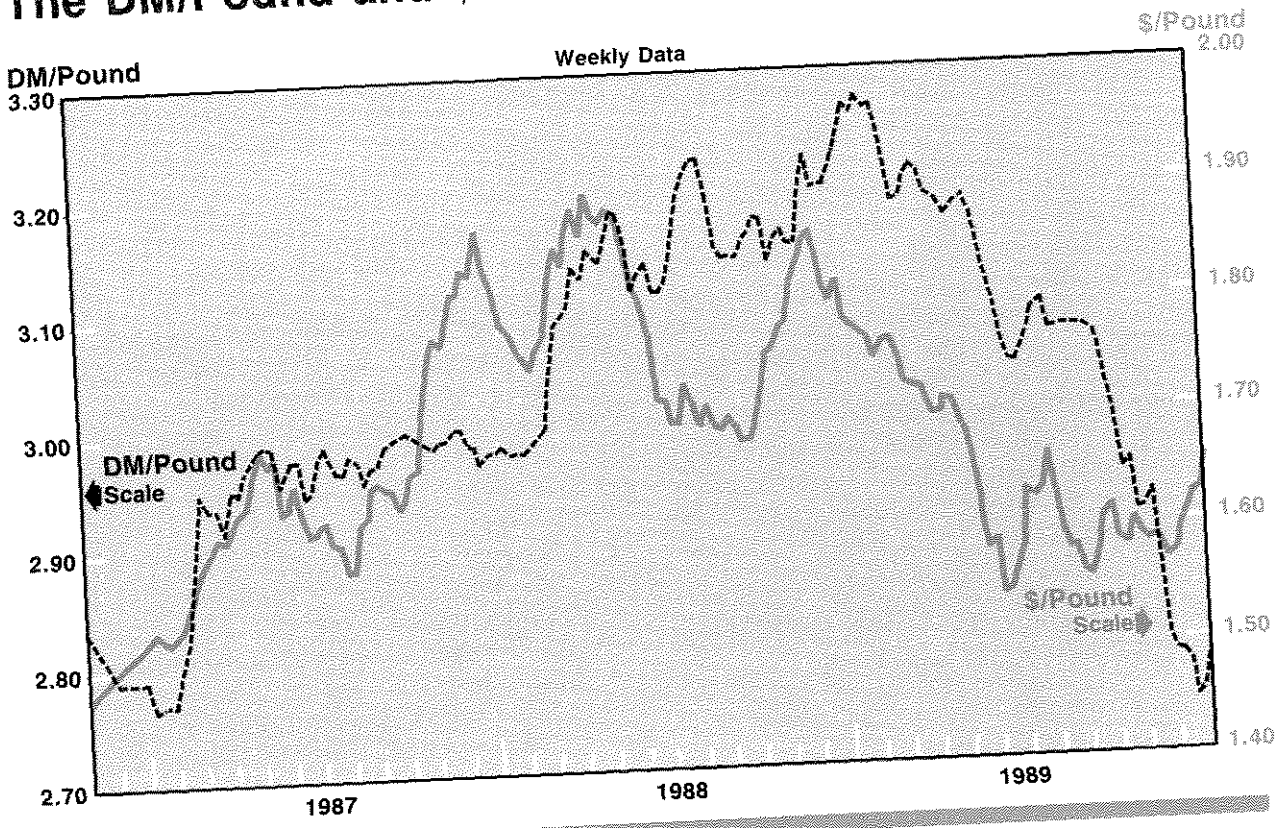


Table 1
Changes in U.K. Foreign Exchange Reserves (millions of dollars)

February 1987	$ 287
March	1,785
April	2,912
May	4,760
June	−230
July	499
August	−457
September	380
October	6,699
November	31
December	3,737
January 1988	38
February	−25
March	2,225
April	514
May	814

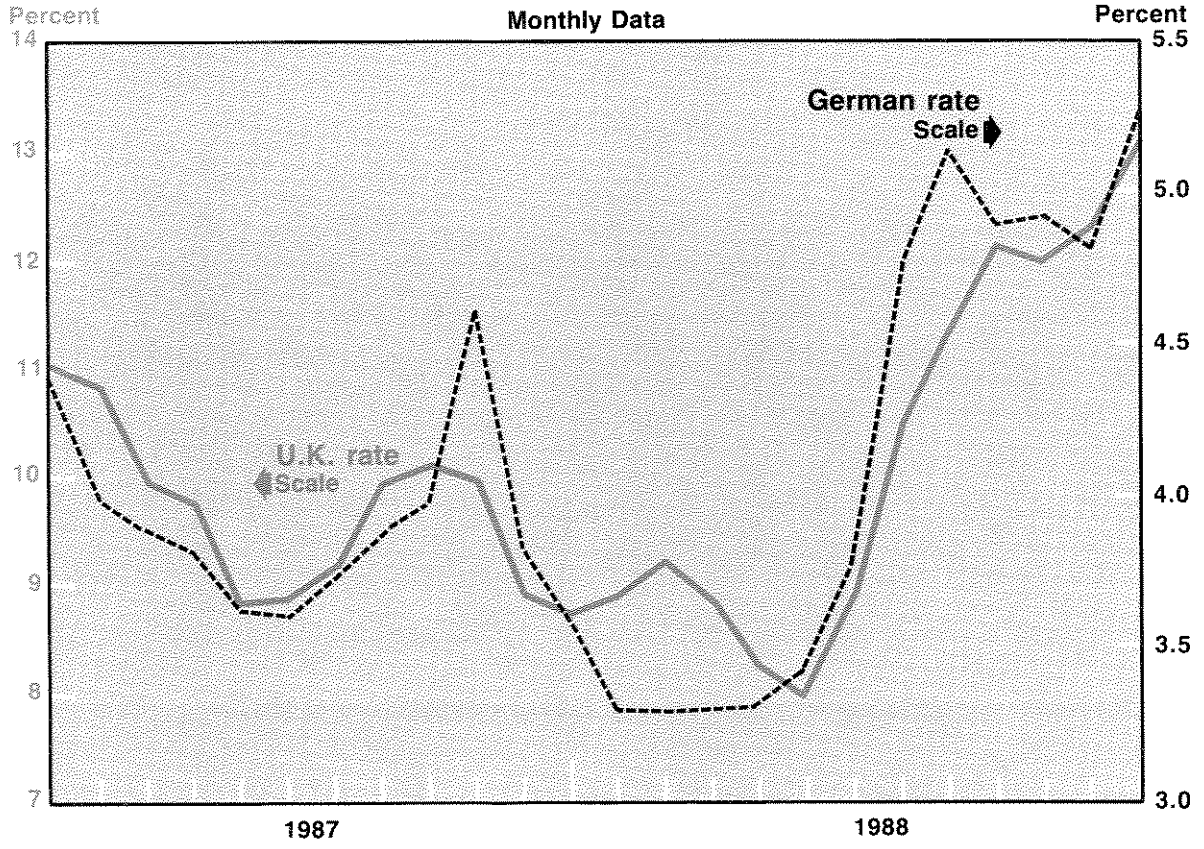
SOURCE: Datastream

Why, then, peg the pound to the DM? To condense a long and complicated series of events leading up to this decision, the monetary aggregates in the United Kingdom—as in other industrialized countries—began to behave in the 1980s in ways that were perceived to be erratic.[15] In particular, the traditional linkages between monetary actions and changes in either output or inflation appeared to weaken or evaporate. Thus, if the monetary aggregates could not be relied upon for guidance in conducting monetary policy, becoming a "shadow" member of the EMS's Exchange Rate Mechanism (ERM) and pegging the pound to the DM might have been viewed as a plausible alternative for monetary targeting.[16] Indeed, one advantage of

[15]This shift in the behavior of the U.K. monetary aggregates was exacerbated by the abolition, in June 1980, of a quantitative control on bank liabilities (known as the corset) and other regulatory changes.

[16]Much of this discussion is drawn from Pepper (1990). Although circumstantial evidence seems to support this view, to our knowledge, no official statements exist that explicitly establish a DM 3.0/£ exchange rate target.

Figure 2
Three-Month Eurocurrency Rates for Germany and the United Kingdom

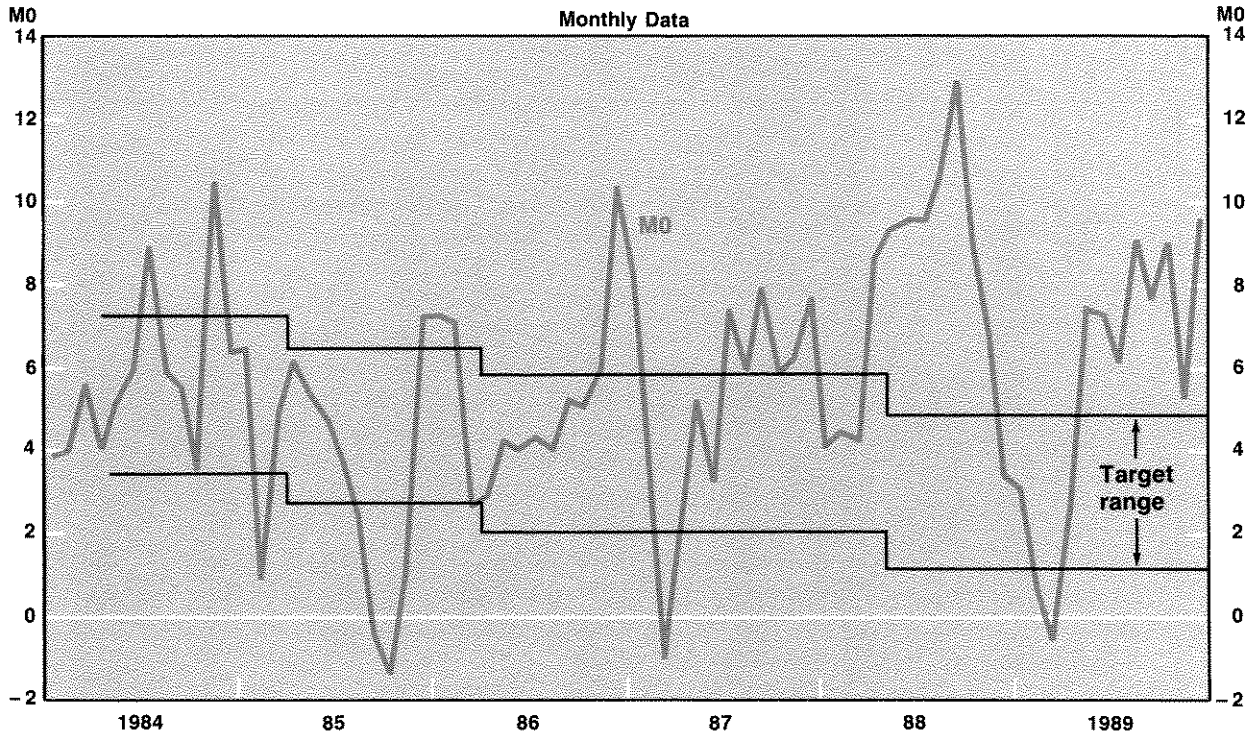


the EMS from the perspective of its high inflation members is that low and stable inflation in Germany will discipline their internal policies—especially monetary policy—if their currencies are tied to the DM. As we shall see, however, it is not enough just to peg your currency to the DM; you must peg it at the correct rate as well.

Early in 1988, the pound again began to appreciate strongly, both in real and nominal terms, because of a widening U.K.-German interest rate differential on one hand and several well-publicized events that presaged stronger U.K. real growth on the other hand. As figure 2 shows, the U.K.-German interest differential widened considerably between December 1987 and February 1988. On the real side, the end of a ban on overtime work by miners on March 7, the announcement of a large oil discovery on March 8 and a large tax-reducing budget on March 16 are consistent with reductions in the values of either the $(i^* - i)$ and $(y^* - y)$ terms in equation 1 and, therefore, appreciations of the pound. Each of these events would tend to raise both the real rate of return on physical assets and real output for the United Kingdom in equation 1 so that (if there were no immediate change in U.K. price levels) the real interest rate and real output differentials would decline and the pound would appreciate.

What could be done about this rise in the exchange rate? From a theoretical standpoint, the term $(m^* - m)$ is an obvious policy lever in equation 1. And, because the money stock can be controlled by the central bank, this is an effective lever with which to achieve a reduction in its currency's nominal value, should that be the desired policy result. What is required is a faster growth rate of its money stock relative to the money growth in the nation against which the exchange rate has appreciated.

Figure 3
Three-Month Moving Average of U.K. M0 Growth



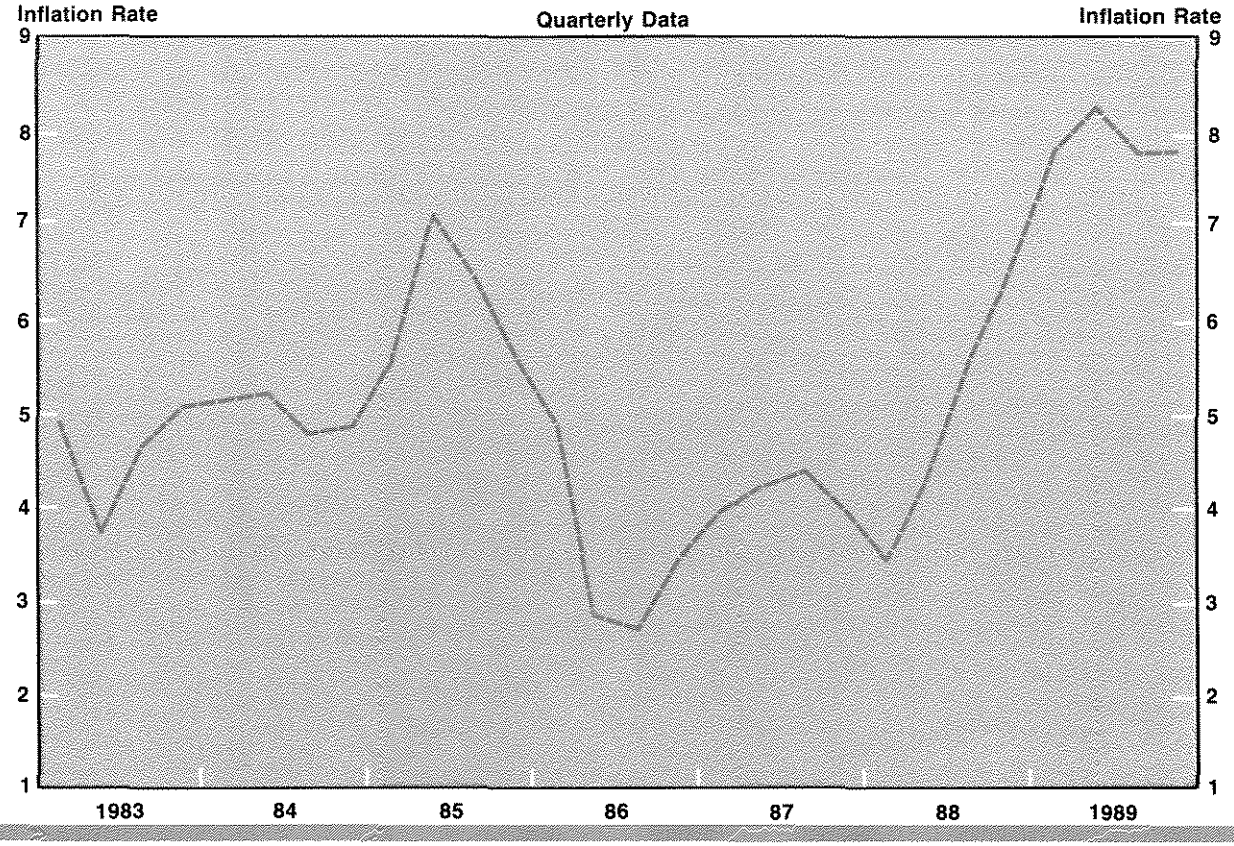
How does this relate to the recent U.K. experience? Figure 3 plots the growth rate of M0 (the U.K. monetary base), the monetary variable targeted by the Bank of England in the late 1980s, and the target ranges that the Bank had established for its policy objective. As the figure shows, while the target range for M0 was being adjusted downward, actual M0 growth was increasing on average.[17] Moreover, a sharp increase in M0 growth occurred early in 1988, when the pound appreciated substantially above the level of 3.0 DM that had prevailed for about a year.

Figure 4 depicts the inevitable consequences of this action. As growth in M0 expanded, the U.K. inflation rate, with a lag, also accelerated. Recalling from equation 2 that faster money growth in the United Kingdom will be associated with a decline in the (nominal) DM/£ exchange rate, the data in figures 1-3 show that the point at which the pound began to decline in value coincides closely with the time at which U.K. money growth began to increase and U.K. interest rates fell. Thus, while expansionary monetary actions by the Bank of England resulted in a reduction in the DM/£ nominal ex-

[17]The effects of this monetary expansion were reinforced by four incremental reductions of 0.5 percentage points each in the U.K. base lending rate between March 9 and May 11. Thus, while expansionary U.K. monetary policy was helping to reduce the pound's value by decreasing the value of the (m^*-m) term in equation 2, further downward pressure on the pound was coming from a widening of the (i^*-i) term in equation 2. This sharp decline in U.K. interest rates and its impact on the German-U.K. interest differential during the March-May interval also are shown clearly in figure 2. The base rate, set by the Bank of England, was reduced from 11 percent to 9 percent. See Pepper (1990).

Another factor in these U.K. interest rate movements is the "excess credibility" problem. The idea is that, under normal circumstances, an investment abroad carries the risk of an adverse exchange rate movement in addition to all of the usual risks. When a country is believed to be pegging its exchange rate, however, the exchange rate risk is reduced and, for a given foreign-domestic interest differential, additional capital will flow into the country that is pegging. Thus, once investors perceived and believed in a continuation of the U.K.'s attempt to peg the pound, financial capital flowed into the United Kingdom and tended to reduce U.K. interest rates.

Figure 4
Four-Quarter Moving Average of U.K. Inflation Rate



change rate, that effort also increased the U.K. inflation rate from 4.1 percent in 1987 to 7.8 percent in 1989 and 9.7 percent as of May 1990.[18]

The final episode, the sharp decline in the pound during 1989, reflects the increase in the U.K. inflation rate, relative to the German inflation rate, that was produced by the excessive U.K. monetary expansion. U.K. inflation, as measured by the CPI, had averaged near 4 percent between 1985-87. With the monetary expansion of 1987-88 the inflation rate accelerated to a peak of 12 percent in January 1989 and stood at 9.7 percent as of May 1990. German inflation, on the other hand, has remained relatively constant, near an average of 4 percent. As equations 1 and 2 indicate, domestic monetary expansion and the associated inflation will reduce a currency's nominal value with no long-run effect on its real value.

This result has led some observers to note the irony of how an attempt to peg the exchange rate to a low-inflation country (Germany) can result in higher domestic inflation. The problem with this reasoning, of course, is not the act of pegging itself but, rather, selecting the wrong value for the exchange rate target. If, for example, the United Kingdom had chosen to pursue an exchange rate objective of, say, DM 3.3/£, the real appreciation of the pound might have been accommodated without resorting to an offsetting domestic monetary expansion. But, by establishing the target at a level too low for the fundamental economic differences that then prevailed between the United Kingdom and Germany, the monetary expansion and subsequent inflation were necessary results of maintaining a DM 3.0 objective. Unfortunately, this type of error is clear only in hindsight. The fundamental problem for policymakers is how to deter-

[18]See Pepper (1990) for more detail on this episode.

mine the "correct" value for the exchange rate target in advance.

CONCLUSIONS

Volatile movements in both exchange rates and trade flows in the 1980s have prompted many calls for nations to join cooperative agreements that would peg bilateral nominal exchange rates at some target level. As this paper points out, however, nominal exchange rates may change because of changes in underlying real economic conditions. To maintain target values for nominal exchange rates, domestic monetary policy must pursue either an expansionary course that ultimately will produce only an increase in the domestic inflation rate or a contractionary stance that will exacerbate an underlying economic downturn. Moreover, whatever effects these monetary actions have on the nominal exchange rate, they will have only transitory effects on trade or other real magnitudes; monetary actions will have no permanent effect on the fundamental real causes of the exchange rate change.

In the European context there are two important lessons for designing steps toward Economic and Monetary Union (EMU). The first lesson is that a system of mutuallly pegged currencies, such as the current ERM, has obvious dangers. Structural changes in one or another of the member countries may cause unnecessary inflation or deflation if real exchange rate adjustments are resisted. The second lesson is that, if a common currency were to be established, obstacles to real market adjustments must be eliminated.

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