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# FRBSF WEEKLY LETTER

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## International Spillovers

U.S. monetary and fiscal policies have spillover effects on foreign economies. How foreign policy makers respond to these spillovers depends to a large extent on business cycles abroad. For example, when U.S. economic policies have stimulative effects on foreign economies, foreign policy makers are likely to seek to counteract the stimulus if inflation abroad is a problem and to welcome the transmitted stimulus if sluggish growth is the concern.

This *Letter* discusses the foreign spillover effects of U.S. policies and examines the historical responses of foreign policymakers. Business cycle conditions abroad appear to have shaped the responses of foreign policymakers to changes in U.S. interest rates and the value of the dollar.

### Transmission of U.S. policy

Whether U.S. economic policies have an expansionary or a contractionary effect on foreign economies depends on the nature of the policy being pursued in the U.S. For example, consider the effects of an expansionary U.S. fiscal policy. Simple economic theory suggests that such a policy has a clear stimulatory effect abroad. By raising U.S. aggregate demand, interest rates, and the value of the dollar, U.S. fiscal expansion stimulates demand for foreign imports and boosts foreign income.

The dollar's appreciation, moreover, reduces U.S. international competitiveness and works to boost demand for foreign goods. Thus in the case of U.S. fiscal stimulus, the resulting income and exchange-rate effects *both* work to boost foreign income. Indeed, most econometric models agree that a U.S. fiscal expansion is expansionary abroad.

In contrast, while tighter U.S. monetary policy also raises U.S. interest rates, its effect on output abroad is theoretically ambiguous. On the one hand, tighter monetary policy works to raise domestic interest rates and lower U.S. spending. The lower U.S. demand, by reducing import demand and improving the U.S. current account, reduces foreign output.

On the other hand, the higher interest rates also attract capital inflows which appreciate the dollar. The appreciation of the dollar, in turn, diminishes U.S. international competitiveness, weakening the demand for exports of U.S. goods and stimulating imports of foreign goods. Consequently, the exchange-rate channel helps to *stimulate* foreign output. Thus, the income and exchange-rate effects of tighter U.S. monetary policy work in *opposite* directions on foreign output.

Whether the income effect or the exchange-rate effect dominates depends on the extent to which interest rate changes affect the value of the dollar. The greater is the degree of international capital mobility, the greater will be the effects of interest rate changes on the exchange rate and the more likely is the exchange-rate effect to dominate.

Simulations of a number of econometric models, including the structural forecasting model used at the Federal Reserve Bank of San Francisco, indicate that the exchange-rate effect does in fact dominate the income effect, implying tighter U.S. monetary policy stimulates foreign output in the long run. That is, the appreciation of the dollar and corresponding depreciation of foreign currencies stimulate foreign income sufficiently to offset the negative effects of the decline in U.S. aggregate demand on imports from abroad.

In sum, rising U.S. interest rates, whether attributable to tighter monetary policy or stimulatory fiscal policy, are generally *expansionary* for foreign economies. Conversely, declining U.S. interest rates, whether from monetary policy ease or tighter fiscal policy, are on balance *contractionary* abroad.

### How will policy makers respond?

Foreign policy makers' response to U.S. policies that cause U.S. interest rates to rise likely will depend on economic conditions abroad. Clearly, when foreign policymakers are concerned with boosting output, they are more likely to be receptive to the expansionary effects on their

economies of higher U.S. interest rates and a stronger dollar. On the other hand, when they are more concerned about excessive expansion and inflation, they are more likely to pursue policies to dampen these effects.

Using this reasoning, Chart 1 categorizes the different associations between U.S. and foreign interest rate movements depending on the primary policy concern of foreign policymakers. The upper left-hand and lower right-hand boxes, the "diagonal cases," correspond to instances in which foreign policy makers are likely to try to dampen the transmitted effects of U.S. policies. By raising or lowering their interest rates in tandem with those of the United States, foreign policymakers can dampen changes in the value of the dollar and the associated spillover effects for their economies.

**Chart 1**  
**Foreign Interest Rate Movements**

When Foreign Policy Concern is with:	When U.S. Interest Rates Are:	
	Rising	Falling
Inflation	Rise	Rise
Recession	Fall	Fall

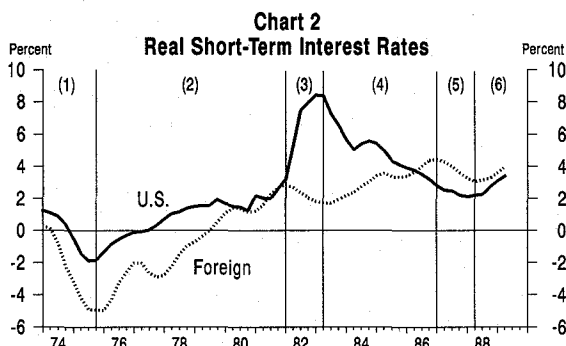
The upper left-hand box, for example, shows that when U.S. interest rates are rising and foreign policy makers are concerned about inflation, foreign interest rates should rise as well. Conversely, the lower-right hand box shows that when U.S. interest rates are falling and foreign policy makers are concerned with recession, foreign interest rates should fall.

The lower left-hand and upper right-hand boxes, the "opposing diagonal cases," correspond to instances in which foreign policymakers are likely to welcome the transmitted effects of U.S. policy and allow their interest rates to diverge from those in the U.S. By adjusting their policies so as to move their interest rates in the opposite direction from that of U.S. rates, they allow the exchange values of their currencies to appreciate if inflation is the concern or depreciate if recession is the concern abroad.

## Historical behavior of interest rates

Insight into the historical interdependence of U.S. and foreign policy actions can be gained

from a comparison of real interest rate movements, presented in Chart 2. The chart shows the four-quarter moving average level of the short-run real interest rate in the U.S. and the "rest of the world." The real interest measures were constructed by subtracting inflation rates over the previous four quarters from the nominal 3-month Treasury bill rate for the U.S. and from a weighted average of the nominal interest rates for ten major foreign countries, respectively.



The graph divides the period from 1974 Q1 to 1989 Q2 into six subperiods. Over three of these subperiods U.S. real interest rates generally have *fallen*; these are 1974–1975, 1984–1986, and 1987. During the remaining three subperiods—1976–1981, 1982–1983, and 1988–1989—U.S. rates generally have *risen*.

As an overall observation, foreign interest rates have tended to move in the same direction as U.S. interest rates, except in subperiods 3 and 4 (1982–1983 and 1984–1986). The divergence in rates during these two periods can be explained by changes in business cycle conditions abroad and foreign policy makers' concerns.

A rough measure of business cycle conditions abroad and therefore, foreign policy makers' concerns during the period from 1975 to 1988 can be obtained by examining annual inflation rates and the level of economic activity (measured by the level of "GNP gap," that is, the percentage deviation of the trend level of output from actual output) in the member countries of the OECD (Organization of Economic Cooperation and Development), excluding the U.S. This examination suggests that foreign policymakers primarily were concerned about boosting economic activity in periods 1, 3, and 5 when the output gap was relatively large. In contrast, the

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focus was on containing inflation in periods 2, 4, and 6 when the output gap was near zero or negative (that is, the level of economic activity was at or above trend).

Given this characterization of business cycle conditions abroad and foreign policy makers' concerns during each of the six subperiods depicted in Chart 2, it is clear that U.S. and foreign interest rates have moved as Chart 1 would predict. In particular, foreign interest rates have risen along with U.S. rates when output and/or inflation have been relatively high abroad (periods 2 and 6) and foreign policymakers have been concerned about controlling inflation. In these periods, they apparently preferred to dampen the stimulatory effects of U.S. rate increases and an appreciating dollar.

Likewise, foreign interest rates have fallen along with U.S. interest rates when output abroad was relatively low (period 1) and/or inflation was low (period 5). In these periods, foreign policymakers preferred to dampen the contractionary effects of declining U.S. rates and a depreciating dollar. Periods 2 and 6 correspond to the upper left-hand box, while periods 1 and 5 correspond to the lower right-hand box of Chart 1—the diagonal cases.

In contrast, during the years 1982–1983 (period 3), foreign interest rates fell in response to a rise in U.S. interest rates. Since the rest of the world was experiencing relatively low inflation, with output levels below trend, the divergence in rates is consistent with a foreign preference for the stimulus associated with rising U.S. rates and an appreciating dollar. This corresponds to the lower left-hand box in Chart 1.

During the period 1984–1986 (period 4), U.S. interest rates were falling, but the net effect of U.S. policies continued to be stimulatory abroad,

because the effects of the high dollar, which continued to appreciate into 1985, were still felt through 1986. Moreover, because the level of foreign output moved closer to trend in this period, foreign central banks chose to raise interest rates somewhat to maintain control of inflation. This corresponds to the upper right-hand box in Chart 1.

Thus over the two periods 1982–1983 and 1984–1986 foreign interest rates tended not to move very closely with U.S. rates (and in fact generally moved in the opposite direction), causing the value of the dollar to change a great deal. In these two opposing diagonal cases, as Chart 1 would predict, the desire of foreign policy makers was to allow the dollar to change and the effects of U.S. policies to spill over.

### **Implications**

Currently, inflation is the major concern of foreign economic policymakers. Projections for the OECD (excluding the U.S.) are that consumer prices will rise on average 4.5 percent in 1989, ranging from two percent in Japan and three percent in Germany to six percent in the U.K. and Italy. Foreign monetary authorities, particularly in Germany and Japan, consistently have expressed low tolerance for further inflation. In addition, output growth is now generally healthy and output levels are above trend.

The recent rise in U.S. interest rates and appreciation of the dollar has added to concerns about further inflation abroad. In light of foreign business cycle conditions, foreign policymakers are likely to continue to resist any further stimulus to their economies and raise their own interest rates to take some of the upward pressure off the dollar.

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