

In Brief

Economic Capsules

Monetary Policy and U.S. External Balances

The trend toward greater economic interdependence among nations has been accompanied by increased interest in the international repercussions of U.S. macroeconomic policies. Policymakers, economists, and businessmen now regularly assess the effect that U.S. policies are likely to have on exchange rates, foreign activity, and external trade positions, concern for these external variables has at times been an important motivation in the formulation of policy.

This *In Brief* examines the impact of monetary policy actions on the U.S. current account balance. Specifically, it analyzes how a move to tighten money and credit growth in the United States will alter the flow of trade between this country and other nations. Both historical evidence and macroeconomic model simulations are used to explore these relationships and to measure the effect of particular policy initiatives on the U.S. external position.

The findings indicate that a tightening in monetary policy unambiguously leads to a decline in the current account balance. The effects of the contraction are seen principally in the services balance, which falls sharply because of the increased net investment income paid to foreigners as interest rates rise. In contrast, the influence of monetary policy on the U.S. merchandise trade balance appears to be small and of uncertain sign over the medium term.

These results suggest that in recent years a significant change has taken place in the way that monetary policy influences the external balance. With the rapid deterioration in the U.S. net external debt position and the related increase in net foreign holdings of U.S. financial assets, the sensitivity of investment income

payments to changes in interest rates has increased. Our estimates indicate that the linkage between monetary policy actions and the investment income balance has strengthened substantially since the early 1980s and is now a powerful channel for monetary influence on the external balance. As a result of this development, monetary policy's effect on the U.S. current account is likely to be stronger and more consistent than it was in the past.

Identifying the main channels of influence

Economists generally agree on the identity of the main channels linking monetary policy to U.S. trade flows. However, these channels have offsetting effects and there is no a priori reason to believe that any particular channel dominates. Consequently, economic theory cannot predict definitively how changes in monetary policy will influence U.S. external balances.

To understand the nature of this ambiguity, consider what is thought to happen to trade flows when monetary policy is tightened. In most conventional models, which posit a well-defined relationship between U.S. interest rates, foreign interest rates, and exchange rates, a monetary contraction raises U.S. interest rates and induces an incipient capital inflow that pushes up the value of the dollar. Rising interest rates slow demand and thereby reduce income growth, causing a fall in import volumes that improves the trade balance. Most analyses suggest that this interest rate effect on income and trade will grow for one to two years and then slowly dissipate.

The appreciation of the dollar will, however, trigger other developments that over the medium term have an

offsetting effect on the trade balance. The dollar's higher value will increase the price of U.S. goods relative to those abroad. Since import and export demands respond slowly to these price movements, trade volume changes are likely to be small at the outset. Over the short run, therefore, the dollar's rise will be felt primarily in nominal trade balance improvement as the value of imports falls along with their price. Nevertheless, over a longer period that may extend well beyond two years, lower import prices will increase demand for import volumes and the higher relative price of our goods abroad will reduce export volumes. The net effect of the higher dollar over this longer horizon will be a worsening in U.S. trade in both real and nominal terms.

While these channels describe policy's impact on trade in most goods and services, monetary policy may also influence trade through the direct effect of interest rate movements on the net investment income component of the services balance.¹ U.S. financial assets and liabilities, consisting of securities holdings and bank claims, are largely denominated in dollars and are responsive to short-term interest rate movements. Consequently, our investment income payments to foreigners as well as receipts on our investments abroad will increase soon after a policy contraction causes interest rates to rise. When the U.S. net financial asset position (representing our net international investment position less direct investments) is close to balance, these changes in investment income flows are likely to lead to small changes in the services and overall trade position. But because our net financial asset position has moved increasingly into deficit since the early 1980s, reaching a level in excess of \$500 billion, changes in investment incomes are now likely to have a more substantial effect on the trade balance. As we will see, this channel has acquired new importance in transmitting the influence of policy actions to the current account balance.

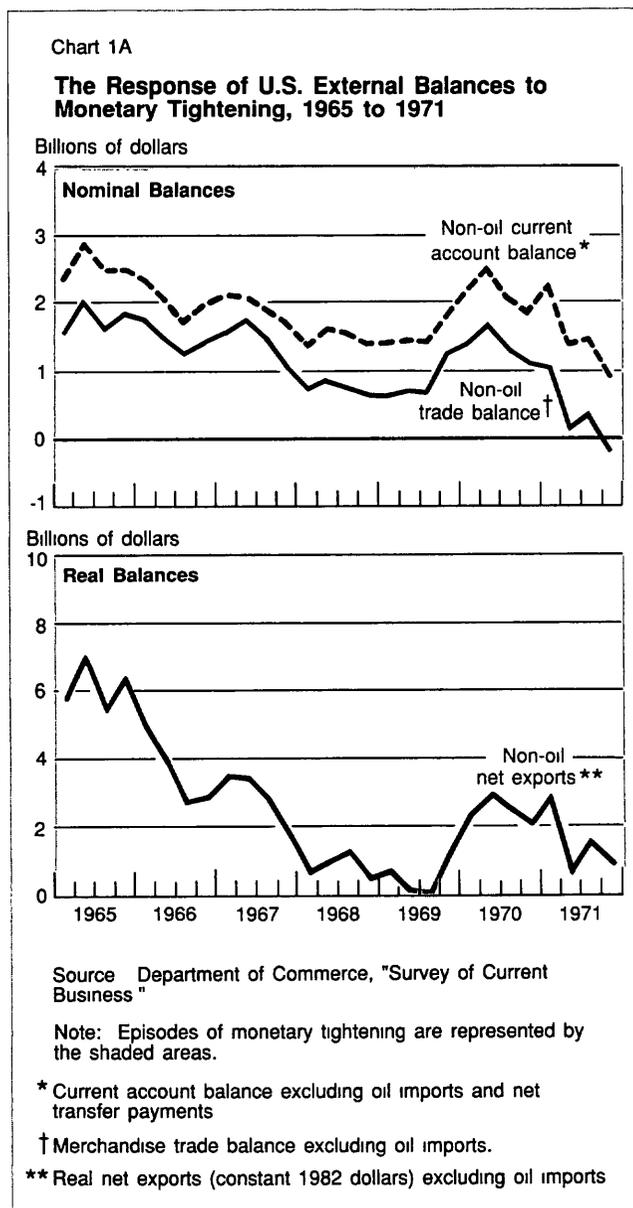
Historical evidence

Because theory cannot offer an unambiguous view of how monetary policy affects the trade balance, we now evaluate the empirical evidence on the issue. A brief review of historical relationships points to the con-

¹The investment income component of the U.S. current account balance measures payments and receipts derived from international direct investment and portfolio holdings. Although our analysis focuses on the influence of interest rate movements on investment income, other forces can alter investment income when monetary policy changes. For a discussion of the determinants of international investment income, see William Helkie and Lois Stekler, "Modeling Investment Income and Other Services in the U.S. International Transactions Accounts," Board of Governors of the Federal Reserve System, International Finance Discussion Papers, no. 319, December 1987.

clusion that monetary policy actions have not in the past had a consistent effect on U.S. external balances over the medium term.

Charts 1A and 1B reveal how different measures of the U.S. trade position responded to monetary contractions during the period 1965-83. The chart plots the U.S. current account balance, the merchandise trade balance, and real net exports—all excluding oil imports—and indicates the major episodes of monetary tightening—

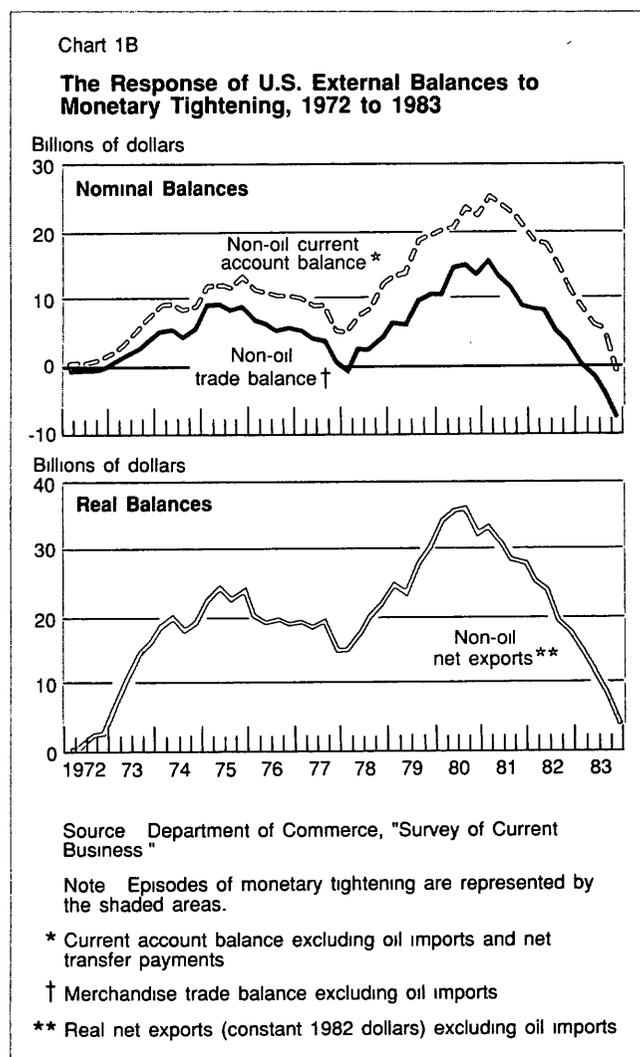


ing with shading.²

Approximately three years after an episode of tightening begins, a point in time when the first-round effects of interest rate and exchange rate changes have been largely realized, no consistent pattern of change in real or nominal trade balances is observed. Some episodes of monetary tightening (1973-74) are followed by improvement in U.S. external positions; others (1966 and 1979-81), by a deterioration in these positions.

Over a shorter horizon, external balances do seem to exhibit a consistent response to tightening. Indeed, in nearly every instance, all three external balances

²A period of monetary tightening is defined here as one in which there are persistent increases in the federal funds rate both in absolute terms and relative to long-term government bond yields



rose in the quarters immediately following a period of contraction. The generally close correlation between movements in merchandise trade and the current account further suggests that this improvement in trade, along with the subsequent tendency of this improvement to dissipate, is attributable to monetary policy's effect on the merchandise trade balance. Policy actions apparently have had only a minor effect on the U.S. services balance during this period.

It is difficult to draw firm conclusions from these historical relationships alone. Numerous factors unrelated to U.S. monetary policy actions undoubtedly have influenced external balances during these periods.³ Nonetheless, the existing body of empirical evidence corroborates these findings.⁴

Table 1 summarizes results from a study of the policy transmission mechanism in twelve large econometric models. The effects on the current account and real net exports of a simulation exercise in which monetary authorities expand the money supply by 4 percent in

³For example, the tightening of U.S. monetary policy from 1979 to 1981 was accompanied by major shifts in the stance of macroeconomic policy in a number of large industrial economies. These shifts are often cited as factors explaining the sharp subsequent decline in U.S. external balances

⁴ See, for example, Ralph C. Bryant, Dale W. Henderson, Gerald Holtham, Peter Hooper, and Steven A. Symansky, eds., *Empirical Macroeconomics for Interdependent Economies* (Washington, D.C. Brookings Institution, 1988), Ralph C. Bryant, John Helliwell, and Peter Hooper, "Domestic and Cross-Border Consequences of U.S. Macroeconomic Policies," Board of Governors of the Federal Reserve System, International Finance Discussion Papers, no. 344, March 1989, and Ralph C. Bryant, Gerald Holtham, and Peter Hooper, *External Deficits and the Dollar: The Pit and the Pendulum* (Washington, D.C. Brookings Institution, 1988)

Table 1

Medium-Term Effects of a Monetary Expansion on U.S. External Balances

(Billion Dollar Deviation from Baseline, Three Years after Initial Shock)

Model	Current Account	Real Net Exports
Median of twelve models	1.8	0.6
DRI	3.2	11.8
EEC	-2.8	-3.3
EPA	2.4	8.2
MCM	-1.9	0.0
OECD	1.8	2.3
LINK	-12.6	-2.4

Source: Data for this table are derived from Richard N. Cooper, "U.S. Macroeconomic Policy, 1986-88: Are the Models Useful?" Tables 12-4 and 12-7, in Ralph C. Bryant and others, eds., *Empirical Macroeconomics for Interdependent Economies* (Washington, D.C. Brookings Institution, 1988).

1985 are provided for the median of the entire group and for a sampling of individual models.⁵ Two points emerge from this analysis. First, there is no consensus among these models regarding the direction in which monetary policy alters trade. Of the six individual models presented in the table, three predict that the current account and real net exports will improve in response to an expansion, while three predict that these balances will fall or remain unchanged.⁶

Second, these models suggest that, on average, monetary policy actions do not have large net effects on U.S. trade. The median estimates predict changes in the current account and real net exports of less than \$2 billion over three years, and most of the individual models predict effects of less than \$3.5 billion. Considerable diversity is displayed, however, with outcomes for the current account ranging from +\$3.2 billion to -\$12.6 billion.

Monetary policy's influence on trade and the growing U.S. net debt position

To assess the influence of monetary policy on the current account in more detail, let us now turn to an analysis of simulation exercises from two large macro-

⁵For further details on this exercise and the properties of the models, see Bryant and others, *Empirical Macroeconomics for Interdependent Economies*.

⁶The disagreement among these six models is also present in the larger sample: seven models predict current account improvement while five predict a deterioration following a monetary expansion.

economic models — the Federal Reserve Board's Multi-country Model (MCM) and the Data Resources Incorporated Model (DRI).⁷

These two models are broadly similar in their view of the structure of the U.S. economy and its international linkages.⁸ However, they employ different estimates for the key parameters determining the relative sizes of the channels of transmission. As a result, in the past they have implied different patterns of transmission. MCM simulations predicted that a monetary policy contraction would yield current account improvement, while DRI simulations predicted deterioration.

In the simulation exercise considered here, authorities generate a sustained increase of 100 basis points in U.S. short-term interest rates beginning at the end of 1989.⁹ In contrast to the somewhat mixed evidence

⁷For a more detailed description of the DRI model, see Roger Brinner, "The 1985 DRI Model: An Overview," in *Data Resources Review of the U.S. Economy* (Lexington, Mass.: Data Resources-McGraw-Hill, September 1985). A detailed description of the MCM model is found in Hal Edison, Jaime Marquez, and Ralph Tryon, "The Structure and Properties of the Federal Reserve Board Multicountry Model," *Economic Modelling*, vol. 4 (April 1987). The 1983 MCM simulation results presented in this section were taken from this article. The 1990 MCM simulation results were graciously provided by William Helkie of the Federal Reserve Board.

⁸In particular, both models have basic Keynesian structures, treat expectations adaptively, and closely link exchange rates to U.S.-foreign interest differentials.

⁹More specifically, the experiment in the MCM model involves a sustained increase of 100 basis points in the U.S. three-month Treasury bill rate in the first quarter of 1990. In the DRI model the

Table 2

Transmission of a Monetary Policy Contraction

(Billion Dollar Deviation from Baseline Level Unless Otherwise Indicated)

	DRI Model†			MCM Model‡		
	Number of Quarters after Shock			Number of Quarters after Shock		
	4	8	12	4	8	12
Current account balance	-3.3	-8.7	-15.5	-3.3	-6.1	-8.6
Merchandise trade balance	1.0	-1.5	-4.5	1.0	1.3	1.4
Exports	-2.6	-10.1	-18.8	-3.9	-11.8	-19.3
Export volume	-1.5	-6.5	-11.2	-2.3	-6.6	-9.6
Imports	-3.7	-8.7	-14.3	-4.9	-13.1	-20.7
Import volume	-0.1	-0.4	-1.2	-1.3	-6.0	-9.4
Net services and transfers	-4.3	-7.2	-11.1	-4.3	-7.4	-10.0
Net investment income	-4.5	-6.6	-9.2	-4.7	-8.4	-11.3
GNP (percent deviation from baseline)	-0.3	-0.7	-1.1	-0.4	-1.0	-1.4
Domestic demand (percent deviation from baseline)	-0.2	-0.7	-1.0	-0.3	-0.9	-1.2
US long-term interest rate (percentage point deviation from baseline)	0.5	0.6	0.6	0.4	0.7	0.8
Effective exchange rate (percent deviation from baseline)	1.4	2.1	2.7	1.6	2.5	3.4

†Simulation consists of a sustained increase of 100 basis points in the U.S. federal funds rate from 1989-III onward.

‡Simulation consists of a sustained increase of 100 basis points in the U.S. three-month Treasury bill rate from 1990-I onward.

presented earlier, these simulations predict that a monetary contraction leads to a persistent worsening in the U.S. current account balance (Table 2) One year after the policy shock, the current account has fallen by \$3.3 billion in each model, and after three years, the current account balance has fallen by \$8.6 billion in the MCM simulation and more than \$15 billion in the DRI model.

The discrepancy between model simulations and historical experience is not evident in the transmission of a monetary contraction to merchandise trade. In the DRI and MCM models, the merchandise trade balance shows a modest improvement in the year after policy tightens, a pattern similar to that which actually emerged in the 1965-83 period. Moreover, at a horizon extending beyond two years, these models support the historical evidence indicating no consistent relationship between monetary policy and merchandise trade. Three years after the contraction begins, the merchandise trade balance is \$1.4 billion dollars above its baseline level in the MCM simulation, in the DRI model, the initial improvement is reversed and a decline of \$4.5 billion is predicted.

This divergence in merchandise trade balance outcomes in the DRI and MCM models is largely explained by their different predictions regarding the response of import demand. Import volumes are largely unchanged following a contraction in the DRI simulation because income and relative price effects are of roughly equal

magnitude. In contrast, the response of import volumes to falling income dominates relative price effects in the MCM model, causing a decline in import volumes that amounts to more than \$9 billion dollars over three years.¹⁰

Although monetary policy's effect on merchandise trade differs in the DRI and MCM simulations, the effect of a monetary contraction on the services balance is similar in the two models. A steady decline in services trade, amounting to roughly \$10 billion dollars over three years, can be observed in both models. This effect, which was not seen in the evidence presented earlier, is the key factor in the predicted deterioration in the U.S. current account in these simulations.

Underlying this substantial decline in the service balance is our large net financial debt position. As a result of the buildup in U.S. financial debt, which has risen from \$26 billion at the end of 1980 to more than \$530 billion at the end of 1988, the investment income component of services trade has become much more sensitive to interest rate movements. Higher interest rates are now accompanied by a large increase in net debt interest payments, reflected in the roughly \$9 billion and \$11 billion declines in net investment income in the DRI and MCM simulations, respectively.

A clear indication of how the transmission of monetary policy to the current account has been changed by the deterioration in our net foreign asset position is provided in Table 3. The table compares our 1990 simulation of monetary tightening with an identical exercise conducted for 1983, a year when the net financial position of the United States was close to balance. The simulation predicts that a monetary contraction in 1983 would reduce net investment incomes by roughly \$3 billion over three years.¹¹ Although the two models predict similar effects of monetary policy on net investment income, they disagree on how a monetary contraction alters the current account balance. This disagreement largely reflects their divergent views on the importance of income and relative price changes for other components of trade.

Since 1983, however, the predicted response of investment income to a monetary tightening has increased significantly in both these models. The effect of monetary policy on debt service payments

Footnote 9 continued

federal funds rate is increased by 100 basis points in the third quarter of 1989. Note that these simulations are not comparable to those presented in Table 1.

Table 3

The Change in Monetary Policy's Effect on Trade

(Billion Dollar Deviation from Baseline, Three Years after a Monetary Contraction)

	Simulation Beginning in 1983†		Simulation Beginning in 1990‡	
	DRI Model	MCM Model§	DRI Model	MCM Model
Current account balance	-4.3	1.0	-15.5	-8.6
Net investment income	-3.5	-2.7	-9.2	-11.3

†The effects of a sustained increase of 100 basis points in federal funds rates (for DRI simulation) or three-month Treasury bill rates (for MCM simulation) beginning in 1983-1

‡Simulation is identical to that conducted in Table 2

§Results for net investment income from 1983 MCM model simulation are derived from staff estimates based on the Federal Reserve Bank of New York services trade model

¹⁰Estimates made by Bryant and others in *External Deficits and the Dollar* suggest that the income sensitivity of non-oil import demand in the MCM model is nearly twice as great as that in the DRI model

¹¹A breakdown of the components of the current account was not available for the 1983 MCM model simulation. Thus, for this simulation, the movements in investment incomes are derived from staff estimates based on the Federal Reserve Bank of New York services trade model. Our analysis suggests that these estimates provide a good indication of how investment incomes evolve in the MCM model. Nonetheless, it must be emphasized that these results may differ somewhat from the actual simulation.

has consequently become a considerably more important channel of policy transmission, and a contraction in monetary policy now clearly worsens the U.S. current account balance in the DRI and MCM models.

The importance of the linkage between interest rates and investment incomes is further emphasized in Chart 2. The chart evaluates the effects of a monetary policy contraction in the DRI model in an environment in which foreign activity and the dollar's value remain unchanged. As might be expected, a tightening in policy can result in a sustained improvement in the merchandise trade balance when the dollar does not appreciate. Over three years, the merchandise trade balance improves by about \$2½ billion dollars. Although the increase is not large in absolute size, it does place the United States in a trade position that is more than \$6 billion better than that achieved when a tightening in policy is accompanied by dollar appreciation.

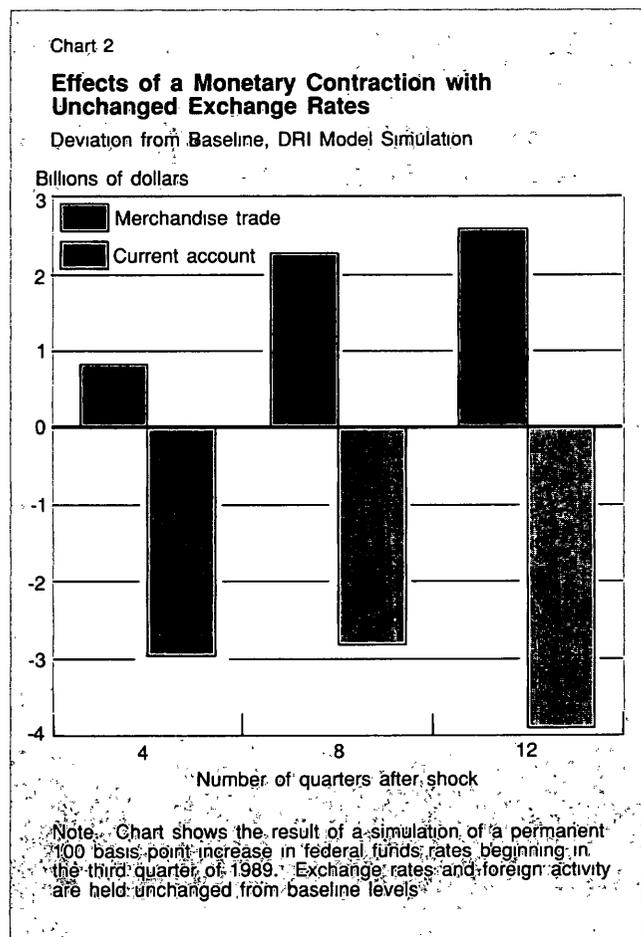
Even when a monetary policy contraction leaves the

dollar's value unchanged, we observe a deterioration in the current account amounting to about \$4 billion dollars over three years. The worsening of the current account is entirely attributable to the effects of higher interest rates on the services balance. This evidence suggests that as a result of the United States' current position as a large net debtor, the size of the direct effect of interest rates on trade through investment income may exceed the size of the traditional linkage of interest rates to trade flows through income.

Although our results indicate that monetary policy actions can now be expected to lead to a significant change in the U.S. current account balance, the model-based estimates presented here may somewhat overstate the actual effects of monetary policy on trade. These model estimates are predicated on the assumption that policymakers can alter the path of interest rates over an extended period. Authorities' control over interest rates in these models is enhanced because market expectations are modeled as adaptive—that is, they respond slowly and with a lag to changes in economic conditions. In practice, market expectations are likely to respond more strongly and immediately to a persistent change in policy, thereby placing greater offsetting pressures on interest rates than these models predict. For example, attempts by authorities to improve the current account by sustaining interest rates at low levels over an extended period will likely encourage expectations of higher inflation and activity growth as market participants become aware of the implications of the policy stance. These expectations will increase upward pressures on both nominal and real interest rates, and consequently limit policymakers' ability to affect the current account balance through monetary policy actions. Further pressures on interest rates may arise if the credibility of monetary authorities' commitment to price stability is eroded by a persistent expansionary policy stance. The perception of the increased risk of inflation and dollar depreciation that will likely accompany such a policy stance will lead market participants to demand higher real rates of return to hold U.S. assets.

Conclusion

This analysis indicates that monetary policy is likely to have a consistent and strong effect on the U.S. current account balance over the medium term. In particular, a monetary contraction can be expected to lead to a deterioration in the current account balance. The deterioration will arise from the higher investment income payments that accompany rising U.S. interest rates. In contrast, there is no clear evidence that monetary policy actions will have a consistent effect on the U.S. merchandise trade balance over the medium term.



The analysis also suggests that the linkage between interest rates and the U.S. current account has strengthened in recent years. The accumulation of U.S. net foreign debt and the greatly increased net foreign holdings of U.S. financial assets have made overall service account flows considerably more sensitive to movements in U.S. interest rates. Although the ability

of authorities to pursue specific current account targets independent of other objectives remains limited, monetary policy actions are likely to have a stronger and more consistent effect on the current account than in the past.

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